

CENTRE COUNTY NATURAL HERITAGE INVENTORY

Updated 31 December 2002

Prepared for:

**The Centre County Planning Office
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PREFACE

The Centre County Natural Heritage Inventory was initially completed in 1991. The 1991 report provided information to identify, map, and describe Centre County's most significant natural places through investigation of plant and animal species and natural communities that are unique or uncommon in the county. Areas important for wildlife habitat and scientific study were also included. This update adapts and augments Linn Stack's work in the original report to provide current information regarding the condition of the resources identified in the earlier study and incorporate new information that has become available about Centre County's natural resources. New sites have been added, the boundaries of some previously mapped sites have been edited, and one site was removed. The format has been substantially revised.

The inventory, while not bestowing protection to any of the areas listed, acts as a tool for informed and responsible decision-making. Public and private organizations may use the inventory to guide land acquisition and conservation decisions as local municipalities and the County may use it to help with comprehensive planning, zoning and the review of development proposals. Developers, utility companies and government agencies all may benefit from access to this environmental information prior to the creation of detailed development plans.

Using tested and proven methodology, the inventory operates as a report on the current status of information regarding Centre County's natural heritage. As this update has incorporated new information and added sites since the original edition in 1991, further investigations could also uncover new information about significant natural features or sites worthy of Natural Heritage Area designation. Additionally, in-depth investigations of sites listed in this report could reveal features of further or greater significance than those documented previously. Anyone wishing to visit inventory sites other than those on public lands should obtain permission from the property owner(s) prior to visitation.

The Western Pennsylvania Conservancy served as the principal investigator for the study and prepared the report and maps as the products of the study. The Western Pennsylvania Conservancy, a private, non-profit, conservation organization, protects natural lands, promotes healthy communities, and preserves Fallingwater. Questions concerning sites or updates to the inventory should be addressed to the Western Pennsylvania Conservancy, 209 Fourth Avenue, Pittsburgh, PA 15222; phone: (412) 288-2777.

The Centre County Planning Office administered this study. Requests for copies of the inventory can be addressed to the Centre County Planning Office, Willowbank Office Building, 420 Holmes Street, Bellefonte, PA 16823-1488.

ACKNOWLEDGMENTS

We would like to acknowledge the many citizens and landowners of the county and surrounding areas who volunteered information, time and effort to the inventory and granted permission to access land.

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Many others contributed to the inventory effort. Without their help the inventory would not see completion.

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TABLE OF CONTENTS

PREFACE	I
ACKNOWLEDGMENTS.....	II
EXECUTIVE SUMMARY	V
RESULTS	3
COUNTY NATURAL HERITAGE INVENTORIES.....	20
INTRODUCTION	20
NATURAL HERITAGE AREAS CLASSIFICATION.....	21
NATURAL HERITAGE INVENTORY METHODS	23
<i>Gathering Existing Information.....</i>	<i>24</i>
<i>Aerial Photo and Map Interpretation</i>	<i>24</i>
<i>Aerial Reconnaissance.....</i>	<i>25</i>
<i>Ground Survey</i>	<i>25</i>
<i>Data Analysis.....</i>	<i>25</i>
GENERAL RECOMMENDATIONS FOR THE PROTECTION OF NATURAL HERITAGE AREAS	26
<i>Natural Heritage Areas</i>	<i>26</i>
<i>Other Recommendations.....</i>	<i>27</i>
OVERVIEW OF CENTRE COUNTY NATURAL FEATURES	29
PHYSIOGRAPHY.....	29
VEGETATION.....	31
IMPORTANT BIRD AREAS OF CENTRE COUNTY	35
RESULTS BY MUNICIPALITY.....	40
INTRODUCTION	40
MOUNTAINTOP REGION	41
<i>Burnside Township.....</i>	<i>42</i>
<i>Snowshoe Township & Snowshoe Borough.....</i>	<i>52</i>
MOSHANNON VALLEY REGION.....	57
<i>Rush Township, Philipsburg Borough, & South. Philipsburg Borough.....</i>	<i>58</i>
UPPER BALD EAGLE REGION	67
<i>Huston Township</i>	<i>68</i>
<i>Taylor Township</i>	<i>72</i>
<i>Union Township & Unionville Borough.....</i>	<i>74</i>
<i>Worth Township & Port Matilda Borough.....</i>	<i>78</i>
LOWER BALD EAGLE REGION.....	81
<i>Boggs Township & Milesburg Borough</i>	<i>82</i>
<i>Curtin Township.....</i>	<i>84</i>
<i>Howard Township & Howard Borough.....</i>	<i>88</i>
<i>Liberty Township</i>	<i>90</i>
NITTANY VALLEY REGION	93
<i>Benner Township</i>	<i>94</i>

<i>Marion Township</i>	98
<i>Spring Township & Bellefonte Borough</i>	100
<i>Walker Township</i>	104
CENTRE REGION	107
<i>College Township & State College Borough</i>	108
<i>Ferguson Township</i>	116
<i>Halfmoon Township</i>	122
<i>Harris Township</i>	128
<i>Patton Township</i>	134
PENNS VALLEY REGION	139
<i>Gregg Township</i>	140
<i>Haines Township</i>	146
<i>Miles Township</i>	162
<i>Penn Township & Millheim Borough</i>	168
<i>Potter Township & Centre Hall Borough</i>	172
REFERENCES	183
GIS DATA SOURCES	186
APPENDICES	187
APPENDIX I: INVASIVE SPECIES INFORMATION SOURCES	187
APPENDIX II: PENNSYLVANIA NATURAL DIVERSITY INVENTORY (PNDI)	188
APPENDIX III: SITE SURVEY FORM	189
APPENDIX IV: CLASSIFICATION OF NATURAL COMMUNITIES IN PENNSYLVANIA	191
APPENDIX V: STATUS OF SPECIES	197
<i>a. Federal Status</i>	197
<i>b. Pennsylvania Status</i>	198
<i>c. Global and State Ranking: Global Element Ranks</i>	202
APPENDIX VI: PLANTS AND ANIMALS OF SPECIAL CONCERN IN CENTRE COUNTY	205

LIST OF TABLES

1: Natural Heritage Areas categorized by significance	4
2: Summary of Natural Heritage Areas and Managed Lands by municipality	13
3: Dedicated Areas protecting biotic resources in Centre County	18

LIST OF FIGURES

1 Biological Diversity Areas and Landscape Conservation Areas of Centre County	2
2 Centre County Planning Regions	12
3 Physiographic Provinces of Centre County	30
4 Important Bird Areas of Centre County	34

EXECUTIVE SUMMARY

INTRODUCTION

The first steps in ensuring protection of environmentally sensitive/ecologically important areas are identifying them and determining their importance. The Centre County Natural Heritage Inventory and the update to the inventory are designed to identify and map important biotic (living) and ecological resources present in Centre County. This information helps county, state, and municipal government, the public, and business interests plan development with the preservation of these environmentally important sites in mind. The biotic resources inherited by the citizens of this region include:

- Lands that support important components of Pennsylvania's native species biodiversity
- Populations of species that are facing imperilment at a state and/or global level, and their habitats.
- Natural communities (assemblages of plants and animals) that are regionally important to biodiversity because they are exceptionally undisturbed and/or unique within the state.
- Areas important for general wildlife habitat, open space, education, scientific study, and recreation.
- Areas that have been left relatively undisturbed by human activity
- Potential habitats for species of special concern

This Natural Heritage Inventory focuses on areas that are the best examples of living *ecological resources* in Centre County. Although agricultural lands and open space

may be included as part of inventory areas, the emphasis of the designation and delineation of the areas are the ecological values present. Important selection criteria for Natural Heritage Areas are the existence of habitat for plants and animals of special concern, the existence of uncommon or especially important natural communities, and the size and landscape context of a site containing good quality natural features. Large areas and areas that are minimally disturbed by development provide the backbone that links habitats and allows plants and animals to shift and move across sizable portions of the landscape. There are many important resources in Centre County not addressed in this inventory. Historic, cultural, geologic, educational, water supply, agricultural and scenic resources are among many the county will address through other projects and programs.

NATURAL HERITAGE INVENTORY METHODS

The following provides an explanation of the general procedures used for Natural Heritage Inventories, and of the procedure used for this update. The methods used in the update reflect changes in NHI methodology since the completion of the first Centre County NHI, and have also been adapted from the general procedure to include review and reconciliation of the substantial amounts of existing information provided by the first report with the new information provided by the update.

Presently, eleven County Natural Heritage Inventories (CNHI) are completed for Western Pennsylvania. The Centre County Natural Heritage Inventory followed the same

methodologies as previous inventories, which proceeded in the following stages:

- gathering existing information
- aerial photo and map interpretation
- aerial reconnaissance
- ground survey
- data analysis

Gathering Existing Information

A review of the Pennsylvania Natural Diversity Inventory (PNDI) database (see Appendix II) determined what, if any, sites for special concern species and important natural communities are known to exist in Centre County. Members of local land trusts and conservancies, environmental advisory councils, and other conservation-oriented citizens' groups were sought out and contacted, as well as other individuals that were able to contribute information to the inventory. Individuals from the state and federal agencies that steward natural resources (PA Game Commission, PA Bureau of Forestry, PA Fish and Boat Commission, PA Department of Environmental Protection, US Fish and Wildlife Service) were also contacted to obtain information about lands or resources they manage.

General information from other sources such as soil maps, geology maps, earlier field studies, and published materials on the natural history of the area helped to provide a better understanding of the characteristics of the area's natural environment.

Update methods: Current information from the PNDI database was reviewed for any information on special concern species and important natural communities that had changed or been added since the time of the original NHI study.

Aerial Photo and Map Interpretation

Aerial photographs were reviewed to identify sites with potential for ecologically interesting features that should receive additional ground surveys. Initial study of aerial photos revealed large-scale natural features (e.g., contiguous forest, wetlands, shale barrens), disturbances (e.g., utility line rights-of-way, strip mines, timbered areas) and a variety of easily interpretable features. Investigation of areas on the ground and review of the same areas on the photos helped to establish a set of "signatures" that allowed a more detailed review of areas not visited on the ground. Some sites could be eliminated from consideration if they proved to be highly disturbed or fragmented or purely attributable to human-made features (e.g., impoundments, clearings, farm fields).

Update methods: The Centre County Planning Office made available the most recent aerial photos of Centre County (2001). All sites designated during the original inventory were reviewed from these photos to determine if any large-scale alterations in their condition had taken place.

Aerial Reconnaissance

Flying over the landscape greatly helps in interpretation of features because of color and tonal differences and because of the 3-dimensional perspective gained of areas and objects that appear as 2-Dimensional on photographic sheets. Information concerning the extent, quality and context of natural communities can be gathered easily from the air. Aerial inspection can also enable us to quickly detect landscape conditions that would disqualify an area from hosting significant natural elements, which can save many hours of ground inspection, particularly when dealing with remote areas. The use of aerial reconnaissance flights and aerial photos proves

particularly important in evaluating sites for which permission to perform field surveys was not granted or was not pursued due to time constraints.

Update methods:

Aerial reconnaissance was not used extensively during the update.

Ground Survey

Areas that were identified on maps, aerial photographs and from the air as potential sites were scheduled for ground surveys. After obtaining permission from landowners, sites were examined to evaluate the condition and quality of the habitat and to classify the communities present. Field survey forms (Appendix III) were completed for each site. Boundaries for each site were mapped on USGS 1":25,000' scale topographic quadrangle maps. Site boundaries include both the key features of the site and the additional buffer areas critical to the protection of the site.

The flora, fauna, level of disturbance, approximate age of community and local threats were among the most important data recorded for each site. In some instances where permission to visit a site was denied, when enough information was available from other sources, or when time did not permit, sites were not ground surveyed.

Update methods: A limited amount of time was available for ground survey work during the update. Areas that received priority were:

- 1) Sites designated during the original study where some information was available suggesting their condition may have changed.
- 2) Sites that fell outside of the original mapped areas where new information

documented the occurrence of a special concern species or important natural community.

- 3) Areas where survey work was incomplete during the initial inventory.

Data Analysis

All information available for the various sites with features that could potentially be ecologically significant within the county was reviewed. Characteristics such as the size, condition, recoverability and rarity of the unique feature were considered in combination with the quality of the surrounding landscape context to generate a ranking of the site's importance relative to others in the county. In the cases when sites could not be compared through the detailed information that ground surveys provide, aerial photographs and existing data provided the necessary information that allowed decisions to be made concerning the site and its inclusion in the inventory.

Update methods: Data on natural communities and species of special concern obtained through fieldwork were synthesized with existing data and summarized. New sites were delineated around significant natural features documented after 1991 that did not fall within already designated areas. Boundaries for the original sites and for newly designated sites were digitized using ArcView 3.2a GIS software; base maps were georeferenced digital raster graphics of 1:24,000 scale USGS topographic quadrangles in the UTM zone 17 and zone 18 projections and the NAD 27 NADCON datum. Site boundaries were designed to delineate those areas where natural resource impacts should receive special consideration during land use planning. Because in many cases the health of the surrounding landscape is critical to the health of the resource itself, a site boundary not only includes the area

directly occupied by significant natural features, but also extends to delineate any areas in the surrounding landscape where new activities could potentially impact the natural features. County municipalities served as the organizing unit for the data with maps of each municipality provided. Municipalities were subsequently grouped by planning region (as shown on page 12, figure 2).

NATURAL HERITAGE AREA CLASSIFICATION

The following classification provides definitions and examples of the two types of Natural Heritage Areas, as well as two other designations from other sources that are included in the report due to their ecological significance.

NATURAL HERITAGE AREAS

BIOLOGICAL DIVERSITY AREA (BDA)

An area containing plants or animals of special concern at either state or federal levels, exemplary natural communities, or exceptional native diversity. BDAs include both the immediate habitat and surrounding lands important in the support of these special elements.

LANDSCAPE CONSERVATION AREA (LCA)

A large contiguous area which is important because of its size, open space, habitats, and/or inclusion of one or more Biological Diversity Areas. Although an LCA includes a variety of land uses, it typically has not been heavily disturbed and thus retains much of its natural character.

OTHER DESIGNATIONS

MANAGED LANDS

Managed Lands are owned or leased properties with importance, or potential importance, to the overall maintenance and protection of ecological resources in Centre County. Managed Lands include:

- Public properties established and managed to a large extent for natural resources. These properties have the potential to be managed in order to maintain or enhance important ecological assets in the county, and by this evaluation are deemed to be among the most ecologically valuable of public properties. Examples include state game lands, state forests, state parks, national historic sites, and county or municipal parklands.
- Private properties held by private organizations concerned with the management and protection of natural resources, and which upon evaluation have been selected to be among the most ecologically "valuable" of such properties. Examples include: private nature preserves, and private environmental education centers.
- Dedicated Area (DA): Managed lands (public or private), possibly disturbed in the past, where the owner's stated objectives are to protect and maintain the ecological integrity and biological diversity of the property. This is usually done largely through a hands-off management approach, with intervention only when there are demonstrable threats to the ecology of the area.

IMPORTANT BIRD AREAS (IBA)

The Pennsylvania Important Bird Area Program is administered by the Pennsylvania Audubon Society. PA Audubon defines an IBA as “a site that is part of a global network of places recognized for their outstanding value to bird conservation. An IBA can be large or small, public or private and must meet one of several objective criteria. Since the IBA program is voluntary, there are no legal or regulatory restrictions.”

RESULTS

The 1991 Centre County Natural Heritage Inventory recognized 64 areas of ecological significance— 62 Biological Diversity Areas and 2 Landscape Conservation Areas. The 2002 update added 35 BDAs and 1 LCA, and removed three BDAs, bringing the total to 97 areas. Boundaries were edited for 7 existing sites.

SITES ADDED IN 2002

Akely Hollow Headwaters BDA
Boalsburg Rd. Hillside BDA
Breon Rd. Wetland BDA
Brush Mountain Vernal Pools #1 BDA
Brush Mountain Vernal Pools #2 BDA
Chime Cave BDA
Fairbrook Cemetery BDA
Galbraith Gap Run Headwaters Seep BDA
Gobbler Knob Vernal Pools BDA
Green Gap BDA
Hough Mountain Vernal Pools BDA
J-4 Cave BDA
Kyler Fork Headwaters BDA
Millheim Narrows BDA
Moshannon Cliffs BDA
Pine Creek-Fiedler Rd. BDA
Pine Run Headwaters BDA
Port Matilda Forest #1 BDA
Potter Run tributary wetland BDA

Potter Run Wetland BDA
Rockview Cave BDA
Rupp Hollow Vernal Pools BDA
Sandy Ridge Cliffs BDA
Scotia #2 BDA
Sinking Creek Wetland #1 BDA
Sinking Creek Wetland #2 BDA
Sinking Creek Wetland #3 BDA
Snowshoe Moshannon BDA
State College Limestone Quarry BDA
State Game Lands #92 Forest BDA
Tomtit Run BDA
Veiled Lady Cave BDA
West Branch Cliffs BDA
White Deer Creek Seeps BDA
Georges Valley Wetlands LCA

SITES EDITED IN 2002

Big Hollow Road BDA
Oliver Run & Port Matilda Forest #2 BDA
Scotia Barrens BDA
Shirks Run BDA
Spruce Run BDA
Tusseyville/Sinking Creek Hillside BDA
(renamed as Sinking Creek Wetland #3 BDA)
Penn’s Creek Conservation Area LCA

SITES REMOVED IN 2002

Cedar Run Springs BDA
Slab Cabin Run BDA
Wingate-Milesburg Floodplain Forest BDA

SITE SIGNIFICANCE CATEGORIES

All sites—those newly designated as well as those retained from the 1991 report—were categorized according to their relative significance to the biological diversity and ecological integrity of the region.

EXCEPTIONAL Sites that are of exceptional importance for the biological diversity and ecological integrity of the county or region. Sites in this category contain one or more occurrences of state or national species of

special concern or a rare natural community type that are of a good size and extent and are in a relatively undisturbed condition. Sites of exceptional significance merit quick, strong and complete protection.

HIGH SIGNIFICANCE Sites that are highly important for the biological diversity and ecological integrity of the county or region. These sites contain species of special concern or natural communities that are highly ranked (see appendix V for explanation of global and state ranks), and because of their size or extent, relatively undisturbed setting, or a combination of these factors, rate as areas with high potential for protecting ecological resources in the county. Sites of high significance merit strong protection in the future.

NOTABLE Sites that are important for the biological diversity and ecological integrity

of the county or region. Sites in this category contain occurrences of species of special concern or natural communities that are either of lower rank or smaller size and extent than exceptional or high significance areas, or are compromised in quality by activity or disturbance. Sites of notable significance merit protection within the context of their quality and degree of disturbance.

COUNTY SIGNIFICANT Sites that have great potential for protecting biodiversity in the county but are not, as yet, known to contain species of special concern or state significant natural communities. Often recognized because of their size, undisturbed character, or proximity to areas of known significance, these sites invite further survey and investigation. In some cases, these sites could be revealed as high or exceptional sites.

NHI SITES GROUPED BY SIGNIFICANCE CATEGORY

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>	
EXCEPTIONAL			
Miller Caves BDA	Ferguson Township	Habitat used by a globally rare bat species and a surface outlet of an aquifer that is habitat for other globally rare animal species	p. 119
Thompsons Meadow Spring BDA	College Township, State College Borough	A surface outlet to an aquifer that is habitat for a globally rare animal	p. 113
State Game Lands #92 Forest BDA	Howard Township, Curtin Township	Habitat for the small whorled-pogonia, a globally rare species	p. 86
Oliver Run & Port Matilda Forest #2 BDA	Worth Township	Habitat for the small whorled-pogonia, a globally rare species	p. 79
Port Matilda Forest #1 BDA	Worth Township, Rush Township	Habitat for the small whorled-pogonia, a globally rare species	p. 79
Hosterman's Pit BDA	Haines Township	Surface outlet to an aquifer that is habitat for a globally rare animal	p. 152

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>	
EXCEPTIONAL			
Scotia Barrens BDA	Patton Township, Ferguson Township, Halfmoon Township	A regionally rare community type that hosts many species of state and global concern	p. 124
Sinking Creek Prairie BDA	Gregg Township, Potter Township	A side-oats gramma grassland community that hosts several plant species of special concern in PA	p. 142
Spring Creek Valley BDA	Benner Township	A landscape that contains several species and communities that are rare within the state	p. 95
Big Hollow Road BDA	Patton Township, College Township, Benner Township	A side-oats gramma grassland community that hosts several plant species of special concern in PA	p. 110
Millbrook Marsh BDA	College Township	Habitat for a fen community that contains several plant species of special concern in PA	p. 111
Stover's Cave #1 BDA	Haines Township	Habitat for globally rare animal species	p. 157
Woodward Cave BDA	Haines Township	Habitat for globally rare animal species	p. 159
Sharer Cave BDA	Potter Township	Habitat for globally rare animal species	p. 174
Penns Creek Hardwoods BDA	Haines Township	Habitat for several special concern animals and a unique forest community	p. 153
Bear Meadows Natural Area BDA	Harris Township	A relict bog that provides habitat for at least two plant species of special concern in PA	p. 129
Linden Hall Park BDA	Harris Township	Habitat for the only population of handsome sedge known in PA	p. 132
Brush Mountain Vernal Pools #1 BDA	Miles Township, Haines Township	Habitat for the northeastern bulrush, a Federally Endangered plant species	p. 164
Brush Mountain Vernal Pools #2 BDA	Miles Township	Habitat for the northeastern bulrush, a Federally Endangered plant species	p. 164
Yost Run BDA	Burnside Township	An Exceptional Value Watershed and habitat for the Federally Endangered northeastern bulrush	p. 49
Hough Mountain Vernal Pools BDA	Miles Township	Habitat for the northeastern bulrush, a Federally Endangered plant species	p. 164
Rupp Hollow Vernal Pools BDA	Haines Township	Habitat for the northeastern bulrush, a Federally Endangered plant species	p. 156
Pine Run Headwaters BDA	Burnside Township	Habitat for the northeastern bulrush, a Federally Endangered plant species	p. 44

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>	
EXCEPTIONAL			
Akely Hollow Headwaters BDA	Burnside Township	Habitat for the northeastern bulrush, a Federally Endangered plant species	p. 44
Blue Rock BDA	Penn Township, Haines Township	Habitat for state-rare calcareous opening/cliff communities and the backwards sedge, a plant of special concern in PA	p. 149
Smay's Run BDA	Rush Township	Habitat for mountain fly honeysuckle, a PA threatened plant species	p. 64
Tomtit Run BDA	Rush Township	Habitat for the mountain starwort, a Pennsylvania Endangered species	p. 65
Rock Run BDA	Snowshoe Township Boggs Township	An Exceptional Value Watershed	p. 53
Wallace Run BDA	Union Township	An Exceptional Value watershed that is one of the most intact in the county and hosts several high quality communities	p. 76
HIGH SIGNIFICANCE			
Spruce Run BDA	Burnside Township	Habitat occupied by the Allegheny Woodrat (global concern species), and a good example of a forest community type	p. 46
Moshannon Cliffs BDA	Burnside Township	Habitat occupied by the Allegheny Woodrat, an animal species of state and global concern	p. 47
Snowshoe Moshannon BDA	Snowshoe Township	Habitat occupied by the Allegheny Woodrat, an animal species of state and global concern	p. 55
West Branch Cliffs BDA	Burnside Township	Habitat occupied by the Allegheny Woodrat, an animal species of state and global concern	p.47
Sandy Ridge Cliffs BDA	Worth Township	Habitat occupied by the Allegheny Woodrat, an animal species of state and global concern	p. 80
Chime Cave BDA	Ferguson Township	Habitat used by the northern long-eared bat, a special concern animal species	p. 119
Scotia #2 BDA	Halfmoon Township	Habitat for the northeastern bulrush, a Federally Endangered plant species	p. 126
Gobbler Knob Vernal Pools BDA	Ferguson Township	Habitat for the northeastern bulrush, a Federally Endangered plant species	p. 120
Hublersburg Wetland BDA	Walker Township	A wetland hosting the backwards sedge, a Special Concern plant	p. 105

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>	
HIGH SIGNIFICANCE			
Greens Valley Road BDA	Spring Township	A good quality wetland community	p. 101
Millheim Narrows BDA	Miles Township	Habitat for backwards sedge and white water crowfoot, plant species of special concern in PA	p. 166
Pine creek-Fiedler Rd. BDA	Penn Township	Habitat for the backwards sedge, a plant species of special concern in PA	p. 155
State College Limestone Quarry BDA	State College Borough	Habitat for a Pennsylvania Endangered species of serviceberry	p. 113
Boalsburg Rd. Hillside BDA	College Township	Habitat for a Pennsylvania Endangered species of serviceberry	p. 111
Fairbrook Cemetery BDA	Ferguson Township	Habitat for a Pennsylvania Endangered species of serviceberry	p. 120
Overlook Heights BDA	Ferguson Township, College Township	Habitat for a Pennsylvania Endangered species of serviceberry	p. 112
State Game Lands #60 Oak Barrens BDA	Rush Township	Habitat for a state-rare community type	p. 64
Black Moshannon Wetlands BDA	Rush Township	A large wetland complex that supports three special concern plant species	p. 60
Burns Run Watershed BDA	Burnside Township	An Exceptional Value Watershed	p. 45
Cherry Run BDA	Haines Township	An Exceptional Value Watershed	p. 149
North Branch Buffalo Creek BDA	Haines Township	An Exceptional Value Watershed	p. 152
Hayes Run BDA	Boggs Township, Curtin Township	An Exceptional Value Watershed	p. 85
Panther Run BDA	Burnside Township, Snowshoe Township	An Exceptional Value Watershed	p. 48
Waddle BDA	Patton Township	Habitat for state-rare calcareous opening/cliff communities and side-oats gramma grass, a plant of special concern in PA	p. 136
Shirks Run BDA	Rush Township	A diverse wetland complex including several examples of communities of special concern	p. 63
Kettle Run Farm BDA	Penn Township	Habitat for wild lupine, a Pennsylvania Rare plant species	p. 169

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>	
NOTABLE			
J-4 Cave BDA	Spring Township, Benner Township	Habitat for the northern long-eared bat, a special concern animal species	p. 102
Rockview Cave BDA	College Township	Habitat for the northern long-eared bat, a special concern animal species	p. 112
Veiled Lady Cave BDA	Gregg Township	Habitat for the northern long-eared bat, a special concern animal species	p. 143
Wildflower Hill BDA	Gregg Township, Potter Township	A good example of a calcareous forest type	p. 144
Pine Creek Meadow BDA	Haines Township	A shrub wetland community and a very extensive, intact seepage fed hemlock palustrine forest	p. 155
Hannah Furnace Road Barrens BDA	Rush Township	Scrub oak shrubland, a state-rare community type	p. 61
Scha's Restaurant Wetland BDA	Rush Township	A large natural wetland complex	p. 62
Galbraith Gap Run Beadwaters Seep BDA	Potter Township, Harris Township	A very extensive, undisturbed mountain seepage wetland	p. 173
White Deer Creek Seeps BDA	Miles Township	A good example of forest seepage communities	p. 167
Big Flat Laurel Natural Area BDA	Miles Township	A scrub oak - shrubland community of local significance	p. 130
Haines Gap BDA	Haines Township	A diverse gap forest and habitat for the northern long-eared bat, a special concern animal species	p. 150
Two Rock Run BDA	Curtin Township	An Exceptional Value watershed	p. 85
Roaring Run BDA	Walker Township, Miles Township, Gregg Township	An Exceptional Value watershed	p. 141
West Branch Big Run Watershed BDA	Curtin Township	An Exceptional Value watershed	p. 85
Breon Road Wetland BDA	Miles Township	Vernal pool communities	p. 163
Beaver Branch Gorge BDA	Ferguson Township	One of the best examples of mature coniferous forest in the county	p. 118

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>	
NOTABLE			
Benner Run BDA	Rush Township, Union Township	An Exceptional Value watershed	p. 60
Green Gap BDA	Miles Township	A good example of a forest community type	p. 165
Penns Creek Conservation Area LCA	Haines Township, Penn Township	The area of the most intact natural landscape surrounding Penns Creek in Centre County, and habitat for several rare animal species	p. 160
Black Moshannon LCA	Rush Township, Snowshoe Township, Burnside Township	An area including diverse forest communities and serving as buffer for Black Moshannon Creek	p. 56
Rock Run #2 BDA	Snowshoe Township, Union Township, Rush Township	An Exceptional Value watershed	p. 54
Stover Gap BDA	Haines Township	A diverse and possibly old growth gap forest	p. 158
COUNTY SIGNIFICANT			
Sinking Creek Wetland #2 BDA	Potter Township	A floodplain forest community in the riparian zone of Sinking Creek	p. 179
Shingletown Gap BDA	Harris Township	A good example of a hemlock (white pine) forest community type	p. 132
Romola Bottomlands BDA	Liberty Township	One of the only remaining examples of floodplain forest in the county	p. 91
Poe Valley State Park Ravine BDA	Penn Township	A good example of a hemlock – northern hardwoods forest community type	p. 170
Pine Swamp BDA	Penn Township	An extensive coniferous wetland recovering from past disturbance	p. 169
Bald Eagle Swamp BDA	Huston Township	One of the only remaining examples of floodplain shrub swamp in the county	p. 69
Fields Run BDA	Burnside Township	A good example of a forest community type	p. 46
Detweiler Run Natural Area BDA	Harris Township	A forest community complex that contains some old growth areas	p. 131
Bear Run Natural Area BDA	Haines Township	A good example of a hemlock – tuliptree – birch forest community type	p. 148
The Hook Natural Area BDA	Haines Township	An Exceptional Value watershed	p. 151

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>	
COUNTY SIGNIFICANT			
Sinking Creek Wetland #1 BDA	Potter Township	A mosaic of wetland communities along Sinking Creek	p. 178
Sinking Creek Wetland #3 BDA	Potter Township	A floodplain forest community in the riparian zone of Sinking Creek	p. 179
Bear Rocks BDA	Union Township	A geologic formation of interest	p. 75
Steel Hollow Road Swamp BDA	Huston Township	One of the only remaining examples of floodplain forest in the county	p. 70
Snowshoe Swamp BDA	Snowshoe Township, Snowshoe Borough	A shrub wetland community in a region of the county where there are few wetlands	p. 55
Potter Run wetland BDA	Potter Township	A wetland	p. 176
Potter Run Tributary Wetland BDA	Potter Township	A wetland	p. 177
Georges Valley Wetlands LCA	Potter Township	An area with an exceptional concentration of wetlands in the county	p. 175
Waddle Swamp BDA	Patton Township	A somewhat disturbed calcareous wetland community	p. 137
Cedar Run Springs BDA	Harris Township	Removed	p. 131
Slab Cabin Run BDA	College Township Harris Township	Removed	p. 133
Wingate-Milesburg Floodplain Forest BDA	Union Township Boggs Township	Removed	p. 83

DISCUSSION AND RECOMMENDATIONS

STATUS OF NATURAL FEATURES TODAY

Centre County spans a great diversity of landscape features, from the Allegheny Plateau to the limestone valleys and forested sandstone ridges in the eastern portion of the county. The landscape has undergone changes resulting from various uses it has experienced during the course of human settlement, most notably from agriculture, timber extraction, and mining. Agriculture remains prevalent in the limestone valleys of the county, while along ridgelines and on the Allegheny Plateau, forests have been regenerating from general clear-cutting and widespread fires in the early 20th century. Also, residential and urban use is increasing. The condition of Centre County's ecological resources today closely reflects the history of human land use.

Natural communities have redeveloped across large swaths of the landscape previously used for timber extraction and coal mining, iron mining, and clay mining. The Allegheny Plateau area and especially the ridges in the eastern part of the county today have large areas of contiguous forest that provide abundant habitat for forest dwelling species. These areas also help to maintain water quality – a relationship particularly reflected within the numerous Exceptional Value watersheds in the county.

The condition of forest communities varies across the county. While many areas have re-grown, and redeveloped a broad ecological spectrum of natural forest communities, some areas are fragmented by artificial clearings related to gas extraction, utility rights-of-way, and other management practices. In many areas the present biodiversity and future regenerative capacity are threatened by deer over-browsing.

However, despite the variable condition of the forests, the contiguity of land in natural condition across the ridges is a great asset to the county's ecological integrity and overall habitat value. Contiguous forested areas offer enhanced habitat value over fragmented forested areas. While a number of generalist species can succeed and reproduce in small patches of forest, many species can only utilize large, unbroken tracts of forest. Because many of the forested areas in Centre County today are large, contiguous patches, they support species which are often declining in other areas of the state and the continent due to lack of habitat.

The forests of Centre County have the potential for even greater significance to biodiversity in the future. Some species can only find appropriate habitat in old-growth forests, because the structures they need for shelter or the food sources they require are not present in younger forests. While there are very few areas in Centre County today that are old growth, the large expanses of younger forests provide the potential for the future development – in ecologically strategic areas— of prime old growth habitat that can host species that are today in decline throughout the continent due to lack of habitat.

Within the matrix of forest in the county, unique communities including scrub oak shrublands, vernal pools and headwaters shrub swamps occur in conjunction with specific topographic or geologic conditions. Although these communities are limited in their extent, occupying a comparatively small portion of the natural landscape in the county, they are of particular value to the county's biodiversity because they support groups of specialist species—such as amphibians that breed only in vernal ponds, or butterflies and moths that require scrub oak shrubland habitat—that would otherwise

not be present in the county. The Scotia area is especially notable for its ecological significance to the county and the region. Despite the impact of past disturbances, the environmental conditions of this landscape today provide habitat for natural communities that are regionally unique and host a large number of plant and animal species that are globally rare or rare within Pennsylvania. The health of this area is precarious; the continued viability of its unique resources is threatened by the suppression of fire, the encroachment of residential development, and management not oriented to maintenance and restoration of the larger natural communities present in the area.

As agricultural cultivation is extensive in the limestone valleys of the county, few examples of the rich forest communities that once occupied these valleys remain. The rich soils and riparian settings that prevail in the valleys are distinctive from those found on the ridges and uplands of the county. The fragments of these communities that remain are facing new challenges from development and expanding infrastructure. Several Biological Diversity Areas were designated around the best remaining examples of these once-prevalent communities. Limestone solutional cave habitats, some of which are utilized by animal species that are rare within the state and in the world—are exceptional ecological features within the valleys of Centre County. Other features of the valley landscape that have exceptional ecological importance are the small areas where dry calcareous soils provide habitat for a grassland community type that is very uncommon in Pennsylvania and hosts several rare plant and animal species.

PLANNING FOR BIODIVERSITY AND ECOLOGICAL HEALTH TOMORROW

Provision for the future health of ecological resources in Centre County will require a combination of efforts to steward specific sites that host unique species and communities, and broader-scale efforts to consider ecologically important landscapes and processes when developing municipal and regional land use plans.

FORESTS—CONTIGUITY AND CONNECTIVITY

In the forested landscapes, objectives for large-scale planning should include maintaining the contiguity and connectivity of natural land. Contiguity is important for the enhanced habitat values outlined above; however, for many species, it is equally critical that natural corridors are maintained that span between forest patches and that connect forests, wetlands, and waterways. The county's forested ridgelines are regionally significant migration routes for raptors and neotropical migrant bird species because they form corridors of unbroken forest. Many species—examples abound among birds, amphibians, and dragonflies—use an aquatic or wetland habitat in one phase of their life, then migrate to an upland, forested habitat for their adult life. Either habitat alone cannot be utilized unless a corridor exists between them.

SCOTIA—REGIONAL ASSET, UNCERTAIN FUTURE

In the Scotia area, itself part of the larger Gatesburg geologic formation, objectives important to ecological health will be the reintroduction of fire or other management-specific disturbance to that landscape, the preservation of large tracts of contiguous area in natural condition, and the retention of natural corridors connecting the Scotia area to the large forested areas to the west and south.

VALLEY LANDSCAPES—ECOLOGICAL
REGENERATION, WATER QUALITY

Broad-scale planning efforts for the ecological health of the valley landscapes should work towards the restoration of water quality in major streams and groundwater aquifers, and the development of an ecologically designed greenway network based along riparian corridors and associated areas of riparian hydrology. Natural areas remaining in the landscape today are often isolated, and their potential to support wildlife and native biodiversity could be greatly enhanced by establishing connective corridors between them. Restoration of native vegetation to riparian corridors and buffers will help greatly in improving water quality and enhancing the habitat value of the waterways for various aquatic and semi-aquatic species. Reduction in the release of pollutants into runoff, including sediments, nutrients, and chemical contaminants, will also be necessary to improve water quality. Attending to the basic ecological functions of streams and wetlands will pay dividends by ensuring the continued capacity of the land in supporting agriculture, maintaining healthy fisheries, and providing the quality of the life for which the region is known.

EVALUATING PROPOSED ACTIVITY WITHIN
NATURAL HERITAGE AREAS

A very important part of encouraging conservation of the Natural Heritage Areas identified within the Centre County Natural Heritage Inventory is the careful review of proposed land use changes or development activities that overlap with Natural Heritage Areas. The following overview should provide guidance in the review of these projects or activities.

Always contact the Centre County Planning Office. The County Planning Office should be aware of all activities that may occur within Natural Heritage Areas in the county, so that they may interface with the County Conservation District and other necessary organizations or agencies to better understand the implications of proposed activities. They also can supply guidance to the landowners, developers, or project managers as to possible conflicts and courses of action.

Once informed of the proposed activity, the County Planning Office should then contact Western Pennsylvania Conservancy (WPC) for direction in arranging further review of the activity. Depending upon the resources contained within the Natural Heritage Area, the agencies/entities responsible for the resource will then be contacted. The points of contact and arrangements for that contact will be determined on a case-by-case basis by the County and WPC. In general, the responsibility for reviewing natural resources is partitioned among agencies in the following manner:

- *U.S. Fish and Wildlife Service* for all federally listed plants or animals.
- *Pennsylvania Game Commission* for all state and federally listed terrestrial vertebrate animals.
- *Pennsylvania Fish and Boat Commission* for all state and federally listed aquatic vertebrate and invertebrate animals.
- *Pennsylvania Bureau of Forestry* for all state and federally listed plants.
- *Western Pennsylvania Conservancy* for all natural communities, terrestrial invertebrates and non-listed species.

WPC and agency biologists can provide more detailed information about the location of the natural resources of concern in regard

to the project area, about the needs of the particular resources in question, and about potential impacts of the project to those resources.

If a ground survey is necessary to determine whether significant natural resources are present in the area of the project, WPC or an agency biologist will recommend a survey be conducted. WPC or other knowledgeable contractors can be retained for this purpose. Early consideration of natural resource impacts is recommended to allow sufficient time for thorough evaluation. Given that some species are only observable or identifiable during certain phases of their life cycle (i.e., the flowering season of a plant or the flight period of a butterfly), a survey may need to be scheduled for a particular time of year.

If the decision is made to move forward with a project in a sensitive area, WPC can continue to work with municipal officials and project personnel during the design process to develop strategies for minimizing the project's ecological impact while meeting the project's objectives. The resource agencies in the state may do likewise.

Note that projects involving numerous activities that will require state permits will require a PNDI review. Consultation with WPC or another agency does not take the place of the PNDI review. However, early consultation and planning as detailed above can provide for a more efficient and better integrated permit review, and a better understanding among the parties involved as to the scope of any needed project modifications.

SUMMARY OF RESULTS

Biological Diversity Areas & Landscape Conservation Areas in Centre County

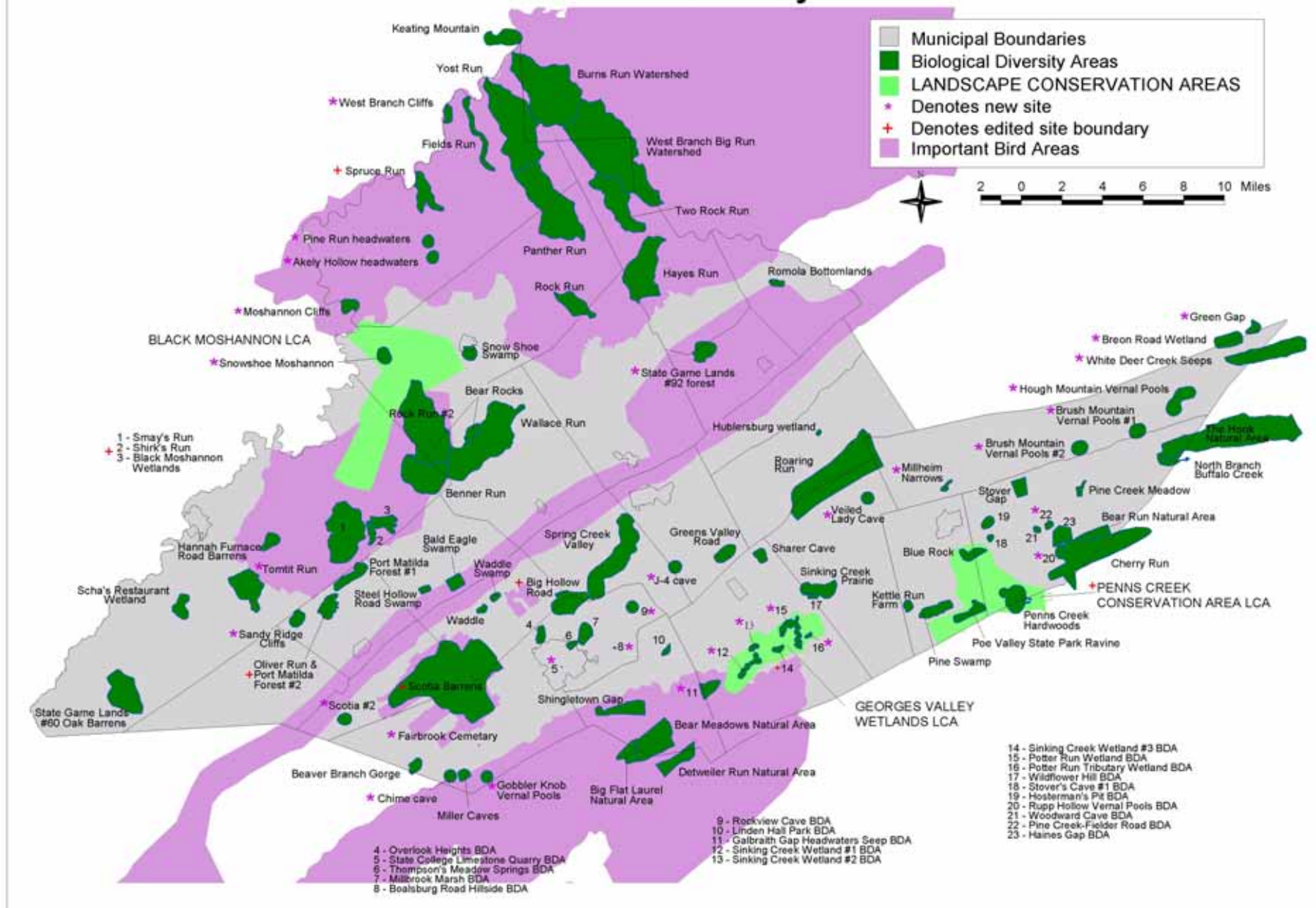


Figure 1: Biological Diversity Areas and Landscape Conservation Areas in Centre County

RESULTS

The results of the Natural Heritage Inventory for Centre County are summarized in tabular form. Figure 1 is an overview map of the Natural Heritage Areas identified in the county, with Important Bird Areas also shown. Table 1(pg. 4) lists the Natural Heritage Areas categorized according to their significance to the protection of the biological diversity and ecological integrity of the region and provides a brief description of each area's important features. Table 2 (pg. 13) organizes the Natural Heritage Areas by the municipality (ies) in which they are located. Fig. 2 precedes this table (pg. 12) and identifies the municipalities and planning regions in Centre County. Table 3 (pg. 18) supplies a list and description of Dedicated Areas (the "Natural Heritage Areas Classification", pg. 21, provides explanation of this and other designations).

Table 1: Natural Heritage Areas categorized by significance.

The Natural Heritage Areas that have qualified for inclusion in this report are ranked according to their significance as areas of importance to the biological diversity and ecological integrity of Centre County. Areas that are state significant due to the presence of a plant or animal species of special concern in Pennsylvania or a significant natural community are given priority. County Significant sites follow. Significance ranks are **Exceptional**, **High Significance**, **Notable**, and **County Significant**. Significance ranks are intended to help in focusing conservation and protection work.

SITE SIGNIFICANCE CATEGORIES

All sites—those newly designated as well as those retained from the 1991 report—were categorized according to their relative significance to the biological diversity and ecological integrity of the region.

EXCEPTIONAL Sites that are of exceptional importance for the biological diversity and ecological integrity of the county or region. Sites in this category contain one or more occurrences of state or national species of special concern or a rare natural community type that are of a good size and extent and are in a relatively undisturbed condition. Sites of exceptional significance merit quick, strong and complete protection.

HIGH SIGNIFICANCE Sites that are highly important for the biological diversity and ecological integrity of the county or region. These sites contain species of special concern or natural communities that are highly ranked (see Appendix V for explanation of global and state ranks), and because of their size or extent, relatively undisturbed setting, or a combination of these factors, rate as areas with high potential for protecting ecological resources in the county. Sites of high significance merit strong protection in the future.

NOTABLE Sites that are important for the biological diversity and ecological integrity of the county or region. Sites in this category contain occurrences of species of special concern or natural communities that are either of lower rank or smaller size and extent than exceptional or high significance areas, or are compromised in quality by activity or disturbance. Sites of notable significance merit protection within the context of their quality and degree of disturbance.

COUNTY SIGNIFICANT Sites that have great potential for protecting biodiversity in the county but are not, as yet, known to contain species of special concern or state-significant natural communities. Often recognized because of their size, undisturbed character, or proximity to areas of known significance, these sites invite further survey and investigation. In some cases, these sites could be revealed as high or exceptional sites.

NHI SITES GROUPED BY SIGNIFICANCE CATEGORY

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>
EXCEPTIONAL		
Miller Caves BDA	Ferguson Township	Habitat used by a globally rare bat species and a surface outlet of an aquifer that is habitat for other globally rare animal species
Thompsons Meadow Spring BDA	College Township, State College Borough	A surface outlet to an aquifer that is habitat for a globally rare animal
State Game Lands #92 Forest BDA	Howard Township, Curtin Township	Habitat for the small whorled-pogonia, a globally rare species
Oliver Run & Port Matilda Forest #2 BDA	Worth Township	Habitat for the small whorled-pogonia, a globally rare species
Port Matilda Forest #1 BDA	Worth Township, Rush Township	Habitat for the small whorled-pogonia, a globally rare species
Hosterman's Pit BDA	Haines Township	Surface outlet to an aquifer that is habitat for a globally rare animal
Scotia Barrens BDA	Patton Township, Ferguson Township, Halfmoon Township	A regionally rare community type that hosts many species of state and global concern
Sinking Creek Prairie BDA	Gregg Township, Potter Township	A side-oats gramma grassland community that hosts several plant species of special concern in PA
Spring Creek Valley BDA	Benner Township	A landscape that contains several species and communities that are rare within the state.
Big Hollow Road BDA	Patton Township, College Township, Benner Township	A side-oats gramma grassland community that hosts several plant species of special concern in PA
Millbrook Marsh BDA	College Township	Habitat for a fen community that contains several plant species of special concern in PA
Stover's Cave #1 BDA	Haines Township	Habitat for globally rare animal species
Woodward Cave BDA	Haines Township	Habitat for globally rare animal species
Sharer Cave BDA	Potter Township	Habitat for globally rare animal species
Penns Creek Hardwoods BDA	Haines Township	Habitat for several special concern animals and a unique forest community

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>
EXCEPTIONAL		
Bear Meadows Natural Area BDA	Harris Township	A relict bog that provides habitat for at least two plant species of special concern in PA
Linden Hall Park BDA	Harris Township	Habitat for the only population of handsome sedge known in PA
Brush Mountain Vernal Pools #1 BDA	Miles Township Haines Township	Habitat for the northeastern bulrush, a Federally Endangered plant species
Brush Mountain Vernal Pools #2 BDA	Miles Township	Habitat for the northeastern bulrush, a Federally Endangered plant species
Yost Run BDA	Burnside Township	An Exceptional Value Watershed and habitat for the Federally Endangered northeastern bulrush
Hough Mountain Vernal Pools BDA	Miles Township	Habitat for the northeastern bulrush, a Federally Endangered plant species
Rupp Hollow Vernal Pools BDA	Haines Township	Habitat for the northeastern bulrush, a Federally Endangered plant species
Pine Run Headwaters BDA	Burnside Township	Habitat for the northeastern bulrush, a Federally Endangered plant species
Akely Hollow Headwaters BDA	Burnside Township	Habitat for the northeastern bulrush, a Federally Endangered plant species
Blue Rock BDA	Penn Township Haines Township	Habitat for state-rare calcareous opening/cliff communities and the backwards sedge, a plant of special concern in PA
Smay's Run BDA	Rush Township	Habitat for mountain fly honeysuckle, a PA threatened plant species
Tomtit Run BDA	Rush Township	Habitat for the mountain starwort, a Pennsylvania Endangered species
Rock Run BDA	Snowshoe Township Boggs Township	An Exceptional Value Watershed
Wallace Run BDA	Union Township	An Exceptional Value watershed that is one of the most intact in the county and hosts several high quality communities
Spruce Run BDA	Burnside Township	Habitat occupied by the Allegheny Woodrat (global concern species), and a good example of a forest community type

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>
HIGH SIGNIFICANCE		
Moshannon Cliffs BDA	Burnside Township	Habitat occupied by the Allegheny Woodrat, an animal species of state and global concern
Snowshoe Moshannon BDA	Snowshoe Township	Habitat occupied by the Allegheny Woodrat, an animal species of state and global concern
West Branch Cliffs BDA	Burnside Township	Habitat occupied by the Allegheny Woodrat, an animal species of state and global concern
Sandy Ridge Cliffs BDA	Worth Township	Habitat occupied by the Allegheny Woodrat, an animal species of state and global concern
Chime Cave BDA	Ferguson Township	Habitat used by the northern long-eared bat, a special concern animal species
Scotia #2 BDA	Halfmoon Township	Habitat for the northeastern bulrush, a Federally Endangered plant species
Gobbler Knob Vernal Pools BDA	Ferguson Township	Habitat for the northeastern bulrush, a Federally Endangered plant species
Hublersburg Wetland BDA	Walker Township	A wetland hosting the backwards sedge, a Special Concern plant
Greens Valley Road BDA	Spring Township	A good quality wetland community
Millheim Narrows BDA	Miles Township	Habitat for backwards sedge and white water crowfoot, plant species of special concern in PA
Pine creek-Fiedler Rd. BDA	Penn Township	Habitat for the backwards sedge, a plant species of special concern in PA
State College Limestone Quarry BDA	State College Borough	Habitat for a Pennsylvania Endangered species of serviceberry
Boalsburg Rd. Hillside BDA	College Township	Habitat for a Pennsylvania Endangered species of serviceberry
Fairbrook Cemetery BDA	Ferguson Township	Habitat for a Pennsylvania Endangered species of serviceberry
Overlook Heights BDA	Ferguson Township, College Township	Habitat for a Pennsylvania Endangered species of serviceberry
State Game Lands 60 Oak Barrens BDA	Rush Township	Habitat for a state-rare community type

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>
HIGH SIGNIFICANCE		
Black Moshannon Wetlands BDA	Rush Township	A large wetland complex that supports three special concern plant species
Burns Run Watershed BDA	Burnside Township	An Exceptional Value Watershed
Cherry Run BDA	Haines Township	An Exceptional Value Watershed
North Branch Buffalo Creek BDA	Haines Township	An Exceptional Value Watershed
Hayes Run BDA	Boggs Township Curtin Township	An Exceptional Value Watershed
Panther Run BDA	Burnside Township Snowshoe Township	An Exceptional Value Watershed
Waddle BDA	Patton Township	Habitat for state-rare calcareous opening/ cliff communities and side-oats gramma grass, a plant of special concern in PA
Shirks Run BDA	Rush Township	A diverse wetland complex including several examples of communities of special concern
NOTABLE		
Kettle Run Farm BDA	Penn Township	Habitat for wild lupine, a Pennsylvania Rare plant species
J-4 Cave BDA	Spring Township Benner Township	Habitat for the northern long-eared bat, a special concern animal species
Rockview Cave BDA	College Township	Habitat for the northern long-eared bat, a special concern animal species
Veiled Lady Cave BDA	Gregg Township	Habitat for the northern long-eared bat, a special concern animal species
Wildflower Hill BDA	Gregg Township Potter Township	A good example of a calcareous forest type
Pine Creek Meadow BDA	Haines Township	A shrub wetland community and a very extensive, intact seepage fed hemlock palustrine forest
Hannah Furnace Road Barrens BDA	Rush Township	Scrub oak shrubland, a state-rare community type

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>
NOTABLE		
Scha's Restaurant Wetland BDA	Rush Township	A large natural wetland complex
Galbraith Gap Run Beadwaters Seep BDA	Potter Township Harris Township	A very extensive, undisturbed mountain seepage wetland
White Deer Creek Seeps BDA	Miles Township	A good example of forest seepage communities
Big Flat Laurel Natural Area BDA	Miles Township	A scrub oak - shrubland community of local significance
Haines Gap BDA	Haines Township	A diverse gap forest and habitat for the northern long-eared bat, a PA Special Concern animal species
Two Rock Run BDA	Curtin Township	An Exceptional Value watershed
Roaring Run BDA	Walker Township Miles Township Gregg Township	An Exceptional Value watershed
West Branch Big Run Watershed BDA	Curtin Township	An Exceptional Value watershed
Breon Road Wetland BDA	Miles Township	Vernal pool communities
Beaver Branch Gorge BDA	Ferguson Township	One of the best examples of mature coniferous forest in the county
Benner Run BDA	Rush Township Union Township	An Exceptional Value watershed
Green Gap BDA	Miles Township	A good example of a forest community type
Penns Creek Conservation Area LCA	Haines Township Penn Township	The area of the most intact natural landscape surrounding Penns Creek in Centre County, and habitat for several rare animal species
Black Moshannon LCA	Rush Township Snowshoe Township Burnside Township	An area including diverse forest communities and serving as buffer for Black Moshannon Creek
Rock Run #2 BDA	Snowshoe Township Union Township, Rush Township	An Exceptional Value watershed

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>
Stover Gap BDA	Haines Township	A diverse and possibly old growth gap forest
COUNTY SIGNIFICANT		
Sinking Creek Wetland #2 BDA	Potter Township	A floodplain forest community in the riparian zone of Sinking Creek
Shingletown Gap BDA	Harris Township	A good example of a hemlock (white pine) forest community type
Romola Bottomlands BDA	Liberty Township	One of the only remaining examples of floodplain forest in the county
Poe Valley State Park Ravine BDA	Penn Township	A good example of a hemlock – northern hardwoods forest community type
Pine Swamp BDA	Penn Township	An extensive coniferous wetland recovering from past disturbance
Bald Eagle Swamp BDA	Huston Township	One of the only remaining examples of floodplain shrub swamp in the county
Fields Run BDA	Burnside Township	A good example of a forest community type
Detweiler Run Natural Area BDA	Harris Township	A forest community complex that contains some old growth areas
Bear Run Natural Area BDA	Haines Township	A good example of a hemlock – tuliptree - birch forest community type
The Hook Natural Area BDA	Haines Township	An Exceptional Value watershed
Sinking Creek Wetland #1 BDA	Potter Township	A mosaic of wetland communities along Sinking Creek
Sinking Creek Wetland #3 BDA	Potter Township	A floodplain forest community in the riparian zone of Sinking Creek
Bear Rocks BDA	Union Township	A geologic formation of interest
Steel Hollow Road Swamp BDA	Huston Township	One of the only remaining examples of floodplain forest in the county
Snowshoe Swamp BDA	Snowshoe Township Snowshoe Borough	A shrub wetland community in a region of the county that contains few wetlands
Potter Run wetland BDA	Potter Township	A wetland
Potter Run Tributary Wetland BDA	Potter Township	A wetland

<u>SITE</u>	<u>MUNICIPALITY</u>	<u>DESCRIPTION</u>
COUNTY SIGNIFICANT		
Georges Valley Wetlands LCA	Potter Township	An area with an exceptional concentration of wetlands in the county
Waddle Swamp BDA	Patton Township	A somewhat disturbed calcareous wetland community
Cedar Run Springs BDA	Harris Township	Removed
Slab Cabin Run BDA	College Township Harris Township	Removed
Wingate-Milesburg Floodplain Forest BDA	Boggs Township Union Township	Removed

CENTRE COUNTY PLANNING REGIONS

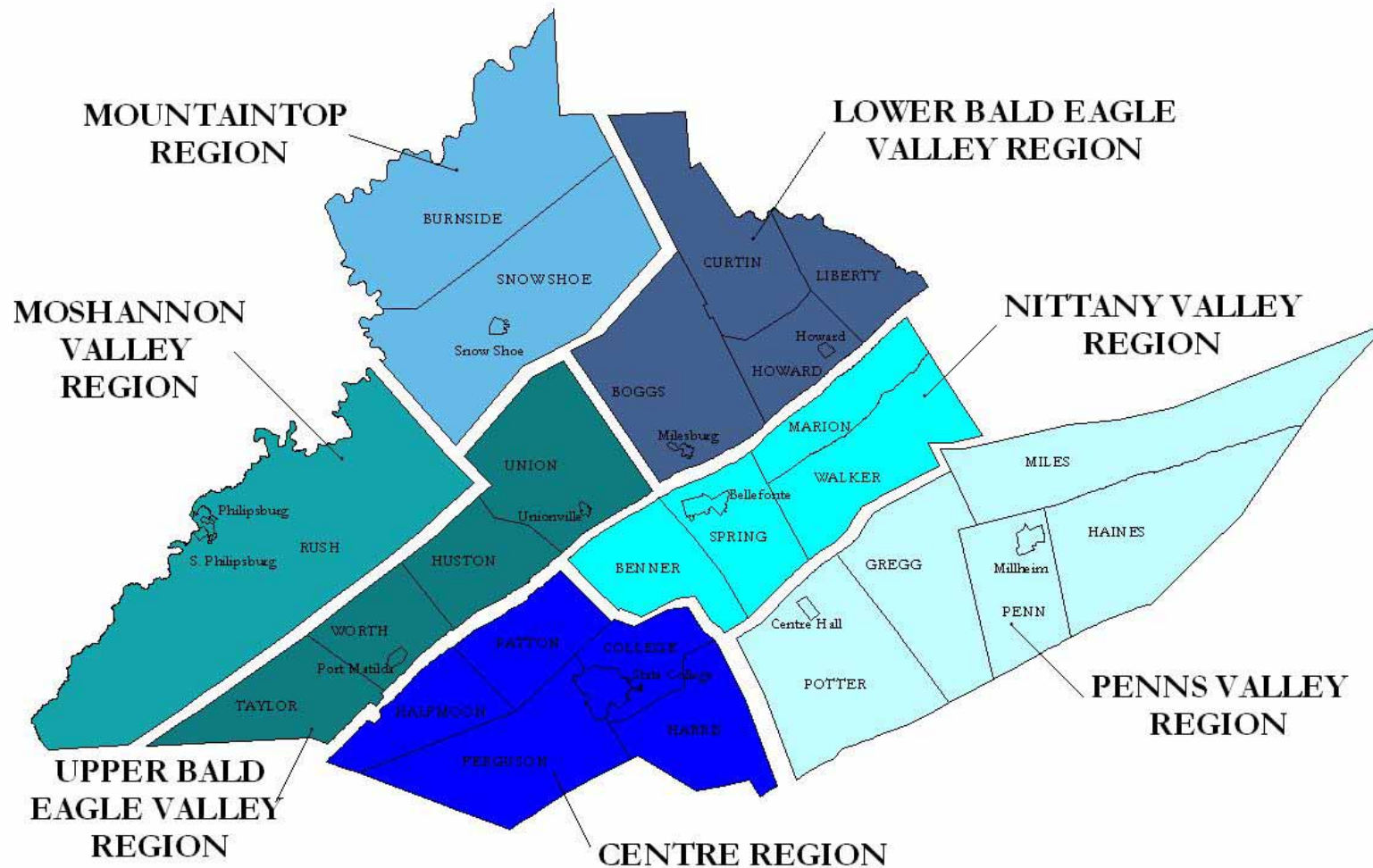


Figure 2: Centre County Planning Regions

Table 2 Summary of Natural Heritage Areas and Managed Lands by municipality
(grouped by planning region, with municipalities listed alphabetically within each region)

<u>Municipality</u>	<u>Site Names & Managed Lands</u>	<u>Planning Region</u>
Burnside Township	Moshannon Cliffs BDA Akely Hollow Headwaters BDA Pine Run Headwaters BDA Spruce Run BDA Fields Run BDA West Branch Cliffs BDA Yost Run BDA Panther Run BDA Burns Run Watershed BDA <i>Moshannon State Forest</i> <i>Sproul State Forest</i> <i>State Game Lands #100</i>	Mountaintop Region
Snowshoe Township	Snowshoe Swamp BDA Snowshoe Moshannon BDA Rock Run BDA Panther Run BDA Rock Run #2 BDA Black Moshannon LCA <i>State Game Lands #100</i> <i>State Game Lands #103</i> <i>Sproul State Forest</i> <i>Moshannon State Forest</i>	Mountaintop Region
Snowshoe Borough	Snowshoe Swamp BDA	Mountaintop Region
Rush Township	State Game Lands #60 Oak Barrens BDA Scha's Restaurant Wetland BDA Tomtit Run BDA Hannah Furnace Road Barrens BDA Black Moshannon Wetlands BDA Shirks Run BDA Smay's Run BDA Benner Run BDA Rock Run #2 BDA Black Moshannon LCA <i>Moshannon State Forest</i> <i>Black Moshannon State Park</i> <i>Black Moshannon State Park</i> <i>Natural Area DA</i> <i>State Game Lands #33/#60</i>	Moshannon Valley Region

<u>Municipality</u>	<u>Site Names & Managed Lands</u>	<u>Planning Region</u>
Port Matilda Borough		Upper Bald Eagle Region
Huston Township	Steel Hollow Road Swamp BDA Bald Eagle Swamp BDA <i>Moshannon State Forest</i>	Upper Bald Eagle Region
Taylor Township	State Game Lands #33/#60	Upper Bald Eagle Region
Union Township	Wallace Run BDA Bear Rocks BDA Rock Run #2 Benner Run <i>State Game Lands #103</i> <i>Moshannon State Forest</i>	Upper Bald Eagle Region
Unionville Borough	None	Upper Bald Eagle Region
Worth Township	Steel Hollow Road Swamp BDA Bald Eagle Swamp BDA <i>Moshannon State Forest</i>	Upper Bald Eagle Region
Boggs Township	Rock Run BDA Hayes Run BDA <i>State Game Lands #92</i> <i>Sproul State Forest</i>	Lower Bald Eagle Region
Curtin Township	Two Rock Run BDA Hayes Run BDA West Branch Big Run Watershed BDA State Game Lands #92 Forest BDA <i>Sproul State Forest</i> <i>State Game Lands #92</i>	Lower Bald Eagle Region
Howard Township	State Game Lands #92 Forest BDA <i>Bald Eagle State Park</i> <i>State Game Lands #92</i>	Lower Bald Eagle Region
Howard Borough	none	Lower Bald Eagle Region

<u>Municipality</u>	<u>Site Names & Managed Lands</u>	<u>Planning Region</u>
Liberty Township	Romola Bottomlands BDA <i>Sproul State Forest</i> <i>Bald Eagle State Park</i> <i>State Game Lands #255</i>	Lower Bald Eagle Region
Milesburg Borough	None	Lower Bald Eagle Region
Bellefonte Borough	None	Nittany Valley Region
Benner Township	Spring Creek Valley BDA J-4 Cave BDA Big Hollow Road BDA	Nittany Valley Region
Marion Township	None	Nittany Valley Region
Spring Township	J-4 Cave BDA Greens Valley Road BDA <i>Bald Eagle State Forest</i>	Nittany Valley Region
Walker Township	Hublersburg Wetland BDA	Nittany Valley Region
College Township	Overlook Heights BDA Millbrook Marsh BDA Big Hollow Road BDA Rockview Cave BDA Boalsburg Road Hillside BDA Thompsons Meadow Spring BDA	Centre Region
Ferguson Township	Beaver Branch Gorge BDA Chime Cave BDA Miller Caves BDA Gobbler Knob Vernal Pools BDA Overlook Heights BDA Fairbrook Cemetery BDA Scotia Barrens BDA <i>State Game Lands #176</i>	Centre Region
Halfmoon Township	Scotia Barrens BDA Scotia #2 BDA <i>State Game Lands #176</i>	Centre Region

<u>Municipality</u>	<u>Site Names & Managed Lands</u>	<u>Planning Region</u>
Harris Township	Shingletown Gap BDA Linden Hall Park BDA Galbraith Gap Run Headwaters BDA Bear Meadows Natural Area BDA Big Flat Laurel Natural Area BDA Detweiler Run Natural Area BDA <i>Rothrock State Forest</i> <i>Penn Roosevelt State Park</i> <i>Thickhead Mountain Wild Area</i> <i>Big Flat Laurel Natural Area</i> <i>Bear Meadows Natural Area</i>	Centre Region
Patton Township	Waddle BDA Waddle Swamp BDA Scotia Barrens BDA <i>State Game Lands #176</i>	Centre Region
State College Borough	Thompsons Meadow Spring BDA State College Limestone Quarry BDA	
Centre Hall Borough	none	Penns Valley Region
Gregg Township	Sinking Creek Prairie BDA Wildflower Hill BDA Roaring Run BDA Veiled Lady Cave BDA <i>Rothrock State Forest</i>	Penns Valley Region
Haines Township	Blue Rock BDA Stover's Cave #1 BDA Hosterman's Pit BDA Stover Gap BDA Penns Creek Hardwoods BDA Woodward Cave BDA Pine Creek-Fielder Road BDA Haines Gap BDA Rupp Hollow Vernal Pools BDA Cherry Run BDA Bear Run Natural Area BDA Pine Creek Meadow BDA North Branch Buffalo Creek BDA The Hook Natural Area BDA Brush Mountain Pools #1 BDA	Penns Valley Region

<u>Municipality</u>	<u>Site Names & Managed Lands</u>	<u>Planning Region</u>
Haines Township (continued)	Penns Creek Conservation Area LCA <i>Poe Valley State Park</i> <i>Bald Eagle State Forest</i> <i>Bear Run Natural Area</i>	Penns Valley Region
Millheim Borough	none	Penns Valley Region
Miles Township	Millheim Narrows BDA Brush Mountain Vernal Pools #2 BDA Hough Mountain Vernal Pools BDA White Deer Creek Seeps BDA Breon Road Wetland BDA Green Gap BdA Roaring Run BDA <i>McCall Dam State Park</i> <i>Bald Eagle State Forest</i>	Penns Valley Region
Potter Township	Georges Valley Wetlands LCA Sinking Creek Wetland #1 BDA Sinking Creek Wetland #2 BDA Sinking Creek Wetland #3 BDA Potter Run Wetland BDA Potter Run Tributary Wetland BDA Galbraith Gap Headwaters Seep BDA Sharer Cave BDA <i>Rothrock State Forest</i> <i>Bald Eagle State Forest</i>	Penns Valley Region

Table 3: Dedicated Areas protecting biotic resources in Centre County.

As a primary objective, the Centre County Natural Heritage Inventory provides information utilized in planning for the protection of the biological diversity and ecological integrity of the region. The preservation of such resources depends, in part, upon the establishment of specific areas and management plans dedicated to protection of these resources called Dedicated Areas. The “Natural Heritage Areas Classification” section of the report gives a definition and description of Dedicated Areas.

Centre County contains five areas that qualify as dedicated areas:

- 1) **Black Moshannon Bog State Park Natural Area DA**
- 2) **The Hook Natural Area DA**
- 3) **Bear Meadows Natural Area DA**
- 4) **Detweiler Run Natural Area DA**
- 5) **Big Flat Laurel Natural Area DA**

Black Moshannon Bog State Park Natural Area DA encompasses a large portion of Black Moshannon State Park. The Bureau of State Parks (PA-DCNR) Natural Areas program assigns the Natural Area designation to “an area within a state park of unique scenic, geologic or ecological value which will be maintained in a natural condition by allowing physical and biological processes to operate, usually without direct human intervention.” Management goals are: “to provide locations for scientific observation of natural systems, to protect examples of typical and unique plant and animal communities and to protect outstanding examples of natural interest and beauty.” (DCNR State Park Natural Area definition, PA-DCNR N.D.).

The Hook Natural Area DA Most of this Bureau of Forestry designated Natural Area is in Union County. The area contains several unique communities that support plant species of special concern. The southern half of the area also falls within the watershed of North Branch Buffalo Creek, an Exceptional Value stream.

Burns Run Wild Area DA is in Sproul State Forest and includes the stream valley and adjacent slopes to Burns Run, an Exceptional Value stream. It does not include the plateau portions of the watershed. The tornado of 1986 cut through the middle of the watershed, where there is now a dense thicket of fallen trees and regrowth. Subsequently, in 1989, much of the eastern section of the area burned, the fire running almost perpendicular to the path of the tornado. In the area unaffected by these disturbances the valley supports hemlock-northern hardwood forest consisting of eastern hemlocks (*Tsuga canadensis*), patches of rhododendron (*Rhododendron maximum*), witch hazel (*Hamamelis virginiana*), and little or no ground cover or herbaceous growth.

Thickhead Mountain Wild Area DA Thickhead Wild Area is a mountainous region of unfragmented deciduous and mixed forest. It surrounds three natural areas: Detweiler Run Natural Area, Bear Meadows Natural Area, and Big Flat Laurel Natural Area.

Bear Meadows Natural Area DA This area includes Bear Meadows, a relict bog community that is unusual in the county because of its suite of northern species. Several plant species of

special concern have populations in this area. The Bear Meadows Natural Area BDA encompasses the Natural Area and extends to include the immediate watershed of Bear Meadows as well.

Detweiler Run Natural Area DA This area includes a stand of old-growth forest surrounded by a maturing second-growth forest community.

Big Flat Laurel Natural Area DA This area contains a ridgetop complex including dry oak-heath woodland and scrub oak shrubland communities. Although the area was heavily logged in the past and used for charcoal production, the climate and ridgetop setting of the area suggest the natural communities found here in the past may be similar to what has regrown today.

Numerous areas recognized in this inventory, including both public and private lands, could be forged into Dedicated Areas through a variety of landowner agreements, easements, special programs, or a combination of methods. Ultimately, areas set aside now will be the exemplary natural areas of the future, and if planned well and of sufficient size, will become the premier areas for biodiversity protection in the region.

COUNTY NATURAL HERITAGE INVENTORIES

INTRODUCTION

The first steps in ensuring the protection of environmentally sensitive/ecologically important areas are identifying them and determining their importance. This information helps county, state, and municipal government, the public, and business interests plan development with the preservation of these environmentally important sites in mind. The Centre County Natural Heritage Inventory identifies and maps important biotic (living) and ecological resources present in Centre County. The biotic resources inherited by the citizens of this region include: areas that are left relatively undisturbed by human activity, potential habitats for species of special concern [species facing imperilment at a state and/or global level (i.e., endangered, threatened, etc.)], significant natural communities (assemblages of plants and animals), and areas important for general wildlife habitat, open space, education, scientific study, and recreation.

Many important resources present in Centre County are not addressed in this inventory. Historic, cultural, geologic, educational, water supply, agricultural and scenic resources are among many the county will address through other projects and programs. This Natural Heritage Inventory focuses on the best examples of living *ecological resources* in Centre County. Although agricultural lands and open space may be included as part of inventory areas, the emphasis of the designation and delineation of the areas are the ecological values present. The existence of habitat for specific plants and animals and the rarity within the state of an area's natural communities are important selection criteria for Natural Heritage Areas, but equally important is the size and contiguousness of an area containing good quality natural features. Large areas provide the backbone that links habitats and allows plants and animals to shift and move across sizable portions of the landscape.

NATURAL HERITAGE AREA CLASSIFICATION

The Natural Heritage Areas identified in this report are recognized according to the classification below. Sites chosen are those that are believed to be of sufficient size and quality (i.e., the natural systems are relatively intact) to continue as viable communities in the foreseeable future.

The inventory identifies ecologically important sites that are of significance in Centre County. Some sites are significant at the state level, due to rarity or quality of their features. Also included are sites whose features are not necessarily uncommon in the region or state, but are unique or uncommon in this county. For example, a floodplain forest along a medium-sized tributary is not so uncommon within Pennsylvania that it is considered a rare or threatened community type, but there are very few of these communities remaining in Centre County.

The following classification provides definitions and examples of the two types of Natural Heritage Areas designated in this report, as well as for two other designations generated by other sources but mapped in this report due to their ecological significance.

Natural Heritage Areas:

BIOLOGICAL DIVERSITY AREA (BDA)

An area containing and important in the support of plants or animals of special concern at either state or federal levels, exemplary natural communities, or exceptional native diversity.

LANDSCAPE CONSERVATION AREAS (LCA)

A large contiguous area; important because of its size, open space, habitats, and/or inclusion of one or more Biological Diversity Areas, and although including a variety of land uses, has not been heavily disturbed and thus retains much of its natural character.

Other Designations:

IMPORTANT BIRD AREAS (IBA)

The Pennsylvania Important Bird Area Program is administered by the Pennsylvania Audubon Society. The following information and definitions are from their brochure and book, available on their website (Audubon 2002).

Definition

An IBA is a site that is part of a global network of places recognized for their outstanding value to bird conservation. An IBA can be large or small, public or private and must meet one of several objective criteria. Since the IBA program is voluntary, there are no legal or regulatory restrictions.

To qualify as an IBA in Pennsylvania, a site must satisfy at least one of several criteria, as follows (Crossley 1999):

1. Any site having exceptional concentration* and/or diversity of birdlife when breeding, in winter, or during migration
2. Sites supporting state or federal endangered or threatened species
3. Sites supporting one or more species on Pennsylvania's "special concern" list
4. Sites containing representative, rare, threatened, or unique habitats, with birds characteristic of those habitats
5. Sites where long-term avian research or monitoring is in process

*Defined as: 2,000 waterfowl (at one time), 100 shorebirds (at once), 50 breeding pairs of wading birds, or 10,000 migrant raptors/season.

Background

Pennsylvania's Important Bird Area (IBA) Program is part of a dynamic worldwide effort to identify and protect outstanding habitats for birds and all wildlife. The IBA concept was first developed in Europe (in 1985) by BirdLife International. The program's resounding success in the Old World quickly spread to North America, where the IBA Program has become pivotal to a continent-wide bird conservation strategy. Working in partnership with the American Bird Conservancy, the National Audubon Society has already identified over 400 Important Bird Areas in the U.S.

Pennsylvania was the first state to develop an IBA program in the United States. Based on strict scientific criteria (given above), a group of scientific advisors (known as the Ornithological Technical Committee) selected 73 IBA sites encompassing over one million acres of public and private lands. These areas include migratory staging areas, winter feeding and roost sites, and prime breeding areas for songbirds, wading birds and other species. They also include critical habitats, such as spruce-fir bogs, tidal saltmarsh, bottomland hardwood swamps, and open grasslands. Additional IBA sites in Pennsylvania will be selected by the technical committee on an ongoing basis.

More information on Important Bird Area program in Pennsylvania can be found on their website, at "pa.audubon.org/Ibamain.htm"

MANAGED LANDS

"Managed Lands" are owned or leased properties that are included in the report because of their importance, or potential importance, to the overall maintenance and protection of ecological resources of Centre County. Managed Lands include:

- Public properties established and managed to a large extent for natural resources, and/or those that have the potential to manage such resources in order to maintain or enhance important ecological assets in the county, and by this evaluation are deemed to be among the most ecologically valuable of public properties. Examples include: state

game lands, state forests, state parks, national historic sites, county or municipal park lands.

- Private properties held by private organizations concerned with the management and protection of natural resources, and which upon evaluation are selected to be among the most ecologically "valuable" of such properties. Examples include: private nature preserves, private environmental education centers.
- Dedicated Areas are managed lands, public or private, where the owners' stated management objectives are the protection of natural ecological systems and biological diversity. These are mapped distinctly and denoted by "DA" following the area's name, because of the ecological emphasis of the owner's management practices and goals. Dedicated Areas are among the most important managed lands since plans to protect the ecological resources therein already exist. An evaluation of the stated management criteria and existing practices of the owner/manager determines whether a site is a Dedicated Area.

Managed Lands do not necessarily include, nor are they necessarily included within, identified Biological Diversity Areas, however, these properties are often large in size (e.g., essentially all state game lands) and, for this and potentially other reasons, are ecologically important in a general sense. The ecological importance and value of some Managed Lands stems from their association with an area identified for natural heritage significance, e.g., a Managed Land within the boundaries of a Biological Diversity Area. However, Managed Lands are legally bounded properties, and are not to be confused with areas of natural heritage importance, which are identified by their ecological significance. Many Managed Lands have the potential to become even more ecologically valuable if their management becomes more sensitive to biological diversity issues and protection.

NATURAL HERITAGE INVENTORY METHODS

The following provides explanation of the procedure followed to generate the initial inventory report and of the procedure used for this update. The methods used in the update reflect changes in NHI methodology since 1991 and have also been adapted from the general procedure to include review and reconciliation of the substantial amounts of existing information provided by the first report.

Presently, eleven County Natural Heritage Inventories (CNHI) are completed for Western Pennsylvania. These include the Bedford CNHI, Butler CNHI (Smith et al. 1991), Centre CNHI (Stack et al. 1991), Beaver CNHI (Smith et al. 1993), Clinton CNHI (Wagner et al. 1993), Erie CNHI (Kline et al. 1993), Allegheny CNHI (Smith et al. 1994), Washington CNHI (Wagner et al. 1994), Westmoreland CNHI (Smith et al. 1998), Fayette CNHI (Wagner and Coxe 2000), and Lawrence CNHI (Coxe 2002). Additional inventories are under way in Mercer County, Elk County, Huntingdon County, Clearfield County and Clinton County (update). Methods used in this inventory are based on those published in previous reports, as well as those used by Anonymous (1985); Reese, G.A., et al. (1988); and Davis A.F., et al. (1990). The Centre County Natural Heritage Inventory followed the same methodologies, which proceeded in the following stages:

- o gathering existing information
- o aerial photo and map interpretation
- o aerial reconnaissance
- o ground survey
- o data analysis

Gathering Existing Information

A review of the Pennsylvania Natural Diversity Inventory (PNDI) database (see Appendix II) determined what, if any, sites for special concern species and important natural communities are known to exist in Centre County. Members of local land trusts and conservancies, environmental advisory councils, and other conservation oriented citizens groups were sought out and contacted, as well as other individuals that were able to contribute information to the inventory. Individuals from the state and federal agencies that steward natural resources (PA Game Commission, PA Bureau of Forestry, PA Fish and Boat Commission, PA Department of Environmental Protection, US Fish and Wildlife Service) were also contacted to obtain information about lands or resources they manage.

General information from other sources such as soil maps, geology maps, earlier field studies, and published materials on the natural history of the area helped to provide a better understanding of the area's natural environment.

Update methods: Current information from the PNDI database was reviewed for any information on special concern species and important natural communities that had changed or been added since the time of the original NHI study.

Aerial Photo and Map Interpretation

Aerial photographs were reviewed to identify sites with potential for ecologically interesting features that should receive ground survey. Initial study of aerial photos revealed large-scale natural features (e.g., contiguous forest, wetlands, shale barrens), disturbances (e.g., utility line rights-of-way, strip mines, timbered areas) and a variety of easily interpretable features. Investigation of areas on the ground and review of the same areas on the photos helped to establish a set of "signatures" that allowed a more detailed review of areas not visited on the ground. Some sites could be eliminated from consideration if they proved to be highly disturbed or fragmented or purely attributable to human-made features (e.g., impoundments, clearings, farm fields).

Update methods: The Centre County Planning Office made available the most recent aerial photos of Centre County (2001). All sites designated during the original inventory were reviewed from these photos to determine if any large-scale alterations in their condition had taken place.

Aerial Reconnaissance

Flying over the landscape greatly helps in interpretation of features because of color and tonal differences and because of the 3-Dimensional perspective gained of areas and objects that on photographic sheets, appear as 2-Dimensional. Again, some sites can be eliminated after such direct inspection. Also, information concerning extent, quality and context can be gathered easily from the air. Any sites that can be eliminated via aerial inspection can save many hours of ground inspection, particularly when dealing with remote areas. The use of aerial reconnaissance flights, as well as aerial photos, proved particularly important in evaluating sites for which permission to perform field surveys was not granted or pursued due to time constraints.

Update methods: Aerial reconnaissance was not used extensively during the update.

Ground Survey

Areas that were identified on maps, aerial photographs and from the air as potential sites were scheduled for ground surveys. Landowners were contacted and the sites examined to evaluate the condition and quality of the habitat and to classify the communities present. Field survey forms (Appendix III) were completed for each site. Boundaries for each site were mapped on USGS 1":25,000' scale topographic quadrangle maps. Site boundaries include both the key features of the site and the additional buffer areas critical to the protection of the site.

The flora, fauna, level of disturbance, approximate age of community and local threats were among the most important data recorded for each site. In some instances where permission to visit a site was denied, when enough information was available from other sources, or when time did not permit, sites were not ground surveyed.

Update methods:

A limited amount of time was available for ground survey work during the update. Areas that received priority were:

- 1) Sites designated during the original study where some information was available suggesting their condition may have changed.
- 2) Sites that fell outside of the original mapped areas where new information documented the occurrence of a special concern species or important natural community.
- 3) Areas where survey work was incomplete during the initial inventory.

Data Analysis

We reviewed all information available for sites within the county where features suggested ecological significance. Characteristics such as the size, condition, recoverability and rarity of the unique feature were considered in combination with the quality of the surrounding landscape context to generate a ranking of the site's importance relative to others in the county. In the cases when sites could not be compared through the detailed information that ground surveys provide, aerial photographs and existing data provided the necessary information that allowed decisions to be made concerning the site and its inclusion in the inventory.

Update methods: Data on natural communities and species of special concern obtained from 2002 fieldwork were synthesized with existing data and summarized. New sites were delineated around significant natural features documented after 1991. Boundaries for the original sites and for newly designated sites were digitized using ArcView 3.2a GIS software; base maps were georeferenced digital raster graphics of 1:24,000 scale USGS topographic quadrangles in the UTM zone 17 and zone 18 projections and the NAD 27 NADCON datum. Site boundaries were designed to delineate those areas where natural resource impacts should receive special consideration during land use planning. .Because in many cases the health of the surrounding landscape is critical to the health of the resource itself, a site boundary not only includes the area directly occupied by significant natural features, but also extends to delineate any areas in the surrounding landscape where new activities could potentially impact the natural features. County municipalities served as the organizing unit for the data with maps of each municipality provided.

GENERAL RECOMMENDATIONS FOR THE PROTECTION OF NATURAL HERITAGE AREAS

The inventory identifies significant Natural Heritage Areas in order to promote their protection. Specific site recommendations for the maintenance of these important biotic and ecological resources are made based upon (1) the classification as to type of Natural Heritage Area (i.e., Biological Diversity Area (BDA), Dedicated Area (DA) or Landscape Conservation Area (LCA); (2) the ecological characteristics of each site; (3) evidence of past or present disturbance within the site; and (4) the potential effects of the land-use activities that surround the site. Thus, these recommendations and site mapping recognize the interaction between the site's biotic resources and the natural ecosystems and/or land-use activities in proximity to the site. The general recommendations furnished below are meant to further clarify the differences between the various sites and to provide a general framework into which specific management recommendations can be made.

Natural Heritage Areas

Biological Diversity Areas

Biological Diversity Areas include those sites that are recognized as supporting populations of state, national or globally significant species or natural communities, high quality examples of natural communities or ecosystems, or exceptional native diversity. Occasionally these areas require some form of management in order to maintain suitable conditions for the species, group of species, or natural communities (e.g. removal of exotic plant species that are threatening the integrity of the natural community may be an acceptable practice, whereas, spraying for gypsy moth probably would not be considering the broad scale effects of the pesticide). Actions and projects impacting BDAs should take into consideration the ecological requirements of the species/community present in the area. When activities threaten to impact ecological features, the responsible agency should be contacted. If no agency exists, private groups such as conservancies, land trusts, and watershed associations should be sought for ecological consultation and specific protection recommendations.

Landscape Conservation Areas

Landscape Conservation Areas recognize large pieces of the landscape that are of higher ecological quality than other areas of similar size. Contiguous natural communities, minimal human disturbance and often the presence of Biological Diversity Areas within the LCA allow ecological processes to function across an entire landscape. Management requirements for LCAs are less stringent than those for either BDAs or DAs because they encompass a variety of land uses, some of which are not directly involved in the protection of specific species or communities. Whereas with BDAs and DAs, disturbances should be evaluated in terms of direct impacts to areas, with LCAs disturbances should be considered on a broad scale in terms of fragmentation and general habitat integrity. Sustainable land-uses that are sensitive to the natural features within the LCA are essential for the long-term preservation of the natural qualities recognized by the LCA. Construction of new roads and utility corridors, non-conservation timber harvesting, clearing or disruption of large pieces of land, and other activities that divide and alter the character of the landscape decrease the integrity and value of LCAs. People and human-created features are part of LCAs but do not dominate the landscape. By limiting the amount of land in intensive use (agricultural zones, residential zones, etc.) and by compressing development into already disturbed areas (villages, roads, existing ROWs, etc.), large pieces of the landscape can be maintained intact. Some LCAs are designed with aquatic resources in mind, and in those cases, a watershed boundary may be used to identify the LCA.

Geologic Features

Geologic features include those areas that illustrate regional geologic processes, landforms or scenery and are those that are recognized as outstanding in Pennsylvania by Geyer and Bolles (1979, 1987). These places are not necessarily of importance to biological diversity and are therefore not considered Natural Heritage Areas. However, they are included as natural history references in the county.

Geologic features are discussed in the text.

Other Recommendations

Buffers

Buffers or buffer zones are the areas surrounding the core areas of a site and provide insulation between significant ecological qualities and the existing, or potential, negative disturbances nearby. The size of the buffer depends upon physical factors (slope, topography, and hydrology) and ecological factors (species present, disturbance regime, etc.) as well as characteristics of the buffer itself, such as uniformity, species composition, and age. Although similar sites may have similar kinds of buffers, no two buffers will be exactly alike in size or extent. Two wetlands, for instance, of exactly the same size, and in the same region, may require very different buffers, if one receives mostly ground water and the other mostly surface water, or if one supports migratory waterfowl and the other does not.

The buffer and the area being "buffered" constantly interact and affect one another. As an example, protecting a section of old growth forest surrounded by second growth forest would involve creating a buffer that would allow plant species unique to the old growth section to spread outward and, at the same time, discourage inward colonization by weedy, opportunistic species. The buffer would also protect the site from heavy winds and storms. Buffers must always be considered in the context of what they are protecting and how these zones will evolve when functioning as buffers. In the case of the old growth forest, a hiking trail through the buffer would probably not significantly change the buffer or impact the old growth forest. However, the expansion of camping facilities into the buffer could slow or prevent the build-up of humus and the reproduction of trees, introduce invasive species and pollutants, and eventually alter the character of the buffer and ultimately decrease its effectiveness in protecting the old growth site.

The decision as to how large a buffer should be for an individual site takes into account the requirements of the natural community or species habitat that were the focus of the site. Buffers are not regarded as fixed distance areas around sites and the often-irregular site boundaries demonstrate that point. A fixed buffer may serve to reduce direct impacts on a site, but may not account for the connections a site has with other parts of the landscape. By either failing to protect the natural system of the site (e.g. ground water recharge zone for a spring) or by allowing other land-uses nearby (e.g. ore extraction within a rock formation supporting a bat cave), a buffer can fail to provide adequate protection to a site. Aquatic communities are buffered using the recommendations of Brown and Schaefer et al. (1987) and by recommendations given by the DCNR Bureau of Topographic and Geologic Survey to the Western Pennsylvania Conservancy on the use of buffers to protect water quality and quantity, as well as to maintain the ecological integrity of the Natural Heritage Area.

Each mapped Biological Diversity Area includes both the feature and a buffer area intended to protect the feature. The maps do not designate a primary boundary or the line delineating the feature. The line that does appear for Biological Diversity Areas, referred to as the secondary boundary, includes the feature (which would be the primary boundary) and a buffer.

Exotic Invasive Species

Exotic invasive species are a great threat to the ecosystems in Centre County. These species can dominate habitats that support native species and disrupt the integrity of the ecosystems involved. Exotic invasive species can be plants or animals. Examples of some of the exotic plant species threatening Centre County include multiflora rose (*Rosa multiflora*), garlic mustard (*Alliaria petiolata*), Autumn olive (*Elaeagnus umbellata*), Russian olive (*Elaeagnus angustifolia*), teasel (*Dipsacus sylvestris*), purple loosestrife (*Lythrum salicaria*) and Japanese knotweed (*Polygonum cuspidatum*).

Management for these species depends upon extent of establishment of the species. Small infestations may be easily controlled or eliminated but more well established populations may present difficult management challenges. Many sources of information are available about exotic species (see Appendix I).

OVERVIEW OF CENTRE COUNTY NATURAL FEATURES

Centre County is located in central Pennsylvania and covers an area of approximately 713,600 acres. It is bounded by Clinton and Union Counties to the north and east, Mifflin, Huntingdon and Blair Counties to the south, and Clearfield County to the west.

PHYSIOGRAPHY

Centre County straddles the boundary between two major physiographic regions: the Ridge and Valley and the Appalachian Plateaus Provinces (Berg, 1989) (Figure 2). The Appalachian Mountain Section of the Ridge and Valley Province consists of a series of nearly parallel, forested ridges that rise steeply from the mainly cleared valley floors. The bedrock is highly folded sedimentary rock; quartzite, sandstone and some shale with an underlying layer of limestone which continues out under the valley floors. The valleys are deep colluvium, weathered from these rocks and they are considered to be the best agricultural soils in the county (Braker, 1981).

The structure of the bedrock and the location of the limestone layer in the Nittany valley create a situation ideal for the formation of limestone solutional caves. Many hundreds have been found in Centre County, mostly along the base of these ridges where water running off the sandstone comes in contact with the water-soluble limestone (White, 1976).

The northwestern half of the county is within the Allegheny Mountain Section, the Mountainous High Plateau and the Pittsburgh Low Plateau Sections of the Appalachian Plateaus Province and is quite different from the Ridge and Valley area. As the name implies, it is generally flat, with occasional deep ravines cut by high gradient streams. The "plateau" is formed mostly of sandstone and shale with occasional deposits of coal, clay and pockets of natural gas. The area is predominately forested, though the forest cover is broken by large tracts of mined land and some wildlife clearings on State Game Lands. The soils on the plateaus are excessively drained sandy loams that have a very low organic content and are considered unsuitable for farming.

Between the two physiographic provinces is a transition zone characterized by progressively higher rolling hills that run from the Bald Eagle Creek valley to the base of the Allegheny Mountain Section of the Appalachian Plateaus Province. This area is heavily logged and farmed.

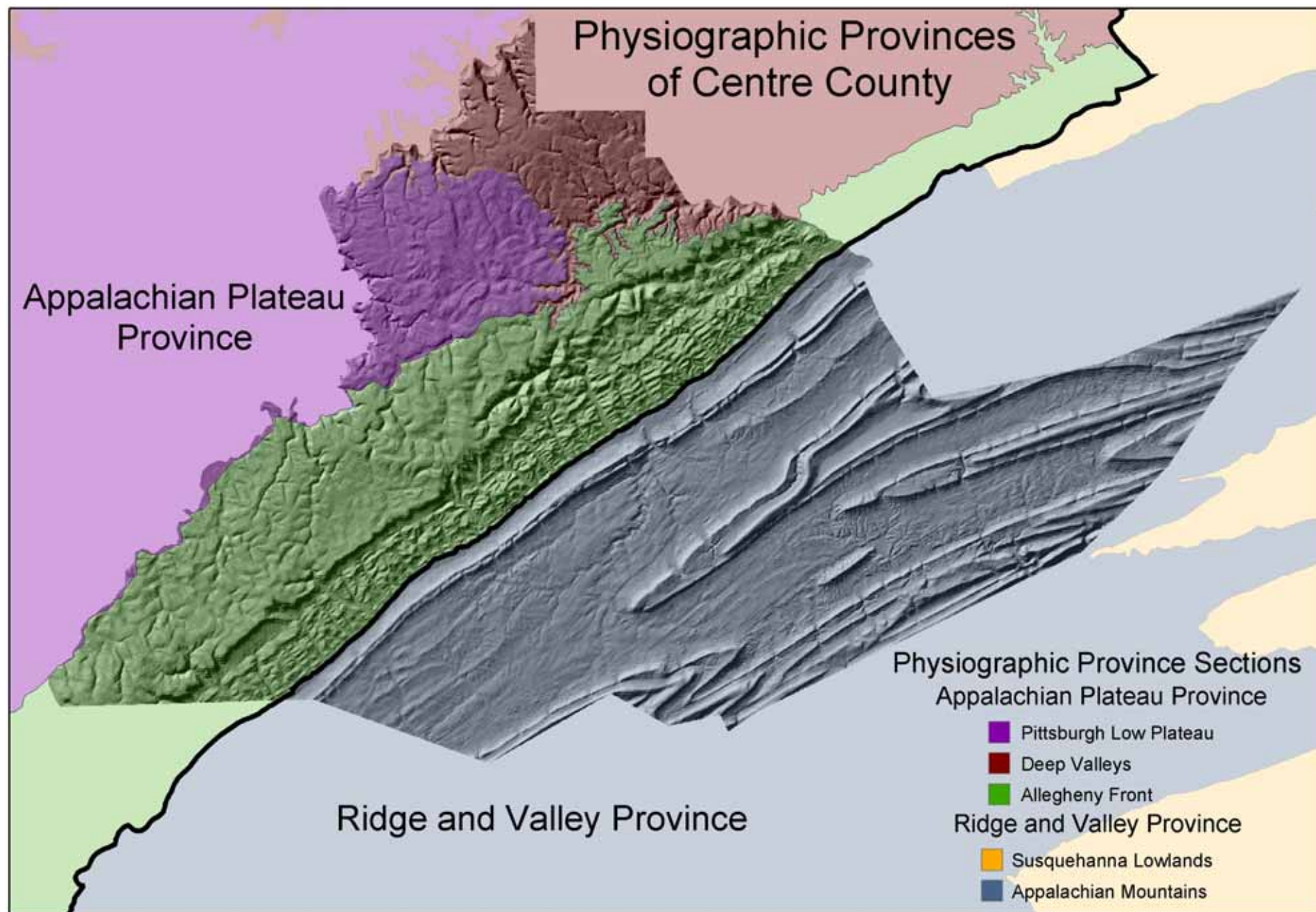


Figure 3: Physiographic Provinces of Centre County

VEGETATION

Centre County lies in the White Pine-Hemlock-Hardwood forest region as described by Lull (1968), and in both the White Pine-Hemlock-Northern Hardwoods and the Oak-Chestnut regions that Braun (1950) defines. The Appalachian Oak Forest as described by K  chler (1964) also includes Centre County. A forest region is an area that would generally have similar vegetation if human influence on it were discontinued and these areas were allowed to return to their natural state. The descriptions of the types do not usually mention what variations in vegetation may be found due to local differences in soil, topography and hydrology, but they are useful for understanding what the potential vegetation of an area might be.

The White Pine-Hemlock-Hardwood forest region stretches roughly from the southern coast of Maine, through New Hampshire and Massachusetts, the southern tip of New York, and the middle of Pennsylvania. This region lies between the Beech-Birch-Maple / Beech-Maple region to the north and the Oak-Yellow Poplar / Oak-Chestnut region to the south (Lull, 1968) (Braun, 1950). Braun (1950) considers the southern edge of the Allegheny Mountain Section to be the boundary line between the White Pine-Hemlock-Hardwoods region and the Oak-Chestnut region. Edges of any of these areas may contain elements of the neighboring regions.

Early descriptions of County describe an oak-chestnut dominated landscape with ash, walnut, hickory, tulip tree and maple as companion species with isolated patches of pine and hemlock (Westerfeld, 1959). The introduced chestnut blight fungus (*Endothia parasitica*) effectively removed the American chestnut (*Castanea dentata*) as a tree-sized component in this forest. The dramatic changes in the vegetation brought about by this fungus, fire, mining, logging and settlement of the area, have influenced the development of the present day mixed oak-hickory forest. In the past two decades gypsy moth (*Lymantria dispar*) outbreaks have periodically resulted in high mortality of oak trees, changing the character of Centre County forests again in some areas.

Northern red oak (*Quercus borealis*) and red maple (*Acer rubrum*) are probably the most common hardwoods in the county's forests, but white oak (*Quercus alba*), black oak (*Quercus velutina*), chestnut oak (*Quercus montana*), scarlet oak (*Quercus coccinea*), shagbark hickory (*Carya ovata*) and mockernut hickory (*Carya tomentosa*) are also rather common throughout. Eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), and pitch pine (*Pinus rigida*) are common conifers that occupy ravines, disturbed or drier sites in the area.

Less common associates found in Centre County forests are green ash (*Fraxinus pennsylvanica*), slippery elm (*Ulmus rubra*), sassafras (*Sassafras albidum*), black gum (*Nyssa sylvatica*), black birch (*Betula lenta*), white birch (*Betula papyrifera*), yellow birch (*Betula allegheniensis*), black cherry (*Prunus serotina*), pin cherry (*Prunus pensylvanica*), and rhododendron (*Rhododendron maximum*).

Though most of the land is covered with mixed oak forests, there are several other types of plant communities in Centre County. Where local conditions and land use history permit, dramatically different types can develop. In areas where the soil is dry and alkaline, nearly pure stands of black walnut (*Juglans nigra*) may flourish. In mountain bogs where the soil is highly acidic, balsam fir (*Abies balsamea*) and black spruce (*Picea mariana*) find suitable habitat. Virginia

pine (*Pinus virginiana*), a species that requires lots of sunlight and little competition from other trees, has found a niche in the barren, high mountain valleys that were once farmed and later abandoned (Westerfeld, 1959). Eastern sycamore (*Platanus occidentalis*) and cattails grow in the floodplains of the larger creeks, and basswood (*Tilia americana*) and sugar maple (*Acer saccharum*) may be found on cool, north facing slopes.

Non-forest natural community types are also found in Centre County. Meadows of alder (*Alnus rugosa*) or sedges (*Carex spp.*) form at the headwaters of streams or in lowland wet areas. Wetlands over limestone soils are uncommon in Centre County, but where present, they support some of the county's rarest plant and animal species. Limestone cliffs, also somewhat rare, shelter species like maiden's bower (*Clematis verticillaris*) and several uncommon ferns and insects. Another type of site in Centre County is classified as a scrub oak shrubland (Fike 1999). This low, scrubby community has extremes of temperature and dryness which favor many of the County's rarest species.

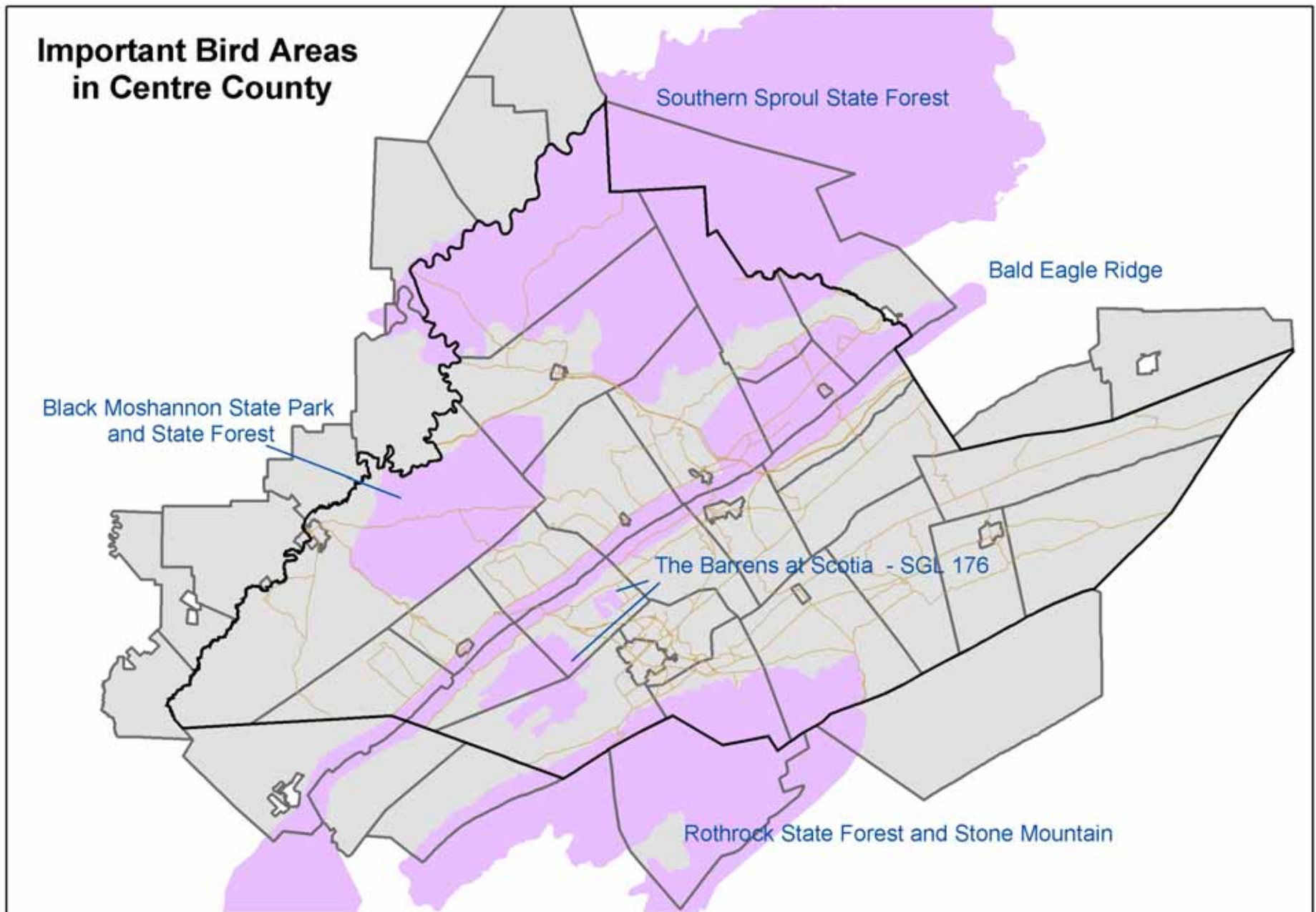


Figure 4: Important Bird Areas in Centre County

Important Bird Areas of Centre County

Centre County includes portions of four Important Bird Areas (the Natural Heritage Areas Classification, pg. 21, provides background regarding the IBA designation, including selection criteria). As these areas typically span across several municipal divisions, they are described separately from the results grouped by municipality. As can be seen in Figure 4, several IBAs extend beyond Centre County; features described below pertain to the entire area and are not necessarily confined to Centre County.

Note: the following information is adapted from the Audubon Society of Pennsylvania IBA site descriptions (Audubon 2002).

Bald Eagle Ridge

Bald Eagle Ridge has varied habitats, including mature forests, late successional stage fields, wetlands, perennial and intermittent streams, and hillside seeps. In some areas, it appears that the entire side of the ridge is seeping water. These areas remain open all year and are important for amphibians, turkeys, grouse, woodcock, and other species that are dependent on open water for survival during the winter. The large expanses of unfragmented forest are important habitat for breeding Neotropical migrant species such as Cerulean Warbler, Worm-eating Warbler, Wood Thrush, Scarlet Tanager, and Ovenbird. Bald Eagle Ridge is also an important flyway for raptors. Counts of Golden Eagles are some of the highest recorded in eastern North America and consistently exceed those of migration count sites along the Kittatinny Ridge.

This area satisfies the following IBA criteria:

1—Exceptional concentration/diversity of birdlife: It is a major flyway for raptor migration in the northeastern US. 174 species of birds have been documented along this ridge, including high counts of Golden Eagle and Broad – winged Hawk.

4—Unique or representative habitat: The area provides large expanse of unbroken forest for forest interior species, such as Cerulean Warbler and Worm – eating Warbler, and provides spring seeps valuable to Woodcock and Turkey.

Conservation Concerns

PennDOT has applied to construct a Traffic Improvement Project on Rt. 220 in Centre and Blair counties. Part of this project is an alignment including 17.5 miles of limited-access highway on the ridgetop of Bald Eagle Mountain. David Densmore, a supervisor with the Fish and Wildlife Service has stated that this project “will have substantial adverse effects on aquatic and terrestrial wildlife habitat that will not, and in some cases cannot, be mitigated.” In October 1997, the Federal Highway Administration approved the building of the four-lane highway up and over the mountain. The only hurdle now left for this project is approval from the Army Corps of Engineers. There is no official management plan for this area, other than Game Commission management of SGL 278.

Black Moshannon State Park & State Forest

Black Moshannon State Park (including the 1500 acre Black Moshannon Bog Natural Area) and part of the immediate surrounding Moshannon State Forest in western Centre County contain several wetland types including bogs, marshes, and swamps, as well as a 250 acre- man-made lake. The surrounding area is primarily an unfragmented mixed forest of oak, hemlock, pine, birch, and hickory. Black Moshannon provides a large expanse of forest for migrating and breeding forest interior bird species. The site's extensive wetlands are areas where wetland species breed. Conifer-associated bird species include 28 species of warblers including Canada, Magnolia, Cerulean, and Blackburnian. Black Moshannon State Forest is also a prime habitat for a significant Whip-poor-will population.

This area satisfies the following IBA Criteria:

3- Special concern species: Northern Goshawk (B), Northern Saw-whet Owl (poss. B), Northern Harrier (poss. B), Pied-billed Grebe (poss. B), Olive-sided Flycatcher (poss. B).

4- Unique or representative habitat: Extensive wetlands around the lake make up what can be considered the best reconstituted bog on the high plateau region: characteristic species of this habitat documented to use the area the American Bittern (B – 1 pair) and Whip-poor-will (poss. B).

Conservation Concerns

Development for gas extraction, and the potential for silt removal are threats to the site. Recreational use by off-road vehicles disturbs wildlife, causes erosion, and costly destruction to foot trails. A large deer population contributes to forest understory damage.

The Barrens at Scotia

This unique habitat is one of the largest examples of a pitch pine – scrub oak barrens left in Pennsylvania. Its forests and its numerous small wetlands provide habitat. It harbors large numbers of Neotropical migrants during spring and fall migration. Thirty-three species of warblers have been observed including Blue-winged, Golden-winged, Tennessee, Orange-crowned, Nashville, Northern Parula, Chestnut-sided, Magnolia, Cape May, Black-throated Blue, Yellow-rumped, Black-throated Green, Blackburnian, Pin, Palm, Bay-breasted, Blackpoll, Cerulean, Black-and-white, Redstart, and Worm-eating Warblers. Other species include the Ovenbird, Northern Waterthrush, and Louisiana Waterthrush.

This area satisfies the following IBA Criteria:

1— Exceptional concentration/diversity of birdlife: high numbers and diversity of bird life in this area feature a high concentration of spring and fall migrating warblers (33+ species)

3—Special concern species: Northern Saw-whet Owl (W, B – 1+- pair).

4—Unique or representative habitat: One of the largest barrens left in the state. Characteristic species documented from the area are Whip-poor-will (B-10+-pair), American Woodcock (B-50+ pair), Ruffed Grouse (B – 50+ pair).

5—Long term avian research: The area is monitored by State College Bird Club; PA Game Commission conducts research on Ruffed Grouse and Wild Turkeys; Breeding Bird Censuses conducted in the area.

Conservation Concerns

This is an area of heavy use by humans for foot travel, biking and hunting. In the past six years, no habitat enhancements have been observed. Long-term research is on-going. Fire suppression is a significant threat to the ecological character of the barrens. Loss of aquatic habitats and pollution of small ponds within the site are also issues. Attempts have been made, with little success, to provide buffer areas between game land and encroaching housing developments.

Rothrock State Forest (part) and Stone Mountain

This site includes Thickhead Wild Area and Alan Seeger Natural Area in the heart of Rothrock State Forest, southeast of State College, as well as the Stone Mountain ridgeline. Thickhead Wild Area is a mountainous region of unfragmented deciduous and mixed forest. It contains three natural areas; Detweiler Run Natural Area, an isolated forest/stream site characterized by virgin White Pine and Eastern Hemlock along with a heavy undergrowth of rhododendron; Bear Meadows Natural Area, an unusual boreal conifer/shrub swamp; and Big Flat Laurel Viewing Area, an area of high plateau pine, heath, and mountain laurel. The 390-acre Alan Seeger Natural Area consists of virgin oak-hickory, maple, and hemlock-pine forest with rhododendron understory.

The Thickhead Wild Area contains some of the best remaining stands of old-growth in central Pennsylvania and large sections of unfragmented forest important for forest-interior species. Stone Mountain ridgeline is one in the system of ridges funneling southbound migrant raptors. Documented numbers average 2,000-4,000 in fall migration; however, the area is not monitored daily, so numbers are likely higher.

This area satisfies the following IBA criteria:

1—Exceptional concentration/diversity of birdlife: large numbers of Raptors (FM – 5000+ est., 2000+ recorded), including Broad-winged Hawk (1000+), Red-tailed Hawk (1000+), Sharp-shinned Hawk (1000+), and American Kestrel (100+).

2—Special Concern Species: Osprey (FM - ~78), Bald Eagle (FM - ~7), Northern Goshawk (B – 2 pair), Northern Harrier (B – 2 pair)

4— Unique or representative habitat: the area contains a large block of representative natural forest habitat. Species dependent on this habitat that have been documented from the area include: Acadian Flycatcher, Red-eyed Vireo, Blackburnian Warbler, Ovenbird, Canada Warbler, Scarlet Tanager, Solitary Vireo, Black-throated Blue Warbler.

5—Long term avian research: Three Breeding Bird survey routes are conducted within the forest along with a Breeding Bird Census and two special areas projects.

Conservation Concerns

Development pressure from State College for commercial, residential, and recreational use is a threat. Recreational overuse is a growing problem with the use of ATVs. A large deer population contributes to forest understory degradation. Access is limited or difficult in much of the area. Detweiler Run Natural Area, Bear Meadows Natural Area, and Big Flat Laurel Natural Area could be expanded into surrounding Rothrock State Forest land to provide more quality habitat for interior forest-nesting species and neotropical migrants. Land acquisitions surrounding these areas also would greatly increase the value to interior forest-nesting species and neotropical migrants in these high-quality sites.

Southern Sproul State Forest

This is an extremely large, remote area representative of northern hardwood forest. Southern Sproul State Forest extends from the West Branch of the Susquehanna River south to approximately the Beech Creek watershed. There are no permanent residences and no electricity within this area, with the only human disturbances being timber sales, limited oil and gas development, and seasonal cabins. The Fish Dam and Burns Run Wild Areas, Bucktail State Park, Cranberry Swamp, and East Branch Swamp Natural Areas are all included within this area.

This site supports breeding species associated with very wild, mixed forest types. Deciduous woods provide habitat for breeding Cerulean and Prairie warblers. Other species include Whip-poor-will, Eastern Wood-Pewee, Least Flycatcher, Eastern Phoebe, Eastern Bluebird, Hermit Thrush, Cedar Waxwing, Black-and-white Warbler, Black-throated Green Warbler, Pine Warbler, Black-throated Blue Warbler, Chestnut-sided Warbler, Ovenbird, Rose-breasted Grosbeak, Indigo Bunting, and Eastern Towhee.

This area satisfies the following IBA criteria:

1— Exceptional concentration/diversity of birdlife: Southern Sproul State Forest is one of the largest areas dominated by forest-interior birds in Pennsylvania.

4— Unique or representative habitat: Southern Sproul State Forest contains rare, threatened, or unusual habitat within the Allegheny Plateau Province. It is exceptionally representative of a characteristic hardwood forest within the province.

Conservation Concerns

Major threats to this area are forest insect pests, and fire. White tailed deer overbrowsing has severely limited the forest habitat diversity, both in structural and species diversity.

Portions are currently protected by State Forest Natural and Wild Area status. Restricting the use of motorized vehicles, thinning of the White-tailed Deer herd, limiting timbering and encouraging passive recreational use will help insure the stability of this valuable area.

RESULTS BY MUNICIPALITY

INTRODUCTION

Detailed maps and description of Centre County's natural features follows, organized by township. For each township a map, a summary table, and full report are provided. Townships are grouped by planning region (figure 2, pg. 12), and arranged alphabetically within each region. Boroughs are treated together with an adjacent township due to their small size.

Biological Diversity Areas, Landscape Conservation Areas, Managed Lands, Dedicated Areas, and Important Bird Areas are indicated on the municipality maps and are labeled in bold.

SUMMARY TABLE CONVENTIONS

A summary table of sites precedes each map and lists identified Biological Diversity Areas, Landscape Conservation Areas, and Managed Lands.

- Managed lands are listed after the Natural Heritage Areas; among managed lands, Dedicated Areas are denoted by "DA".
- Following each site name is the site's relative significance. Table 1 (pg. 2) summarizes sites by significance category, and definitions of the significance categories precede the table.
- Listed under each site name are any state-significant natural communities and species of special concern that have been documented within the area.
 - see Appendix IV for a list of Natural Communities recognized in Pennsylvania.
 - Some species which are perceived to be highly vulnerable to intentional disturbance are referred to as "special animals" or "special plants" rather than by their species name. Within each site these species are numbered.
 - The PNDI (Pennsylvania Natural Diversity Inventory) ranks and current legal status (detailed in Appendix Va and Vb) are listed for each community and species.
- The text that follows each table discusses the natural qualities of the site and includes descriptions, potential threats, and recommendations for protection.

This report does not intend to encourage visitation of private lands without explicit permission of the landowner. Also, the report does not contain all the detailed information required to manage the species of special concern. If more information is needed, ecological professionals at the Western Pennsylvania Conservancy or at the state natural resource agencies should be contacted. Hopefully, this report will encourage communication between ecological professionals—at the Conservancy and within state natural resource agencies—with municipalities, organizations, and individuals.

Mountaintop Region

- **Burnside Township**
- **Snowshoe Township**
- **Snowshoe Borough**



Hemlock palustrine forest community
Cinnamon fern, sphagnum, and rhododendron



Vernal pool

BURNSIDE TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

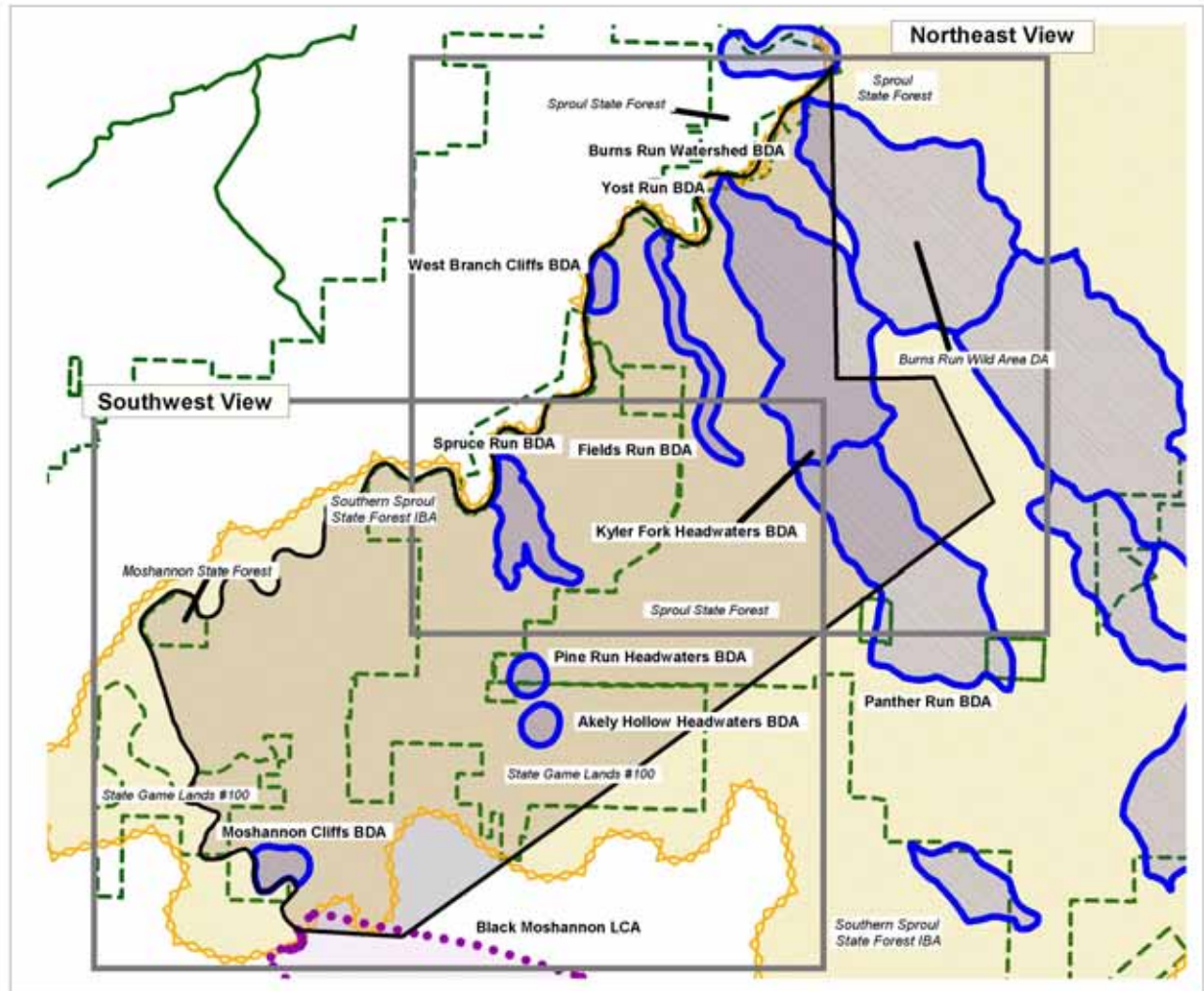
NATURAL HERITAGE AREAS:

AKELY HOLLOW HEADWATERS BDA		<i>Exceptional Significance</i>			
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE	
PINE RUN HEADWATERS BDA		<i>Exceptional Significance</i>			
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE	
BURNS RUN WATERSHED BDA		<i>High Significance</i>			
High-gradient clearwater creek			PA	Exceptional Value	
FIELDS RUN BDA		<i>County Significance</i>			
SPRUCE RUN BDA		<i>County Significance</i>			
MOSHANNON CLIFFS BDA		<i>High significance</i>			
Allegheny woodrat (<i>Neotoma magister</i>)	G3G4	S3		PT	
PANTHER RUN BDA		<i>High Significance</i>			
High-gradient clearwater creek			PA	Exceptional Value	
WEST BRANCH CLIFFS BDA		<i>High Significance</i>			
Allegheny woodrat (<i>Neotoma magister</i>)	G3G4	S3		PT	
YOST RUN BDA		<i>Exceptional Significance</i>			
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE	
BLACK MOSHANNON LCA		<i>Notable Significance</i>			

(continued following maps)



Burnside Township (full view summary) **Centre County** **Natural Heritage Inventory**



Biological Diversity Areas:

Akely Hollow headwaters
Pine Run Headwaters
Burns Run Watershed
Fields run
Spruce Run
Moshannon Cliffs
Panther Run
West Branch Cliffs
Yost Run

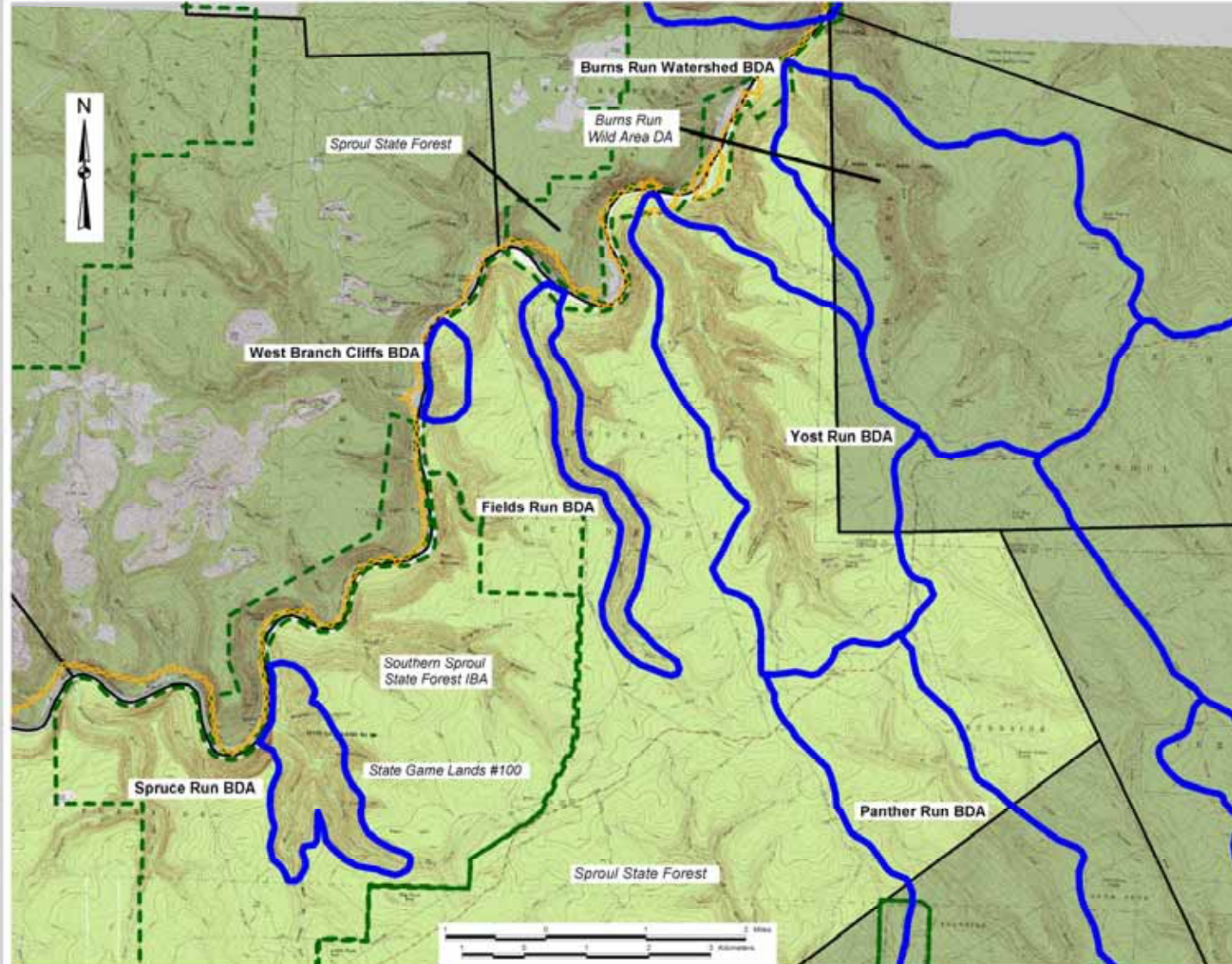
Landscape Conservation Areas:

Black Moshannon LCA

Managed Areas:

Burns Run Wild Area DA
Moshannon State Forest
Spruce State Forest
State Game Lands #100

Burnside Township (northeast view)



Burnside Township (northeast view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

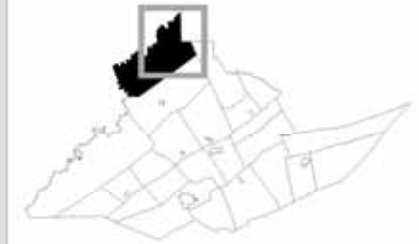
Burns Run Watershed
Fields run
Spruce Run
Panther Run
West Branch Cliffs
Yost Run

Landscape Conservation Areas:

None

Managed Areas:

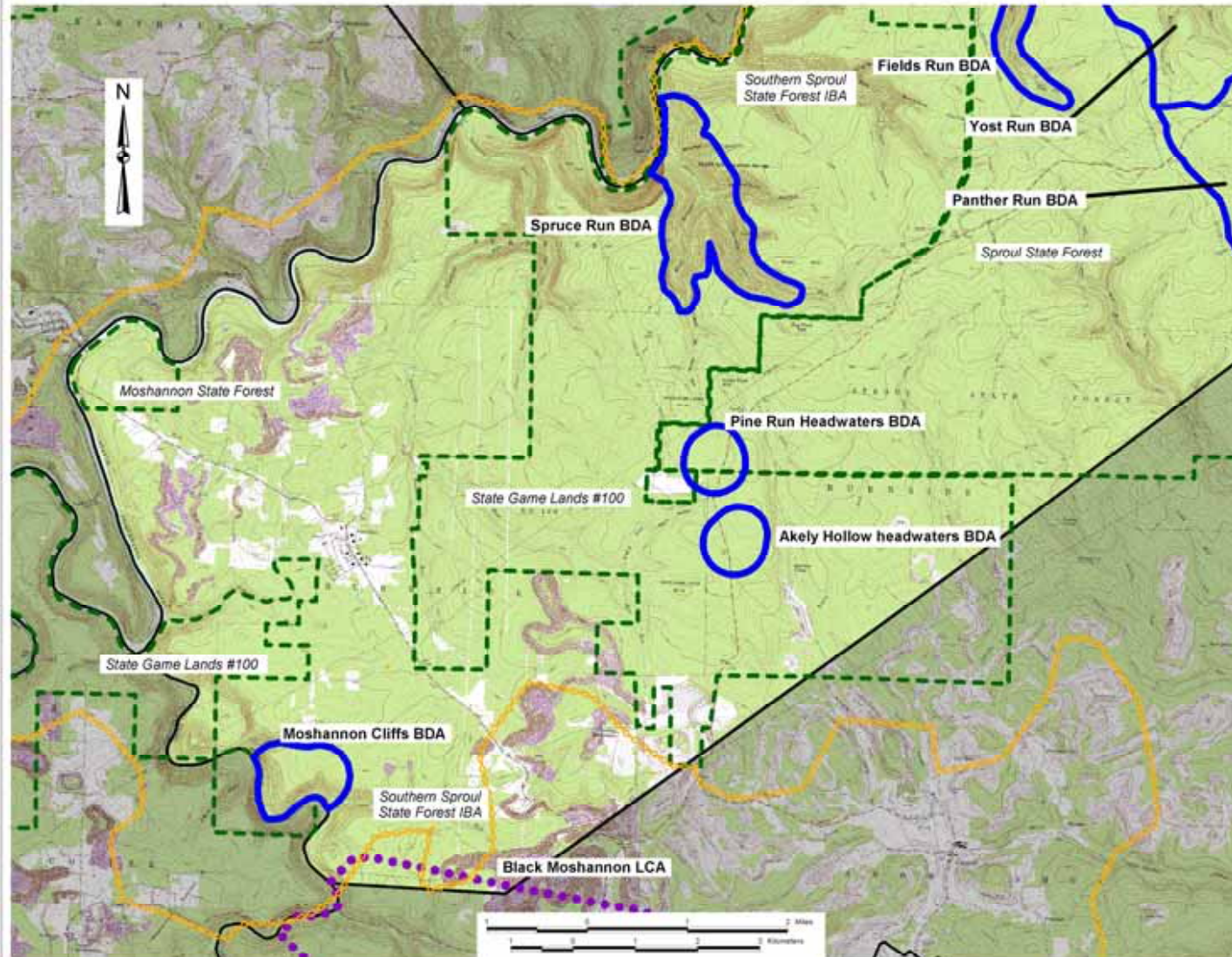
Burns Run Wild Area DA
Spruce State Forest
State Game Lands #100



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

Burnside Township (southwest view)



Burnside Township (southwest view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Akely Hollow headwaters
Pine Run Headwaters
Fields run
Spruce Run
Moshannon Cliffs
Panther Run
West Branch Cliffs
Yost Run

Landscape Conservation Areas:

Black Moshannon

Managed Areas:

Burns Run Wild Area DA
Moshannon State Forest
Spruce Run State Forest
State Game Lands #100



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

OTHER CONSERVATION AREAS: Southern Sproul State Forest Important Bird Area

*MANAGED LANDS: Moshannon State Forest
Sproul State Forest
State Game Lands #100*

GEOLOGIC FEATURES: none

BURNSIDE TOWNSHIP

This township includes a large section of forested land and is a very remote part of Centre County. The area is part of the Mountainous High Plateau Section of the Appalachian Plateaus Province and has a series of deep valleys that run northwest to the West Branch of the Susquehanna River. The elevation differences from top to bottom of these valleys can be as great as 900 feet. Slopes of greater than 60 percent are not uncommon. The land is mainly within Sproul State Forest and state game lands and has been logged extensively. Hundreds of acres on the high flats between ravines have been cleared for wildlife food plots. Not visible on the preceding map but very common in the landscape are natural gas wells, both active and capped, whose pipelines and clearings create a network of interconnected fields and edges. However, the area retains habitat value for birds and other species that depend on interior-forest conditions because it is part of a fairly extensive block of contiguous forest; almost all of the township falls within the area designated by the PA Audubon Society as the Southern Sproul State Forest Important Bird Area (see page 38 for more detail).

Akely Hollow Headwaters BDA & Pine Run Headwaters BDA

These sites were designated because each contains a vernal pool inhabited by the northeastern bulrush (*Scirpus ancistrochaetus*), a plant currently listed as Federally Endangered and Pennsylvania Threatened. The pools themselves also comprise natural communities of unique ecological value.

The northeastern bulrush is a sedge species that is only known to inhabit the northeastern Appalachian mountains. Furthermore, the portion of the Appalachians occurring in Pennsylvania appears to be the global center of this species' range, as over half (62%) of all known locations fall within Pennsylvania— and more locations are currently known from Centre County than from any other county in Pennsylvania. Although not all potential habitat areas in Pennsylvania have been surveyed, the Centre County populations currently make up 15% of all known locations globally. The species is frequently associated with vernal pools, although in other parts of its range it is known from other types of wetland habitat. The various habitats all appear to share the characteristic of seasonally fluctuating water levels. Within Pennsylvania very few occurrences are known from habitats other than vernal pools. In Centre County, most occurrences are known from the eastern ridges; the two pools within the Akely Hollow Headwaters and Pine Run Headwaters BDAs support two of the three populations of northeastern bulrush known from the Appalachian Plateau (physiographic province) portion of Centre County.

The vernal pools provide a unique habitat. A variety of animal species utilize vernal pools, and some species require these habitats for survival. Jefferson and Slimy salamanders breed exclusively in vernal pools, laying their eggs in the spring, then migrating outwards up to 500 m away from the pools to spend much of the rest of the year living in the surrounding forest. Invertebrate species such as fairy shrimp also depend upon vernal pools. The animal species composition is especially unique because the absence of fish enables the survival of many smaller organisms which would otherwise be eliminated by predation. While the habitat at these sites appears highly suitable for animal species typical of vernal pools, animal populations have not been surveyed, so no definitive information is available on species composition. The exact

composition of plant communities is somewhat variable among the ponds; species that are often present include sharp-flowered manna grass (*Glyceria acutiflora*), sedges (*Carex canescens*, *Carex lupulina*, *Carex intumescens*), woolgrass (*Scirpus cyperinus*), beggar-ticks (*Bidens* sp.), and fireweed (*Erechtites hieracifolia*).

Threats and stresses

Changes in hydrological pattern, light levels, or the contiguity of the forest habitat would negatively impact the species and natural communities within this BDA. The vernal pools that are the significant features of this site are fed by surface runoff from the entire watershed area above them. Any activity resulting in earth disturbance would affect the current hydrological pattern at this site and potentially alter conditions within the vernal pools. Such a change could impact the success of the northeastern bulrush populations because the species appears to be very sensitive to alterations of the water regime in its habitat, although it is not known what conditions are optimal. Changes in light levels may also impact northeastern bulrush populations. Additionally, disruptions to the forest within 500 m of a pond may impact amphibian populations associated with the vernal pools. Conditions on the forest floor, including the presence of woody debris and leaf litter, moisture levels, and temperature, are important to the ability of amphibians to use this habitat. While amphibian surveys have not been conducted at this site, the vernal pool is highly suitable habitat, and surveys should be conducted in the pool and surrounding forest area before any assumption is made that they are not present.

Recommendations

Activities that remove forest canopy or result in earth disturbance should be avoided within a 500 m buffer of the ponds, in order to avoid disrupting natural hydrological patterns in the ponds and to avoid impacts to potential amphibian populations. The forest canopy should remain intact in the area immediately surrounding the ponds. Where roads, clearings or staging areas have already been constructed within these BDAs, ditching and other drainage solutions should consider and attempt to preserve the natural drainage of the site, and should provide effective erosion control measures. Also, a fuller understanding of the animal species utilizing these vernal pools would be gained through invertebrate and amphibian surveys, and this knowledge would provide an important basis for site-specific conservation planning.

Burns Run Watershed BDA

Burns Run is designated as an Exceptional Value stream by the Pennsylvania Department of Environmental Protection. Most of the watershed is in Clinton County; only a segment including the confluence of Burns Run and the West Branch Susquehanna River falls within Centre County. The main stream valley is included in the Burns Run Wild Area, while the upper portion of the watershed is not. The entire watershed is designated as a BDA because the health of the stream is integrally dependent on the health of the forest within its watershed, which anchors sediments and provides for natural uptake and input of nutrients. The condition of land immediately adjacent to the stream is also particularly important to the habitat quality of the stream for aquatic organisms, as some depend on the light levels and temperature conditions created by a forest canopy and others utilize the forest habitat.

The floor of the portion of the ravine within Centre County contains a hemlock terrestrial forest community with large eastern hemlock along the creek, thick patches of rhododendron (*Rhododendron maximum*), scattered witch hazel (*Hamamelis virginiana*), and a very sparse herbaceous layer. The remainder of the watershed area has not been ground surveyed.

The tornado of 1986 cut through the middle of the watershed, leveling trees and creating a nearly impenetrable mass of trunks, branches, saplings and brambles. Subsequently, in 1989, much of the eastern section of the area burned, the fire running almost perpendicular to the path of the tornado. Still, the valley supports a hemlock – northern hardwoods forest community consisting of eastern hemlocks (*Tsuga canadensis*), patches of rhododendron (*Rhododendron maximum*), witch hazel (*Hamamelis virginiana*), and little or no ground cover or herbaceous growth. Although the Wild Area does afford protection to Burns Run, the upper sections of the watershed are part of the commercial forest. This stream and watershed are in the process of recovering after the natural disturbances mentioned and are particularly susceptible to changes in hydrology and runoff patterns associated with activities like road building and maintenance, and timber salvage operations. All activities affecting the watershed should be reviewed in this light and restricted where possible. Also, consideration should be given to the value of naturally evolving habitat to flora, fauna, and managed wildlife.

Threats and Stresses

The area is currently very intact, and much of it is managed as a Bureau of Forestry Wild Area, so few threats are imminent. Large scale forest cover removal in the upper portions of the watershed that do not fall within the Wild Area might result in some pollution of the stream with sediment or excess nutrients.

Recommendations

In order to avoid impacts to the health of Burns Run, it is recommended that any forest cover removal operations in the upper watershed be small-scale and conducted with appropriate erosion control precautions.

Fields Run BDA & Spruce Run BDA

These BDAs are designated around the high quality forest communities found in these ravines. Neither Fields Run or Spruce Run are designated as Exceptional Value and both hold improved roads, hunting cabins, and campsites in close vicinity to the streams. Most of the Fields Run area contains hemlock-northern hardwoods terrestrial forest community, and eastern hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*), and sugar maple (*Acer saccharum*) are important species in the canopy. Fields Run is a High Gradient Clearwater Creek identified by the Fisheries Management Division of the Pennsylvania Fish and Boat Commission as Class "A" wild brook trout habitat, and is qualified as a High Quality-Cold Water Fishery by the DCNR Bureau of Water Quality.

Spruce Run is also a High Gradient Clearwater Creek, but it has not been identified as a Class "A" trout stream. The forest that surrounds it is mostly characterized by an eastern hemlock

(*Tsuga canadensis*) overstory and rhododendron (*Rhododendron maximum*) shrub layer and is classified a hemlock (white pine) terrestrial forest community. Aerial photographs indicate several different communities along the lower part of this creek that may warrant further investigation.

Threats and stresses

Disturbance in the ravine areas would damage the forest communities and might make the areas more susceptible to the establishment of exotic species. Also, any forest cover without effective provision for controlling soil erosion emanating from road use and maintenance will negatively impact the health of the streams. In various places forest cover has been removed, especially along the stream valley, and it is unknown whether erosion is adequately controlled in these areas. Large-scale removal of forest cover would also alter the level of nutrients entering the stream, which may detrimentally impact the aquatic community.

Recommendations

Large-scale forest cover removal should be avoided within the bounds of this site in order to preserve the integrity of the high quality forest communities and to avoid nutrient runoff pollution of the waterways. In those areas where forest cover has already been removed, erosion control measures should be implemented if not in place already. Also, forest cover should be left intact on steep slopes over 15%, as erosion is very rapid and difficult to prevent in these areas. On more gradually sloping land, if activities are pursued which result in forest cover removal, great care should be taken to prevent the movement of eroding sediments away from the immediate area of operation.

Moshannon Cliffs BDA & West Branch Cliffs BDA

These sites encompass habitat areas where the Allegheny woodrat (*Neotoma magister*)— an animal species of special concern— has been documented to live. The woodrat inhabits rocky cliffs and outcroppings. Historically it is known from a fairly large range in the eastern U.S., from New York to Alabama and west to Indiana and Tennessee, but it is extirpated or declining over about 35% of the range. While it is still common in other areas, the decline has been rapid and the cause is not yet fully understood. Allegheny woodrats eat leaves, twigs, fruits, and seeds from many plants, and acorns may form a substantial component in their diet.

Threats and Stresses

Several different studies provide evidence that there may be a variety of factors contributing to the observed declines in populations of the Allegheny woodrat in different parts of its range. Some populations appear to have suffered heavy mortality from the raccoon roundworm. Raccoons are habitat generalists that tolerate or even benefit from habitat fragmentation and disturbance. Since raccoon populations increase in areas where human settlement patterns have greatly increased the level of fragmentation and disturbance, these landscape changes may have created conditions that increase the exposure of woodrats to the raccoon roundworm parasite. Population declines are also correlated with gypsy moth infestations of oak trees and with exceptionally severe winter conditions. Work in Pennsylvania suggests that acorns are a major

food source, and in the event of widespread oak mortality resulting from a severe gypsy moth infestation, the decline in acorn production might create significant limitations in food supply for this animal.

Recommendations

Forest cover is important in maintaining the microhabitat conditions and some of the food sources utilized by Allegheny woodrats. Oak trees are especially important because of the food source they provide and should not be removed. Fragmentation and disturbance within the area should be avoided. The PA Game Commission has developed further recommendations regarding management of woodrat habitat, which may be available upon request.

Panther Run BDA

Ground surveys have not been conducted of this area. Aerial reconnaissance suggests the area is mainly a deciduous forest type. Several roads and disturbed areas are present in the watershed and detract from its contiguity. No indicators of especially unique terrestrial community types were observed within the watershed. However, while the forest community is not distinctive, it plays a vital role in maintaining the health of the stream by anchoring soil sediments and maintaining a natural cycle of nutrient input and uptake. The condition of land immediately adjacent to the stream is also particularly important to the habitat quality of the stream for aquatic organisms, as some depend on the light levels and temperature conditions created by a forest canopy, and others utilize the forest habitat.

Threats and Stresses

Any removal of forest cover without effective provision for controlling the resultant soil erosion will negatively impact stream health. In various places forest cover has been removed, and it is unknown whether erosion is adequately controlled in these areas. Large-scale removal of forest cover will also alter the level of nutrients entering the stream, which may detrimentally impact the aquatic community.

Recommendations

Large-scale forest cover removal should be avoided within the bounds of this site in order to prevent pollution of the waterway with sediment and excess nutrients. In those areas where forest cover has already been removed, erosion control measures should be implemented if not in place already. Also, forest cover should be left intact on steep slopes greater than 15%, as erosion is very rapid and difficult to prevent in these areas. On more gradually sloping land, if activities are pursued which result in forest cover removal, great care should be taken to prevent the movement of eroding sediments away from the immediate area of operation.

Yost Run BDA

Yost Run is designated as an Exceptional Value stream by the Pennsylvania Department of Environmental Protection and has the pristine character and wildlife species associated with such a designation. It is an important site because it is one of the two most intact watersheds among all of Centre County's Exceptional Value watersheds. The Yost Run valley includes a hemlock (white pine) terrestrial forest in addition to a couple of waterfalls and plungepools at the confluence of Yost Run with Kyler Fork, and several areas of acidic cliffs along the sides of the creek. The hemlock (white pine) forest community is restricted to the valley floor, and in places where the valley widens, northern hardwoods like beech (*Fagus grandifolia*) and white ash (*Fraxinus americana*) can occasionally be found among the conifers. The ravine has few old logging roads along the valley, which is very unusual. Old roads run along several of the forks but the main stem appears to be relatively undisturbed. This is one of the two large valleys surveyed in the county that does not have apparent signs of past roads.

The forest community in the watershed plays a vital role in maintaining the health of the stream by anchoring soil sediments and maintaining a natural cycle of nutrient input and uptake. The condition of land immediately adjacent to the stream is also particularly important to the habitat quality of the stream for aquatic organisms, as some depend on the light levels and temperature conditions created by a forest canopy, and others utilize the forest habitat.

In the headwaters of Yost Run there is also a vernal pool that contains a population of the Federally Endangered plant species – the northeastern bulrush (*Scirpus ancistrochaetus*). Please see discussion of this species' ecology under Akely Hollow Headwaters BDA above. The pool within the Yost Run watershed is near the northwestern extent of the species' known range, and is one of only a few known populations in the Deep Valleys section of the Appalachian Plateau physiographic province; most other populations in Centre County are found in the more southerly Appalachian Mountain Section of the Ridge and Valley province, where vernal pools are more common.

Threats and Stresses

Any removal of forest cover or earth disturbance without effective provision for controlling the resultant soil erosion will negatively impact the health of the stream. Large-scale removal of forest cover will also alter the level of nutrients entering the stream, which may detrimentally impact the aquatic community. Please see discussion of Threats and Stresses under Akely Hollow Headwaters BDA (pg. 45) for more information regarding the needs of the northeastern bulrush and vernal pond communities.

Recommendations

The large area of contiguous forest in this watershed is unique within the county, and it is recommended that this feature of the area be preserved. Additionally, in order to protect the water quality of Yost Run, large-scale forest cover removal should be avoided within the bounds of this site. In those areas where forest cover has already been removed, erosion control measures should be implemented if not in place already. Also, forest cover should be left intact on steep slopes greater than 15%, as erosion is very rapid and difficult to prevent in these areas.

On more gradually sloping land, if activities are pursued which result in forest cover removal, great care should be taken to prevent the movement of eroding sediments away from the immediate area of operation. Please see recommendations under Akely Hollow BDA (pg. 45) for more information regarding the needs of the northeastern bulrush and vernal pond communities.

SNOWSHOE TOWNSHIP & SNOWSHOE BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

PANTHER RUN BDA	<i>High Significance</i>		
High-gradient clearwater creek	PA Exceptional Value		
ROCK RUN BDA	<i>Notable Significance</i>		
High-gradient clearwater creek	PA Exceptional Value		
ROCK RUN #2 BDA	<i>Exceptional Significance</i>		
High-gradient clearwater creek	PA Exceptional Value		
SNOWSHOE MOSHANNON BDA	<i>High Significance</i>		
Allegheny woodrat (<i>Neotoma magister</i>)	G3G4 S3	PT	PT
SNOWSHOE SWAMP BDA	<i>County Significance</i>		
BLACK MOSHANNON LCA	<i>Notable Significance</i>		

OTHER CONSERVATION AREAS: *Southern Sproul State Forest Important Bird Area
Black Moshannon State Park and State Forest Important Bird Area*

MANAGED LANDS: *Moshannon State Forest
Sproul State Forest
State Game Lands #100
State Game Lands #103*

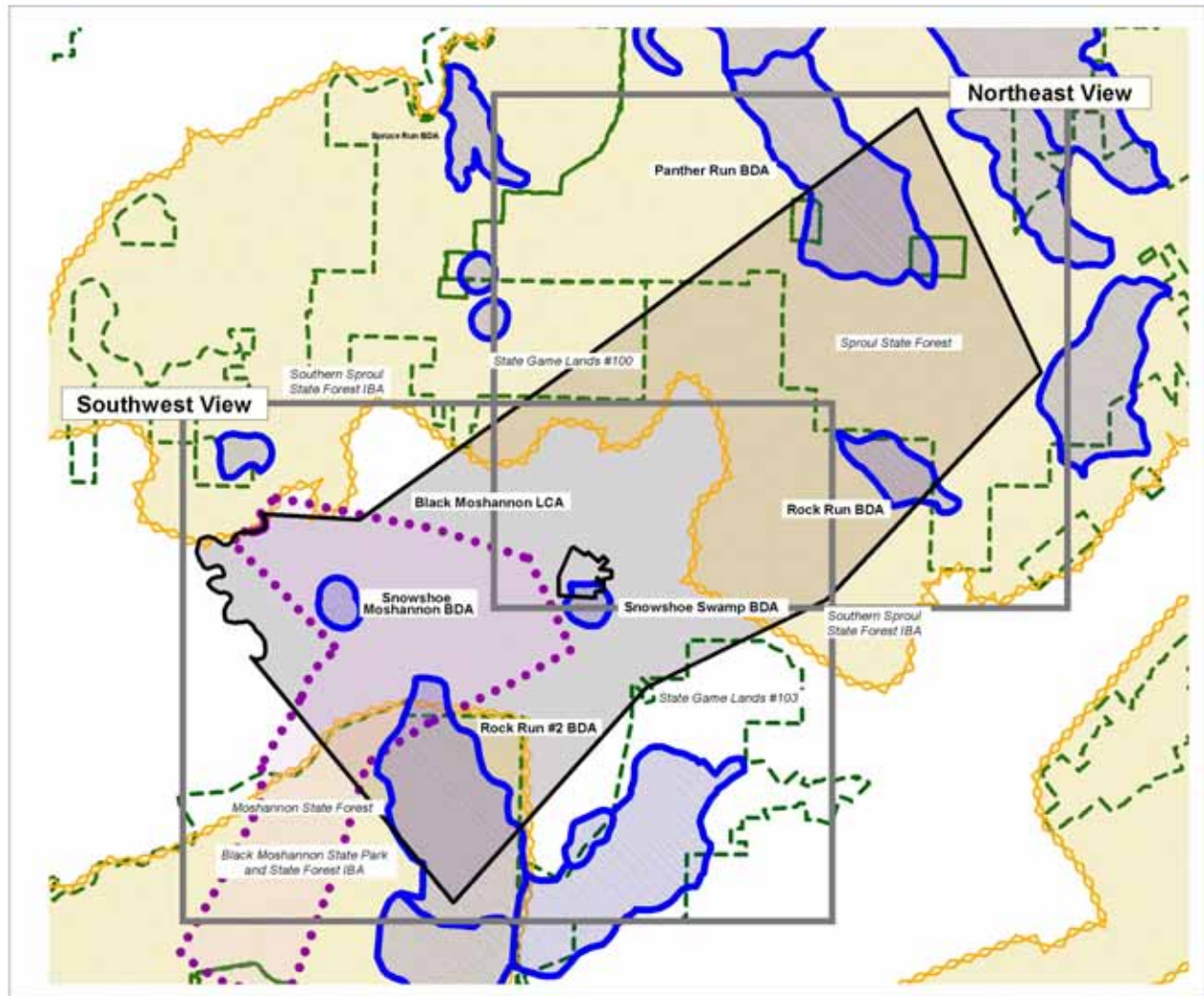
GEOLOGIC FEATURES: *none*



Snowshoe Township and Snowshoe Borough

(full view summary)

Centre County Natural Heritage Inventory



Biological Diversity Areas:

Panther Run
Rock Run
Rock Run #2
Snowshoe Moshannon
Snowshoe Swamp

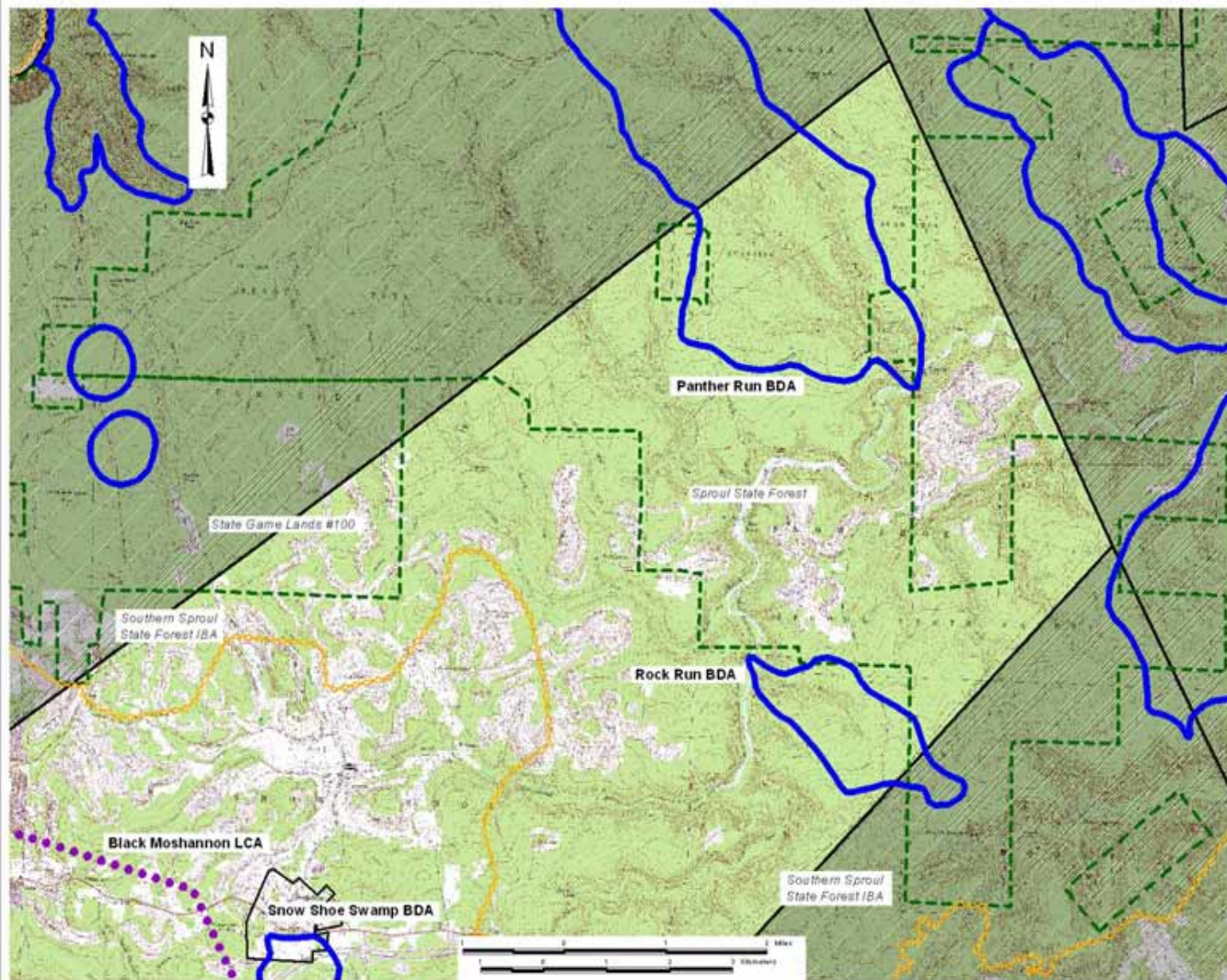
Landscape Conservation Areas:

Black Moshannon LCA

Managed Areas:

Moshannon State Forest
Sprout State Forest
State Game Lands #100
State Game Lands #103

Snowshoe Township & Snowshoe Borough (northeast view)



Snowshoe Township & Snowshoe Borough (northeast view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Panther Run
Rock Run
Snowshoe Swamp

Landscape Conservation Areas:

Black Moshannon

Managed Areas:

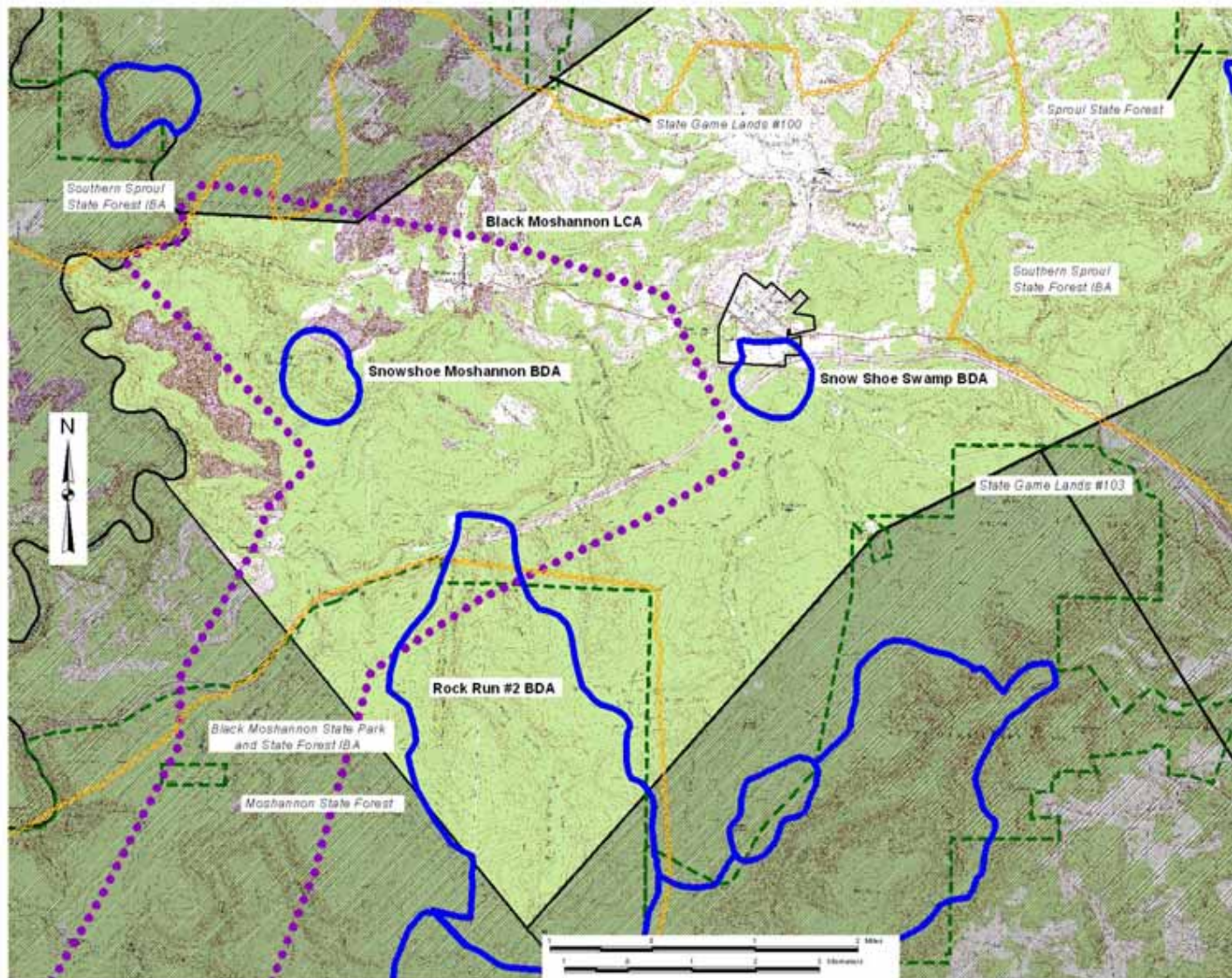
Sproul State Forest
State Game Lands #100



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

Snowshoe Township & Snowshoe Borough (southwest view)



Snowshoe Township & Snowshoe Borough (southwest view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Rock Run #2
Snowshoe Moshannon
Snowshoe Swamp

Landscape Conservation Areas:

Black Moshannon

Managed Areas:

Moshannon State Forest
Sprout State Forest
State Game Lands #100
State Game Lands #103



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

SNOWSHOE BOROUGH

The Snowshoe Swamp BDA falls partially within Snowshoe Borough. Please see description below.

SNOWSHOE TOWNSHIP

This township spans portions of three different physiographic province sections of the Appalachian Plateau physiographic province, the Deep Valleys section, the Allegheny Front section, and the Pittsburgh Low Plateau section. The Beech Creek Valley and areas to the north fall within the Deep Valleys section. Much of the land within the township is forested, but much of the forested land is laced with disturbed areas due to the establishment of gas wells and associated roads, and also due to mining activities. The northeastern half of the township falls within the Southern Sprout State Forest Important Bird Area, designated by the PA Audubon Society to recognize the value of this large block of relatively unbroken forest in supporting bird biodiversity in the state and region. The southwestern end of the township falls within the Black Moshannon State Park and State Forest Important Bird Area, recognized for the value of its wetland and forest habitats. Full descriptions of the Important Bird Areas are provided on page 35. A recent significant addition to the Sprout State Forest land in the northeastern portion of the township adds to the contiguity of this large managed area.

Panther Run BDA

This area is discussed under Burnside Township.

Rock Run BDA

This watershed was included as a BDA because Rock Run is listed by the Pennsylvania Department of Environmental Protection as an Exceptional Value stream. Ground surveys have not been conducted of this area. Aerial reconnaissance suggests the area is mainly a deciduous forest type, although several roads run through the area and detract from its contiguity. No indicators of especially unique terrestrial community types were observed within the watershed. However, while the forest community is not distinctive, it plays a vital role in maintaining the health of the stream by anchoring soil sediments and maintaining a natural cycle of nutrient input and uptake. The condition of land immediately adjacent to the stream is also particularly important to the habitat quality of the stream for aquatic organisms, as some depend on the light levels and temperature conditions created by a forest canopy and others utilize the forest habitat.

Threats and Stresses

Any removal of forest cover without effective provision for controlling the resultant soil erosion will negatively impact stream health. In various places forest cover has been removed, and it is unknown whether erosion is adequately controlled in these areas. Large-scale removal of forest cover will also alter the level of nutrients entering the stream, which may detrimentally impact the aquatic community.

Recommendations

Large-scale forest cover removal should be avoided within the bounds of this site in order to avoid pollution of the waterway with nutrient and sediment runoff. In those areas where forest cover has already been removed, erosion control measures should be implemented if not in place already. Also, forest cover should be left intact on steep slopes greater than 15%, as erosion is very rapid and difficult to prevent in these areas. On more gradually sloping land, if activities are pursued which result in forest cover removal, great care should be taken to prevent the movement of eroding sediments away from the immediate area of operation.

Rock Run #2 BDA

This watershed was designated as a BDA because the stream running through it, which shares the name Rock Run with a smaller stream further east in the county, is listed as an Exceptional Value stream by the Pennsylvania Department of Environmental Protection. The watershed is unique because it is more intact than most of Centre County's Exceptional Value watersheds, almost completely lacking roads or developed areas. While logging and fire likely left much of the area open at the beginning of the century, it is now largely forested. Several areas of open, grassy vegetation are found in the basin, perhaps artifacts of the earlier fires, but aside from these areas, dry oak – heath and red maple – mixed hardwoods terrestrial forest communities are the most prevalent types. These types of forest community are fairly common in Centre County. The health of the Exceptional Value stream is integrally dependent on the health of the forest in the watershed, as the forest anchors soil sediments and maintains a natural cycle of nutrient input and uptake. The condition of land immediately adjacent to the stream is also particularly important to the habitat quality of the stream for aquatic organisms, as some of these depend on the light levels and temperature conditions created by a forest canopy, and others utilize the forest habitat.

Threats and Stresses

Any removal of forest cover without effective provision for controlling the resultant soil erosion will negatively impact stream health. Large-scale removal of forest cover will also alter the level of nutrients entering the stream, which may detrimentally impact the aquatic community. Near the confluence of Rock Run and Black Moshannon Creek, Interstate 80 crosses over Rock Run. A spill of hazardous materials on the bridge would be very detrimental to aquatic species occupying the lower reach of Rock Run and the Black Moshannon Creek.

Recommendations

Maintaining the contiguity of this watershed would allow this area to continue as one of the few forested areas within Centre County that are so completely free of developed areas. Large-scale forest cover removal should be avoided within the bounds of this site in order to avoid pollution of the waterway with sediment and excess nutrients. Also, forest cover should be left intact on steep slopes greater than 15%, as erosion is very rapid and difficult to prevent in these areas. On more gradually sloping land, if activities are pursued which result in forest cover removal, great

care should be taken to prevent the movement of eroding sediments away from the immediate area of operation.

Snowshoe Moshannon BDA

This site encompasses a habitat where the Allegheny woodrat (*Neotoma magister*)— an animal species of special concern— has been documented to live. The woodrat inhabits rocky cliffs and outcroppings. Historically it is known from a fairly large range in the eastern U.S., from New York to Alabama and west to Indiana and Tennessee, but it is extirpated or declining over about 35% of the range. While it is still common in other areas, the decline has been rapid and the cause is not yet fully understood. Allegheny woodrats eat leaves, twigs, fruits, and seeds from many plants, and acorns may form a substantial component in their diet.

Threats and Stresses

Several different studies provide evidence that there may be a variety of factors contributing to the observed declines in populations of the Allegheny woodrat in different parts of its range. Some populations appear to have suffered heavy mortality from the raccoon roundworm. Raccoons are habitat generalists that tolerate or even benefit from habitat fragmentation and disturbance. Since raccoon populations increase in areas where human settlement patterns have greatly increased the level of fragmentation and disturbance, these landscape changes may have created conditions that increase the exposure of the woodrat to the raccoon roundworm parasite. Population declines are also correlated with gypsy moth infestations of oak trees, and with exceptionally severe winter conditions. Work in Pennsylvania suggests that acorns are a major food source, and in the event of widespread oak mortality resulting from a severe gypsy moth infestation, the decline in acorn production might create significant limitations in food supply for this animal.

Recommendations

Forest cover is important in maintaining the microhabitat conditions and some of the food sources utilized by Allegheny woodrats. Oak trees are especially important because of the food source they provide and should not be removed. Fragmentation and disturbance within the area should be avoided. The PA Game Commission has developed further recommendations regarding management of woodrat habitat, which may be available upon request.

Snowshoe Swamp BDA

This area is a wetland that contains a highbush blueberry – meadow-sweet shrub community. The area was revisited during this update to assess whether the proximity of Interstate 80 and residential areas had resulted in degradation of its condition. The substrate and the vegetation appear undisturbed. However, the wetland is almost certainly receiving contaminants in runoff from Interstate 80, and due to the size of the road and the traffic volume it receives this load may be substantial. Iron precipitate appears to be present in the water in some areas of the wetland, suggesting that the wetland may be receiving acid mine discharge from the strip-mined areas upslope to the north and west. These contaminants may degrade the habitat for many species. Especially at risk are animals that are very sensitive to toxins (i.e. amphibians) and plants that are

sensitive to changes in pH. A powerline right-of-way crosses this wetland as well; these are typically maintained through the use of herbicides, and if this practice is followed here it will detrimentally impact wetland vegetation.

Recommendations

The possibility that the wetland is receiving mine drainage contamination should be investigated further to determine the sources and the degree of toxicity associated with the discharge. Working towards prevention of detrimental impacts associated with herbicides will require approaching those who maintain the powerline right-of-way to discuss their management practices here.

Black Moshannon LCA

This site was not revisited during this update, and no new information is available. Review of 2002 aerial photographs suggests no large-scale changes have occurred.

The site includes several areas where the natural communities are somewhat disturbed but nonetheless provide buffer for Black Moshannon Creek and its banks. The dry oak – mixed hardwood forest community along the creek is well recovered and highly diverse. The community includes species common in nearby oak forests as well as species that require more mesic conditions. There are few cabins along the creek, but several roads cross it, including Interstate 80. Rapids, deep pools and small riverside wetlands dot this ravine, but no communities of county significance were found. This creek has been nominated in the Pennsylvania Scenic Rivers Program and is included here as a landscape conservation area.

Threats and Stresses

Mining in surrounding areas could produce acid discharge that will degrade water quality in the creek.

Recommendations

If possible, the areas surrounding the creek should be left as they are or returned to their natural condition. Any mining activities should be monitored. If the road connecting the town of Moshannon to the camps near the deserted town of Gorton is to be used by large vehicles, it would be useful to consider enlarging the bridge south of Moshannon. This would keep vehicles out of the ford and would help keep oil and other contaminants out of the creek as well.

Moshannon Valley Region

- Rush Township
- Philipsburg Borough
- South Philipsburg Borough



Cottongrass seedheads in a wetland
of Black Moshannon Natural Area



Black Moshannon Lake

RUSH TOWNSHIP, PHILIPSBURG BOROUGH, & SOUTH PHILIPSBURG BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

BENNER RUN BDA *Notable Significance*

High-gradient clearwater creek	PA Exceptional Value
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BLACK MOSHANNON WETLANDS BDA *High Significance*

Creeping snowberry (<i>Gaultheria hispidula</i>)	G5	S3	PR
Mountain starwort (<i>Stellaria borealis</i>)	G5	S1S2	N
Small floating manna-grass (<i>Glyceria borealis</i>)	G5	S2	PE
Hemlock palustrine forest community		S3	
Leatherleaf-sedge wetland community		S3	

HANNAH FURNACE ROAD BARRENS BDA *Notable Significance*

Scrub oak shrubland community	S3
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ROCK RUN #2 BDA *Exceptional Significance*

High-gradient clearwater creek	PA Exceptional Value
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SCHA'S RESTAURANT WETLAND BDA *Notable Significance*

SHIRKS RUN BDA *High Significance*

Hemlock palustrine forest community	S3
Leatherleaf-sedge wetland	S3

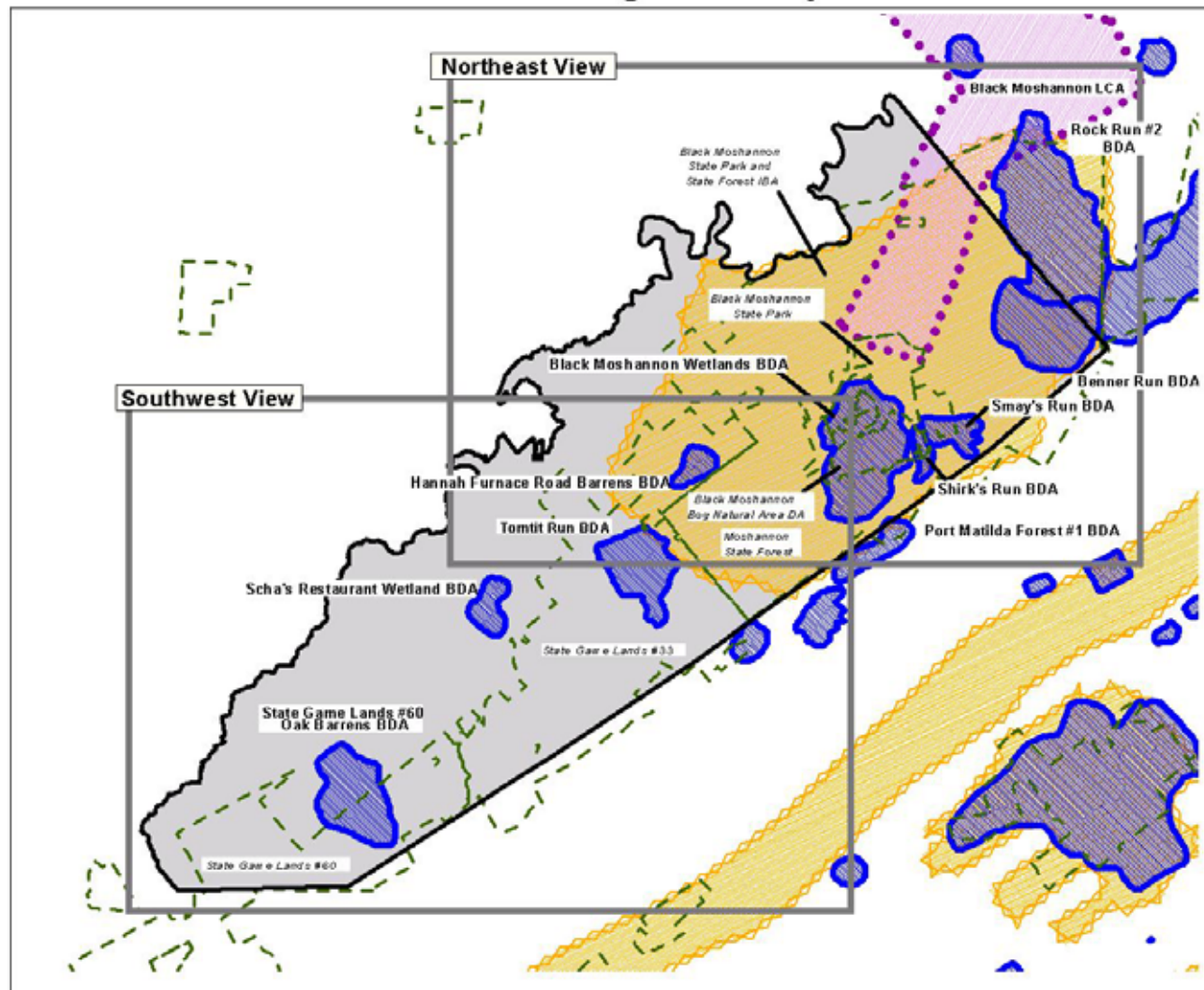
SMAY'S RUN BDA *Exceptional Significance*

Mountain fly-honeysuckle (<i>Lonicera villosa</i>)	G5	S1	PE
Small floating manna-grass (<i>Glyceria borealis</i>)	G5	S2	PE

(continued following maps)



Rush Township Phillipsburg & South Phillipsburg Boroughs (full view summary) Centre County Natural Heritage Inventory



Biological Diversity Areas:

Benner Run
Black Moshannon Wetlands
Hannah Furnace Road Barrens
Port Matilda Forest #1
Rock Run #2
Scha's Restaurant Wetland
Shirk's Run
Smay's Run
State Game Lands #60 Oak Barrens
Tomtit Run

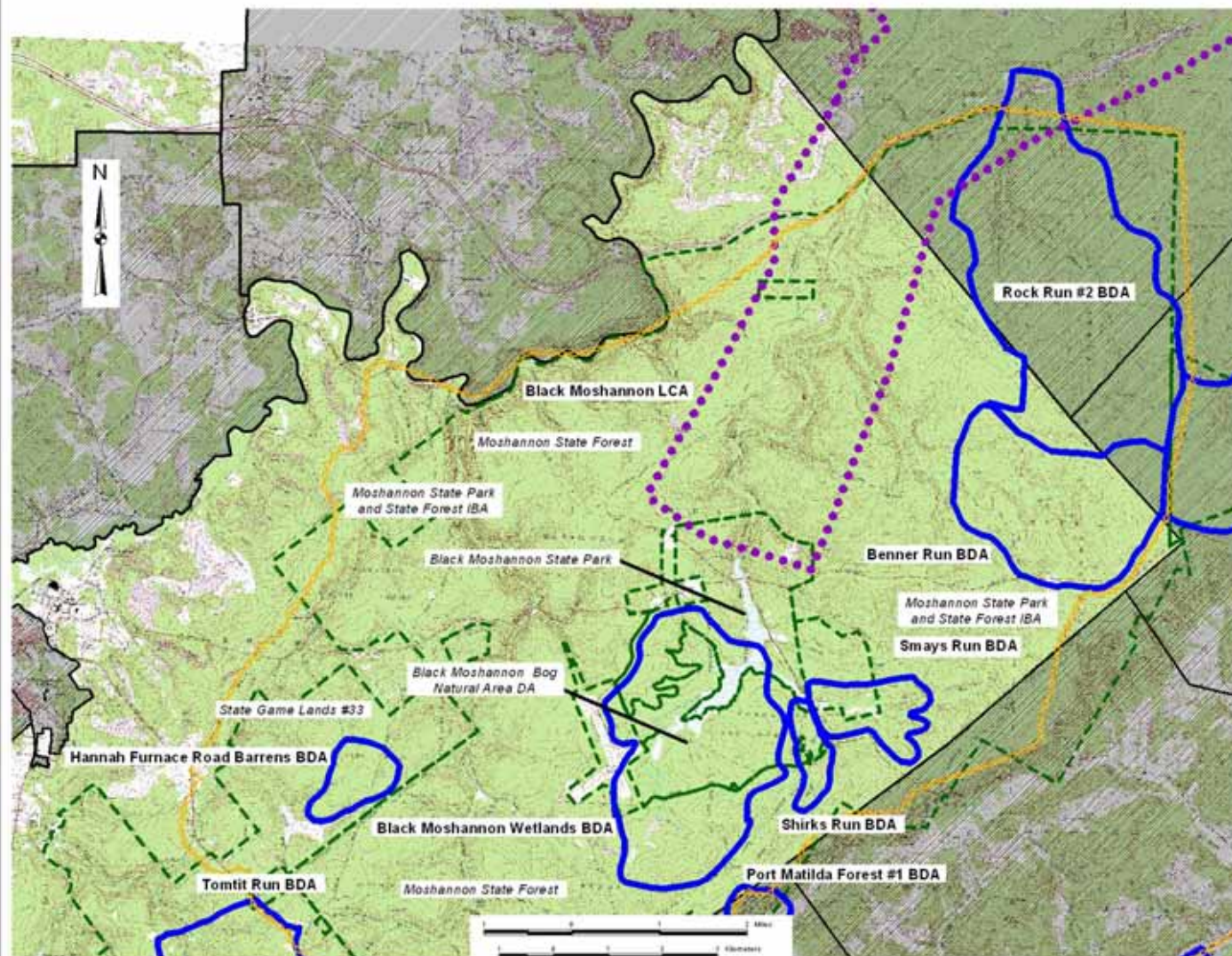
Landscape Conservation Areas:

Black Moshannon LCA

Managed Areas:

Black Moshannon State Park
Moshannon State Forest
Black Moshannon Bog
Natural Area DA
State Game Lands #33
State Game Lands #60

Rush Township, Philipsburg Borough & South Philipsburg Borough (north view)



Rush Township Philipsburg Borough & South Philipsburg Borough (north view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Benner Run
Black Moshannon Wetlands
Hannah Furnace Road Barrens
Port Matilda Forest #1
Rock Run #2
Shirks Run
Smays Run
Tomtit Run

Landscape Conservation Areas:

Black Moshannon

Managed Areas:

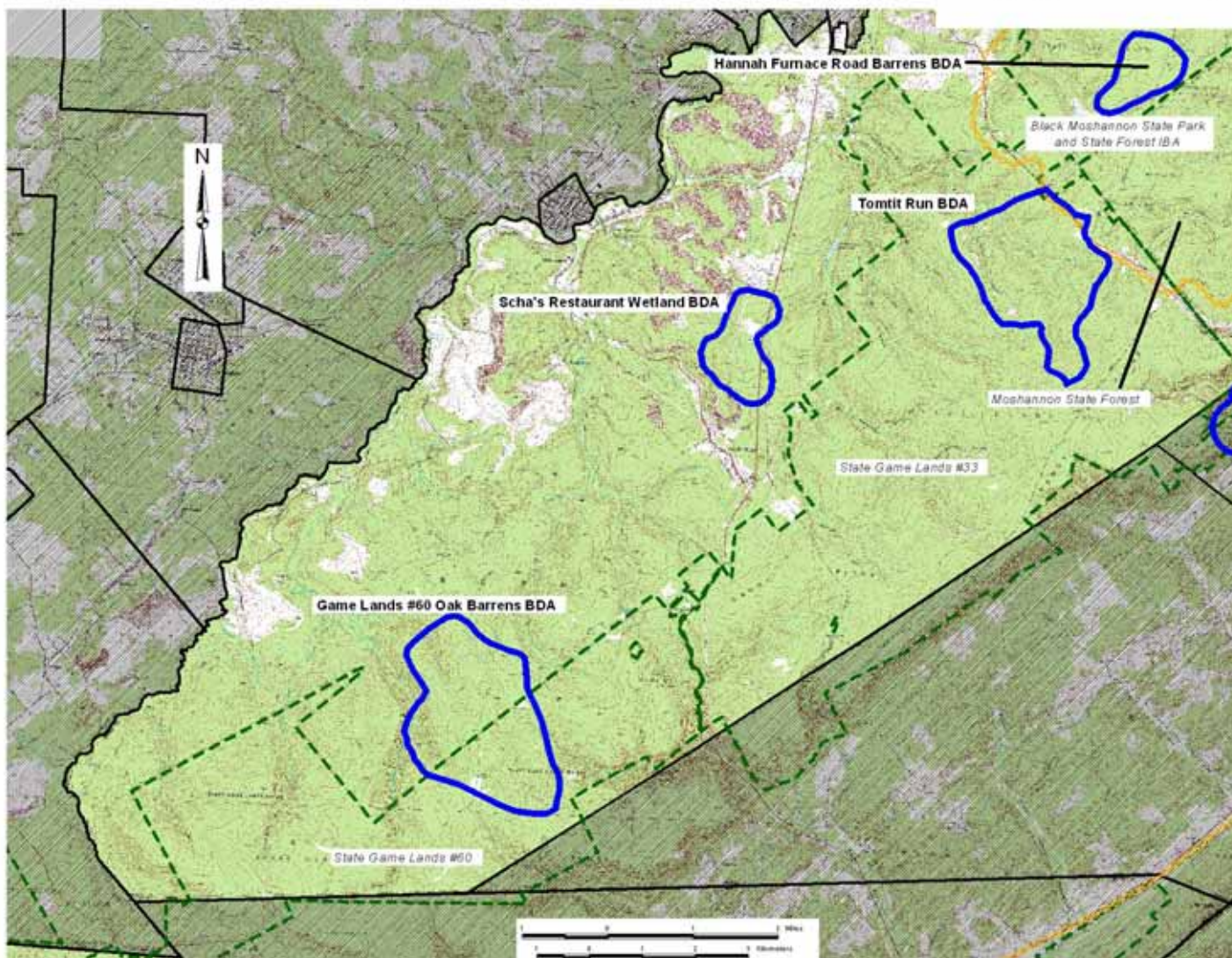
Black Moshannon State Park
Black Moshannon Bog Natural Area DA
Moshannon State Forest
State Game Lands #33



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

Rush Township, Philipsburg Borough & South Philipsburg Borough (south view)



Rush Township Philipsburg Borough & South Philipsburg Borough (south view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Hannah Furnace Road Barrens
Tomtit Run
Scha's Restaurant Wetland
State Game Lands #60 Oak Barrens

Landscape Conservation Areas:

None

Managed Areas:

Moshannon State Forest
State Game Lands #33
State Game Lands #60



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

STATE GAME LANDS #60 OAK BARRENS BDA	<i>High Significance</i>
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Scrub oak shrubland community	G?	S3	N
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TOMTIT RUN BDA	<i>Exceptional Significance</i>
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Mountain starwort (<i>Stellaria borealis</i>)	G5	S1S2	N
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BLACK MOSHANNON LCA	<i>Notable Significance</i>
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OTHER CONSERVATION AREAS: Black Moshannon State Park and State Forest Important Bird Area

*MANAGED LANDS: Black Moshannon Bog Natural Area DA
Black Moshannon State Park
Moshannon State Forest
State Game Lands #33/#60*

*GEOLOGIC FEATURES: Wolf Rocks (erosional remnant)
Turtle Rocks (erosional remnant)*

RUSH TOWNSHIP

This township contains a portion of Allegheny Front, and makes up most of that part of Centre County that falls within the Appalachian Plateau physiographic province. Most of the northern half of the township falls within the Black Moshannon State Park and State Forest Important Bird Area, designated by the PA Audubon Society to recognize the value of the forest and wetland habitat in this area in supporting bird biodiversity. A full description of this IBA is provided on page 36. Most of the township drains into the Moshannon Creek, which feeds the West Branch Susquehanna River. There are two geologic features of note, Wolf Rocks and Turtle Rocks. These are outcroppings of rock formed by erosion of softer rock that once surrounded them.

Benner Run BDA

Benner Run has been designated an Exceptional Value stream by the Pennsylvania Department of Environmental Protection. The majority of this stream's southern watershed has been cut recently. Some areas are regenerating well, but the rest has developed into open fields of goldenrod (*Solidago spp.*) and aster (*Aster spp.*). Immediately along the stream is a corridor of hemlock – northern hardwood community, which narrows as it follows the creek towards its source. This remaining corridor is an asset to the habitat value of the stream: the condition of land immediately adjacent to the stream is particularly important to aquatic organisms, as some depend on the light levels and temperature conditions created by a forest canopy, and others utilize the forest habitat.

Threats and Stresses

The removal of forest cover in the watershed heightens the danger of water quality degradation in Benner Run. Any pollutants, including erosion from roads and logging, are no longer as effectively filtered and may impact the stream adversely.

Recommendations

Further earth disturbances should not be conducted in this watershed without effective provision for erosion control, and would best be avoided altogether due to the fragility of the unforested landscape. The corridor of forest along the stream should be maintained to preserve the habitat quality of the stream for aquatic organisms.

Black Moshannon Wetlands BDA

This is a large site that encompasses the wetland areas adjacent to the Black Moshannon Lake, an artificial impoundment. This area is likely very different now from its pre-settlement condition, due to the extensive history of human manipulation of the landscape here. In addition to the impoundment, various surrounding areas have been cleared, burned, logged, and planted in artificial forest. Originally, it is likely that the present day lake and surrounding area were a seepage-fed wetland complex that contained a very extensive forested coniferous swamp, areas of shrub wetland, and open wetland areas dominated by graminoids (grass-like plants) or

sphagnum. The community composition was almost certainly more northern in character than is typical for Centre County. Today, the natural communities that have formed in most of the remaining wetland complex are of a type observed in many other areas throughout the state that have been subjected to similar types of disturbances. However, vestiges of the original communities persist in various patches scattered throughout the wetland complex, including several areas that still harbor species typically associated with more northern climates. The most extensive example of this is the shrub zone directly adjacent to the lake, which often includes leatherleaf (*Chamaedaphne calyculata*), a typical component of northern bog communities. There is also a small population of the mountain starwort (*Stellaria borealis*) growing in a cool hemlock-forested spring and a larger population of the creeping snowberry (*Gaultheria hispidula*) growing in a sphagnous shrub swamp, and patches of small floating manna-grass (*Glyceria borealis*) are scattered in shallow water along the lake and its tributaries. In addition to the presence of these state-significant species and the unique character of the community, the site is significant as one of the largest unpolluted wetland complexes in Centre County. Furthermore, much of the biodiversity of healthy wetlands is in their insect life, and insects have not been well documented in this area, so there may be significant species living here as yet undiscovered.

Threats and stresses

This area falls almost entirely within Black Moshannon State Park and Moshannon State Forest. A large portion of the state park area within this site has been designated as a Natural Area, and thus is managed for its ecological value. Current management practices of these agencies should preclude exposure of these areas to major threats. Practices which may impact ecological health at this site would include removal of native forest cover near the wetland areas or the use of pesticides or other chemicals in the vicinity of wetlands. Pesticides can be extremely detrimental to native insect populations, and thus their use would be likely to have a major impact on biodiversity at this site.

Recommendations

If any pesticide spraying is to be conducted in this region, spray blocks should be adjusted to prevent pesticides from reaching wetland areas by either direct application or drift, in order to prevent damage to insect biodiversity. The overall contiguity and integrity of the community complex will be enhanced if native forest cover is allowed to develop undisturbed in the vicinity of the wetland complex.

Hannah Furnace Road Barrens BDA

This area was not revisited during this update. Review of 2001 aerial photography suggests no major changes have occurred.

The Hannah Furnace Road Barrens in State Game Lands No. 33 contains a partially recovered scrub oak shrub community (previously listed as an acidic rocky summit community following Smith 1991). The area has been mown and intentionally burned for habitat management; however, examination of past aerial photographs suggests that the site may have supported this

community prior to the human manipulation. On hilltops off of Hannah Furnace Road, the vegetation is scrubby and composed of dwarfed chestnut oak (*Quercus montana*) and sassafras (*Sassafras albidum*) emergents (trees which grow above the level of surrounding vegetation) within a thick canopy of scrub oak (*Quercus ilicifolia*). The scrub oak grows into dense thickets approximately 2 meters tall that allow little to grow beneath them. Red maple (*Acer rubrum*) occurs occasionally as an emergent, while sweetfern (*Comptonia peregrina*) and black huckleberry (*Gaylussacia baccata*) grow in openings and along roadsides. Wintergreen (*Gaultheria procumbens*) is a very common herbaceous species in the area. The site has a history of wildfire and is known to have extreme cold snaps late into spring and early summer. These influences would tend to keep the vegetation low and "barrens-like" naturally. Game Commission personnel confirm that the Hannah Furnace Road hilltops were scrub oak communities prior to manipulation. For these reasons, the Hannah Furnace Road site has been determined to be a significant natural community.

Threats and Stresses

The scrub oak shrub community type is naturally maintained by periodic fire. If fire is suppressed here for a long period, the character of the community may change.

Recommendations

The proper management of scrub oak communities is a subject of debate in the ecological community. Though it is clear fire is the best method of maintaining the community in its natural state, the frequency of burns appears to vary with each individual site. Different species that rely upon this community may thrive at different fire frequencies. For this area, it is recommended that the Game Commission begin a study to determine what frequency of fire historically occurred, to document the full diversity of species currently inhabiting the site, and to assess what artificial frequency would best preserve the biodiversity and character of the site. Once this data has been gathered, a management program using controlled burns at the predetermined frequency could be designed to improve habit and promote the health of this unique community. Insecticides should not be used in this area, because of the potential of this community type to support rare insect species.

Rock Run #2 BDA

This site is discussed under Snowshoe Township.

Scha's Restaurant Wetland BDA

This is a large headwaters wetland complex that is a mosaic of several shrub and herbaceous wetland community types. Beaver have been active in various parts of the wetland periodically, resulting in a dynamic hydrological regime that causes community composition to vary over time. The southern headwaters of this wetland were visited during the 2002 update, during which the state-rare plant species screwstem (*Bartonia paniculata*) was documented. The extent of this population is not known; it may extend to occupy suitable habitat areas (open, moist sphagnum) in the wetland itself.

Threats and Stresses

The wetland complex itself appears intact at this time, but there are potential risks to its health from activities in surrounding areas.

In the southern portion of this BDA a residential development is under construction. Although the plans do not include development of any wetland areas, they do include a portion of the immediate watershed area above the wetlands. Stormwater management from the development could impact the wetland either by concentrating flow (and subsequent inputs of nutrients or sediments) or by diverting water that maintains the hydrology of the wetland.

SR 350 runs through the immediate watershed of this wetland. Roads in close proximity to water bodies or wetlands introduce the possibility of a major pollution event through a spill. Additionally, road runoff typically contains a wide assortment of toxic substances including heavy metals, polyaromatic hydrocarbons (PAHs), motor oil, antifreeze, and road salt. These are likely accumulating in the wetland. Finally, strip mining is taking place in areas immediately adjacent to the watershed of the wetland. There is some risk that acid mine drainage may develop and reach the wetland via seepage through the rock layers in the small ridge separating the mines and the wetland watershed.

Recommendations

For the developed area, a stormwater management plan designed to avoid transport of pollutants to the wetland while minimizing the volume of water diverted from its normal flow pattern may reduce impacts to the wetland feature. Utilization of best management practices for road runoff management can help to minimize the impact of the road on the wetland.

Shirks Run BDA

This site is one of the more unique and lightly impacted wetlands in the Black Moshannon area. It contains a seepage-fed wetland complex that grades into Black Moshannon Lake, with several unique natural communities occurring along the transition between upland and lake. The southern extent is a fairly extensive and intact hemlock palustrine forest. There are several herbaceous openings classified as Skunk cabbage-golden saxifrage forest seeps, which transition downstream into a palustrine shrub community. The northern extent bordering the lake becomes a leatherleaf-sedge wetland community, which is fairly extensive here in comparison to other areas around the lake.

Threats and stresses

This site falls within the Black Moshannon State Park Natural Area, and is managed for preservation of natural features. Because it is bordered closely to the east by Julian Pike, road runoff compounds may be entering the lake.

Recommendations

Best management practices should be employed to mitigate the impact of road runoff from Julian Pike on the wetlands in this area.

Smay's Run BDA

As with Shirks's Run BDA, this site recognizes a portion of the Black Moshannon wetland complex that contains high quality natural communities and appears to have been more lightly impacted by disturbance than is generally the case. The wetland complex is contiguous with Black Moshannon Lake and exhibits some elevational zonation of the plant communities. The area closest to the lake is an extensive herbaceous emergent zone, dominated by tussock sedge (*Carex stricta*). The Pennsylvania Endangered plant species small floating manna-grass (*Glyceria borealis*) also grows in this area.

Threats and Stresses

About half of this area is contained within Black Moshannon State Park, and half of it is held in private ownership. Earth disturbance in the area of the wetland would disrupt the elements of the natural community and permanently alter the character of the habitat. Earth disturbances or development higher in the watershed could impact the wetland through sediment or contaminants in runoff. The quality of the habitat for many animal species would also be diminished by development of nearby areas, as many animal species depend not only on the wetland areas but also utilize surrounding forest habitat. Also, many species are also detrimentally impacted by fragmentation and the subsequent increase in habitat for general predators and exotic species. Pesticide use could be extremely detrimental to insect biodiversity in the area. While the insect fauna of the site has not yet been documented, much of the diversity in wetlands is often comprised of insects.

Recommendations

The future health of this unique wetland area would be best preserved if development and forest cover disturbance were avoided in the immediate watershed. Pesticide use should also be avoided to protect insect biodiversity.

State Game Lands #60 Oak Barrens

This site was not revisited during this update. Review of 2001 aerial photography suggests no major disturbances have occurred here since the time of the original Centre County Natural Heritage Inventory.

The State Game Lands #60 Oak Barrens is a scrub oak shrubland community (previously listed as a mountaintop acidic rocky summit community following Smith 1991) that probably looks today very much as it did before European settlement. The area is on one of the highest summits in the county, and due to the extremes of heat and cold, xeric conditions, and probably fire, it has developed a thick vegetation type dominated by dwarfed scrub oak (*Quercus ilicifolia*) that is fairly rare in the state and the world. This site, unlike the Hannah Furnace Road Barrens found on the Philipsburg quadrangle, has not been intentionally burned or mowed to maintain the scrub oak community, yet it is very low, only two to three meters tall, with few chestnut oak (*Quercus montana*) emergents. Game Commission officials report that the site has extreme cold snaps, although temperature records are not available to confirm the frequency or extremity of these incidences.

Threats and Stresses

Scrub oak shrubland communities are hardy, capable of surviving moderate cutting and fire. This site was probably spared even this kind of disturbance because of its apparent unproductivity. However, the associated insect communities, often consisting of dozens of specialized species that are restricted to barrens habitats, are highly sensitive. Barrens lepidoptera (butterflies and moths), such as the barrens buck moth (*Hemileuca maia*), and the frosted elfin (*Incisalia irus*), are susceptible to reduction of habitat because they require a large area to maintain a viable population. They can also be detrimentally impacted by over-maturing of vegetation, which results in a lack of young shoots upon which the larvae feed, and reduction of plant species diversity (Schweitzer and Rawinski, 1987). These conditions can develop in the community if it does not experience occasional fires. The application of pesticides, such as gypsy moth spraying, can also be detrimental to barrens insect communities.

Recommendations

More research needs to be done at this site to determine which, if any, rare plant or animal species might be found here. Prescribed fire will probably also have to be reintroduced to manage the site properly. The proper management of scrub oak communities is a subject of debate in the ecological community. Though it is clear fire is the best method of maintaining the community in its natural state, the frequency of burns appears to vary with each individual site. For this area, it is recommended that a study be conducted to determine what frequency of fire historically occurred and what artificial frequency would best preserve the biodiversity and character of the site. Once this data has been gathered, a management program using controlled burns at the predetermined frequency could be designed to improve habit and promote the health of this unique community. In the interim, the site should be protected, with the cooperation of the State Game Commission, from clearing, spraying or conversion to food plots.

Tomtit Run BDA

The significant feature at this site is a population of a rare plant—the mountain starwort (*Stellaria borealis*). The plant lives in cold seepage areas along Tomtit Run. It was first documented in 1947, and surveys during the 2002 CNHI update confirmed that the plant continues to inhabit the area. The BDA includes the portion of the stream occupied by the plant

as well as the immediate watershed area above it. The watershed is intermittently forested, with some cleared areas and some areas in regeneration. Although the forest communities within this area are not especially unique, the area is included because the health of the stream and its communities are dependent on land use within it. The seepages that emerge in the stream headwaters are fed by a groundwater aquifer, which is recharged by percolation of surface water through fissures in the rock of the surrounding land. The forest community in the surrounding watershed is also important to the stream health because the forest anchors the soil and provides for natural levels of nutrient input and uptake.

Threats and stresses

Earth disturbance or loss of vegetative cover within this watershed might result in sediment erosion into Tomtit run. Sediment negatively affects plants and animals of aquatic communities, and the mountain starwort has a semi-aquatic growth habit at this site. Also, substantial change in water quality or sediment load will change the character of the habitat, and it is not known how the plant may respond. Disturbance of forest or shrub cover along the banks of the stream or its tributaries would alter light levels, a change to which this species may be sensitive. Additionally, any activity that will impact groundwater quality or quantity, such as well drilling, increase in impervious surfaces, and stormwater management, could impact the health of the seepage wetland community and the mountain starwort which inhabits it.

Recommendations

This site is publicly held by the Pennsylvania Game Commission. It will be important to ensure that the current land manager and other agency personnel assigned to this area are aware of the mountain starwort population and its habitat. Periodic monitoring of the population will also help to maintain knowledge of its status and of the condition of the habitat over time. Identifying the recharge zone of the groundwater aquifer that feeds the seeps is a crucial first step in understanding the extent of the surrounding area that is important to the maintenance of this habitat. A map to aquifer recharge areas is an important resource for a community to have available for safeguarding not only drinking water supplies, but natural resources. It is further recommended that disturbance of the stream channel and its tributaries be avoided, that any forest cover removal operations in the watershed minimize erosion, and that care be taken to avoid the introduction of non-native plant species into this area.

Black Moshannon LCA

This site is discussed under Snowshoe Township.

PHILIPSBURG BOROUGH & SOUTH PHILIPSBURG BOROUGH

No Natural Heritage Areas were identified within these boroughs.

Upper Bald Eagle Region

- **Huston Township**
- **Taylor Township**
- **Union Township**
- **Unionville Borough**
- **Worth Township**
- **Port Matilda Borough**



Small whorled-pogonia
(*Isotria medeoloides*)



Allegheny Front

HUSTON TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

BALD EAGLE SWAMP BDA	County Significance
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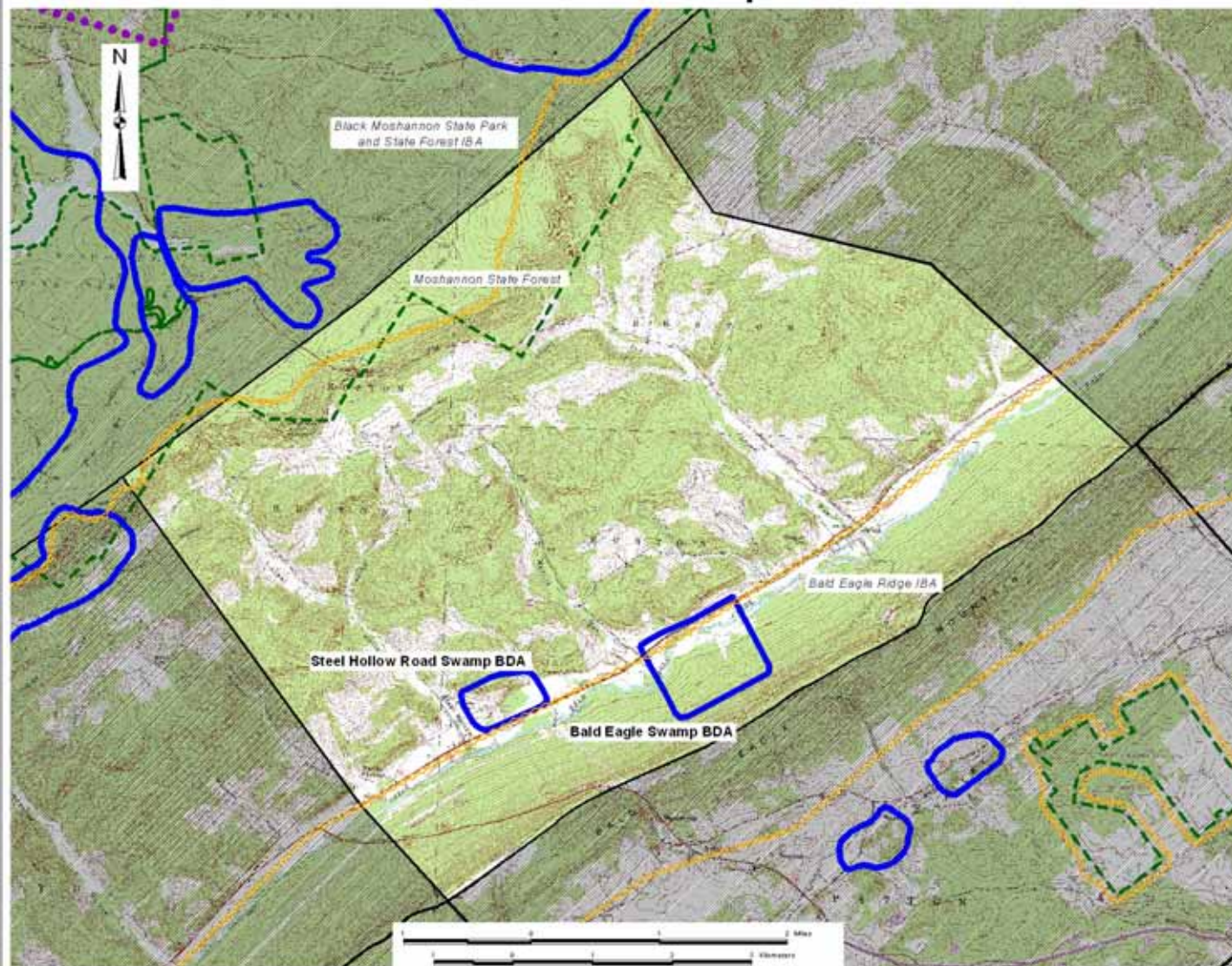
STEEL HOLLOW ROAD SWAMP BDA	County Significance
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OTHER CONSERVATION AREAS: Bald Eagle Ridge Important Bird Area
Black Moshannon State Park and State Forest Important
Bird Area

MANAGED LANDS: Moshannon State Forest

GEOLOGIC FEATURES: none

Huston Township



Huston Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Bald Eagle Swamp
Steel Hollow Road Swamp

Landscape Conservation Areas:

None

Managed Areas:

Moshannon State Forest



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

HUSTON TOWNSHIP

The township encompasses a portion of the northern slope of Bald Eagle Ridge, the Bald Eagle Valley, and the Allegheny Mountain foothills, and extends northwest partly up the slope of Allegheny Front. The forested corridor along Bald Eagle Ridge is an important flyway for migrating birds, and is recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (see page 35 for more detail). Much of Bald Eagle Valley, between the base of the Allegheny mountain foothills and Bald Eagle creek, was probably once swampland. Today, the valley has mainly been cleared of the natural communities which previously existed here. An outstanding natural feature of this township is that it contains two sites in the Bald Eagle Valley with natural wetland communities—the Bald Eagle Swamp and the Steel Hollow Road Swamp. The northwestern edge of the township also falls within the Black Moshannon State Park and State Forest Important Bird Area (see page 36 for more detail).

Bald Eagle Swamp BDA

This area was not revisited during 2002 fieldwork. Review of 2001 aerial photography indicates no major disturbances have taken place at the site. The natural community at this site was listed as a Circumneutral Shrub Swamp in the 1991 inventory, which followed Smith's Natural Ecological Communities of PA. The community is listed as an alder – ninebark shrub wetland in this update, which follows a more recently developed classification system based primarily on vegetation (Fike 1999). No other new information has become available regarding this site.

This may be the only wetland left in the Bald Eagle Valley that is in relatively pristine condition. Most of Bald Eagle Creek's numerous wetlands are either man-made, altered by farming or overly fragmented. The Bald Eagle Creek Swamp has an alder – ninebark shrub community in the wetland; it is bounded by a hemlock – northern hardwoods forest community on the Bald Eagle Ridge to the south, and by residential land and farmland to the east and west. A portion of this community is within a pasture, but it does not appear to be very disturbed. The shrub swamp is patchy with some standing water and supports dogwood (*Cornus spp.*), speckled alder (*Alnus rugosa*), spicebush (*Lindera benzoin*), cattails (*Typha latifolia*), skunk cabbage (*Symplocarpus foetidus*) and other hydrophytic species. In contrast to many other wetlands examined in the valley, few introduced species were observed at this site. As invasive species diminish the habitat potential of a site for native plant and animal species, the lack of invasive species at this site elevates its ecological value relative to other sites.

Threats and stresses

The habitat is in good condition, but has little buffer except to the south. To the north is a small thicket of disturbed forest that borders the creek that is used by fishermen, but this use does not appear to be impacting the adjacent wetland. The thick vegetation of the wetland may discourage traffic.

Recommendations

Disturbances to the current hydrological regime should be avoided, as should further fragmentation of this community.

Steel Hollow Road Swamp BDA

This site in the Bald Eagle Valley contains a remnant of bottomland oak-hardwood palustrine forest. The physical setting which supports this community type— alluvial soils and flat, poorly drained topography—is very prevalent in the valley, but much of this land is now farmed and no longer supports natural communities.

Threats and Stresses

There is some evidence of dumping and possible tree removal, but no other imminent threats of physical disturbance to the site. Due to the flat topography in this area, it is likely that the wetland is hydrologically connected to all surrounding areas. A seasonally high water table likely occurs beneath the entire area, and meets the surface in the area of the wetland. Thus any seepage escaping from sewer systems or septic tanks in the area will likely reach the wetland. This type of pollution can raise nutrient levels to artificially high levels in a wetland, which may cause changes in its plant and animal species composition. Farm runoff containing excess fertilizer would cause similar impacts, while pesticide runoff may be toxic to various animal species inhabiting the wetland, especially insects and amphibians.

Recommendations

Disturbances to the current hydrological regime should be avoided, as should further fragmentation of this community.

TAYLOR TOWNSHIP

<u>PNDI Rank</u>
Global State

<u>Legal Status</u>
Fed. State

NATURAL HERITAGE AREAS:

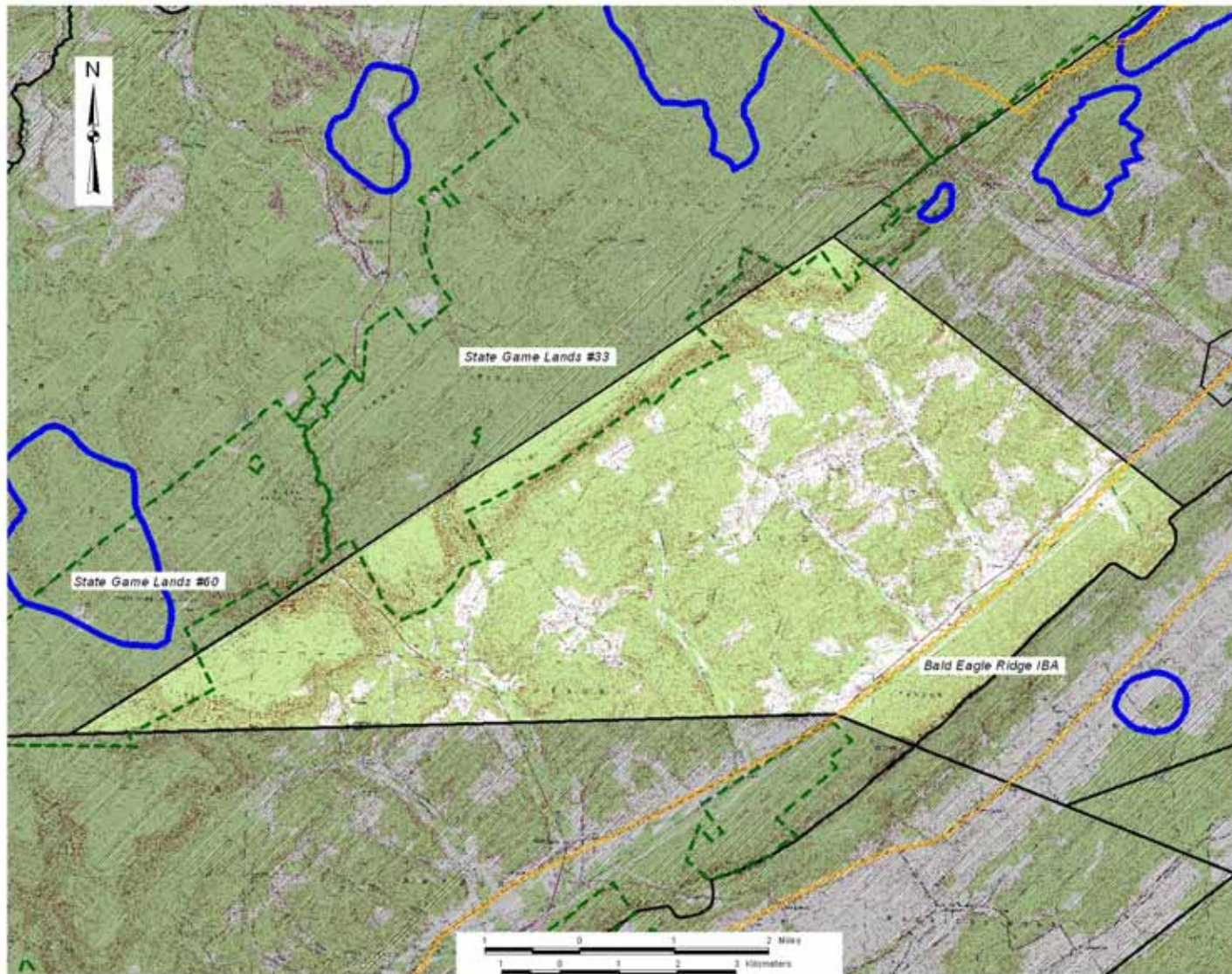
none

OTHER CONSERVATION AREAS: *Bald Eagle Ridge Important Bird Area*

MANAGED LANDS: *State Game Lands #33/#60*

GEOLOGIC FEATURES: *none*

Taylor Township



Taylor Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

None

Landscape Conservation Areas:

None

Managed Areas:

State Game Lands #33

State Game Lands #60



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

TAYLOR TOWNSHIP

The township stretches from the eastern edge of the ridge of Allegheny Mountain southeast to the Bald Eagle ridgeline, encompassing a section of the Allegheny Front, the Allegheny Mountain foothills, Bald Eagle Valley, and the northern face of Bald Eagle Ridge. The forested corridor along Bald Eagle Ridge is an important flyway for migrating birds, and is recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (see page 35 for more detail). Most of the township falls within the Allegheny Front section of the Appalachian Plateau physiographic province. Though there are several impressive hollows, with scenic stands of eastern hemlock (*Tsuga canadensis*), forests in this part of the county appear to be younger and have more weedy species than those further east in the Ridge and Valley physiographic province. In the southeast corner of the township, the headwaters of the Bald Eagle Creek lies just inside the Centre County line near the settlement of Dix. This curious headwaters feeds two creeks, both called Bald Eagle Creek. One flows east into Centre County, while the other flows west into Blair County and the Little Juniata River.

UNION TOWNSHIP & UNIONVILLE BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

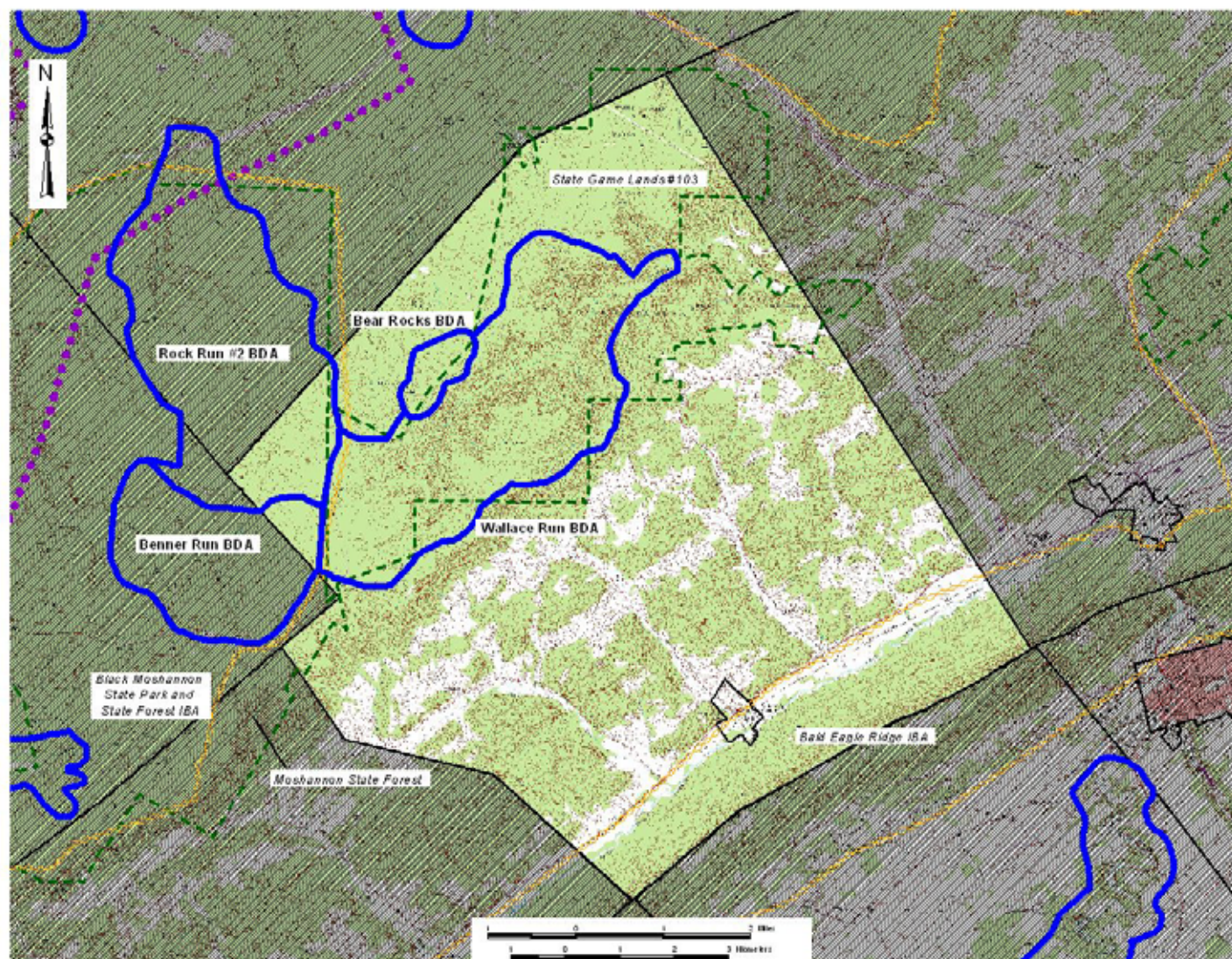
BEAR ROCKS BDA	County Significance
BENNER RUN BDA	Notable Significance
High-gradient clearwater creek	PA Exceptional Value
ROCK RUN #2 BDA	Exceptional Significance
High-gradient clearwater creek	PA Exceptional Value
WALLACE RUN BDA	Exceptional Significance
High-gradient clearwater creek	PA Exceptional Value
WINGATE-MILESBURG FLOODPLAIN FOREST BDA	--removed--

OTHER CONSERVATION AREAS: Bald Eagle Ridge Important Bird Area
Black Moshannon State Park and State Forest Important Bird Area

MANAGED LANDS: Moshannon State Forest
State Game Lands #103

GEOLOGIC FEATURES: none

Union Township & Unionville Borough



Union Township & Unionville Borough

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Bear Rocks
Benner Run
Rock Run #2
Wallace Run

Landscape Conservation Areas:

None

Managed Areas:

Moshannon State Forest
State Game Lands #103



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

UNION TOWNSHIP

Union township straddles Bald Eagle Ridge and Allegheny Mountain. The northern face of Bald Eagle Ridge falls within the township, with the crest of the ridge forming the southeastern township boundary. At the base of Bald Eagle Ridge the township contains a section of Bald Eagle valley and its drainage—Bald Eagle Creek. To the northwest above the valley are the foothills of Allegheny Mountain, from which the Allegheny Front slopes upward. The northwestern township boundary follows near to the ridgeline of Allegheny Mountain, reaching an elevation of 2260' at its highest point. Most of the township is forested. However, most of the lands immediately adjacent to waterways are in agriculture or other non-forested use, with the exception of Wallace Run. The forested corridor along Bald Eagle Ridge is an important flyway for migrating birds, and is recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (IBA—see page 35 for more detail). The western tip of the county falls within the Black Moshannon State Park and State Forest IBA (pg. 36).

Bear Rocks BDA

No new information is available for this area. It was not visited during this update; review of 2001 aerial photographs suggests no major changes have taken place.

This site is a geologic oddity that also may support a unique biological community. The Bear Rocks are coarse sandstone blocks, which are remarkably square and nearly as big as houses. These blocks cover the top of a hill northwest of Wallace Run and are strewn unevenly along this crest for nearly a mile. The plant community growing on this unique landscape is an open mixture of gnarled chestnut oak (*Quercus montana*), occasional white and black oaks (*Quercus alba*, *Quercus velutina*) and ericaceous (heath family) shrubs. The site has a long popular history of being a habitat for bobcat, bear, porcupine, raccoon and other wildlife, which inhabit the caves between the rocks. The landowner, whose family has held this property for the past century, claims the land has never been logged in his memory, a claim which is supported by the roughness of the terrain and lack of stumps.

Threats and Stresses

There appear to be no serious threats to this site. The present landowner is aware of the uniqueness of the site and appears interested in maintaining the habitat.

Recommendations

It is recommended that the area be left undisturbed.

Benner Run BDA

Most of this BDA falls within Rush Township; please reference the Rush Township section for further description.

Rock Run #2 BDA

Most of this BDA falls within Snowshoe Township; please reference the Snowshoe Township section for further description.

Wallace Run BDA

No new information is available for this area. It was not visited during this update; review of 2001 aerial photographs suggests no major changes have taken place. Wallace Run is designated by the Pennsylvania Department of Environmental Protection as an Exceptional Value stream from the headwaters to the confluence with Grindstone Gap Run. This watershed is considered an exceptional site because of its mature, diverse forest community and because it is one of the most intact watersheds in the county. The flat valley floor is nearly 100 feet wide in places and supports a 1000 acre recovering hemlock – northern hardwoods community of exceptional quality and diversity. Beech (*Fagus grandifolia*), hemlock (*Tsuga canadensis*), black birch (*Betula lenta*), white ash (*Fraxinus americana*), green ash (*Fraxinus pennsylvanica*), tulip tree (*Liriodendron tulipifera*) and yellow birch (*Betula allegheniensis*), plus many others form this open canopy forest. The character of the floodplain exhibits the effects of spring runoffs and a frequently meandering creek. The valley is completely unimproved but the remnants of an old railroad grade can be occasionally found where it cut into the sides of the valley. Evidence of this railway has mostly been destroyed by floods that periodically rearrange the contours of the valley floor.

Threats and Stresses

Wallace Run has an excellent buffer and difficult access. Few campsites impact it, and each of them is located on the plateau 900 feet above the valley floor community. The easternmost end of the ravine, where it widens, is privately owned and shows signs of disturbance from logging on the north slope, and from the cabins in the valley. Logging of the watershed at the lower end of Wallace Run has damaged the forest community there and it is reasonable to assume that this activity would damage the community upstream, also. The Game Commission has made several timber cuts along Birch Lick Road north of the creek. Forest cover removal in the valley floor would be especially detrimental at this site because in addition to threatening the habitat quality of the stream for aquatic organisms, it would also disrupt the extensive floodplain seepage community that exists here.

Recommendations

It is recommended that forest cover removal and any large-scale disturbances be avoided in this watershed, due to the quality of its forest community. Any earth disturbances that are conducted should provide for effective erosion control measures to avoid damaging the water quality of this Exceptional Value stream.

Wingate-Milesburg Floodplain Forest BDA

This site is discussed under Boggs Township.

UNIONVILLE BOROUGH

Unionville Borough is located in the Bald Eagle Valley at the confluence of Dewitt Run and Bald Eagle Creek. All of the land in the borough drains into these two streams. No natural features of county or state significance have been documented in Unionville Borough.

WORTH TOWNSHIP & PORT MATILDA BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

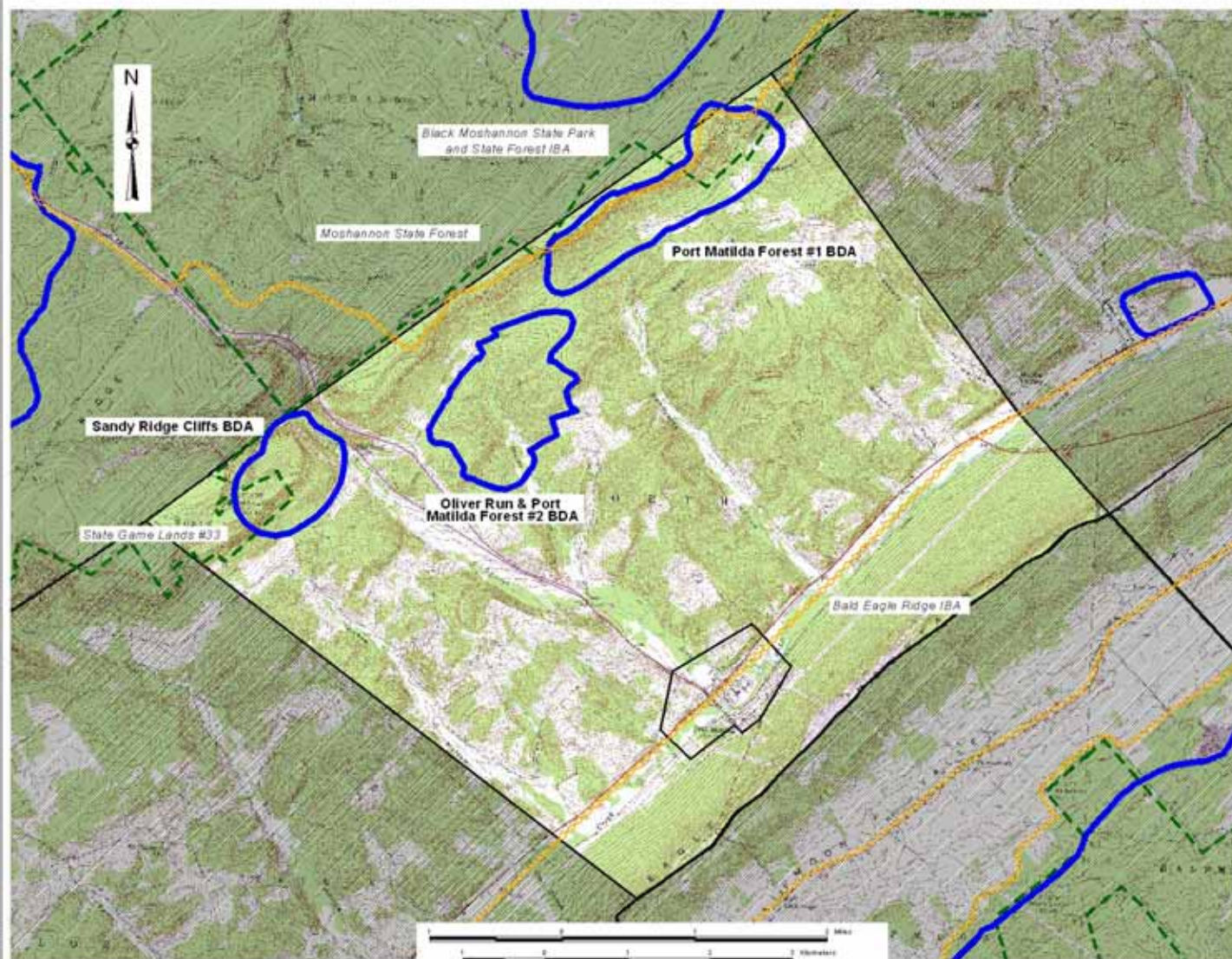
OLIVER RUN & PORT MATILIDA FOREST #2 BDA		<i>Exceptional Significance</i>			
Small whorled-pogonia (<i>Isotria medeoloides</i>)	G2	S1	LT	PE	
PORT MATILDA FOREST #1 BDA		<i>Exceptional Significance</i>			
Small whorled-pogonia (<i>Isotria medeoloides</i>)	G2	S1	LT	PE	
SANDY RIDGE CLIFFS BDA		<i>High significance</i>			
Allegheny woodrat (<i>Neotoma magister</i>)	G3G4	S3	PT	PT	

OTHER CONSERVATION AREAS: *Bald Eagle Ridge Important Bird Area*

MANAGED LANDS: *Moshannon State Forest*
State Game Lands #33/#60

GEOLOGIC FEATURES: *none*

Worth Township & Port Matilda Borough



Worth Township & Port Matilda Borough

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Port Matilda Forest #1
Oliver Run and Port Matilda Forest #2
Sandy Ridge Cliffs

Landscape Conservation Areas:

None

Managed Areas:

Moshannon State Forest
State Game Lands #33



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

WORTH TOWNSHIP

This township encompasses a section of the northern slope of the Bald Eagle Ridge, the Bald Eagle Valley, and the foothills of Allegheny Mountain. Its northwestern border runs along the easternmost peaks of Allegheny Mountain. Within Worth Township there are three populations of species that are globally threatened: two populations of the very rare small whorled-pogonia, a woodland orchid, and a population of the Allegheny woodrat, an animal species of special concern which— although not as rare as the orchid— has a limited range and is feared to be in decline. The forested corridor along the Bald Eagle Ridge is an important flyway for migrating birds, and is recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (see page 35 for more detail).

Port Matilda Forest #1 BDA & Oliver Run & Port Matilda Forest #2 BDA

Both of these sites host populations of the small whorled-pogonia, an orchid species that is Federally Threatened and Pennsylvania Endangered. Its known global distribution includes a fairly wide geographic range in the eastern US, from Maine to Georgia and west as far as Missouri and Ontario, but the species appears to be very uncommon in most of this range. It appears to be extremely uncommon in Pennsylvania, as it has only ever been documented from ten locations in the state. Of these, four populations are believed to no longer exist, and several others may be in poor condition. All sites known in Pennsylvania are small populations compared to locations known from some other states. Precise characterization of this species' habitat requirements remains elusive; it is known from a variety of forest types and soil types, and could potentially have different habitat preferences in different areas of its range. The site boundaries are drawn to include areas of potential habitat that are in close proximity to the known population.

Threats and stresses

Any disturbance within these BDAs could negatively impact the populations of these plants; especial care is required to evaluate potential disturbances because of the difficulty in monitoring this species' distribution and identifying its habitat requirements.

Recommendations

If any activities involving vegetation or earth disturbance are planned within these BDAs, the Pennsylvania Department of Conservation and Natural Resources' Bureau of Forestry and the United State Fish and Wildlife office should be consulted for assistance in avoiding sensitive areas.

Oliver Run is an area of great diversity. This short ravine supports a disturbed but recovering dry oak - hardwoods forest community that possesses some unique properties. Little of the Allegheny Mountain foothills area in Centre County is undisturbed. The majority of forests in the area are heavily cut or planted stands of various pine species. The remaining land is farmed. This valley is unusual in that it supports a fairly mature forest recovering from sporadic logging.

Continued support of the recovery and maturation of this valley forest would increase the ecological and landscape-level value of this area.

Sandy Ridge Cliffs BDA

This site encompasses a habitat where the Allegheny woodrat (*Neotoma magister*)— an animal species of special concern— has been documented to live. The woodrat inhabits rocky cliffs and outcroppings. Historically it is known from a fairly large range in the eastern U.S., from New York to Alabama and west to Indiana and Tennessee, but it is extirpated or declining over about 35% of the range. While it is still common in other areas, the decline has been rapid and the cause is not yet fully understood. The Allegheny woodrat eats leaves, twigs, fruits, and seeds from many plants, and acorns may form a substantial component in its diet.

Threats and Stresses

Several different studies provide evidence that there may be a variety of factors contributing to the observed declines in populations of Allegheny woodrats in different parts of the species' range. Some populations appear to have suffered heavy mortality from the raccoon roundworm. Raccoons are habitat generalists that tolerate or even benefit from habitat fragmentation and disturbance. Since raccoon populations increase in areas where human settlement patterns have greatly increased the level of fragmentation and disturbance, these landscape changes may have created conditions that increase the exposure of the woodrat to the raccoon roundworm parasite. Population declines are also correlated with gypsy moth infestations of oak trees, and with exceptionally severe winter conditions. Work in Pennsylvania suggests that acorns are a major food source, and in the event of widespread oak mortality resulting from a severe gypsy moth infestation, the decline in acorn production might create significant limitations in food supply for this animal.

Recommendations

Forest cover is important in maintaining the microhabitat conditions and some of the food sources utilized by Allegheny woodrats. Oak trees are especially important because of the food source they provide and should not be removed. Fragmentation and disturbance within the area should be avoided. The PA Game Commission has developed further recommendations regarding management of woodrat habitat, which may be available upon request.

PORT MATILDA BOROUGH

No Natural Heritage Areas were identified in Port Matilda Borough.

Lower Bald Eagle Region

- **Boggs Township**
- **Milesburg Township**
- **Curtin Township**
- **Howard Township**
- **Howard Borough**
- **Liberty Township**



C.W. Bier

Bear Rocks, Centre County

BOGGS TOWNSHIP & MILESBURG BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

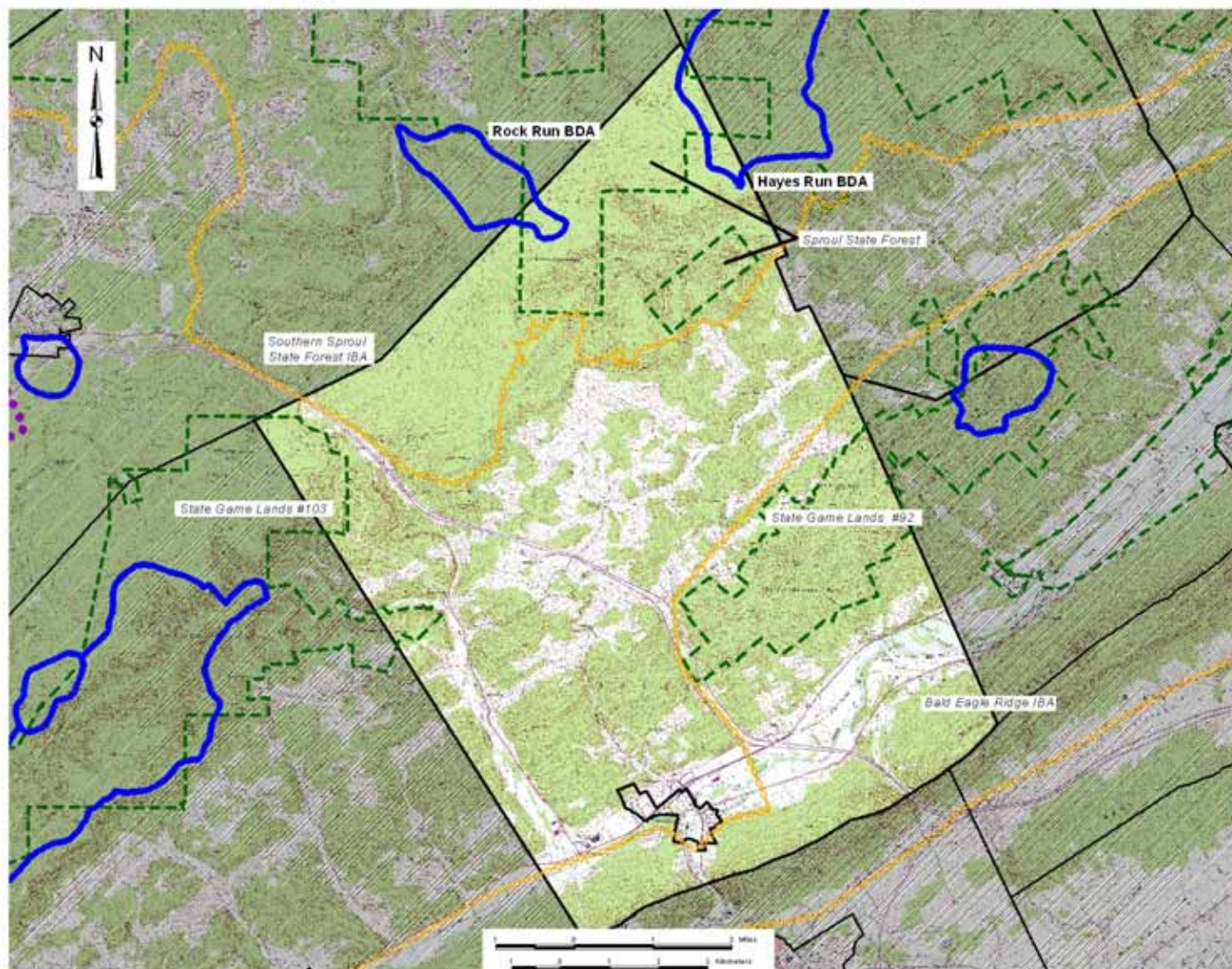
HAYES RUN BDA	<i>High significance</i>
High-gradient clearwater creek	PA Exceptional Value
ROCK RUN BDA	<i>Notable Significance</i>
High-gradient clearwater creek	PA Exceptional Value
WINGATE-MILESBURG FLOODPLAIN FOREST BDA	--removed--

OTHER CONSERVATION AREAS: *Bald Eagle Ridge Important Bird Area*
Southern Sproul State Forest Important Bird Area

MANAGED LANDS: *Sproul State Forest*
State Game Lands #92
State Game Lands #102
State Game Lands #353

GEOLOGIC FEATURES: *none*

Boggs Township & Milesburg Borough



Boggs Township & Milesburg Borough

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Hayes Run
Rock Run

Landscape Conservation Areas:

None

Managed Areas:

State Game Lands #92
State Game Lands #103
Sprout State Forest



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

BOGGS TOWNSHIP

Boggs Township falls between the ridgelines of Allegheny Mountain and Bald Eagle Ridge. In addition to holding a portion of the northern slope of Bald Eagle Ridge, it contains a section of Bald Eagle Valley and its drainage Bald Eagle Creek. Much of the township is forested, while the Bald Eagle Valley and land along some of the tributary streams have been largely cleared. The forested corridor along Bald Eagle Ridge is an important flyway for migrating bird species, and has been recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (IBA—see pg. 35 for more detail). The northwestern portion of the township falls within the Southern Sproul State Forest IBA (pg. 38), recognized for the habitat value to birds of the large, contiguous forest block in this area. The eastern corner of the township is included in the newly designated State Game Lands #323 that covers a portion of Bald Eagle Ridge.

Hayes Run BDA

This site is discussed under Curtin Township.

Rock Run BDA

This site is discussed under Snowshoe Township.

Wingate-Milesburg Floodplain Forest BDA

This site was designated in the 1991 Natural Heritage Inventory to recognize the Floodplain Forest community that occurred here, at the time one of the more intact and extensive examples of this community type remaining in Centre County. However, the area is not recognized as significant in 2002 because disturbance has degraded the habitat quality of the area.

MILESBURG BOROUGH

Milesburg borough mainly contains land in urban use. Bald Eagle Creek is a major waterway that runs through the borough, and most of the land in the borough drains into it. As part of the 2002 update mussel surveys were conducted in Bald Eagle Creek. Although some mussels were found lower in the drainage, none were found at the Milesburg sampling point. No Natural Heritage Areas were identified in Milesburg Borough.

CURTIN TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

TWO ROCK RUN BDA	<i>Notable Significance</i>			
High-gradient clearwater creek	PA Exceptional Value			
WEST BRANCH BIG RUN WATERSHED BDA	<i>Notable Significance</i>			
High-gradient clearwater creek	PA Exceptional Value			
HAYES RUN BDA	<i>High significance</i>			
High-gradient clearwater creek	PA Exceptional Value			
STATE GAME LANDS #92 FOREST BDA	<i>Exceptional Significance</i>			
Small whorled-pogonia (<i>Isotria medeoloides</i>)	G2	S1	LT	PE

OTHER CONSERVATION AREAS: *Bald Eagle Ridge Important Bird Area*
Southern Sproul State Forest Important Bird Area

MANAGED LANDS: *Sproul State Forest*
State Game Lands #92

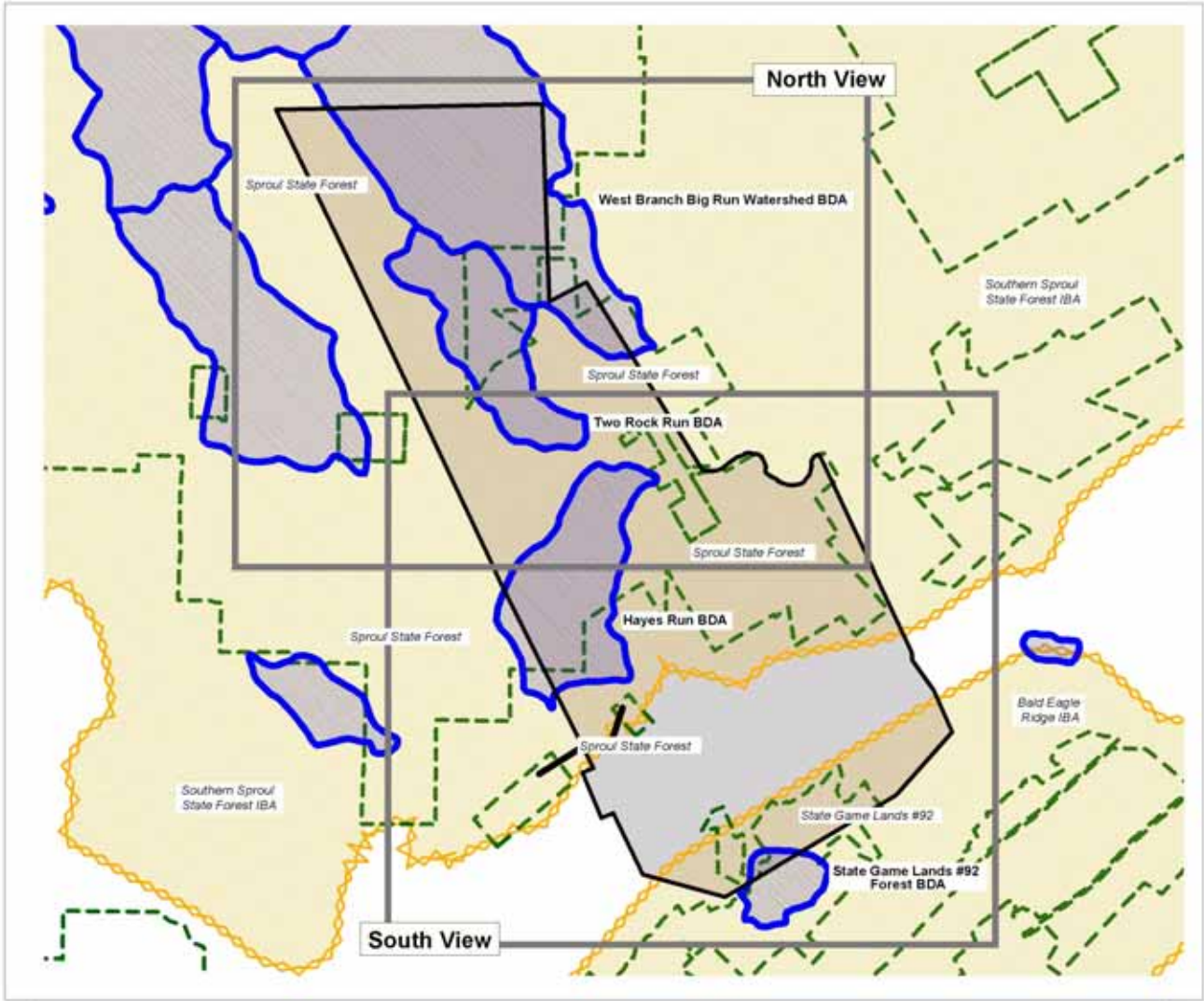
GEOLOGIC FEATURES: *none*



Curtin Township (full view summary) **Centre County** **Natural Heritage Inventory**

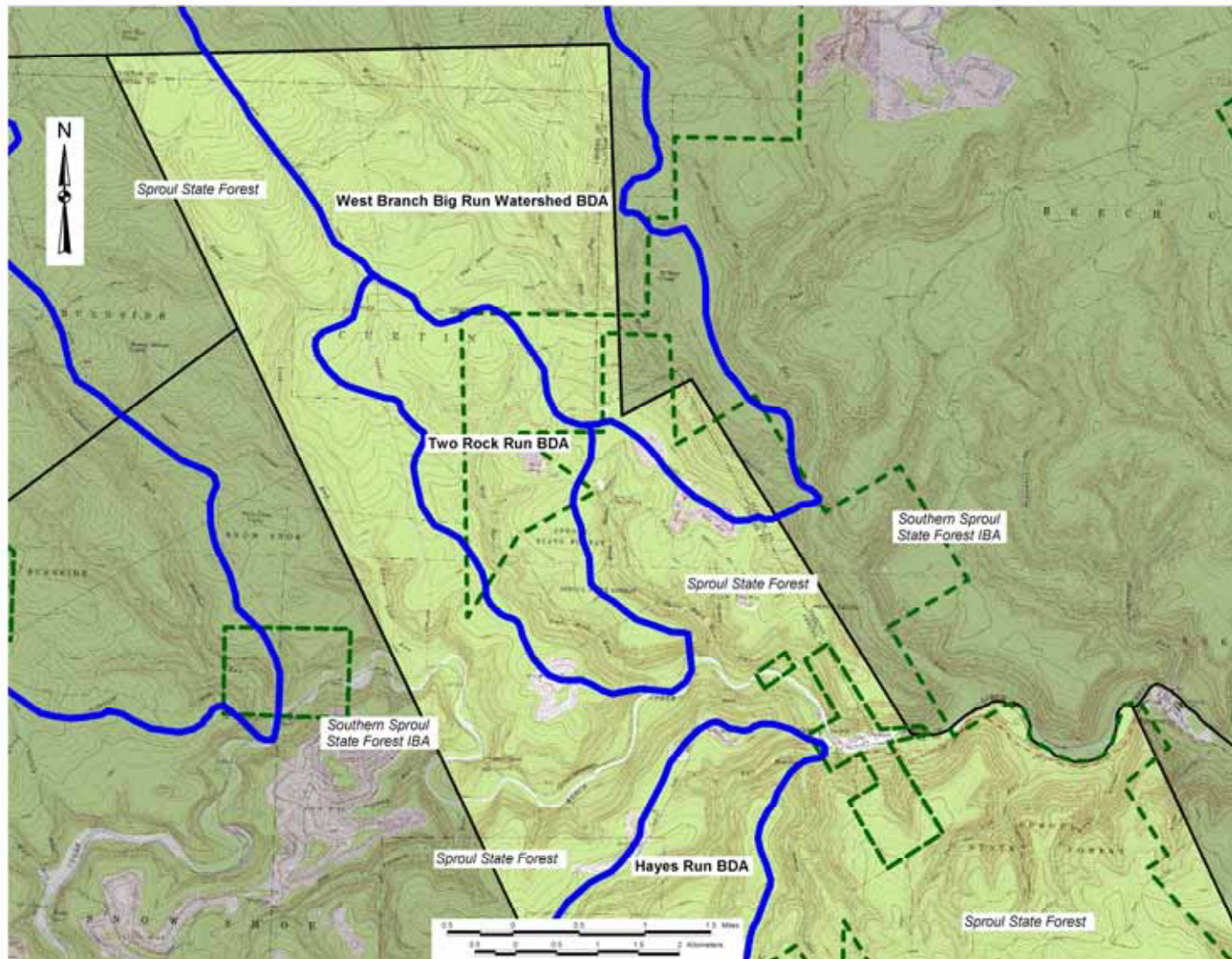
Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Audubon Society Important Bird Area (IBA)
- Managed Area (MA)
- Municipal Boundary



Biological Diversity Areas:	Landscape Conservation Areas:	Managed Areas:
Two Rock Run West Branch Big Run Watershed Hayes Run State Game Lands #92 Forest	None	Sprout State Forest State Game Lands #92

Curtin Township (north view)



Curtin Township (north view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Two Rock Run
West Branch Big Run Watershed
Hayes Run
State Game Lands #92 Forest

Landscape Conservation Areas:

None

Managed Areas:

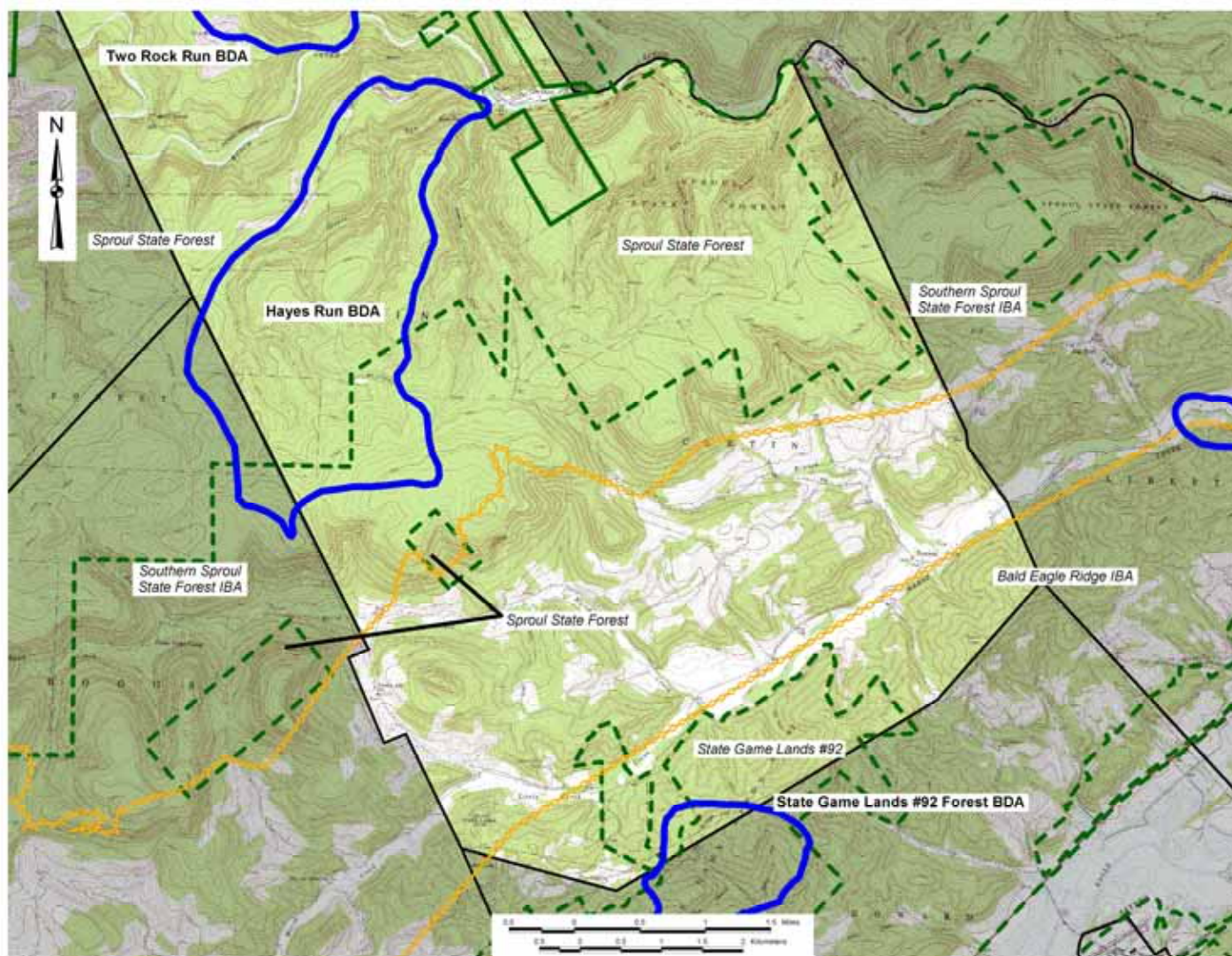
Sproul State Forest



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

Curtin Township (south view)



Curtin Township (south view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Two Rock Run
Hayes Run
State Game Lands #92 Forest

Landscape Conservation Areas:

None

Managed Areas:

Sproul State Forest
State Game Lands #92



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

CURTIN TOWNSHIP

The northern portion of the township falls within the Deep Valleys section of the Appalachian Plateau physiographic province. The Appalachian Plateau province was formed by uplift. In Curtin Township, the mountainous ridges run SW-NE. In the area of the Deep Valleys section, the ridges are cut frequently by deep, narrow stream ravines that generally run northwest to southeast. Curtin township contains several such valleys in its northern half, and the streams that run through them are classified as Exceptional Value. This area is sparsely populated and much of it is covered by forest—a condition largely responsible for maintaining many of its streams in pristine health. Large scale timber operations and subsequent fires wrought a great change on this landscape in the early part of the twentieth century. The impact of these historical disturbances is still discernable in the forest species composition and through scars that remain on the physical landscape in many places. The forest communities are redeveloping; most upland areas contain dry oak forest types. Some more recent and present day disturbances also impact the natural features of the area. These include the massive fire that burned across part of the township, various gas extraction operations, and the roads associated with them. However, the area provides important habitat value for birds and other species that depend upon interior-forest conditions; the northern two-thirds of Curtin Township falls within the area designated by the PA Audubon Society as the Southern Sproul State Forest Important Bird Area (see page 38 for more detail). A large portion of the township was recently added to the Sproul State Forest, joining adjacent portions of forest land. The added contiguity of this managed area provides potential for increased habitat value in the future.

Two Rock Run BDA, Hayes Run BDA, & West Branch Big Run Watershed BDA

All three of these BDAs are designated around the watersheds of streams designated by the Pennsylvania Department of Environmental Protection as Exceptional Value. In all of these areas, the continued health of the streams is integrally dependent on the condition of land in the watershed. Forest cover plays a vital role in maintaining the health of the stream by anchoring soil sediments and maintaining a natural cycle of nutrient input and uptake. The condition of land immediately adjacent to the stream is also particularly important to the habitat quality of the stream for aquatic organisms, as some depend on the light levels and temperature conditions created by a forest canopy, and others utilize the forest habitat.

The ecological characteristics of each site are discussed separately below, while one set of Threats and Stresses and Recommendations is outlined for all three due to their similar requirements.

The vegetative communities in the **Two Rock Run** watershed are mainly young to middle-aged forests dominated by oak species (*Quercus montana*, *Quercus velutina*, etc.) and black cherry (*Prunus serotina*), and as such are not particularly unique. However, the health of the stream is dependent on the health of the forest communities, which anchor sediments and provide for natural levels of nutrient uptake and input. The forest communities in the Two Rock Run watershed were impacted by a massive fire that burned much of this area in April of 1990. The

fire started from a campsite in the Two Rock Run headwaters, and burned more than 11,000 acres of forest and brush to the north and west of this ravine, most of it in Clinton County. The effects of this fire on the wildlife and quality of the streams are unknown.

The vegetative community in the **Hayes Run** watershed is mainly forest dominated by young oaks and black cherry (*Prunus serotina*), with occasional patches of hemlock (*Tsuga canadensis*) and understory mountain laurel (*Kalmia latifolia*). These forest types are not exceptionally unique. However, the health of the stream depends upon the health of these forest communities, because the forests anchor sediments and provide for natural levels of nutrient uptake and input. Portions of this site were not investigated. Permission to access certain areas is needed for further study.

The **West Branch Big Run** begins and ends outside of Centre County, but the section within the county contains a very narrow strip of hemlock – northern hardwoods terrestrial forest. The strip is patchy, with several inclusions of recovering oak forest, but for most of its length this hemlock (*Tsuga canadensis*) and birch (*Betula spp.*) community is in good condition.

Threats and Stresses

Any removal of forest cover or earth disturbance that is conducted without effective provision for controlling the resultant soil erosion will negatively impact the health of these streams. In various places within these watersheds, forest cover has been removed for roads or other purposes, and it is unknown whether erosion is adequately controlled in these areas. Large-scale removal of forest cover will also alter the level of nutrients entering the stream, which may detrimentally impact the aquatic community. There is a very high likelihood that if coal mining is pursued within these areas, it will create a perpetual source of pollution entering the streams that will degrade water quality.

Recommendations

Large-scale forest cover removal should be avoided within the bounds of this site in order to prevent pollution of the waterway with sediment and excess nutrients. In those areas where forest cover has already been removed, erosion control measures should be implemented if not in place already. Also, forest cover should be left intact on steep slopes greater than 15%, as erosion is very rapid and difficult to prevent in these areas. On more gradually sloping land, if activities are pursued which result in forest cover removal, great care should be taken to prevent the movement of eroding sediments away from the immediate area of operation. Coal mining should be avoided in these watersheds due to its detrimental impact on water quality.

State Game Lands #92 Forest BDA

This area was designated because a population of the Federally Threatened and Pennsylvania Endangered plant species the small whorled-pogonia (*Isotria medeoloides*) is located within its boundaries. The small whorled-pogonia is a type of orchid found in forests. Its known global distribution includes a fairly wide geographic range in the eastern US, from Maine to Georgia

and west as far as Missouri and Ontario, but the species appears to be very uncommon in most of this range. It appears to be extremely uncommon in Pennsylvania, as it has only ever been documented from ten locations in the state. Of these, four populations are believed to no longer exist, and several others may be in poor condition. All sites known in Pennsylvania are small populations compared to locations known from some other states. Precise characterization of this species' habitat requirements remains elusive; it is known from a variety of forest types and soil types, and may have different habitat preferences in different areas of its range. The site boundaries are drawn to include areas of potential habitat that are in close proximity to the known population.

Threats and stresses

Any disturbance within these BDAs could negatively impact the populations of these plants, particularly given the difficulty in monitoring its distribution and identifying its habitat requirements.

Recommendations

The most effective way to promote the safety of these populations will be to consult with the Pennsylvania Department of Conservation and Natural Resources' Bureau of Forestry and the United State Fish and Wildlife office when planning activities that might involve vegetation or earth disturbance within this BDA for assistance in avoiding sensitive areas.

HOWARD TOWNSHIP & HOWARD BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

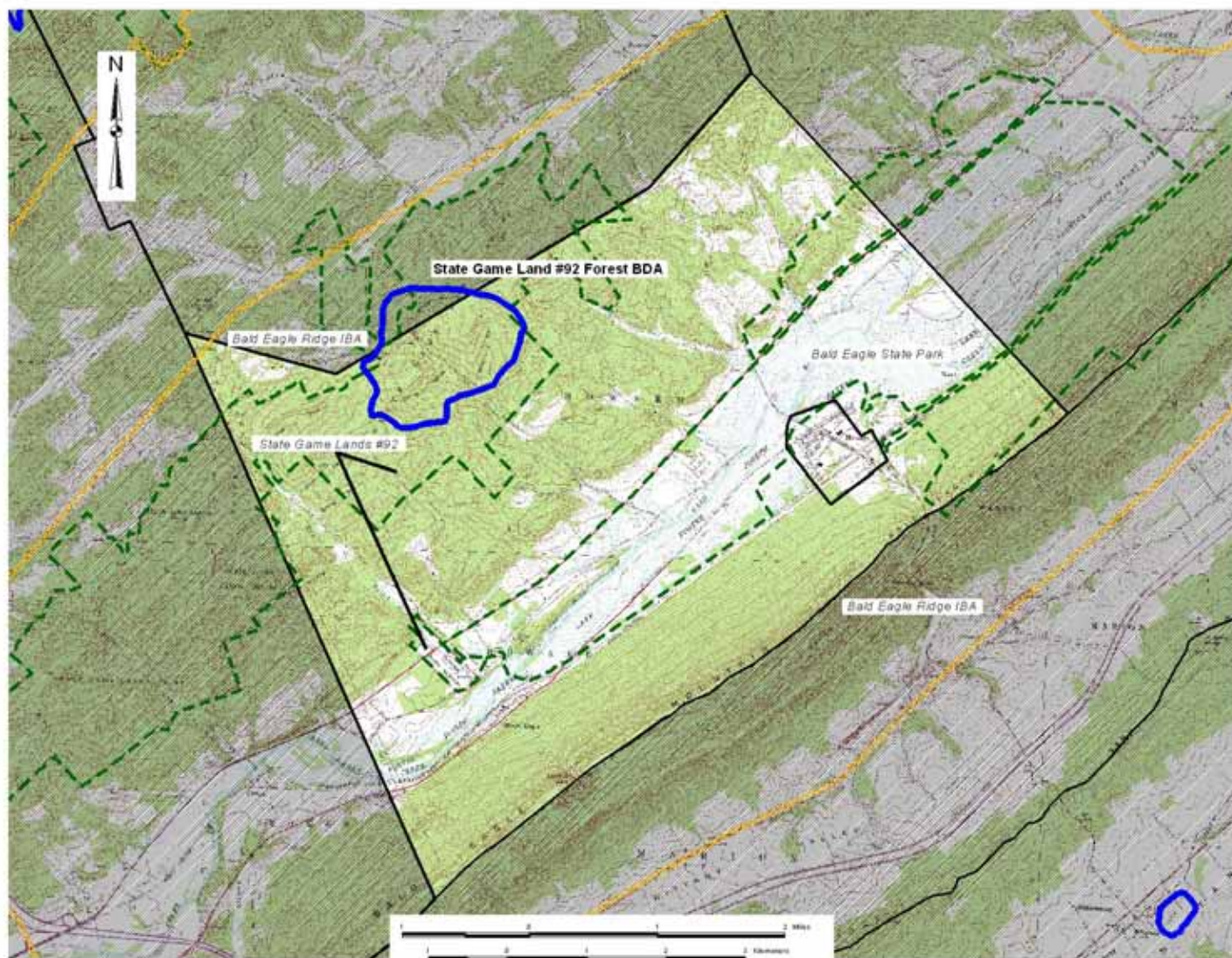
STATE GAME LANDS #92 FOREST BDA	Exceptional Significance			
Small whorled-pogonia (<i>Isotria medeoloides</i>)	G2	S1	LT	PE

OTHER CONSERVATION AREAS: *Bald Eagle Ridge Important Bird Area*

MANAGED LANDS: *Bald Eagle State Park*
State Game Lands #92

GEOLOGIC FEATURES: *none*

Howard Township & Howard Borough



Howard Township & Howard Borough

Centre County Natural Heritage Inventory

Biological Diversity Areas:

State Game Land #92 Forest

Landscape Conservation Areas:

None

Managed Areas:

Bald Eagle State Park
State Game Lands #92



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

HOWARD TOWNSHIP

The northwestern border of the township runs along the eastern edge of the Allegheny Mountain ridge, while the southeastern border runs along Bald Eagle Ridge. Between these boundaries the township stretches across Allegheny Front, the foothills of Allegheny Mountain, Bald Eagle Valley, and the northern face of Bald Eagle Ridge. Most of the portion of the Bald Eagle Valley that falls within Howard Township is occupied by the Foster Joseph Sayers Lake. The township contains a portion of one BDA, designated around a population of a Federally Threatened species of orchid, the small whorled-pogonia (*Isotria medeoloides*). The forested corridor along Bald Eagle Ridge is an important flyway for migrating birds, and because of the habitat value of the lake and other forest, all of Howard Township is included in the PA Audubon-designated Bald Eagle Ridge Important Bird Area (see pg. 35 for more detail). A significant portion of Bald Eagle Ridge within the township is included the newly designated State Game Lands #323.

State Game Lands #92 Forest BDA

This site is discussed under Curtin Township.

HOWARD BOROUGH

No natural features of county or state significance have been documented from this area.

LIBERTY TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

ROMOLA BOTTOMLANDS BDA

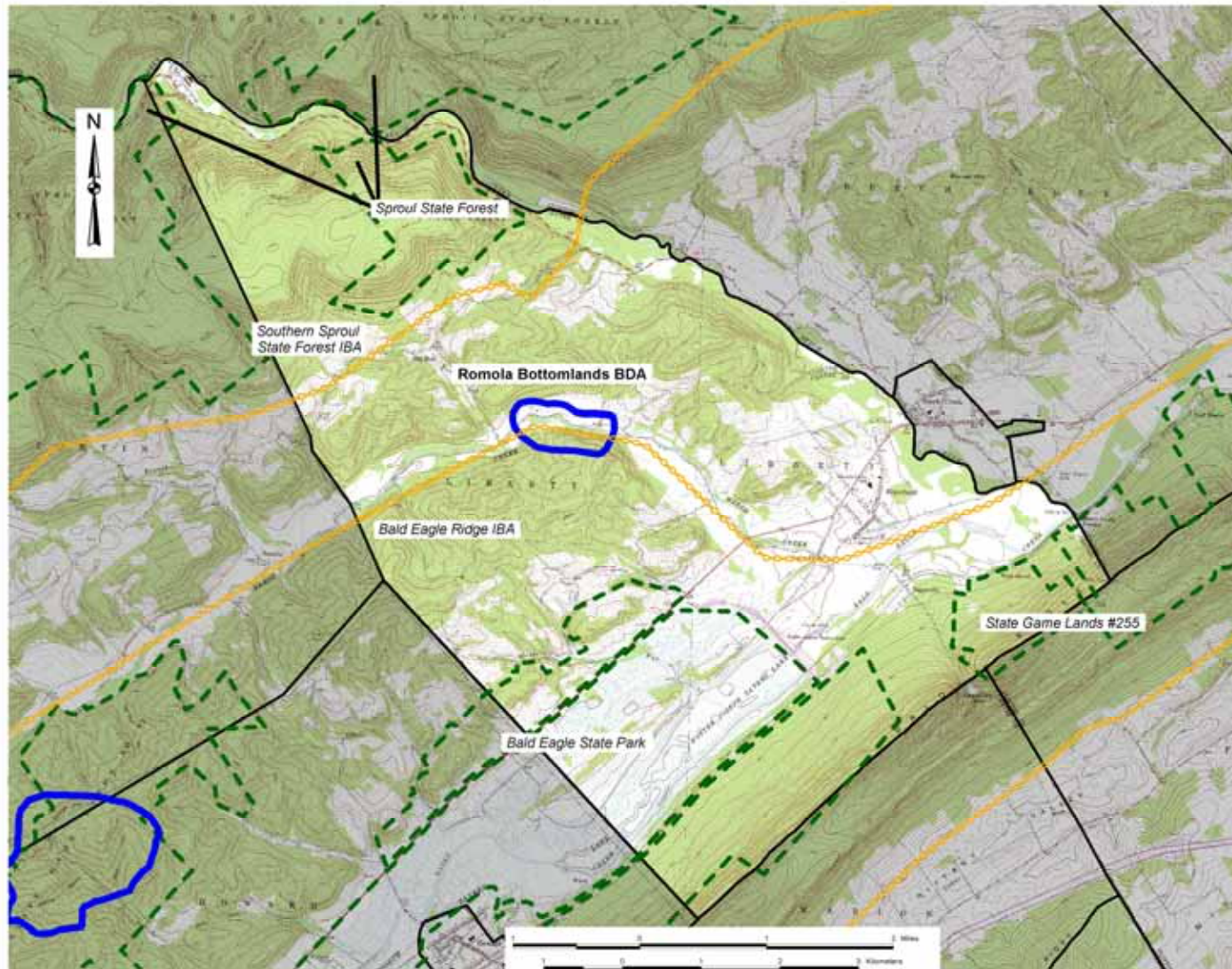
County Significance

OTHER CONSERVATION AREAS: *Bald Eagle Ridge Important Bird Area*
Southern Sproul State Forest Important Bird Area

MANAGED LANDS: *Bald Eagle State Park*
Sproul State Forest
State Game Lands #255

GEOLOGIC FEATURES: *none*

Liberty Township



Liberty Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Romola Bottomlands

Landscape Conservation Areas:

None

Managed Areas:

Bald Eagle State Park
Sprout State Forest
State Game Lands #255



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

LIBERTY TOWNSHIP

One unique feature within the township is the Romola Bottomlands BDA, one of the only remaining examples of a floodplain forest natural community in Centre County. There are many areas along Marsh Creek that were likely once occupied by this type of forest, and which may recover floodplain forest communities if undisturbed. Bald Eagle Ridge, which runs through the southern portion of the township, is an important flyway for migrating birds. It is recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (IBA—see page 35 for more detail). The forested northern portion of the township falls within the Southern Sprout State Forest IBA, recognized for the habitat value this large, contiguous forested area provides to bird species (see page 38 for more detail).

Romola Bottomlands BDA

This site was not revisited during this update; no new information is available. Review of 2001 aerial photography suggests no major landscape disturbances have occurred in the area.

This area along Marsh Creek contains two small, disjunct pieces of Sycamore – (river birch) – box elder floodplain forest. An additional, larger section of this forest community type is found further upstream, but like most others along this creek, this stand is used as a cattle pasture and has been impacted very heavily by the animals. The Romola Bottomlands site is one of the only good examples of floodplain forest in the county, and thus provides unique habitat value. Great blue herons (*Ardea herodias*) and several species of reptiles are animal species that utilize this type of habitat.

Threats and Stresses

Grazing may prevent regeneration of woody plants here if intense, and it also may damage the health of the stream if animals are allowed to roam freely through it.

Recommendations

Grazing should only be occasional and should be of light intensity in this site. The establishment of an ungrazed, fenced riparian buffer can help to safeguard water quality if the area will be grazed. Additionally, there are many areas along this creek where it appears there once were high quality forest communities that could recover if simply left to mature.

Nittany Valley Region

- Benner Township
- Marion Township
- Spring Township
- Bellefonte Borough
- Walker Township



C.W. Bier

Giant Swallowtail on prickly ash



P. Wiegman

Side-oats grama grass
(*Bouteloua curtipendula*)



P. Wiegman

BENNER TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

BIG HOLLOW ROAD BDA	Exceptional Significance			
Laurentian bladder-fern (<i>Cystopteris laurentiana</i>)	G3	S1	TU	PE
Hard-leaved goldenrod (<i>Solidago rigida</i>)	G5	S1	TU	PE
Side-oats gramma grass (<i>Bouteloua curtipendula</i>)	G5	S2	PT	PT
Side-oats gramma calcareous grassland community		S1		
Calcareous opening/cliff community		S2		

J-4 CAVE BDA	Notable Significance			
Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3		CR

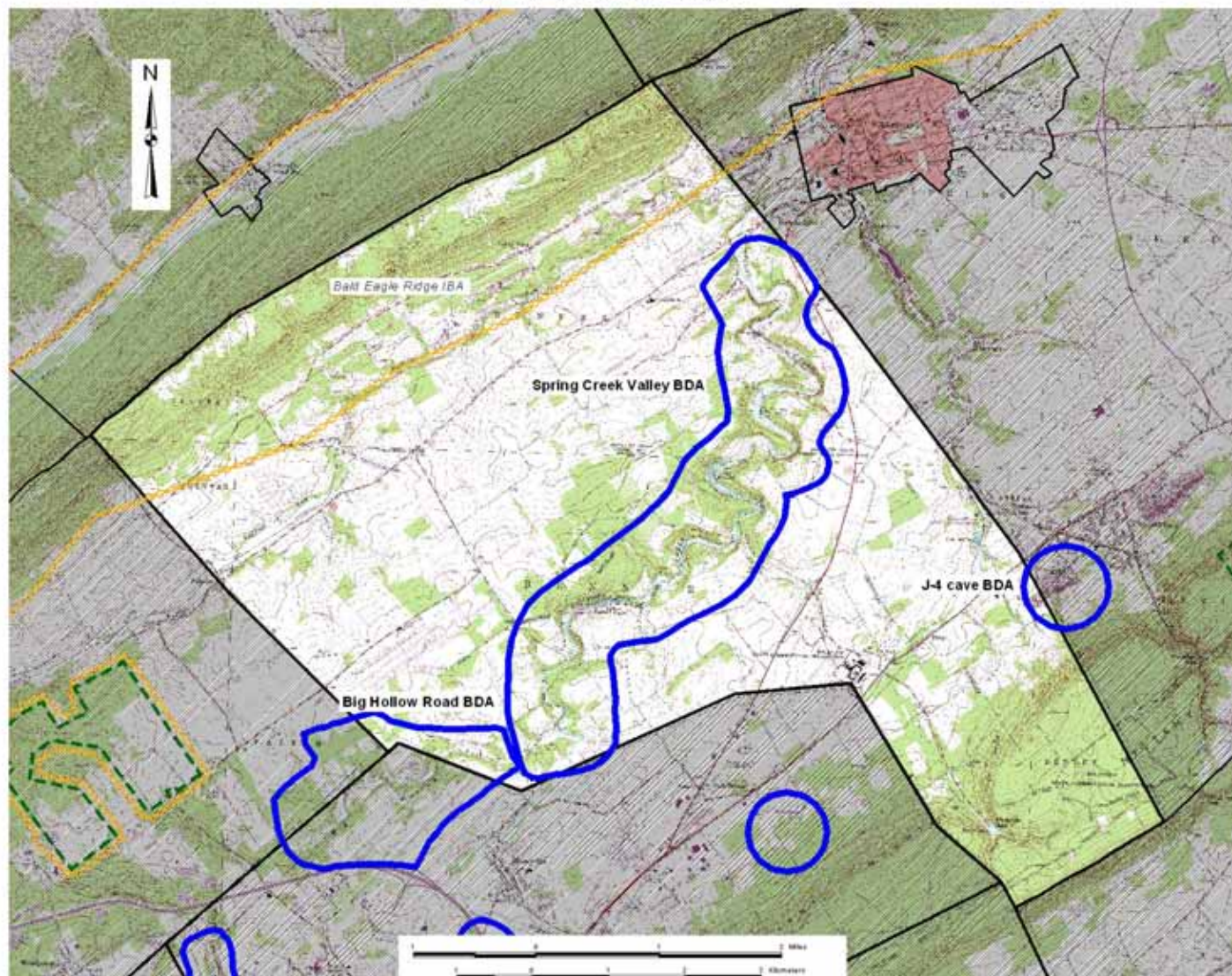
SPRING CREEK VALLEY BDA	Exceptional Significance			
Serviceberry (<i>Amelanchier humilis</i>)	G5	S1		TU
Roundleaf serviceberry (<i>Amelanchier sanguinea</i>)	G5	S1		TU
Ebony sedge (<i>Carex eburnea</i>)	G5	S1		PE
Geyer's sedge (<i>Carex geyeri</i>)	G5	S1		PE
Laurentian bladder-fern (<i>Cystopteris laurentiana</i>)	G3	S1		TU
Tufted buttercup (<i>Ranunculus fascicularis</i>)	G5	S1S2		PE
Lance-leaved buckthorn (<i>Rhamnus lanceolata</i>)	G5	S1		PE
Calcareous opening/cliff community		S2		
Special animal #1	G5	S2		
Special animal #2	G3G4	S2		
Special animal #3	G4	S1S2		

OTHER CONSERVATION AREAS: Bald Eagle Ridge Important Bird Area

MANAGED LANDS: none

GEOLOGIC FEATURES: none

Benner Township



Benner Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Big Hollow Road BDA
J-4 Cave BDA
Spring Creek Valley BDA

Landscape Conservation Areas:

None

Managed Areas:

None



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

BENNER TOWNSHIP

The township is bounded in the northwest by Bald Eagle Ridge, which forms a forested corridor that is an important flyway for migrating birds. It has been recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (IBA—see pg. 35 for more detail). The southeastern-most portion of the township extends across Nittany Mountain. In between these ridges, most of the area of the township is a broad valley underlain by limestone bedrock of the Gatesburg formation. Spring Creek runs north-south through the center of the township, and has cut a deep ravine in the valley floor. While most of the valley has been cleared for agriculture or other use, the steep slopes of the Spring Creek ravine have discouraged attempts to utilize the area intensively, and it retains natural cover in many places along its length. This site is one of the most exceptional areas within Centre County for native biodiversity.

Big Hollow Road BDA

This site is discussed under College Township.

J-4 Cave BDA

This site is discussed under Spring Township.

Spring Creek Valley BDA

Spring Creek Valley contains some of the most intact examples of limestone-dependent natural community types to be found anywhere in Centre County, and these communities host a number of plant and animal species which are extremely uncommon in Pennsylvania, several of which are also globally rare. There are several very distinct habitat types within the valley, due to the range of environmental conditions the valley's dramatic topography creates. Rock outcroppings frequently occur in the steepest portions of the valley, where the limestone geologic layer that forms the bedrock of the Nittany Valley is exposed to the surface. The plants and animals that are able to utilize these rock outcroppings include many that are specialists, able to survive only in particular conditions and not found in the general landscape. Furthermore, outcroppings at the summit of the slopes with a westerly aspect are hot and dry, while outcroppings in a mid- or lower-slope position that are well-shaded and north- or east-facing are cool and moist, and different assemblages of species are found in both settings, although both fall under the classification of calcareous opening/cliff community. The forest communities that occupy the more moderate slopes of the valley are also ecologically important. The limestone-enriched soil facilitates the development of distinctive communities. As limestone-enriched soils are often highly productive for agriculture, few examples of these communities today remain in Centre County, and among those that do, the forests of Spring Creek Valley are the most extensive and are in relatively good condition.

Threats and Stresses

The use of pesticides in the area would be extremely detrimental to the unique animal species found at this site. The communities occupying the Spring Creek Valley slopes receive runoff from lands above the valleys. A number of invasive exotic species have established in the valley to date. The management of the Spring Creek Valley landscape may determine how dominant these species eventually become, given that fragmentation and disturbance of natural landscapes are correlated with increased success of invasive exotic species. Another detrimental effect of fragmentation is that it alters habitat characteristics, causing changes in light levels and temperatures and imposing obstacles to species movement. These changes may negatively impact native species, particularly the more specialized ones, leading to an overall reduction in the biodiversity within the area.

Recommendations

Pesticide spraying should be avoided within the BDA to protect the special animal populations living here. The natural communities of the valley are already somewhat fragmented by features such as roads, trails, and various facilities; in order to preserve the integrity and native biodiversity of the valley's unique communities, care should be taken in future plans regarding this site to minimize disturbance and maximize the contiguity of the natural landscape.

MARION TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

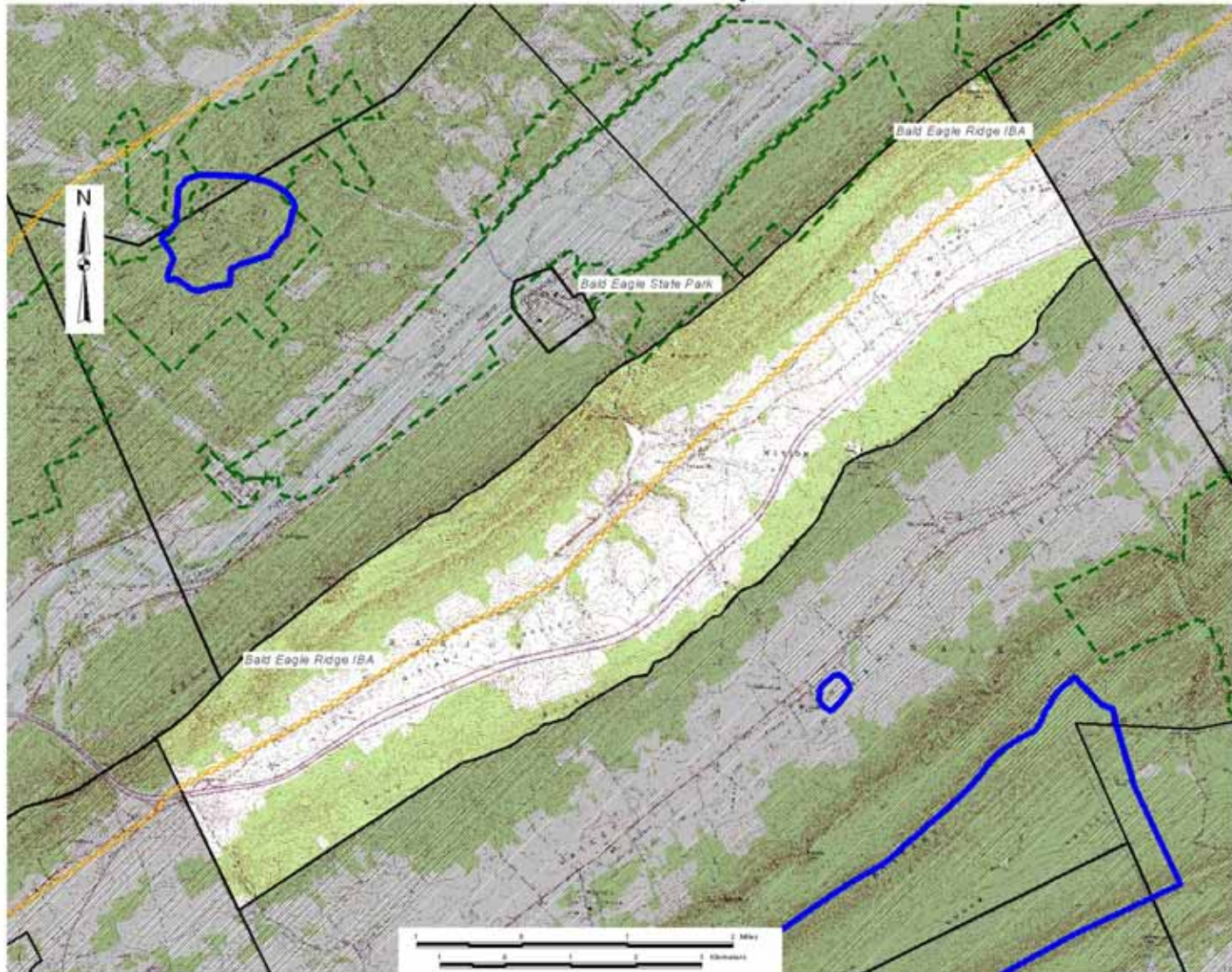
NATURAL HERITAGE AREAS:

none

OTHER CONSERVATION AREAS: *Bald Eagle Ridge Important Bird Area*

MANAGED LANDS: *none*

Marion Township



Marion Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

None

Landscape Conservation Areas:

None

Managed Areas:

Bald Eagle State Park



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

MARION TOWNSHIP

Marion Township includes a long section of the south face of Bald Eagle Mountain, the north face of Sand Ridge, and the portion of the Little Nittany Valley that falls between them. Bald Eagle Ridge forms a forested corridor that is an important flyway for migrating birds, and has been recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (see pg. 35 for more detail). The western corner of the township falls within the newly designated State Game Lands #323, which covers a portion of Bald Eagle Ridge. Most of the valley is in agricultural use, while the slopes of the ridges are mainly forested. No sites of county or state ecological significance have been identified in this township.

SPRING TOWNSHIP & BELLEFONTE BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

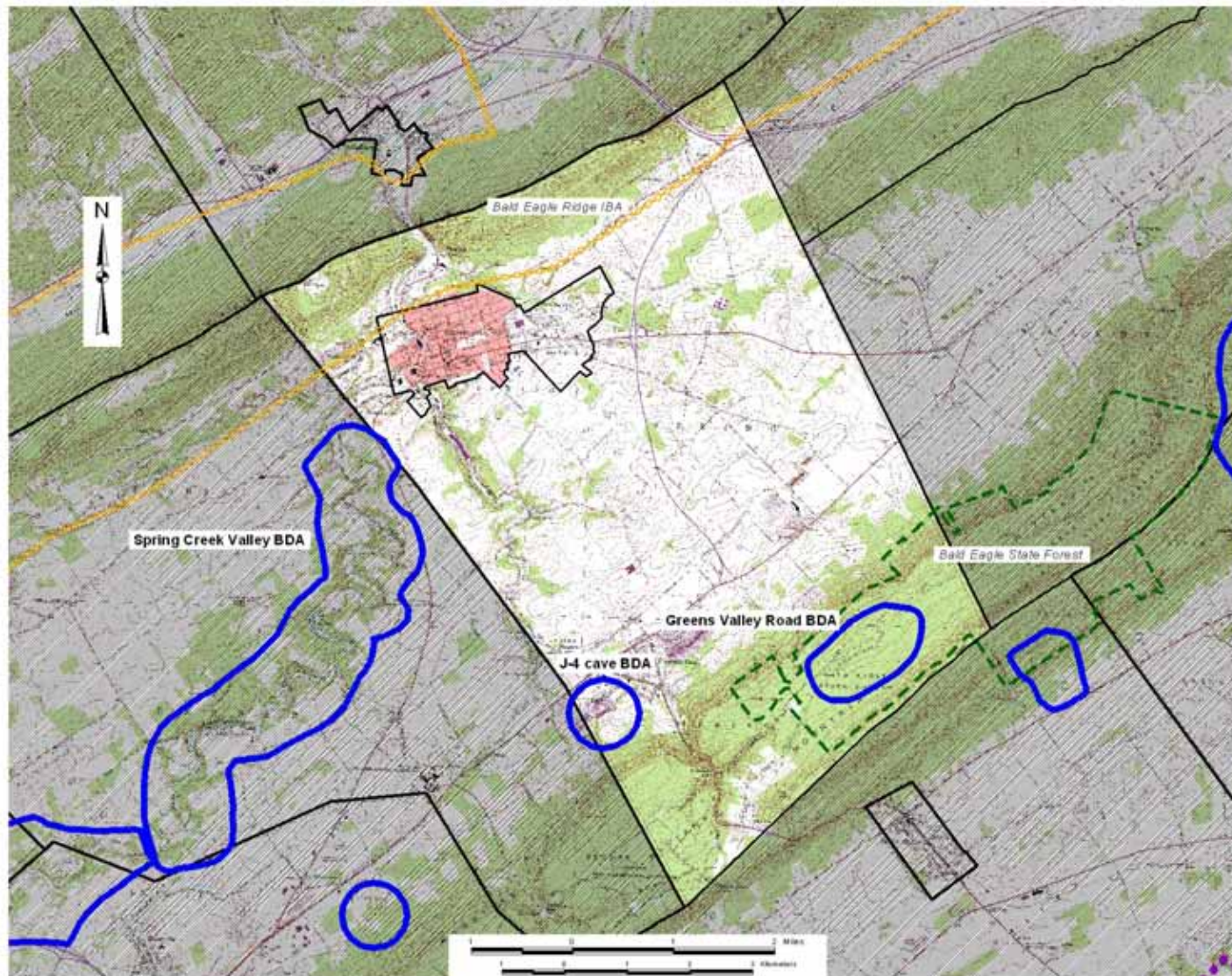
GREENS VALLEY ROAD BDA		High significance	
Lupine (<i>Lupinus perennis</i>)	G5	S3	PR
J-4 CAVE BDA		Notable Significance	
Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3	CR

OTHER CONSERVATION AREAS: *Bald Eagle Ridge Important Bird Area*

MANAGED LANDS: *Bald Eagle State Forest*

GEOLOGIC FEATURES: *Big Springs
Springs #2*

Spring Township & Bellefonte Borough



Spring Township & Bellefonte Borough

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Greens Valley Road BDA
J-4 Cave BDA

Landscape Conservation Areas:

None

Managed Lands:

Bald Eagle State Forest



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

SPRING TOWNSHIP

Spring Township stretches from the ridgeline of Bald Eagle Mountain to the ridgeline of Nittany Mountain, and in between includes a portion of the Nittany Valley. Bald Eagle Mountain forms a forested corridor that is an important flyway for migrating birds, which has been recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (IBA—see pg. 35 for more detail). The northern corner of the township falls within the newly designated State Game Lands #323, which covers a portion of Bald Eagle Ridge. Nittany valley is underlain by limestone geology, and has mineral-rich, high pH soil; it is mainly in agricultural use and has been cleared of natural communities. However, one important feature is a limestone solutional cave that provides habitat for the northern long-eared bat, a rare bat species. This cave is part of a subterranean network of channels carved by water through the highly soluble limestone-based rock layers. This aquifer may underlie a much larger portion of the valley than is occupied by its surface outlet, and may also receive surface water inputs from this area. Spring Creek flows through the northwestern corner of the township, and the landscape surrounding the creek is largely unforested, the major landuses being agricultural and residential. Other unique features of the township are a relatively undisturbed mountain seepage wetland in Greens Valley, and a population of a plant species of special concern that also occupies the mountainous southern portion of the township. There is one geologic feature of note, a spring that occurs along Bald Eagle Creek near Bellefonte.

Greens Valley Road BDA

This site was revisited during this update to better characterize the vegetative community. The wetland area does not appear to have changed due to any unnatural disturbances.

This site includes a mountaintop region in Bald Eagle State Forest. Most of the area is disturbed white oak (*Quercus alba*) and chestnut oak (*Quercus montana*) forest, but the headwaters of Little Fishing Creek support a hemlock - mixed hardwoods palustrine forest community. Towards the base of the slope into the valley, the forest community includes more birch (*Betula allegheniensis*) and hemlock (*Tsuga canadensis*), and in the floor of the valley several springs and seeps emerge. Rhododendron (*Rhododendron maximum*) cover is thick in these areas; the seepages have variable amounts of plant cover, often including sphagnum moss, golden saxifrage (*Chrysosplenium americanum*), and violets (*Viola sp.*) These areas are classified as skunk cabbage – golden saxifrage forest seep communities, although skunk cabbage is not prevalent here. The central portion of the valley is an open shrub and herbaceous wetland dissected with several weak meandering channels. The community is classified as a highbush blueberry – meadowsweet wetland. Alder (*Alnus sp.*) and common mountain holly (*Nemopanthus mucronata*) also contribute to the shrub layer; the herbaceous layer includes patches of tussock sedge (*Carex stricta*) and other graminoids, as well as marsh St. Johnswort (*Triadenum virginicum*) and marsh fern (*Thelypteris palustris*).

Researchers from Penn State's wildlife department have identified a very diverse fauna that uses the area, including some of the rare bat species documented from the Sharer Cave site. A spring house, a bridge and an old dam can be found in the wetland indicating prior uses and

disturbance. Nonetheless, this site has few weedy species, the physical environment is fairly intact, and native species have returned to form a diverse community. After it emerges from this wetland, Little Fishing Creek becomes a High Quality-Cold Water Fishery and Class "A" Wild Brook Trout creek; maintaining the relatively pristine condition of the stream headwaters will be important to maintain the habitat value of the stream.

Also within the watershed of Little Fishing Creek is a single occurrence of Lupine (*Lupinus perennis*), a Pennsylvania Rare plant species. This plant is found growing in the drier oak forest surrounding the swamp.

Threats and Stresses

Presently, several cabins sit at the edge of the wetland, introducing the possibility of septic inputs and disturbance from accompanying roads. The surrounding area sees more use than many public forests because of its proximity to urban areas. With such activity, there is always the threat of illegal dumping or fire. The rare species found within this BDA (wild lupine) is threatened by road maintenance and collection. The Bureau of Forestry has been alerted to the plant's presence and is taking steps to protect the occurrence.

Recommendations

Forest cover removal should be avoided in the vicinity of the wetlands, as it would alter the light levels, temperature, and possibly the hydrology of that habitat. Other physical disturbances should be minimal as well.

J-4 Cave BDA

This cave is used by the northern long-eared bat, (*Myotis septentrionalis*), an animal species of special concern in Pennsylvania, as winter hibernation grounds. This species has fairly specific environmental requirements for suitable hibernation habitat, and its use of the J-4 cave is evidence that the cave contains some areas with the appropriate temperature and humidity conditions. The northern long-eared bat is considered a species of special concern because a relatively low number of individuals have been documented, although it is not as rare as the eastern small-footed bat. It hibernates in relatively small groups compared to other bat species and thus is more difficult to locate than more colonial species.

Threats and Stresses

As is the case with all cave-hibernating bats, the northern long-eared bat can be negatively impacted by disturbances in the cave during the winter months. Even low levels of noise, heat, or light can be sufficient to disturb this species. Physical disturbance of the rock surrounding the cave or the cave entrance could alter environmental conditions in the cave, which may make it unusable for this and other bat species.

Recommendations

The cave should be left undisturbed during the months of November through March. If uninvited human traffic is a problem here, the installation of a special bat gate can serve to better secure the cave from frequent disturbance. However, the gate must be installed very carefully in order to prevent rendering the cave unusable to bats. Please consult the Pennsylvania Game Commission for assistance with bat gate installation.

BELLEFONTE BOROUGH

The area is mostly in urban use. Spring Creek flows through the borough, and all of the land in the borough drains into this stream, thus the condition of this land and the inputs it supplies to rainwater runoff influence the health of the creek. No features of unique ecological value within the county have been identified in this area. There is one geologic feature of note, Big Springs, recorded from the Borough.

WALKER TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

HUBLERSBURG WETLAND BDA	High Significance
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Backwards Sedge (<i>Carex retrorsa</i>)	G5	S1	PE
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ROARING RUN BDA	Notable Significance
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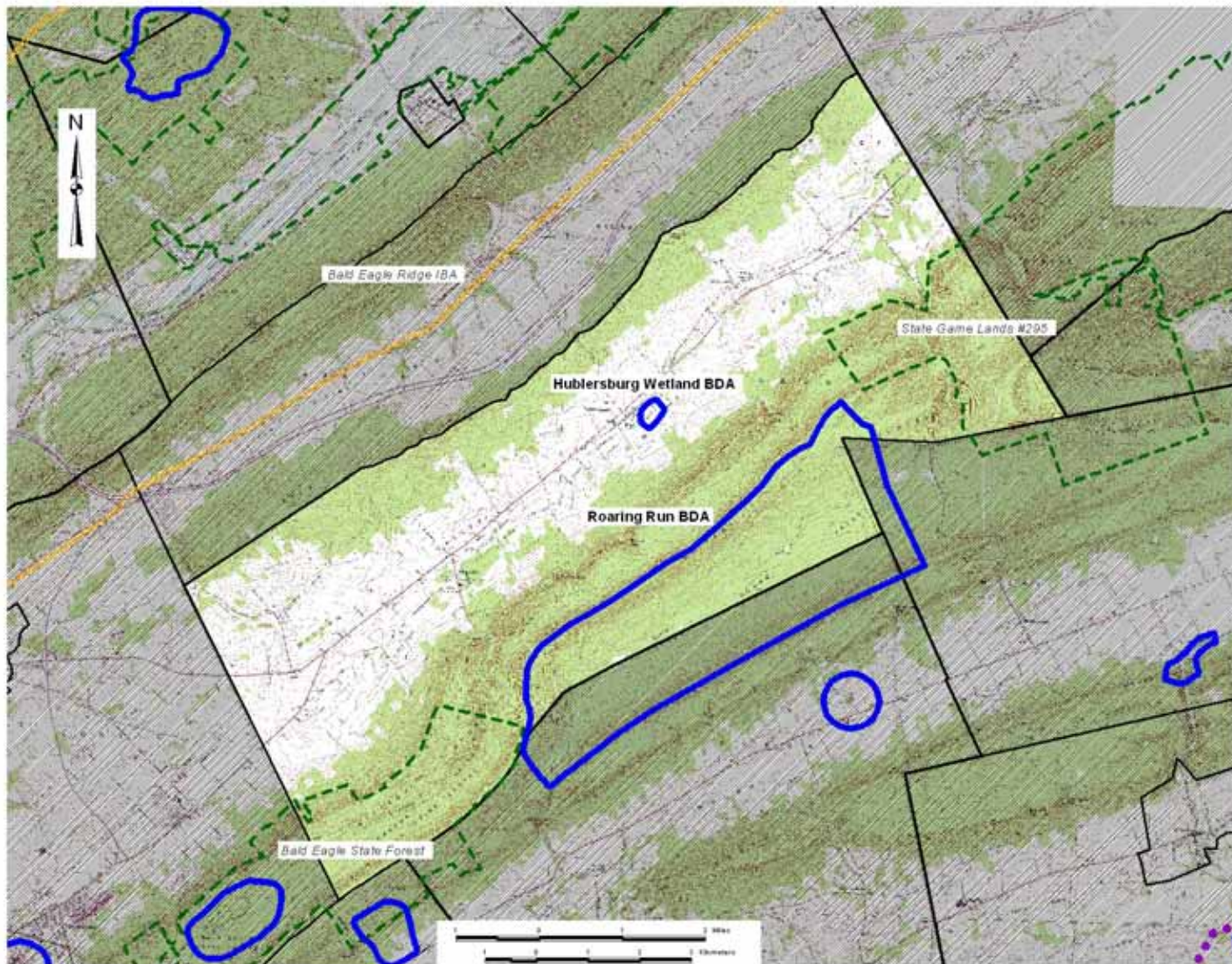
High-gradient clearwater creek	PA Exceptional Value
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OTHER CONSERVATION AREAS: none

MANAGED LANDS: Bald Eagle State Forest
State Game Lands #295

GEOLOGIC FEATURES: none

Walker Township



Walker Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Hublersburg Wetland
Roaring Run

Landscape Conservation Areas:

None

Managed Areas:

Bald Eagle State Forest
State Game Lands #295



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

WALKER TOWNSHIP

Walker Township includes the southern face of Sand Ridge, a section of the Nittany Valley, and a portion of Nittany Mountain. It also extends past the ridge of Nittany Mountain to include half of the Little Sugar Valley and a section of Roaring Run, an Exceptional Value stream. The ridges are underlain by sandstone and are mostly forested, while most areas of the valley are underlain by limestone bedrock and are in agricultural or residential use.

Hublersburg Wetland BDA

This BDA is an area that supports a small channel scar wetland. This type of graminoid marsh community formed after the stream changed course and left behind a low, narrow channel that is frequently wet. The channel scar fills with water after heavy rain or when the stream floods. The site is very small, only five acres, and is somewhat disturbed, but because the community is rare in Centre County, it is important to include it in the inventory. This site also provides habitat for the backwards sedge (*Carex retrorsa*), a Special Concern plant located during the 1991 NHI study.

Threats and Stresses

The Hublersburg Wetland is bounded by a road to the east, a cornfield to the north, and a pasture to the south, with no buffer zone for the wetland. Present activities do not seem to be impacting the site but pasturing, mowing, flooding, or other changes would adversely affect it.

Recommendations

If the site and the species are to be protected, the landowner should be made aware of their existence and a cooperative management plan should be drawn up for them. The development of a buffer area of natural vegetation around the wetland will help to enable the small community to persist and give it some degree of protection against disturbances in the periphery.

Roaring Run BDA

This site is discussed under Gregg Township.

Centre Region

- College Township
- State College Borough
- Ferguson Township
- Halfmoon Township
- Patton Township



Barrens buckmoth
(*Hemileuca maia*)
Egg case, caterpillar, and adult



Scotia Barrens
in summer



Spiny oakworm moth
(*Anisota stigma*)



Broad swallow moth
(*Xylotype capax*)

COLLEGE TOWNSHIP & STATE COLLEGE BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

BIG HOLLOW ROAD BDA *Exceptional Significance*

Laurentian bladder-fern (<i>Cystopteris laurentiana</i>)	G3	S1	TU
Hard-leaved goldenrod (<i>Solidago rigida</i>)	G5	S1	TU
Side-oats gramma grass (<i>Bouteloua curtipendula</i>)	G5	S2	PT
Side-oats gramma calcareous grassland community		S1	
Brome grass (<i>Bromus kalmii</i>)	G5	S3	N
Calcareous opening/cliff community		S2	

BOALSBURG ROAD HILLSIDE BDA *High significance*

Roundleaf serviceberry (<i>Amelanchier sanguinea</i>)	G5	S1	TU
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MILLBROOK MARSH BDA *Exceptional Significance*

Bebb's sedge (<i>Carex bebbii</i>)	G5	S1	PE
Slender sedge (<i>Carex lasiocarpa</i>)	G5	S3	PR
Prairie sedge (<i>Carex prairea</i>)	G5?	S2	PT
Open sedge (<i>Carex stricta</i> , <i>C. prairea</i> , <i>C. lacustris</i>) fen		S1	

OVERLOOK HEIGHTS BDA *High significance*

Serviceberry (<i>Amelanchier humilis</i>)	G5	S1	TU
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ROCKVIEW CAVE BDA *Notable Significance*

Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3	CR
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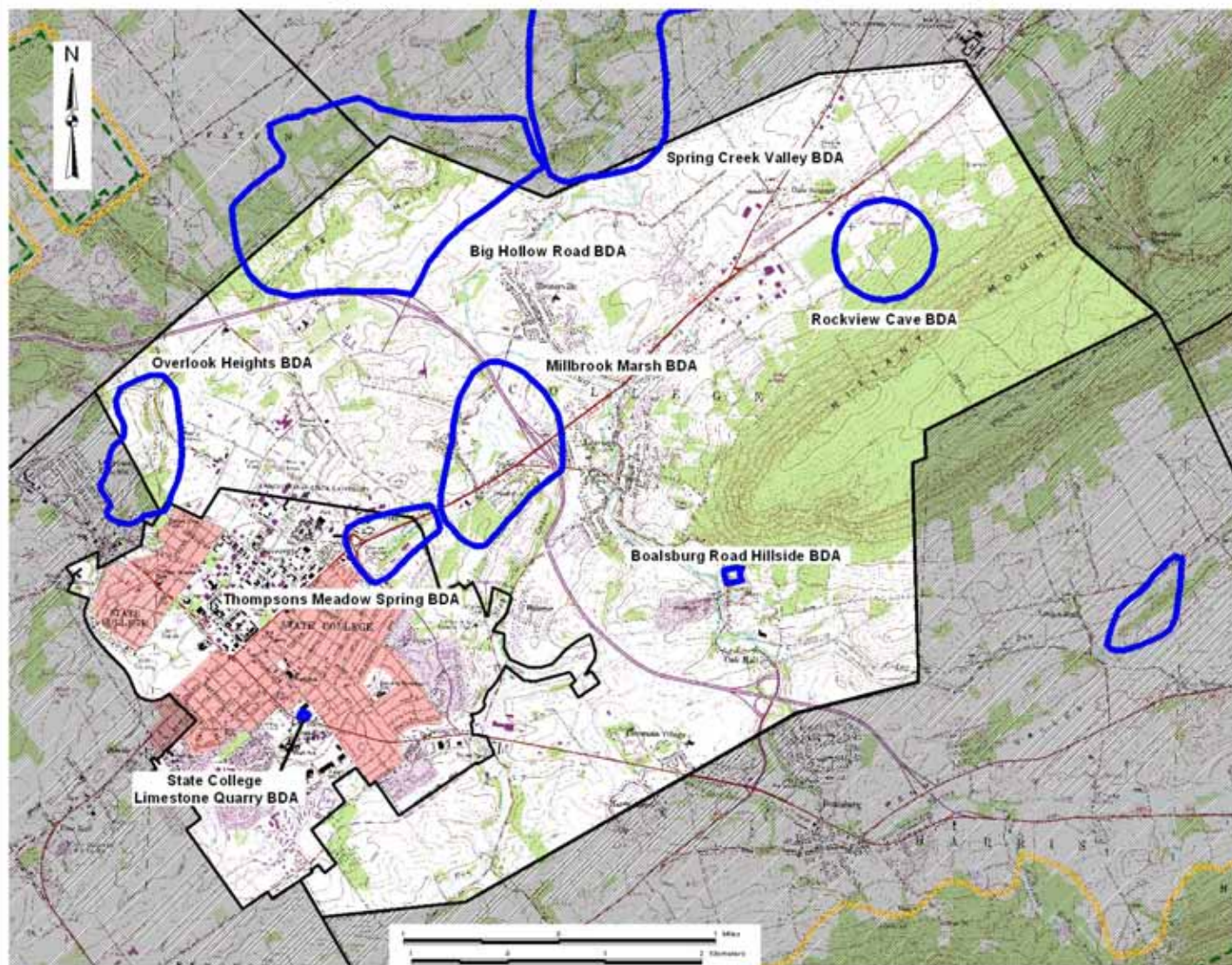
SLAB CABIN RUN BDA --removed--

STATE COLLEGE LIMESTONE QUARRY BDA *High significance*

Serviceberry (<i>Amelanchier humilis</i>)	G5	S1	TU	PE
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(continued following maps)

College Township & State College Borough



College Township & State College Borough

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Big Hollow Road
Boalsburg Road Hillside
Millbrook Marsh
Overlook Heights
Rockview Cave
Spring Creek Valley
State College Limestone Quarry
Thomson Meadow Spring

Landscape Conservation Areas:

None

Managed Lands:

None



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

THOMPSONS MEADOW SPRING BDA

Exceptional Significance

Special animal

G1G2 S1

OTHER CONSERVATION AREAS: none

MANAGED LANDS: none

GEOLOGIC FEATURES: none

COLLEGE TOWNSHIP

A large portion of this township occupies limestone valley area. The limestone bedrock in this area results in soils that are rich in minerals and have high pH. Much of the land has been cleared for agriculture or for urban use, but a few significant natural communities still remain in the valleys. Spring Creek also flows through this township. The Spring Creek gorge is a site of very high ecological significance because of the unique habitats and the populations of rare species it supports.

Big Hollow Road BDA

Big Hollow is a tributary to Spring Creek that is dry much of the year. The underlying geology of the area is limestone of the Gatesburg, Stonehenge, and Larke formations. The Big Hollow ravine contains several kinds of alkaline soil based communities, including a calcareous forest type and a side-oats gramma calcareous grassland. The forest community is scattered throughout the valley wherever cultural use has allowed the forest time to grow back. None of the areas surveyed are entirely undisturbed, but they are important because calcareous forests are rather uncommon in Centre County. The side-oats gramma grassland community is especially unique because it occupies very limited area in Pennsylvania. This community only develops on dry sites with thin, calcareous soil and a low coverage of woody vegetation, which was probably historically maintained by grazing or fire. Many of the plant species found in these communities are typical of western prairies, because the unique conditions described above provide an environment where prairie species are able to outcompete eastern species better adapted to this climate. Some of these prairie species, such as little bluestem grass (*Schizachyrium scoparium*) are also able to utilize other habitat types in Pennsylvania and are not that uncommon, but there are also a number of species that are almost exclusively limited to side-oats gramma grasslands and thus are fairly rare. The side-oats gramma grassland in Big Hollow has three such species that are also listed species of special concern in Pennsylvania: side-oats gramma grass (*Bouteloua curtipendula*), hard-leaved goldenrod (*Solidago rigida*), and a native species of brome grass (*Bromus kalmii*). There are also several limestone outcrops in the Big Hollow ravine that host calcareous opening/cliff communities. Some of these are inhabited by the Laurentian bladder-fern (*Cystopteris laurentiana*).

Changes since 1991

An interstate highway has recently been constructed within the watershed of Big Hollow. It will probably not impact the side-oats gramma grassland community, as it is on the opposite drainage slope and fairly distant from the grassland. The limestone outcrops are in the same drainage slope, but much lower down in the watershed than the highway and separated by a substantial distance, so they also are not likely to be impacted.

Threats and Stresses

There is a powerline that runs through the side-oats gramma calcareous grassland. Roadways also pass near the limestone outcrops where the Laurentian bladder-fern lives. Several species of invasive shrubs, including privet (*Ligustrum vulgare*), bush honeysuckle (*Lonicera sp.*), are present in the forest, and also in the opening where the side-oats gramma grassland occurs. They

may pose a threat to the grassland community if they spread extensively, because many of the grassland species have high light requirements and will decline under a shrub canopy.

Recommendations

The forest communities will best recover into healthy and diverse examples of their unique type if major earth disturbances and canopy removal activities are avoided.

Boalsburg Road Hillside BDA

This small area is designated around a population of a rare species of serviceberry, *Amelanchier humilis*.

Threats and stresses

A limestone quarry is directly adjacent to the site. The serviceberries are at risk for damage or elimination by mining where they grow, or by mining activities in nearby areas that undermine the substrate or physically disturb the plants.

Recommendations

Physical disturbance of the substrate in the area where the plants grow or of the plants themselves should be avoided.

Millbrook Marsh BDA

Millbrook Marsh represents one of the rarest types of communities in the county. It is the only sizeable example of an open sedge fen (listed as calcareous marsh NC002 in the previous edition) in the county. This wetland is a fifty acre marsh. Although there have been as many as ten species of special concern reported for the site since its discovery, only three have been reconfirmed within the past ten years. These are Bebb's sedge (*Carex bebbii*), the prairie sedge (*Carex prairea*), and the slender sedge (*Carex lasiocarpa*). Much of the diversity in the plant species of this marsh is found in its graminoid (grass-like: sedges, grasses, rushes etc.) species, of which these are three. The rare species noted in the past (many also graminoid) may still be inhabiting the fen and marsh and might be revealed by further study, although some deterioration of the habitat appears to have occurred. The site features an education center and a boardwalk which allows visitors to observe the area's unique community.

Threats and stresses

Very much of the landscape surrounding the marsh is developed. Thus runoff may be entering the marsh that contains pollution in the form of sediment from nearby farms, chemical contaminants from urban areas and roadways, and excessive nutrient input. The isolation of this site from other natural areas also threatens the ability of animal species to sustain healthy populations, as the developed areas bar immigration. Chance natural events that would only damage a population in a larger natural setting might eliminate an isolated population that can receive no recharge from surrounding areas, and genetic inbreeding can also be a problem.

Furthermore, the exotic invasive species reed canarygrass (*Phalaris arundinacea*) is very pervasive here; purple loosestrife (*Lythrum salicaria*) also poses a threat.

Recommendations

Little can be done about Millbrook Marsh's isolation, as barriers are formed on two sides by major roads and on a third by a residential area, and there are no nearby areas with mature natural communities. Within the area dedicated to the conservation of the marsh, it will be beneficial to allow the largest possible contiguous area to revert to native vegetation. Naturally vegetated upland areas can help to serve as a buffer for the wetland and also have habitat value for some species that live in the marsh. The populations of reed canarygrass should be monitored to determine if they are spreading, particularly in the sensitive fen area, and if any control action should be undertaken.

Overlook Heights BDA

This area was designated because it contains a population of a serviceberry (*Amelanchier humilis*) listed as Pennsylvania Endangered. Serviceberries include several different species of flowering shrub in the Rose family. It is unknown when the serviceberries became established in the area. The landscape context suggests it is possible the plants are remnants of the community that once covered the site. The scattered patches of trees remaining in what is today a municipal park suggest the area probably once supported a calcareous forest community, which would be typical habitat for the serviceberry.

Threats and Stresses

As the plants are in a populated area which receives pedestrian and potentially vehicular traffic, they face a strong risk of physical damage or removal.

Recommendations

It will be key to the safety of these plants to establish awareness of their significance among those that use this area frequently to prevent damage during maintenance or other activities.

Rockview Cave BDA

Rockview cave is inhabited by the northern long-eared bat, Pennsylvania Rare animal species. The northern long-eared bat is also considered a species of special concern because a relatively low number of individuals have been documented, although it is not as rare as the eastern small-footed bat. It hibernates in relatively small groups compared to other bat species and thus is more difficult to locate than more colonial species. The BDA boundary is drawn to include both the cave and a buffer area within which activities may impact the cave's inhabitants. northern long-eared bats have been documented to use the cave as a hibernation area during the winter. As with all bats, if individuals of this species are disturbed from hibernation, they will become active and may use up critical fat stores needed to survive the winter. Juveniles can perish from repeated disturbances, and individuals may also be weakened such that they do not have the energy to forage successfully in the spring.

Threats and Stresses

The northern long-eared bats and other bats using the cave will be negatively impacted by disturbance in the cave during the winter months. Even small amounts of light, noise, or heat will be enough to bring the animals out of hibernation. Any physical alteration to the cave entrance or the rock surrounding the cave could alter the patterns of air and water flow that currently create a suitable microclimate for the species, and render the habitat unusable.

Recommendations

It is recommended that the cave be left undisturbed during the months of November through March. If human traffic is a problem, the installation of a special bat gate can be a deterrent. However, the gate must be carefully installed or it may render the cave unusable to bats. More information on bat gate installation is available through the Pennsylvania Game Commission.

STATE COLLEGE BOROUGH

Most of State College Borough is occupied by intensive urban development. The borough falls within a limestone valley region, and thus was likely once occupied mainly by rich forest community. Today it retains two state significant natural features, around which the State College Limestone Quarry BDA and the Thompson's Meadow Springs BDA are designated.

State College Limestone Quarry BDA

This BDA is designated around some individuals of a rare species of serviceberry (*Amelanchier humilis*) that are growing on this old limestone quarry.

Threats and Stresses

The serviceberries face a high risk of physical damage or removal because of their location in a heavily used urban area.

Recommendations

It is recommended that the owners of the old quarry and of surrounding lots be made aware of the serviceberry plants, as well as any staff involved in maintenance activities in the area, in order to prevent inadvertent damage. The situation of the plants should also be evaluated to determine whether any physical protection structures would be helpful.

Thompsons Meadow Spring BDA

The spring around which this area is designated is a point discharge from an underground aquifer. An extremely rare animal species has been documented to inhabit the underground aquifer. Due to its subterranean habitat, very little is known about this species or how much of the network of underground waterways it might inhabit.

Threats and Stresses

The greatest threat to this species is degradation of water quality in the underground waterways it inhabits. The locations of the sources feeding this aquifer are unknown. Considering that much of the surrounding landscape is developed, this population is at high risk for several extremely detrimental kinds of impact. Blasting, digging, or other activities that disrupt bedrock could impact the aquifer and disrupt its flow or introduce contaminants to the water. The aquifer is probably receiving water from the surface at various points that may contain a number of detrimental contaminants, including fertilizer, pesticides, road salt and other compounds. It is unknown how these inputs have impacted the water quality or the animal species of special concern.

Recommendations

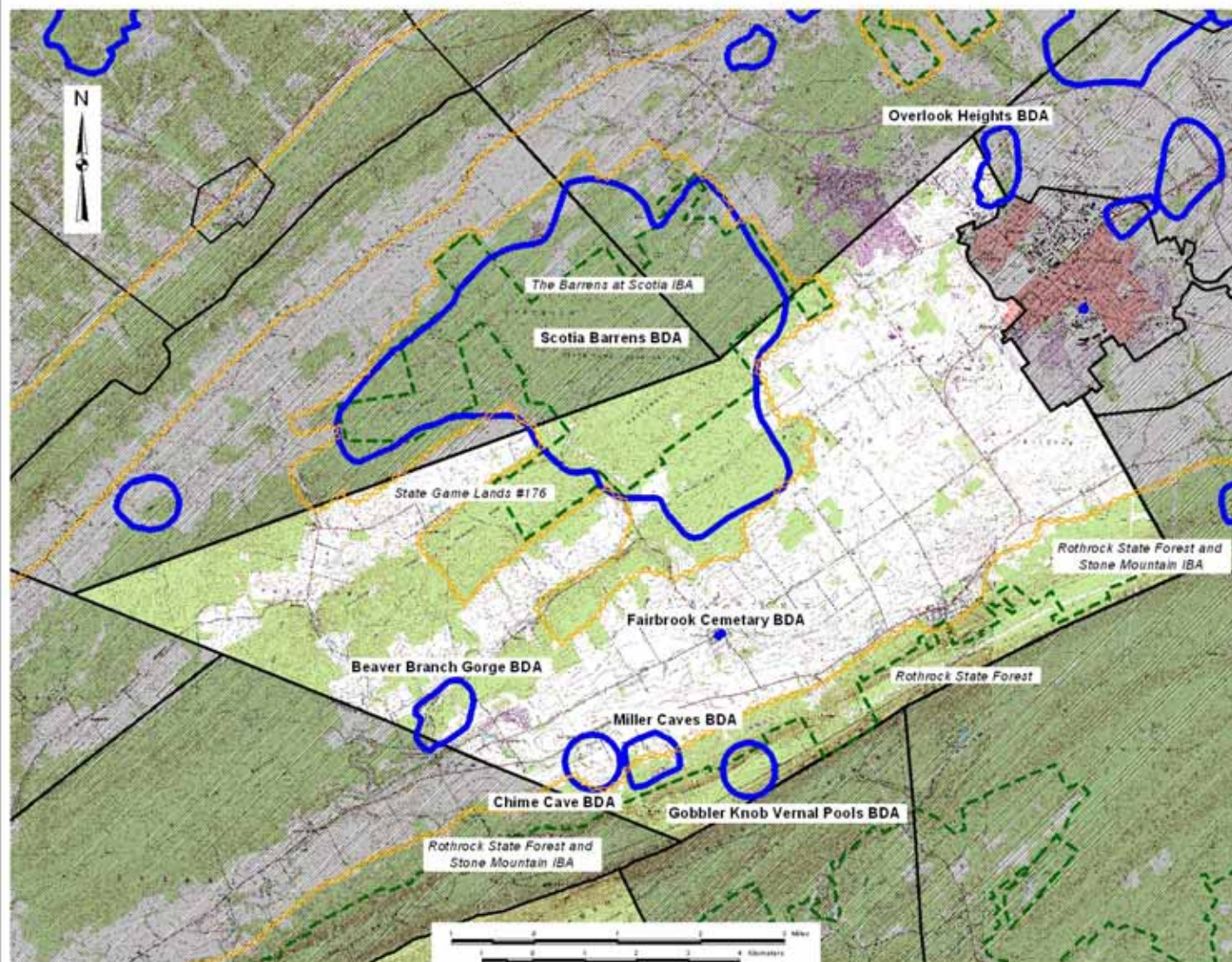
The most useful tool in beginning to address conservation of this species will be to map the hydrological inputs to the subterranean aquifer where it lives. If this kind of mapping is developed, planning can help to avert landuse impacts in those areas that are either above bedrock through which the aquifer runs or are sources of surface input.

FERGUSON TOWNSHIP

	<u>PNDI Rank</u>		<u>Legal Status</u>	
	Global	State	Fed.	State
NATURAL HERITAGE AREAS:				
BEAVER BRANCH GORGE BDA				
<i>Notable Significance</i>				
CHIME CAVE BDA				
<i>High significance</i>				
Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3		
MILLER CAVES BDA				
<i>Exceptional Significance</i>				
Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3		
Eastern small-footed bat (<i>Myotis leibii</i>)	G3	S1		PT
Special animal #3	G1G2	S1		
Special animal #4	G2G3	S1		
FAIRBROOK CEMETERY BDA				
<i>High significance</i>				
Serviceberry (<i>Amelanchier humilis</i>)	G5	S1		TU
GOBBLER KNOB VERNAL POOLS BDA				
<i>High significance</i>				
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE
OVERLOOK HEIGHTS BDA				
<i>High Significance</i>				
Serviceberry (<i>Amelanchier humilis</i>)	G5	S1		TU
SCOTIA BARRENS BDA				
<i>Exceptional Significance</i>				
Roundleaf serviceberry (<i>Amelanchier sanguinea</i>)	G5	S1		TU
Brome grass (<i>Bromus kalmii</i>)	G5	S3		N
Few-seeded sedge (<i>Carex oligosperma</i>)	G4	S2		PT
Weak rush (<i>Juncus debilis</i>)	G5	S3		N
Round-head gayfeather (<i>Liatris scariosa</i>)	G5?	S2		N
Hoary puccoon (<i>Lithospermum canescens</i>)	G5	S2		
Lupine (<i>Lupinus perennis</i>)	G5	S3		PR
Drooping bluegrass (<i>Poa languida</i>)	G3G4	S2		TU
Oakes' pondweed (<i>Potamogeton oakesianus</i>)	G4	S1S2		TU

(continued following maps)

Ferguson Township



Ferguson Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Beaver Branch Gorge
Chime Cave
Miller Caves
Fairbrook Cemetary
Gobbler Knob Vernal Pools
Overlook Heights
Scotia Barrens

Landscape Conservation Areas:

None

Managed Areas:

Rothrock State Forest
State Game Lands #176



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

Allegheny plum (<i>Prunus allegheniensis</i>)	G4	S2S3		N
Sand cherry (<i>Prunus pumila</i> var. <i>susquehanae</i>)	G5T4	S2		PT
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE
Spiny oakworm moth (<i>Anisota stigma</i>)	G5	S?		
A tiger beetle (<i>Cicindela formosa</i>)	G5	S1		
Melsheimer's sack bearer (<i>Cicinnus melsheimeri</i>)	G4	S1		
Persius duskywing (<i>Erynnis persius persius</i>)	G5T2	S1S2		
Barrens buckmoth (<i>Hemileuca maia</i>)	G5	S1S2		
Frosted elfin (<i>Incisalia irus</i>)	G3	S2		
Doll's Merolonche (<i>Merolonche dolli</i>)	G3G4	S1		
Northern brocade moth (<i>Oligia hausta</i>)	G4	S1		
An oak moth (<i>Phoberia orthosoides</i>)	G4	S3		
Broad sallow moth (<i>Xylotype capax</i>)	G4	S3		
A zale moth (<i>Zale submediana</i>)	G4	S2		
Special animal #1	G3G4	S1		
Special animal #2	G5	S1		
Special animal #3	G5	S1S2		

OTHER CONSERVATION AREAS: *The Barrens at Scotia Important Bird Area*
Rothrock State Forest and Stone Mountain Important Bird Area

MANAGED LANDS: *Rothrock State Forest*
State Game Lands #176

GEOLOGIC FEATURES: *none*

FERGUSON TOWNSHIP

Ferguson township includes in its northwestern half a large segment of the Gatesburg geologic formation where it surfaces in Centre County. The Gatesburg formation is predominantly composed of limestone layers, and is associated with barrens and pool habitats that are ecologically unique and host species of state and global concern. Some portions of the Gatesburg formation also include iron, and mining activities to extract the iron during the early part of the century resulted in dramatic disturbance of the landscape, the scars of which are still visible today. Part of this area has been included in the Barrens at Scotia Important Bird Area (IBA), a PA Audubon Society designation, to recognize the importance of this habitat to bird biodiversity in the state and region. A full description of the IBA is provided on page 36. The southern half of the township includes a portion of a limestone valley; the bedrock here is of different limestone formations, and the soil is generally mineral-rich with a high pH. Much of this land has been cleared for agriculture, and few natural communities remain. Another feature of the limestone geology are solutional caves, formed by the slow dissolution of limestone in water over millennia. Several of these are present in Ferguson township; the caves and the subterranean aquifer system of which they are a part are habitats occupied by several very rare animal species. The southeastern edge of the township is forested, contributing to a large block of contiguous forest that has been recognized as the Rothrock State Forest and Stone Mountain IBA (pg. 37).

Beaver Branch Gorge BDA

The Beaver Branch Gorge contains an old railroad grade with the remnants of a calcareous glade (calcareous opening/cliff community) and a beaver-impounded wetland. Historically, several rare species were known from this general area, but today a gas pipeline runs through the area and the limestone glade appears to be disrupted. Soil tests and the remaining vegetation suggest this was a calcareous community. The area may be worth investigating further to check for rare species and determine if it may merit BDA designation in its own right.

The Beaver Branch Gorge BDA designation focuses on a dry, hemlock (white pine) terrestrial forest (listed as northern conifer forest NC001 in the previous edition following Smith 1991) of nearly pure eastern hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*) growing on the east bank of the gorge. This community probably once covered both banks of Beaver Branch, but the west side was cut sometime prior to 1991 and is regenerating to hardwoods. The conifer community is large, nearly 50 acres, and is mature. It shows few signs of disturbance and core data on trees indicate that the stand is at least 100 years old. Though this forest may not be old growth, it does represent a type of forest that was once much more prevalent in this part of Pennsylvania. The vast hemlock/ white pine forests noted by the earliest settlers were almost completely gone by the 1920's (Westerfeld 1959) and were replaced, not by hemlock, but by a dry oak – mixed hardwoods forest community that today completely dominates the forests of Centre County.

Threats and Stresses

If the area were to be logged, the regeneration of the west side of the bank suggests a hardwood community might replace the mature hemlock-white pine community currently present.

Recommendations

This forest community is a type that has more county significance than state or global importance. Its protection is dependent upon the landowners' desire to maintain it.

Chime Cave BDA & Miller Caves BDA

These two caves are discussed together because they are part of the same aquifer system. The northern long-eared bat (*Myotis septentrionalis*), an animal species that is considered Pennsylvania Rare, uses Chime cave for winter hibernation. In Miller Cave, two globally rare aquatic animal species (special animals #1 and #2) have been documented. Additionally, both the northern long-eared bat and the even rarer eastern small-footed bat (*Myotis leibii*), have been documented to hibernate in this cave during the winter.

The eastern small-footed bat has a fairly wide range in eastern North America, but populations appear to be scattered and small throughout its range. Unlike bat species that form large hibernation colonies, this species usually hibernates alone or in very small groups. Because of the low number of individuals documented (3,000 in total) in fairly extensive survey work, the species is considered to be at risk globally. Although historical records for this species are scarce, its habits and current data suggest that it may always have been relatively rare. In Pennsylvania, historical survey data is available, and comparison to more recent data suggests a population decline occurred in Pennsylvania during the last century. Little is known about its habits or its requirements for food and summer habitat, except that it may be dependent on forests (NatureServe 2002).

The northern long-eared bat is also considered a species of special concern because a relatively low number of individuals have been documented, although it is not as rare as the eastern small-footed bat. It hibernates in relatively small groups compared to other bat species and thus is more difficult to locate than more colonial species.

Threats and Stresses

The greatest threat to the globally rare aquatic animals that occupy the aquifer connected to these caves is the degradation of water quality in the aquifer through pollutant runoff from the watershed above. Sediment pollution, nutrient enrichment, and chemical contamination could all be very damaging to these species. The bat populations cannot tolerate disturbances in the caves during their hibernation period in the winter months. Additionally, any physical alterations to the cave entrance or the rock surrounding the cave could render the cave unusable to bats by altering the patterns of air and water flow such that the microclimatic conditions would no longer meet their requirements.

Recommendations

The quality of the subterranean aquifer can best be safeguarded by the careful attention of landowners and others pursuing activities in the watershed to ensure that excessive sediment, nutrient pollution, and chemical contaminants do not enter runoff. Cooperation among residents,

municipal officials, farm operators, and developers will be necessary to devise strategies that can successfully reduce pollution in runoff. The caves should be left undisturbed during the months of November through March in order to protect the bats that use it as habitat during that time. Physical alteration of the cave entrances and the rock in the vicinity of the caves should be avoided.

Fairbrook Cemetery BDA

This BDA is designated around a small population of a rare species of serviceberry (*Amelanchier humilis*). While the plants do not occur in a natural community setting, they are considered important because as there are very few individuals of this species known from Pennsylvania, and the genetic diversity contained in particular individuals may be important to the maintenance of a viable population in the state/region as a whole.

Threats and Stresses

The greatest threat to this population is likely to be physical disturbance, given its location in a populated area.

Recommendations

Landowners are aware of this population. It is recommended that if maintenance activities are undertaken in the area, special care should be used to avoid damaging the serviceberry plants.

Gobbler Knob Vernal Pools BDA

This BDA is designated around a series of vernal pools, some of which are inhabited by the northeastern bulrush (*Scirpus ancistrochaetus*), a Federally Endangered plant species. The pools themselves are also unique habitats that host ecologically important communities.

The northeastern bulrush is a sedge species that is only known to inhabit the northeastern Appalachian mountains. Furthermore, the portion of the Appalachians occurring in Pennsylvania appears to be the global center of this species' range, as over half (62%) of all known locations fall within Pennsylvania, and more locations are currently known from Centre County than from any other county in Pennsylvania. Although not all potential habitat areas in Pennsylvania have yet been surveyed, the Centre County populations currently make up 15% of all known locations globally. The species is frequently associated with vernal pools, although in other parts of its range it is known from other types of habitat. The various habitats all appear to share the characteristic of seasonally fluctuating water levels. Within Pennsylvania very few occurrences are known from habitats other than vernal pools. In the eastern portion of the county, as is the case with this site, vernal pools frequently develop in broad, flat mountain saddles as accumulation points for surface water runoff.

A variety of animal species utilize vernal pools, and some species require these habitats for survival. Jefferson and Slimy salamanders breed exclusively in vernal pools, laying their eggs in the spring, then migrating outwards up to 500 m away from the pools to spend much of the rest of the year living in the surrounding forest. Invertebrate species such as fairy shrimp also

depend upon vernal pools; the animal species composition is especially rich and unique because the absence of fish enables the survival of many smaller organisms which would otherwise be preyed upon by fish. While the habitat at these sites appears highly suitable for animal species typical of vernal pools, animal populations have not been surveyed, so no definitive information is available on species composition. The exact composition of plant communities is somewhat variable among the ponds; some are very large and include substantial shrub cover, mainly by buttonbush (*Cephalanthus occidentalis*) but also including common mountain holly (*Nemopanthus mucronata*), winterberry (*Ilex verticillata*), lowbush blueberry (*Vaccinium angustifolium*) and Aronia (*Aronia sp.*). Smaller ponds are more often dominated by herbaceous species, including sharp-flowered manna grass (*Glyceria acutiflora*), sedges (*Carex canescens*, *Carex lupulina*, *Carex intumescens*), woolgrass (*Scirpus cyperinus*), beggar-ticks (*Bidens sp.*), and fireweed (*Erechtites hieracifolia*). The forest surrounding these ponds is very young and generally dominated by black birch (*Betula lenta*), suggesting it was clearcut within the last 10-15 years.

Threats and stresses

Changes in hydrological pattern, light levels, and forest continuity would negatively impact the species and natural communities within this BDA. The vernal pools that are the significant features of this site are fed by surface runoff from the entire watershed area above them. Any activity resulting in earth disturbance would affect the current hydrological pattern at this site and potentially alter conditions within the vernal pools community. The northeastern bulrush appears to be very sensitive to alterations of the water regime in its habitat, although it is not known what conditions are optimal. The forest canopy should remain intact in the area immediately surrounding the ponds, because changes in light levels may also impact northeastern bulrush populations. Additionally, disruptions to the forest within 500 m of a pond may impact amphibian populations associated with the vernal pools. While amphibian surveys have not been conducted at this site, and the surrounding forest is rather young and disturbed, surveys should be conducted before any assumption is made that they are not present.

Recommendations

Activities that remove forest canopy or result in earth disturbance should be avoided within a 500 m buffer of the ponds, in order to avoid disrupting natural hydrological patterns in the ponds and to avoid impacts to potential amphibian populations. A fuller understanding of the animal species utilizing these vernal pools would be gained through invertebrate and amphibian surveys, and this knowledge would provide an important basis for site-specific conservation planning.

Overlook Heights BDA

Please see discussion of this BDA under College Township.

Scotia Barrens BDA

Please see discussion of this BDA under Halfmoon Township

HALFMOON TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

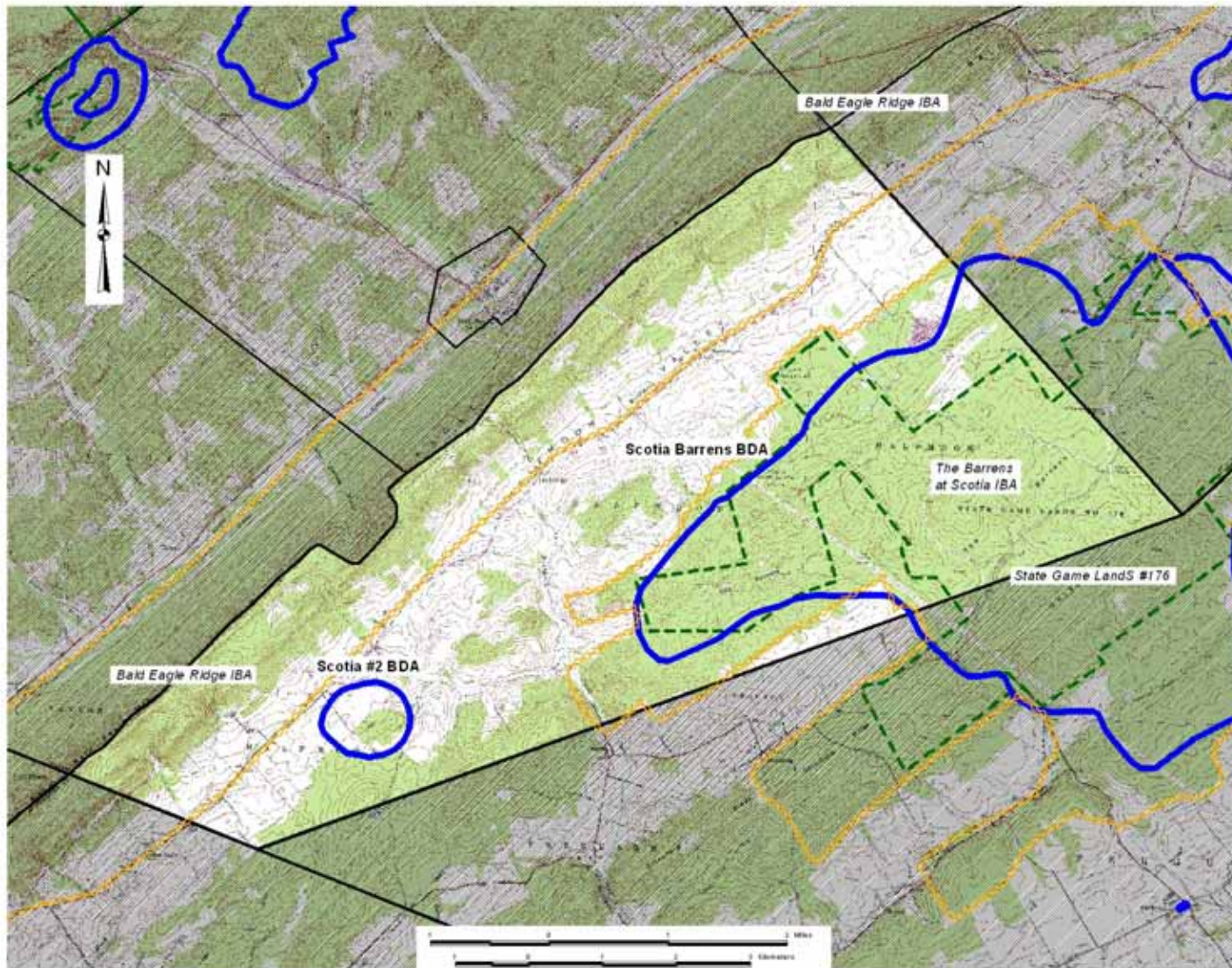
NATURAL HERITAGE AREAS:

SCOTIA BARRENS BDA	Exceptional Significance			
Roundleaf serviceberry (<i>Amelanchier sanguinea</i>)	G5	S1		TU
Brome grass (<i>Bromus kalmii</i>)	G5	S3		
Few-seeded sedge (<i>Carex oligosperma</i>)	G4	S2		PT
Weak rush (<i>Juncus debilis</i>)	G5	S3		
Round-head gayfeather (<i>Liatris scariosa</i>)	G5?	S2		
Hoary puccoon (<i>Lithospermum canescens</i>)	G5	S2		
Lupine (<i>Lupinus perennis</i>)	G5	S3		PR
Drooping bluegrass (<i>Poa languida</i>)	G3G4	S2		TU
Oakes' pondweed (<i>Potamogeton oakesianus</i>)	G4	S1S2		TU
Allegheny plum (<i>Prunus allegheniensis</i>)	G4	S2S3		
Sand cherry (<i>Prunus pumila</i> var. <i>susquehanae</i>)	G5T4	S2		PT
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE
Spiny oakworm moth (<i>Anisota stigma</i>)	G5	S?		
A tiger beetle (<i>Cicindela formosa</i>)	G5	S1		
Melsheimer's sack bearer (<i>Cicinnus melsheimeri</i>)	G4	S1		
Persius duskywing (<i>Erynnis persius persius</i>)	G5T2	S1S2		
Barrens buckmoth (<i>Hemileuca maia</i>)	G5	S1S2		
Frosted elfin (<i>Incisalia irus</i>)	G3	S2		
Doll's Merolonche (<i>Merolonche dolli</i>)	G3G4	S1		
Northern brocade moth (<i>Oligia hausta</i>)	G4	S1		
An oak moth (<i>Phoberia orthosoides</i>)	G4	S3		
Broad sallow moth (<i>Xylotype capax</i>)	G4	S3		
A zale moth (<i>Zale submediana</i>)	G4	S2		
Special animal #1	G3G4	S1		
Special animal #2	G5	S1		
Special animal #3	G5	S1S2		

SCOTIA #2 BDA	High Significance			
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE

(continued following maps)

Halfmoon Township



Halfmoon Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Scotia Barrens
Scotia #2

Landscape Conservation Areas:

None

Managed Areas:

State Game Lands #176



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

<i>OTHER CONSERVATION AREAS:</i>	<i>Bald Eagle Ridge Important Bird Area The Barrens at Scotia Important Bird Area</i>
<i>MANAGED LANDS:</i>	<i>State Game Lands #176</i>
<i>GEOLOGIC FEATURES:</i>	<i>none</i>

HALFMOON TOWNSHIP

The northwestern boundary of the township runs along the ridgeline of Bald Eagle Mountain, and the southern slope of the mountain falls within the township. The ridge is a major flyway for migrating birds, and is recognized by the PA Audubon Society as Bald Eagle Ridge Important Bird Area (IBA—see pg. 35). Below Bald Eagle Mountain is a limestone valley, which is largely in agricultural use. The remainder of the township is underlain by the Gatesburg geologic formation, which is associated with distinctive barrens and pool habitats that host unique and significant species and natural communities. The unique natural features of this area are recognized in the Scotia Barrens BDA, and the Barrens at Scotia IBA (pg. 36), large portions of which fall within Halfmoon Township.

Scotia Barrens BDA

Where the Gatesburg geologic formation surfaces in Centre County, there are very unique environmental conditions that provide habitat for uncommon natural communities as well as several extremely rare plant and animal species. The condition of natural communities in the area today results in part from these unique conditions, and in part from the dramatic changes visited on the landscape by iron mining and associated settlement activities in the early 1900s.

The soils of the area are naturally very sandy, well drained, and low in organic materials, which gives rise to vegetative communities dominated by species that are highly tolerant of drought and low nutrient availability. During the mining era, vast areas of what is presently forest were cleared, with railroad tracks and roads crisscrossing the landscape attesting to that activity. The present-day composition of the vegetative community has developed partly in response to this clearing, although it is not fully understood how the community today may differ from its historic, presettlement condition. However, the communities present today broadly resemble those found in similar barrens habitats elsewhere. Pitch pine (*Pinus rigida*) and scrub oak (*Quercus ilicifolia*) are very frequently dominant, and other oaks (*Quercus montana*, *Quercus prinoides*, etc.) and heath shrubs (huckleberry, lowbush blueberry, mountain laurel) are common as well. The forest canopy is patchy, with some areas dominated by extensive shrub thickets and scattered pockets where only scattered herbaceous vegetation grows. The open, scrubby character and difficult growing conditions gave rise to the term “barrens” – used both colloquially to refer to the area and also more broadly to describe similar community types. Barrens habitats typically experience frequent fires, which helps to maintain the open character of the vegetation.

In contrast with these very dry adapted terrestrial communities, another feature of the landscape is the frequent occurrence of depressions that hold water seasonally, especially in the spring and early summer. There are also many large, deep ponds that hold water throughout the year. While these deeper pools are certainly legacies of the mining activities once conducted in the area, many of the smaller depressions are naturally developed features. Both types of habitat are now utilized by rare plant and animal species.

The depressional wetlands that are not fully inundated all year long often support variable and diverse herbaceous communities. Some ponds are inhabited by the northeastern bulrush (*Scirpus ancistrochaetus*), a Federally Endangered plant species that typically requires fluctuating water

levels (see discussion of Scotia #2 BDA for more information on the northeastern bulrush and vernal ponds).

Numerous rare insect species have been documented within the Scotia Barrens BDA. Some species depend on several of the habitat types described above during different phases of their life cycle. Many require large areas to maintain viable population sizes. Some are specifically adapted to the barrens habitat and rely on communities maintained by fire and other natural disturbances for food and habitat. The future success of these species ultimately depends on the condition of the landscape across a broad area and the processes – whether fire, unique hydrology, or other factors – that maintain these unique communities.

Threats and Stresses

The landscape of Scotia Barrens faces several serious threats to the continued viability its unique plants, animals, and natural communities. The long term suppression of fire in the area will likely result in gradual disappearance of the open patches utilized by lupine, the gayfeather, and several insect species.

Presently, much of the area is being used for a research project to determine the effects of forest management techniques on ruffed grouse populations. The research is being done on an area of approximately 1400 acres in the center of State Game Lands No. 176 and involves the cutting and mowing of vegetation on alternating sections in order to provide different aged habitats in one small area. Though the action of mowing does reduce the vegetation and encourage new shoots, it does not have the ability to selectively suppress non-barrens species. Invasive exotic plants like honeysuckle (*Lonicera spp.*) and native plants that generally dominant forest communities, like red maple (*Acer rubrum*), can withstand the mowing but not the fires that naturally maintain barrens communities. As non-barrens vegetation increases, successful reestablishment of barrens vegetation and character will become increasingly difficult. The pitch pine-scrub oak community is already less prevalent than in the past. The spread of invasive exotic shrub species like honeysuckle, which dominates the vegetation in some areas, is a serious problem.

Additionally, groundwater levels and water quality are threatened by earth disturbance and pumping in the area. Anecdotal reports suggest that the water level in some ponds has been decreased near Marysville, where water is pumped. Any contaminants in stormwater runoff will migrate quickly into the sandy, porous soils of the Barrens and could impact waters in the seasonal ponds.

One of the major requirements for viable populations of barrens fauna is that the habitat be large (Schweitzer, Rawinski 1987), and the continued loss of this habitat area to development threatens these species. At present, the populations appear to be stable but it is unknown what substantial reduction of available habitat will do. Finally, the Game Commission does not spray pesticides to combat the gypsy moth on its lands, but there is no such protection for private lands within the Barrens site boundary. Several of the rare animals, as well as pollinators of rare plants, are potentially impacted by pesticides with gypsy moth control being one of the more wide-spread sources of pesticide.

Recommendations

Planning aimed at protecting the ecological integrity of the Scotia BDA will be critical as pressure to use this land increases. Research to determine the historic role and frequency of fire at the Scotia Barrens and to detail an appropriate approach to maintain barrens conditions should provide the foundation for area-wide planning. A fire management plan should be drawn up in order to carefully reintroduce fire to the site at a frequency that approximates the historic one. These fires should be monitored and studied to determine their effects. Similar management of barrens in New York and New Jersey has shown controlled fire is extremely effective in maintaining this unusual community and its rare flora and fauna. Furthermore, natural resource agencies in these areas have developed techniques for safely enacting controlled burns near populated areas. However, until such time as plans can be developed for employing controlled fire management of this area, other management techniques developed to simulate the effects of fire should be explored. In order to preserve the unique insect biodiversity in this habitat it is important to restrict the use of pesticides within the site. It would be a benefit to the community for long term planning in the area to work towards preservation of corridors of natural vegetation that maintain the contiguity of this site with the forested areas to the south and west, so that animals can travel across the landscape and do not become isolated within the site.

Scotia #2 BDA

This site is designated around several vernal pool communities, some of which are inhabited by the northeastern bulrush, a Federally Endangered plant species. The vernal pools themselves also comprise a habitat of unique ecological significance. The BDA boundary includes the area around the ponds within which some types of activities could damage the pond communities or the northeastern bulrush.

The northeastern bulrush is a sedge species that is only known to inhabit the northeastern Appalachian mountains. Furthermore, the portion of the Appalachians occurring in Pennsylvania appears to be the global center of this species' range, as over half (62%) of all known locations fall within Pennsylvania, and more locations are currently known from Centre County than from any other county in Pennsylvania. Although not all potential habitat areas in Pennsylvania have yet been surveyed, the Centre County populations currently make up 15% of all known locations globally. The species is frequently associated with vernal pools, although in other parts of its range it is known from other types of habitat. The various habitats all appear to share the characteristic of seasonally fluctuating water levels. Within Pennsylvania very few occurrences are known from habitats other than vernal pools. The area where the Gatesburg geologic formation forms surface geology has a particular concentration of vernal pools. They are lower in elevation than the mountain pools in the eastern and northern parts of the county, and have slightly different composition. The ponds vary in their size and the degree of saturation they experience throughout the year. Some are mostly unvegetated, others are dominated by graminoids (sedges, rushes, and grasses), and some contain a mixture of herbaceous species including sedges, grasses, marsh St. Johnswort (*Triadenum virginicum*), smartweeds (*Polygonum* spp.), and beggar-ticks (*Bidens* sp.). Larger ponds that do not contain standing water all year

may contain shrubs such as buttonbush (*Cephalanthus occidentalis*), chokeberry (*Aronia sp.*), and winterberry (*Ilex verticillata*).

A variety of animal species utilize vernal pools, and some species require these habitats for survival. Jefferson and Slimy salamanders breed exclusively in vernal pools, laying their eggs in the spring, then migrating outwards up to 500 m away from the pools to spend much of the rest of the year living in the surrounding forest. Invertebrate species such as fairy shrimp also depend upon vernal pools; the animal species composition is especially rich and unique because the absence of fish enables the survival of many smaller organisms which would otherwise be preyed upon by fish. While the habitat at these sites appears highly suitable for animal species typical of vernal pools, animal populations have not been surveyed, so no definitive information is available on species composition. The exact composition of plant communities is somewhat variable among the ponds; species that are often present include sharp-flowered manna grass (*Glyceria acutiflora*), woolgrass (*Scirpus cyperinus*), beggar-ticks (*Bidens sp.*), and fireweed (*Erechtites hieracifolia*).

Threats and stresses

Changes in hydrological pattern, light levels, and forest continuity would negatively impact the species and natural communities within this BDA. The vernal pool containing the northeastern bulrush population is privately held and very close to agricultural land, and because of this proximity there is some potential it might be disturbed or modified. The plant appears to be sensitive to changes in the amount of light it receives, which would result if forest cover around the pond edges were removed.

Furthermore, vernal pools are fed by surface runoff from the entire watershed area above them. Any activity resulting in earth disturbance would affect the current hydrological pattern at this site to some degree and could potentially alter conditions within the vernal pools community. The northeastern bulrush appears to be very sensitive to alterations of the water regime in its habitat, although it is not known what conditions are optimal. Disruptions to forested areas within 500 m of a pond may impact amphibian populations associated with the vernal pools. While amphibian surveys have not been conducted at this site, the habitat may be suitable and surveys should be conducted before any assumption is made that they are not present.

Recommendations

In order to avoid disrupting natural hydrological patterns in the ponds, any earth moving activity proposed for the area should be carefully assessed and designed to minimize hydrological impacts. Activities that remove forest canopy should be avoided within a 500 m buffer of the ponds to avoid impacts to potential amphibian populations. A fuller understanding of the animal species utilizing these vernal pools would be gained through invertebrate and amphibian surveys, and this knowledge would provide an important basis for site-specific conservation planning.

HARRIS TOWNSHIP

	<u>PNDI Rank</u>		<u>Legal Status</u>	
	Global	State	Fed.	State

NATURAL HERITAGE AREAS:

BEAR MEADOWS NATURAL AREA BDA *Exceptional Significance*

Heart-leaved twayblade (<i>Listera cordata</i>)	G5	S1	PE
Kidney-leaved twayblade (<i>Listera smallii</i>)	G4	S1	PE
Black spruce-tamarack palustrine woodland	G?	S2	
Highbush blueberry – sphagnum wetland	G?	S4	

BIG FLAT LAUREL NATURAL AREA BDA *Notable Significance*

CEDAR RUN SPRINGS BDA *--removed--*

DETWEILER RUN NATURAL AREA BDA *County Significance*

GALBRAITH GAP RUN HEADWATERS BDA *Notable Significance*

Seepage wetland (unclassified)	G4	S3	CR
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LINDEN HALL PARK BDA *Exceptional Significance*

Handsome sedge (<i>Carex formosa</i>)	G4	S1	PE
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SHINGLETOWN GAP BDA *County Significance*

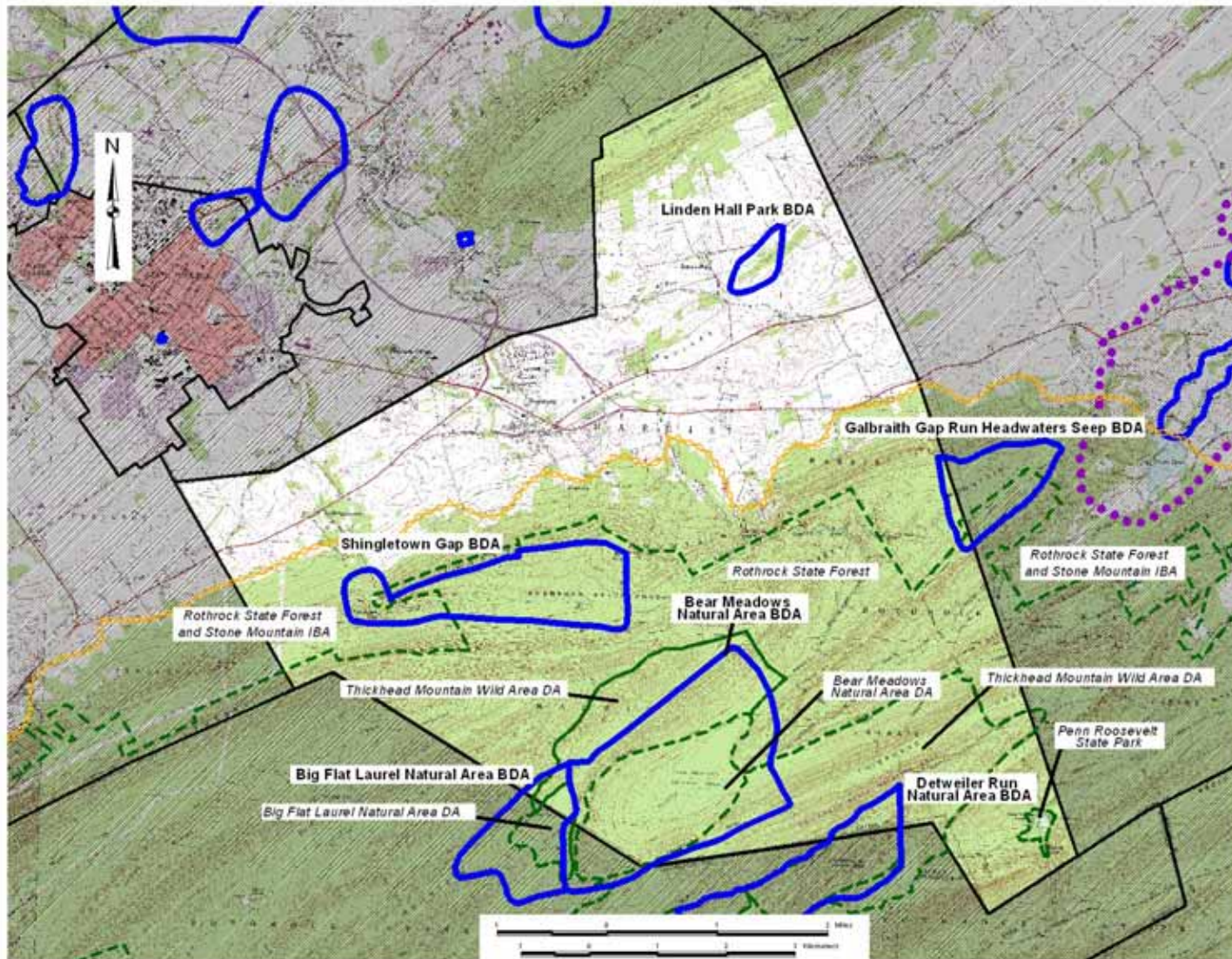
SLAB CABIN RUN BDA *--removed--*

OTHER CONSERVATION AREAS: *Rothrock State Forest and Stone Mountain Important Bird Area*

MANAGED LANDS: *Bear Meadows Natural Area DA
Big Flat Laurel Natural Area DA
Penn Roosevelt State Park
Rothrock State Forest
Thickhead Mountain Wild Area DA*

GEOLOGIC FEATURES: *none*

Harris Township



Harris Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Bear Meadows Natural Area
Big Flat Laurel Natural Area
Detweiler Run Natural Area
Galbraith Gap Run Headwaters Seep
Linden Hill Park
Shingletown Gap

Landscape Conservation Areas:

None

Managed Areas:

Bear Meadows Natural Area DA
Big Flat Laurel Natural Area DA
Penn Roosevelt State Park
Rothrock State Forest
Thickhead Mountain Wild Area DA



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

HARRIS TOWNSHIP

The southern two-thirds of Harris Township is mountainous and mainly forested, including portions of Tussey Mountain and Thickhead Mountain. This is one of the largest intact forested regions in the county, and the unique habitat value it provides as such is recognized through the inclusion of this area in the Rothrock State Forest Important Bird Area (IBA). The IBA is detailed on pg. 37. The Thickhead Mountain Wild Area encompasses much of the area, and surrounds several Bureau of Forestry-designated Natural Areas recognized for their unique biological communities—Bear Meadows Natural Area, Detweiler Run Natural Area, and Big Flat Laurel Natural Area.

The northern portion of the township is a limestone valley. The limestone bedrock that underlies the surface resulted in nutrient-rich, high-pH soils that probably hosted forest community types specifically keyed to these conditions in times previous to European settlement. Today, most of the valley is in agricultural or residential use, although forests have remained or regrown in small scattered patches. One such area of remnant forest, the Linden Hall Park BDA, hosts the only population of the handsome sedge (*Carex formosa*) known in Pennsylvania.

Bear Meadows Natural Area BDA

This is probably the most famous state-designated natural area in central Pennsylvania. It is a mountain bog located in a horseshoe-shaped valley between two 'C' shaped ridges. The resulting valley has developed a deep, poorly drained bog famous for its relict boreal forest and highbush blueberries. The black spruce – tamarack palustrine woodland community (listed as boreal conifer swamp NC001 following Smith 1991 in the previous edition) is located in one arm of the horseshoe where the land is flat, the soil is high in organic material and the drainage is poor. This unique stand consists of balsam fir (*Abies balsamea*) and black spruce (*Picea mariana*), with rhododendron (*Rhododendron maximum*) and eastern hemlock (*Tsuga canadensis*) as associates. Though it has been cut, the community is well recovered and shows excellent regeneration of both major species. Drier areas in the western part of the swamp also support species like red maple (*Acer rubrum*), white pine (*Pinus strobus*) and yellow birch (*Betula allegheniensis*).

The central part of the natural area consists of a highbush blueberry – sphagnum wetland community (listed as non-glacial bog NC002 in the previous edition following Smith 1991) which has a peat deposit recorded at over 9 1/2 feet deep (Dunson and Martin 1973). The open bog community is predominantly mosses (*Sphagnum spp.*), sedges and shrubs (*Vaccinium sp.*, *Alnus sp.*, *Viburnum sp.*). Tannic acid leached from the peat turns the water a dark brown color. The tannins make the water too acidic for fish— but amphibians, dragonflies and other insects seem to thrive here. At the edge of the bog is a swampy forest that supports two populations of two very diminutive orchid species, the heart-leaved twayblade (*Listera cordata*) and the kidney-leaved twayblade (*Listera smallii*), neither of which are known at any other site in the county.

The third community found in the area is the forest community that grows on the edges of the open bog. This is probably the smallest community, since most of the surrounding area is second growth dry oak forest, but the forest on the southernmost edge of the bog is a well-developed

hemlock – northern hardwoods community with red oak (*Quercus borealis*), white oak (*Quercus alba*), and red maple, that appears more mature than the surrounding forests. This community type is not tracked as rare. It was listed as a mesic central forest in the previous edition, following Smith 1991.

Wildlife species are also extremely abundant here. It is known among birding enthusiasts and insect collectors as an extremely rich site. The Bear Meadows Natural Area has been designated as a National Natural Landmark by the Department of the Interior since 1966.

Threats and Stresses

The area is protected from most threats by its designation as a Bureau of Forestry Natural Area. Though the area is heavily used as a recreation site, there are not heavy impacts apparent from this use. There is some problem with trash dumping and some trampling of the delicate peat. Though there is an excellent, if damp, trail through the natural area, many people prefer to walk on the peat mats in the pursuit of blueberries. Human traffic does not seem to be a problem in any other part of the natural area.

Recommendations

An evaluation of the problem of peat damage in the area of the blueberries should be conducted in order to devise a solution that protects the peat from trampling. One option for consideration would be to build a spur trail leading to blueberry areas.

Big Flat Laurel Natural Area BDA

This site was not revisited during this update. Review of 2001 aerial photography suggests no major landscape alterations have taken place. No other new information is available concerning this BDA.

Most of this BDA falls within Huntingdon County. Above Bear Meadows at an area known as Big Flat is a dry oak heath woodland community and a scrub oak shrubland community (listed as acidic rocky summit community NC004 following Smith 1991 in the previous edition) that has been designated by the Pennsylvania Department of Environmental Resources as the Big Flat Laurel Natural Area. This area was heavily logged and the wood was used to produce charcoal on the site. In some parts of the flat, the charcoal pits are still evident. Despite the activity, the stunted chestnut oak (*Quercus montana*), scrub oak (*Quercus ilicifolia*) and mountain laurel (*Kalmia latifolia*) community present today is probably similar to that which it originally supported. The soil is extremely thin on this flat ridge. Rocky outcrops are common, as are shallow depressions where rainwater collects to form an almost swampy habitat in this otherwise extremely dry community. Sassafras (*Sassafras albidum*) and ericaceous shrubs like black huckleberry (*Gaylussacia baccata*) and lowbush blueberry (*Vaccinium angustifolium*) are also common, as well as black gum, (*Nyssa sylvatica*) which thrives in the shallow depressions.

This community is restricted to the highest elevations on Greenlee Mountain. A more disturbed example is found to the north on Little Flat, but this area also contains a radio tower and the center of the natural community has been cleared for this structure.

Threats and Stresses:

There are few threats to this community besides the roads that cut through it. There is some evidence of dumping, but it is restricted to the roadway. At some point, there was an effort by the State Forest managers to reforest the Big Flat with non-native conifer species—Norway spruce (*Picea abies*) and European larch (*Larix decidua*). A few of these specimens are still alive and there is apparently some regeneration. The dryness of the area and the species present suggest a higher than normal susceptibility to fire, so there should be some effort to inform visitors of this danger and encourage them to be more cautious in this area. However, occasional natural wildfires are not considered detrimental to this natural community and may be a typical influence on its ecological condition.

Recommendations

Dumping should be monitored in the area. It may also be beneficial to further assess the influence of the non-native conifers on the community; if assessment suggests they are influencing soil chemistry or regenerating to comprise a substantial portion of the community, the natural ecosystem may benefit from their removal.

Cedar Run Springs BDA

This site was removed, as its designation was based on a geologic feature, a criterion no longer employed in NHI site identification.

Detweiler Run Natural Area BDA

This site was not revisited during this update. Review of 2001 aerial photography suggests no major landscape alterations have taken place. No other new information is available concerning this BDA.

Most of this BDA is within Huntingdon County. The Detweiler Run Natural Area contains what is reported to be a virgin stand of forest. There are magnificent hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*), some of which are nearly 36 inches in diameter. Only the center of the natural area is old growth, but the surrounding buffer is maturing into an impressive forest. In addition to the conifers, the old growth stand has a thick understory of rhododendron (*Rhododendron maximum*), with a sparse herbaceous layer of Jack-in-the-pulpit (*Arisaema triphyllum*), goldthread (*Coptis trifolia*), and red trillium (*Trillium erectum*). Though no rare amphibians are known to inhabit the area, there is a large population of the fairly common red spotted newts (*Notophthalmus viridescens viridescens*) present in the ravine.

Threats and Stresses

No threats are presently imminent in this area.

Recommendations

The current management program meets the ecological needs of the area.

Galbraith Gap Headwaters BDA

This BDA is discussed under the Potter Township section. Harris Township contains a small strip at the westernmost edge of the watershed.

Linden Hall Park BDA

This site is a private park in Penns Valley maintained by the Linden Hall Village Association. The area has seen a variety of past uses, including a railroad and a carriage road. Today most of the area is forested, although signs of the past uses here are still visible. Within the park grows the only population of handsome sedge (*Carex formosa*) known to exist in Pennsylvania. Another unique feature of the park are several clusters of Canada lily (*Lilium canadense*), a plant which is not common in Centre County or in western Pennsylvania.

Threats and Stresses

The handsome sedge and the Canada lily at this site are fairly secure from threats, as the park is private and the Village Association is aware of the location of these plants.

Recommendations

When maintaining trails in the vicinity of the lilies or the handsome sedge, it is recommended that caution be used to avoid damaging the plants.

Shingletown Gap BDA

This site was not revisited during this update. Review of 2001 aerial photography suggests no major landscape alterations have taken place. No other new information is available concerning this BDA.

Shingletown Gap is a roughly three mile long valley which carries Roaring Run through Tussey Mountain. This area has been examined extensively for invertebrate animals and has been found to support two species of black fly previously unknown from the county and one genus previously unknown from the state. Another uncommon species, the adder's-tongue fern (*Ophioglossum vulgatum*), was also found in this ravine and in no other site in the county. The ravine has a hemlock – white pine terrestrial forest of mature hemlock (*Tsuga canadensis*), included mainly because of its use as a recreational area, and a natural spring that is in very good condition. The forest is slightly more mature than other sites in the county, probably since it was once the headwaters of the State College Borough water supply and was preserved to protect its water quality. The spring community is one of the finer ones in the county. It consists of a main spring and several smaller ones that keep an extremely consistent temperature throughout the year. Though the area shows signs of human impacts, (a well worn trail) the spring community has few introduced species and shows few signs of deterioration.

Threats and Stresses

The area is quite well known for its beauty and excellent trail. As it is very close to the borough of State College, it receives a lot of recreational pressure in the form of hikers and mountain bicycle riders. The trail itself is washing out in places because of the heavy use, and this erosion may be a source of sediment pollution in Roaring Run. There is evidence of logging in the headwaters of the stream, but it is unknown what effect these activities have had on the designated communities.

Recommendations

If local authorities wish to protect this ravine for future recreation and possible future use as a water supply, it will be necessary to stabilize the trail or restrict access.

Slab Cabin Run BDA

This BDA is no longer considered a county-significant natural feature; it was designated around a population of an aquatic plant (*Zannichelia palustris*) that was considered rare at the time of the initial CNHI report. However, the plant has since been documented in many other locations, leading to its removal from the list of Plant Species of Special Concern in Pennsylvania. The natural community here is relatively disturbed and fragmented.

PATTON TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

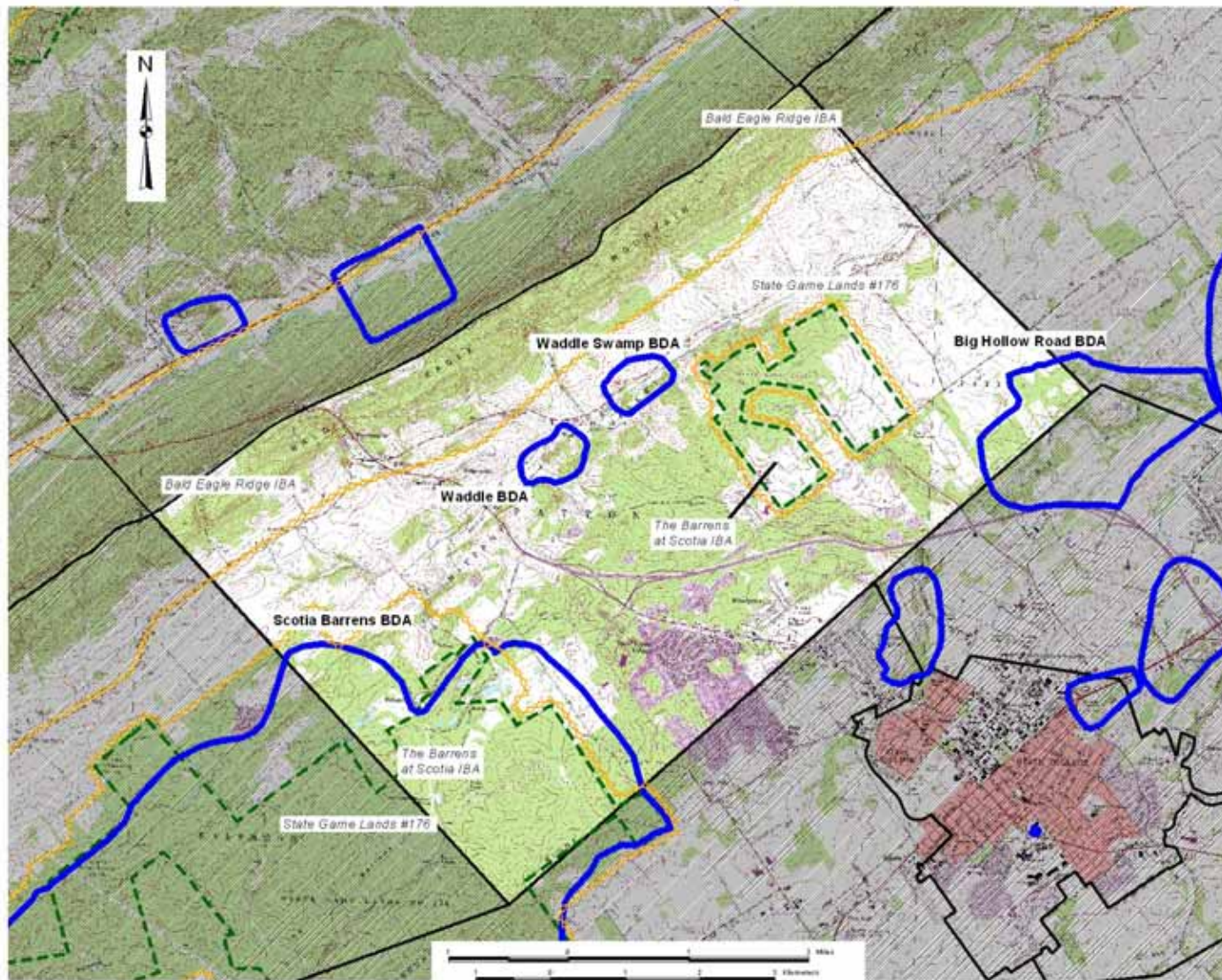
NATURAL HERITAGE AREAS:

BIG HOLLOW ROAD BDA	Exceptional Significance			
Laurentian bladder-fern (<i>Cystopteris laurentiana</i>)	G3	S1	TU	PE
Hard-leaved goldenrod (<i>Solidago rigida</i>)	G5	S1	TU	PE
Side-oats gramma grass (<i>Bouteloua curtipendula</i>)	G5	S2	PT	PT
Side-oats gramma calcareous grassland community		S1		
Calcareous opening/cliff community		S2		

SCOTIA BARRENS BDA	Exceptional Significance			
Roundleaf serviceberry (<i>Amelanchier sanguinea</i>)	G5	S1		TU
Brome grass (<i>Bromus kalmii</i>)	G5	S3		N
Few-seeded sedge (<i>Carex oligosperma</i>)	G4	S2		PT
Weak rush (<i>Juncus debilis</i>)	G5	S3		N
Round-head gayfeather (<i>Liatris scariosa</i>)	G5?	S2		N
Hoary puccoon (<i>Lithospermum canescens</i>)	G5	S2		
Lupine (<i>Lupinus perennis</i>)	G5	S3		PR
Drooping bluegrass (<i>Poa languida</i>)	G3G4	S2		TU
Oakes' pondweed (<i>Potamogeton oakesianus</i>)	G4	S1S2		TU
Allegheny plum (<i>Prunus allegheniensis</i>)	G4	S2S3		N
Sand cherry (<i>Prunus pumila</i> var. <i>susquehanae</i>)	G5T4	S2		PT
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE
Spiny oakworm moth (<i>Anisota stigma</i>)	G5	S?		
A tiger beetle (<i>Cicindela formosa</i>)	G5	S1		
Melsheimer's sack bearer (<i>Cicinnus melsheimeri</i>)	G4	S1		
Persius duskywing (<i>Erynnis persius persius</i>)	G5T2	S1S2		
Barrens buckmoth (<i>Hemileuca maia</i>)	G5	S1S2		
Frosted elfin (<i>Incisalia irus</i>)	G3	S2		
Doll's Merolonche (<i>Merolonche dolli</i>)	G3G4	S1		
Northern brocade moth (<i>Oligia hausta</i>)	G4	S1		
An oak moth (<i>Phoberia orthosoides</i>)	G4	S3		
Broad sallow moth (<i>Xylotype capax</i>)	G4	S3		
A zale moth (<i>Zale submediana</i>)	G4	S2		
Special animal #1	G3G4	S1		
Special animal #2	G5	S1		
Special animal #3	G5	S1S2		

(continued following maps)

Patton Township



Patton Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Big Hollow Road BDA
Scotia Barrens BDA
Waddle BDA
Waddle Swamp BDA

Landscape Conservation Areas:

None

Managed Lands:

State Game Lands #176



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

WADDLE BDA		High Significance		
Side-oats gramma grass (<i>Bouteloua curtipendula</i>)	G5	S2		PT
Calcareous opening/cliff community		S2		
WADDLE SWAMP BDA		County Significance		

OTHER CONSERVATION AREAS: *Bald Eagle Ridge Important Bird Area*
The Barrens at Scotia Important Bird Area

MANAGED LANDS: *State Game Lands #176*

GEOLOGIC FEATURES: *none*

PATTON TOWNSHIP

The northwestern boundary line of Patton Township follows the ridgeline of Bald Eagle Mountain. The southern slope of the mountain falls within the township. The forested corridor along the ridge is an important flyway for migrating birds, which has been recognized by the PA Audubon Society as the Bald Eagle Ridge Important Bird Area (IBA—see pg. 35 for more detail). Below the ridge is a portion of valley with mineral-rich, limestone-influenced soils. Most of the valley has been cleared of natural communities; however, there are two areas where fragments of the natural communities which once occupied the valley still remain, the Waddle and Waddle Swamp BDAs. The southeastern half of the township is underlain by the Gatesburg geologic formation, which typically signifies a landscape of ecologically distinctive barrens and pool habitats that host species and natural communities of state and global significance. Portions of this geologic formation also contain iron; mining activities to extract this iron caused dramatic disturbance to the landscape in the early part of the century, the scars of which are still visible today in many places. The unique natural features of this area are recognized in the Scotia Barrens BDA and the Barrens at Scotia IBA (pg. 36), portions of which fall within Patton Township.

Big Hollow Road BDA

Please see discussion of this BDA under College Township.

Scotia Barrens BDA

Please see discussion of this BDA under Halfmoon Township.

Waddle BDA

The settlement of Waddle is located near a calcareous outcrop that supports a population of side-oats gramma grass (*Bouteloua curtipendula*), a Plant Species of Special Concern in Pennsylvania. This population was first documented in 1990, but other species that are indicative of a limestone outcrop community were previously known from the area.

Threats and Stresses

Since a road is close to the special plant habitat, road maintenance activities could have a profound impact on the community and species present. Cutting of brush and applications of herbicides or salt to these areas would be of immediate concern. A large development is also planned for an area adjacent to the plant population. Construction activities or increased traffic of the area could result in disruption of the plants or the habitat.

Recommendations

The township maintenance personnel should be made aware of the location of this species and any road maintenance or new projects should be reviewed with the needs of the species in mind. Developers should exercise caution while working close to the habitat to avoid filling, use of the

area for storage or staging and direct disruption of the area of concern. The boundary of the BDA includes the buffer zone required for protection of the species.

Waddle Swamp BDA

The Waddle Swamp is a wetland that is probably an artifact of the railroad grade that separates it from the headwaters of Buffalo Run. It contains a type of palustrine shrub community (previously listed as a circumneutral shrub swamp following Smith 1991); further information on species composition would be necessary to refine this categorization. Although the conditions and vegetation may not be entirely of natural origin, this area is designated as a county – significant site because few wetlands remain in areas of limestone geology. It is frequently used by the staff of Penn State University as an example wetland for class field trips.

Threats and Stresses

No information has been received regarding specific threats to this area.

Recommendations

Physical disturbance to the wetland area, discharge of pollutants within its immediate watershed, and modification of the hydrologic patterns that regulate water levels in the wetland may all have detrimental impacts on the wetland ecosystem and its inhabitants and should be avoided.

Penns Valley Region

- **Gregg Township**
- **Haines Township**
- **Miles Township**
- **Millheim Borough**
- **Penn Township**
- **Potter Township**
- **Centre Hall Borough**



Joe-pye weed and hemlocks, along Sinking Creek

Bear Meadows



Northeastern bulrush (*Scirpus ancistrochaetus*)

GREGG TOWNSHIP

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

ROARING RUN BDA	Notable Significance		
High-gradient clearwater creek	PA Exceptional Value		

SINKING CREEK PRAIRIE BDA	Exceptional Significance		
Grooved yellow flax (<i>Linum sulcatum</i>)	G5	S1	PE
Long-fruited anemone (<i>Anemone cylindrica</i>)	G5	S1	PE
Side-oats gramma grass (<i>Bouteloua curtipendula</i>)	G5	S2	PT
Hard-leaved goldenrod (<i>Solidago rigida</i>)	G5	S1	TU
Tufted buttercup (<i>Ranunculus fascicularis</i>)	G5	S1S2	PE
Columbine duskywing (<i>Erynnis lucilius</i>)	G4	S1S2	
Silvery blue (<i>Glaucopsyche lygdamus lygdamus</i>)	G5T4	S2	
False gromwell (<i>Onosmodium molle</i> var. <i>hispidissimum</i>)	G4G5T4	S1	PE

VEILED LADY CAVE BDA	Notable Significance		
Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3	CR

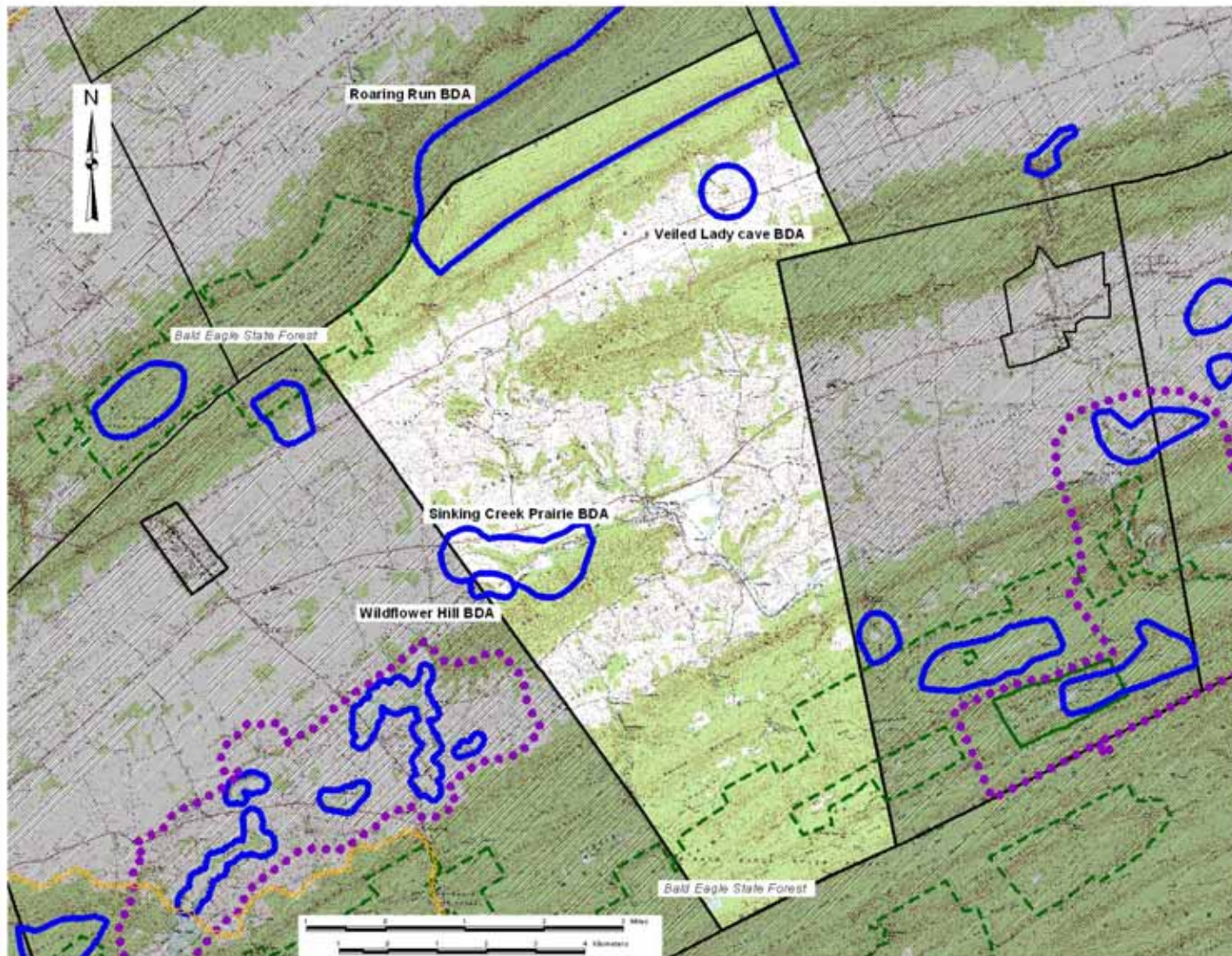
WILDFLOWER HILL BDA	Notable Significance		
Sugar maple – basswood forest community	G?	S4	

OTHER CONSERVATION AREAS: none

MANAGED LANDS: Bald Eagle State Forest

GEOLOGIC FEATURES: Springs (at Spring Mills)

Gregg Township



Gregg Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Roaring Run
Sinking Creek Prairie
Veiled Lady Cave
Wildflower Hill

Landscape Conservation Areas:

None

Managed Areas:

Bald Eagle State Forest



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

GREGG TOWNSHIP

The township stretches from the ridgeline of Long Mountain north across Penns Valley, Egg Hill, Brush Mountain, and Brush Valley, and its northern boundary follows Roaring Run through Little Sugar Valley on Nittany Mountain. The mountains are sandstone ridges and are largely forested. The valleys, underlain by limestone bedrock, are mainly in agricultural use. Several unique communities occur within the township. There is one geologic feature of note, springs that arise near the village of Spring Mills.

Roaring Run BDA

High in the dividing ridge of Nittany Mountain, the Little Sugar Valley stretches more than six miles and holds Roaring Run, listed by the Pennsylvania Department of Environmental Protection as an Exceptional Value stream and identified in this inventory as a High Gradient Clearwater Creek. This BDA is the watershed of Roaring Run. The stream valley has patches of coniferous forest and several grassy openings that probably resulted from periodic fires and blow downs. The largest of these openings is quite marshy, but has little accumulated organic matter, an indication of historic ground fire. The remaining stumps were not cut but appeared to have all been pushed over in the same direction, suggesting they have been blown over before or after the fire. The openings lack diversity and have several clumps of the invasive exotic shrub Japanese barberry (*Berberis thunbergii*). Investigation of the surrounding area revealed evidence of an old farmstead. Westerfeld (1959) states that during early settlement of the area, high mountain valleys were often farmed because of their rich forests but were later abandoned when the soils became depleted. It appears that this was the case with the Little Sugar Valley.

While the natural communities in the watershed of Roaring Run are not especially intact or unique, the health of the stream is dependent on the condition of the land in the watershed. Forested land anchors sediments and provides for natural levels of nutrient input and uptake, and thus maintains the healthy condition of the stream. The condition of land immediately adjacent to the stream is also particularly important to the habitat quality of the stream for aquatic organisms, as some depend on the light levels and temperature conditions created by a forest canopy, and others utilize the forest habitat.

Threats and Stresses

During the last two decades timber removal operations have been active in the watershed of Roaring Run. Removal of forest cover, and especially the construction of roads, exposes bare soil and results in erosion. If effective erosion control measures are not enacted, sediment pollution will enter the stream. Sediment pollution degrades water quality and reduces the biodiversity of the aquatic community living in the stream. Presently this is the only potential impact to the creek; however, other types of development in the watershed could also result in water quality impacts.

Recommendations

For this and any other Exceptional Value waters on private lands, it is important to gain the cooperation of surrounding landowners so management of the watershed is ecologically sound.

Erosion control measures should be implemented for road construction and for timbered areas. In planning any other types of development, special attention should be given to stormwater management and sewage treatment plans to avoid runoff of chemical, nutrient, or sediment pollution into Roaring Run. A wider buffer than is presently in place between the logging activities and the stream, perhaps as much as 100 yards, would be advisable considering the importance of this stream.

Sinking Creek Prairie BDA

The Sinking Creek Prairie is a "relict prairie opening" on dry calcareous soils north of Sinking Creek. The prairie consists of three main openings and several smaller ones within the somewhat dwarfed forest cover along an abandoned railroad grade. The openings have an association of species usually found in Ohio and further west; where it occurs in Pennsylvania, it is classified as a side-oats gramma grassland community. It is especially unique because this community occupies very limited area in Pennsylvania. It only develops on dry sites with thin, calcareous soil and a low coverage of woody vegetation, which was probably historically maintained by grazing or fire. Many of the plant species found in these communities are typical of western prairies, because the unique conditions described above provide an environment where prairie species are able to outcompete eastern species better adapted to this climate. Some of these prairie species, such as little bluestem grass (*Schizachyrium scoparium*) are also able to utilize other habitat types in Pennsylvania and are not that uncommon, but there are also a number of species that are almost exclusively limited to side-oats gramma grasslands and thus are fairly rare in the state.

The "prairie" openings at this site are dominated by grasses and herbaceous species. Scattered in the openings, and surrounding them, are woody species including short-stalked arrowwood (*Viburnum rafinesquianum*), slippery elm (*Ulmus rubra*), white pine (*Pinus strobus*), black walnut (*Juglans nigra*) and white oak (*Quercus alba*). The exotic invasive species Morrow honeysuckle (*Lonicera morrowii*) and ragweed (*Ambrosia spp.*) are also present.

Two rare butterfly species have been documented from the site, the columbine duskywing (*Erynnis lucilius*) and the silvery blue (*Glaucopsyche lygdamus lygdamus*). As with many species of butterflies, there is some concern that populations may be declining globally due to habitat loss and pesticides. The silvery blue's range includes much of North America, while the columbine duskywing's range is more limited, from southern Quebec west to Minnesota and south to New Jersey, Pennsylvania, and Virginia and Kentucky in the Appalachian Mountains (Allen 1997). These species both depend on particular species of plants as food for their larvae, and thus they can only reproduce in areas where these "host plants" occur. The columbine duskywing uses wild columbine (*Aquilegia canadensis*), which only occurs on calcium-rich soil. The silvery blue's host plant may be a vetch species (*Vicia sp.*) or the veiny pea (*Lathyrus venosus*) (Allen 1997).

There are an exceptional number of Plant Species of Special Concern in Pennsylvania inhabiting the area: side-oats gramma grass (*Bouteloua curtipendula*), grooved yellow flax (*Linum sulcatum*), long-fruited anemone (*Anemone cylindrica*), hard-leaved goldenrod (*Solidago rigida*), tufted buttercup (*Ranunculus fascicularis*), false gromwell (*Onosmodium molle* var. *hispidissimum*), and a native species of brome grass (*Bromus kalmii*). The long-fruited anemone

population is especially significant because it is the only population of this species known to exist in the state.

Threats and Stresses

Local conservationists are aware of the interest in the Sinking Creek Prairie and there is a general public understanding that the site is significant. Access to the site through private lands is restricted so human impacts are probably few. Presently, collection does not appear to threaten the rare species. The openings may slowly be closing up due to regrowth of woody vegetation; if a canopy develops, some of the unique herbaceous species may be shaded out. Regrowth may be occurring due to the absence of fire or grazing in recent years, forces which probably maintained the open character historically. There are also invasive species present at the site, including a shrub species of honeysuckle. If populations of these species spread to become dominant, the diversity of native plant species will almost certainly decline. New developments along the Route 45 corridor introduce new threats and opportunities to this BDA. Stormwater management projects that are not conducted in an ecologically sensitive manner, the introduction of exotic landscaping plants and materials, or the use of lawn and garden chemicals—particularly pesticides—could lead to a decline in usable habitat for the numerous species keyed into this area.

Recommendations

The site is privately owned, and the owners are aware of its unique biological features. They are reportedly planning to graze cattle in a portion of the property including the “prairie” openings. If grazing is not intense, it may help to prevent woody regrowth in the openings. The establishment of a buffer zone of natural native vegetation around the openings might help to discourage the spread of invasive species. The opportunity exists to develop educational materials and programs in affiliation with the development projects in this area. Such efforts could raise awareness and provide reference to alternative lawn and garden care as well as provide information about the use of native plant species in landscaping. A well-informed and interested local community is critical in the stewardship of this site given the close proximity of residential development.

Veiled Lady Cave BDA

Veiled Lady Cave is used by the northern long-eared bat (*Myotis septentrionalis*)—a Pennsylvania Rare animal species—as winter hibernation grounds. The northern long-eared bat is also considered a species of special concern because a relatively low number of individuals have been documented, although it is not as rare as the eastern small-footed bat. It hibernates in relatively small groups compared to other bat species and thus is more difficult to locate than more colonial species.

The BDA boundary is drawn to include both the cave and a buffer area within which activities may impact the cave’s inhabitants. If the northern long-eared bats or other bats using the cave during the winter are disturbed from hibernation, they will become active and may use up critical fat stores needed to survive the winter. Juveniles can perish from repeated disturbances, and

individuals may also be weakened such that they do not have the energy to find food in early spring when it is scarce.

Threats and Stresses

The northern long-eared bats and other bats will be negatively impacted by disturbance in the cave during the winter months. Even small amounts of light, noise, or heat will be enough to bring the animals out of hibernation. Any physical alteration to the cave entrance or the rock surrounding the cave could alter the patterns of air and water flow that currently create a suitable microclimate for the species, and render the habitat unusable.

Recommendations

It is recommended that the cave be left undisturbed during the months of November through March. If human traffic is a problem, the installation of a special bat gate can be a deterrent. However, the gate must be carefully installed or it may render the cave unusable to bats. More information on bat gate installation can be obtained through the Pennsylvania Game Commission.

Wildflower Hill BDA

The important feature of this BDA is a sugar maple – basswood forest community (classified as a mesic calcareous central forest community in the previous edition) on a south facing slope along Sinking Creek. The site is locally known for profuse early spring wildflowers, which include cut-leaved toothwort (*Cardamine concatenata* = *Dentaria laciniata*), hepatica (*Hepatica americana*), columbine (*Aquilegia canadensis*), bloodroot (*Sanguinaria canadensis*), spring beauty (*Claytonia virginica*), squirrel corn (*Dicentra canadensis*) and round-leaved violet (*Viola rotundifolia*). In addition to the canopy dominant species sugar maple (*Acer saccharum*) and American basswood (*Tilia americana*), there is a sparse understory of flowering dogwood (*Cornus florida*) and viburnums (*Viburnum spp.*).

Threats and Stresses

There do not appear to be many signs of disturbance, except a lightly used trail and a rock pile at the side of the road. Overcollection of some wildflowers may be a problem at this site. The forest is also downslope from a major road; runoff of salts and other compounds may impact the forest community. Widening of the road would encroach on the area occupied by the forest community, and would specifically impact the population of an uncommon species known from this forest and few other sites in the county. Agricultural fields across the road are also upslope from the forest, and runoff of nutrients or chemicals applied here may impact the forest.

Recommendations

Educational efforts geared toward informing people in the local community of the issues and requirements of plant collection would be useful in addressing this potential problem. Collection guidelines as furnished by the vascular plant technical committee of the Pennsylvania Biological Survey may serve as a reference for collecting plants in an ecologically sound manner. Care

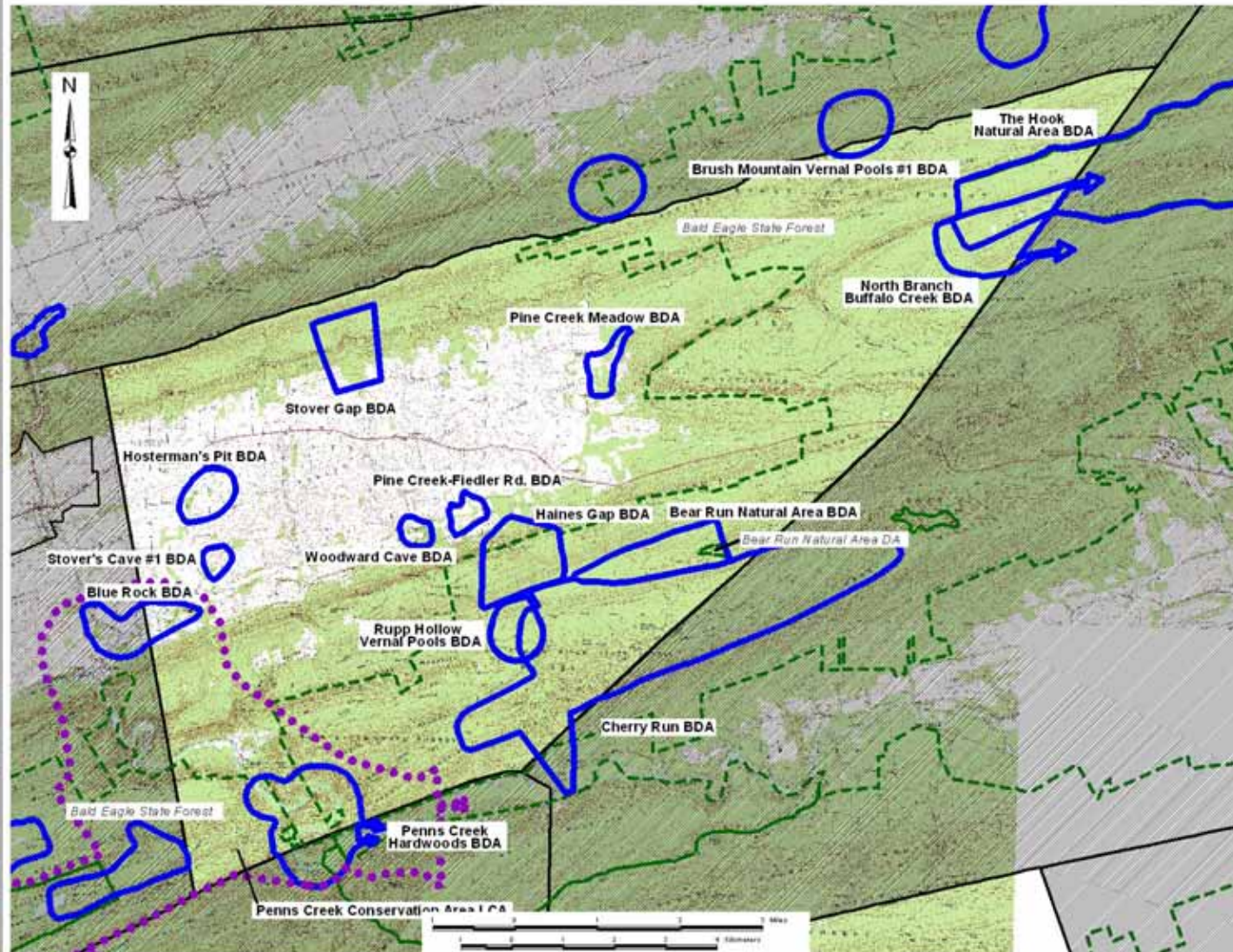
should be used in applying chemicals to the cornfields across the road to avoid overspray or runoff during precipitation events.

HAINES TOWNSHIP

	<u>PNDI Rank</u>		<u>Legal Status</u>	
	Global	State	Fed.	State
<i>NATURAL HERITAGE AREAS:</i>				
BEAR RUN NATURAL AREA BDA	<i>County Significance</i>			
BLUE ROCK BDA	<i>Exceptional Significance</i>			
Backwards sedge (<i>Carex retrorsa</i>)	G5	S1		PE
BRUSH MOUNTAIN VERNAL POOLS #1 BDA	<i>Exceptional Significance</i>			
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE
CHERRY RUN BDA	<i>High significance</i>			
High Gradient Clearwater Creek	PA Exceptional Value			
HAINES GAP BDA	<i>Notable Significance</i>			
Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3		
THE HOOK NATURAL AREA BDA	<i>County Significance</i>			
Hartford fern (<i>Lygodium palmatum</i>)	G4	S3		PR
HOSTERMAN'S PIT BDA	<i>Exceptional Significance</i>			
Special animal #1	G4	S2S3		
NORTH BRANCH BUFFALO CREEK BDA	<i>High significance</i>			
Hemlock palustrine forest community	G?	S3		
High gradient Clearwater Creek	PA Exceptional Value			
PENNS CREEK HARDWOODS BDA	<i>Exceptional Significance</i>			
Eastern small-footed bat (<i>Myotis leibii</i>)	G3	S1		PT
Special animal #1	G5	S2		
Special animal #2	G4	SU		

(continued following maps)

Haines Township



Haines Township

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Bear Run Natural Area
Blue Rock
Brush Mountain Pools #1
Cherry Run
Haines Gap
The Hook Natural Area
Hosterman's Pit
North Branch Buffalo Creek
Penns Creek Hardwoods
Pine Creek Meadow
Pine Creek-Fiedler Road
Rupp Hollow Vernal Pools
Stover's Cave #1
Stover Gap
Woodward Cave

Landscape Conservation Areas:

Penns Creek Conservation Area

Managed Areas:

Bald Eagle State Forest
Bear Run Natural Area DA



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

PINE CREEK-FIEDLER ROAD BDA		<i>High significance</i>			
Backwards sedge (<i>Carex retrorsa</i>)	G5	S1		PE	
PINE CREEK MEADOW BDA		<i>Notable Significance</i>			
Hemlock palustrine forest		S3			
RUPP HOLLOW VERNAL POOLS BDA		<i>Exceptional Significance</i>			
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	LE	PE	
STOVER'S CAVE #1 BDA		<i>Exceptional Significance</i>			
Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3			
Eastern small-footed bat (<i>Myotis leibii</i>)	G3	S1		PT	
STOVER GAP BDA		<i>County Significance</i>			
WOODWARD CAVE BDA		<i>Exceptional Significance</i>			
Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3			
Eastern small-footed bat (<i>Myotis leibii</i>)	G3	S1		PT	
PENNS CREEK CONSERVATION AREA LCA		<i>Notable Significance</i>			

OTHER CONSERVATION AREAS: none

MANAGED LANDS: *Bald Eagle State Forest*
 Bear Run Natural Area DA
 Poe Valley State Park

GEOLOGIC FEATURES: none

HAINES TOWNSHIP

Haines Township covers a large area that includes great landscape diversity, and contains an exceptional concentration of significant ecological features. The eastern end of Penn's Valley falls within the township. The valley is underlain by limestone bedrock, and thus the soils are mineral-rich with a high pH, and the waterways of the valley are also alkaline and abundantly buffered against pH disruption. As limestone is a highly soluble rock type, over time extensive networks of underground water passages and caves have formed in the limestone geology beneath the valley. Haines Township contains four limestone solutional caves that are utilized by animal species of special concern in Pennsylvania. Outside of the valley, the topography of the township is mountainous, defined by the sandstone ridges that run nearly east-west, and the land is largely forested. In this large expanse of relatively lightly used land within the townships, there are portions of several Exceptional Value streams and their watersheds, and several areas with forest and wetland communities that are uniquely mature or undisturbed in comparison to other examples of their types in the county. Gaps cut into the ridges by stream flow over the centuries are a regular feature throughout the Ridge and Valley section of the county; however, two of the gaps found in Haines township are notable for their exceptionally mature and diverse forest communities.

Bear Run Natural Area BDA

Bear Run Natural Area has recently been designated as a State Forest Natural Area by the Bureau of Forestry. It contains a hemlock -tulip tree – birch (*Liriodendron tulipifera*) community. The site is reported to have never been cut because of boundary disputes, but the local area, this hollow included, was burned over severely between 1885 and 1895. Fire scars, burned stumps, and the age of the trees in the stand seem to confirm this. The ecological significance of the community is limited by its small size: many of the species that depend on mature forest must also have a large area of this habitat available in order to sustain a population.

Threats and Stresses

Due to the ease of access conferred by the nearby roads, the site may be vulnerable to impacts from recreational traffic, such as physical disturbance, trampling of vegetation, or littering. The site already has several old campfire rings. Road grading and other maintenance activities could also result in sediment deposition in the ravine, since there is no bank or ditch between the road and the natural area.

Recommendations

Occasional patrols along the nearby roads may assist in protecting this site. Building some kind of mitigation, like a ditch or curb, between the road and the community would prevent sedimentation in the stream. Increasing the size of the natural area to include the upper end of the watershed of Bear Run would make management of the site more effective and easier. Managers would be able control all impacts to the core of natural area, the site would have a larger buffer, and larger size would also help to buffer the impacts of natural disturbance on the community.

Blue Rock BDA

Blue Rock is the local name for an area along Pine Creek in the vicinity of Coburn. The name has been applied to a BDA drawn around a series of areas on Pine Creek and Elk Creek where there are calcareous opening/cliff communities (listed as limestone cliff communities in the previous edition) mingled among forest of the sugar maple – basswood type (described as mesic calcareous forest NC003 in the previous edition) and channel scar wetlands along the creek. Scattered in the floodplain and along streambanks are backwards sedge (*Carex retrorsa*) plants, a Pennsylvania Endangered species. Most of the cliff communities are small, found only where the slope is steepest and soil has washed away. The limestone cliffs support a limited number of limestone indicator species, like walking fern (*Camptosorus rhizophyllus*) and ebony spleenwort (*Asplenium platyneuron*). Where the steep hills have soil, the mesic calcareous central forest prevails. Typical tree species in this forest are basswood (*Tilia americana*), eastern hemlock (*Tsuga canadensis*) and hop-hornbeam (*Ostrya virginiana*). The steep hill/cliff sites are scattered over several areas on the banks of Pine Creek and Elk Creek before the confluence of the two. The communities vary in level of disturbance, from one that is near an illegal trash dump, to an isolated one that looks fairly pristine, but none are highly significant. This community association found good condition is uncommon enough in the county to be worth noting and protecting.

Threats and Stresses

The most easterly cliff has a public road at its summit where people have dumped trash. There are "no dumping" signs posted, but the site is somewhat isolated and probably difficult to police. It includes a fairly representative limestone cliff community. To the west of this area is a steep hillside that farther along becomes cliffs. These are probably the best quality cliffs in the area, but an introduced succulent plant species was gaining a foothold on the rock face. The final area along Elk Creek is mainly mesic forest since the cliff there had been quarried for stone to make a bridge. Cliff species were attempting to recolonize the stone surface but it was plain the community will need more time to reestablish itself.

Recommendations

Protecting this site will involve cleanup of the trash and some way of closing the cliffs to future dumping. Although the community on the cliffs is currently degraded by disturbance, the cliffs are an important habitat where a significant community could redevelop if rehabilitated. The sections of the site that are fairly well protected from the above-mentioned impacts due to of lack of access should recover well if left alone.

Brush Mountain Vernal Pools #1 BDA

Please see discussion of this BDA under Miles Township.

Cherry Run BDA

Cherry Run is a high-gradient clearwater creek that has its headwaters in Union County; it is classified as an Exceptional Value stream by the Pennsylvania Department of Environmental

Protection where it flows through Centre County. The BDA includes the area of the Cherry Run watershed. The stream has a well-traveled road along it and many cabins in the watershed. The forest community which currently occupies much of the watershed anchors the soil and provides for natural cycles of nutrient input and uptake. The condition of land immediately adjacent to the stream is also particularly important to the habitat quality of the stream for aquatic organisms, as some of these depend on the light levels and temperature conditions created by a forest canopy, and others utilize the forest habitat.

Threats and Stresses

This creek probably has the most heavily populated watershed among the EV streams examined in Centre County. It is not known whether effective erosion control techniques have been employed in the construction of the road along Cherry Run. If these are not in place, the road may be a source of sediment pollution into the stream. If there is any leakage from sewage or septic systems associated with the cabins, this could also be a source of bacterial contamination or nutrient runoff into Cherry Run. Changes in land use within the watershed area could affect the water quality, as removal of forest cover will expose the stream to nutrient and sediment pollution.

Recommendations

As the population of the watershed creates potential for water quality impacts, chemical and biological indicators should be regularly monitored in Cherry Run for early detection of any problems. Water quality can best be preserved by leaving much of the watershed in forest cover; if any activities resulting in forest cover removal are planned, effective erosion control measures should be implemented to prevent sediment erosion into the stream.

Haines Gap BDA

Haines Gap is a north-facing valley in Bald Eagle State Forest that harbors several natural communities. Two of these are significant within the county as pristine examples of their types. The ravine is a 'T' shaped gap with an old tram road cutting across its top and steep sandstone cliffs on three sides. In the basin of this valley grows a very tall forest of hemlock (*Tsuga canadensis*), tulip tree (*Liriodendron tulipifera*), white ash (*Fraxinus americana*), and red oak (*Quercus borealis*) forest that is classified as a hemlock – tuliptree – birch forest community. Small, intermittent streams flow from east and west into the ravine and there is a spring in the very center of the ravine basin. Though springs are fairly common in Centre County, there are few which have not been overrun by watercress (*Nasturtium officinale*), a non-native plant species. This one is still in pristine condition.

Further down the ravine, the community becomes more xeric and supports hickories (*Carya spp.*), other oaks (*Quercus spp.*), and black cherry (*Prunus serotina*). The creek begins to cut through a layer of shale creating a sheer cliff along one bank. Approximately one half mile north of the ravine is a small cave that, in winter, harbors a medium-size colony of bats. The northern long-eared bat (*Myotis septentrionalis*)—a Pennsylvania Rare species—is among those species that have been documented to hibernate here. The various bat species require very specialized temperature and humidity conditions for winter hibernation. These conditions arise from the

shape of the cave and its entrance, the pattern of air flow through the cave, and the pattern of water drainage from the surface and from subterranean sources. Every cave provides different microhabitat conditions, and not all caves are suitable.

Haines Gap, though small, does possess an exceptional community. It is probably not old growth forest since charred stumps and an old tram road were found in the area, but site factors like moisture and protection from winds by the steep cliffs have allowed the forest to mature more rapidly than surrounding areas. Of the many mountain gaps in Centre County, this one is somewhat ecologically unique. It is a well-recovered forest of a less common type and shows the potential to become an even more significant forest community if allowed to continue to mature.

Threats and Stresses

The area occupied by the unique natural communities is owned by the PA Bureau of Forestry: presently there are no apparent threats. The bats inhabiting the cave can be seriously impacted by any traffic or disturbance during the winter months. Very low levels of noise, heat, or light will awaken hibernating bats, which then begin to move about and expend energy, depleting their winter fat reserves. Repeated disturbances can kill the bats, especially juveniles, outright, or can weaken them so much that they cannot meet the energy demands of foraging in early spring when insects are still scarce, or of long flights to their summer territories. Any physical alteration to the cave or the cave opening could alter the microclimate conditions and make the habitat unusable to bats.

Recommendations

It is recommended that forest canopy removal operations not be conducted in Haines Gap, due to the uniqueness of the forest community there. As with all caves that are utilized by bats, human traffic or other disturbances should be avoided during the months of November through March. If human traffic is a problem, the installation of a bat gate can help to deter traffic, although this must be done very carefully to avoid rendering the habitat unusable to the bats. Please consult the PA Game Commission for further assistance in bat gate construction.

The Hook Natural Area BDA

The Hook Natural Area is mainly located in Union County. The portion in Centre County is a pair of valleys and a ridge that lie between two parallel roads. One of these roads is no longer maintained and will one day be untravelable, but the northern Pine Creek Road is state forest owned and maintained.

Threats and Stresses

Road maintenance activities in the watershed can generate sediment pollution in the watershed.

Recommendations

It is advised that special care be taken when grading or cleaning turn outs on this road. There are some campsites within this natural area boundary. These should be carefully monitored to prevent abuses such as dumping or sewage discharge in the protected area. Several trails crisscross the natural area and maintenance of these should also be accomplished with as little impact to the site as possible.

Hosterman's Pit BDA

This site was not revisited during this update, and no new information concerning the site has become available.

Hosterman's Pit is one of the largest caverns in Centre County. This 6,630 foot limestone solutional cave has been explored and mapped by the Nittany Grotto, a local, conservation oriented, spelunking organization (Dayton, White 1979). The cavern is covered with a steel door which does not readily allow access to bats. No bats presently use the cavern, but bones of bats and other animals—including an extinct species of elk—have been found in some rooms. The cave does provide habitat for a species which does not seem to be affected by the presence of the metal door. This animal, Special Animal #1, is an aquatic subterranean species that is known from only one other site in Centre County. More studies are needed to further investigate the aquatic underground community.

Threats and Stresses

Any alteration in the quantity or quality of groundwater in the aquifer that flows through the cave could impact the aquatic animal species that inhabit it. Physical disruption of bedrock in the cave or nearby areas could alter the pattern of groundwater flow which currently maintains the aquifer. It could also introduce surface contaminants into the water.

Recommendations

If the cave is to continue to support the rare aquatic species, water resources in the surrounding land should be protected and monitored to keep contaminants out of the aquifer flowing through the cave. If possible, bat access should be restored by using a "bat friendly" gate, although natural repopulation of the cave cannot be guaranteed. The Pennsylvania Game Commission should be consulted on this matter. Physical disruption of the cave and its associated underground channels should be avoided.

North Branch Buffalo Creek BDA

This BDA is the watershed of North Branch Buffalo Creek, classified as an Exceptional Value stream by the Pennsylvania Department of Environmental Protection. The stream begins in The Hook Natural Area on the eastern edge of the Woodward quadrangle. The Bureau of Forestry reports that prior to its designation as a natural area, the watershed was logged over, and there is evidence it also burned. Though most of the protected lands have been disturbed, there is a recovering alder-sphagnum shrub wetland community, and a hemlock palustrine forest

community in the headwaters area of the creek. These communities are intermingled and the vegetation is quite thick and difficult to traverse. Standing water and small, sandy stream channels are common. The acidic shrub swamp consists of small openings in the thick speckled alder (*Alnus incana*) canopy that largely support sedges (*Carex spp.*) and white pine (*Pinus strobus*). Small "bog-like" openings with sphagnum and maleberry (*Lyonia ligustrina*) are also included in this community type. Very little organic material is evident in the soil of these areas. The northern conifer swamp community that occurs throughout the remainder of the headwaters area is made up of dense hemlock, black gum (*Nyssa sylvatica*), and rhododendron (*Rhododendron maximum*) growing on a thick organic matt with little understory vegetation. It is possible that these two communities reflect different fire histories, with the more open, grassy areas indicating that a fire burned down to the mineral soil in these places. Hemlock palustrine forest communities probably developed on the parts of the headwaters that were not burned so thoroughly.

The forest community in the watershed plays a vital role in maintaining the health of the stream by anchoring soil sediments and maintaining a natural cycle of nutrient input and uptake. The condition of land immediately adjacent to the stream is also particularly important to the habitat quality of the stream for aquatic organisms, as some depend on the light levels and temperature conditions created by a forest canopy, and others utilize the forest habitat.

Threats and Stresses

Any removal of forest cover or earth disturbance without effective provision for controlling the resultant soil erosion will negatively impact the health of the stream. Large-scale removal of forest cover will also alter the level of nutrients entering the stream, and removal of forest cover immediately adjacent to the creek may degrade the creek's suitability as habitat for some species: both changes may detrimentally impact the aquatic community.

Recommendations

The large area of contiguous forest in this watershed is unique within the county, and it is recommended that this feature of the area be preserved. Additionally, in order to protect the water quality of Yost Run, large-scale forest cover removal should be avoided within the bounds of this site. In those areas where forest cover has already been removed, erosion control measures should be implemented if not in place already. Also, forest cover should be left intact on steep slopes greater than 15%, as erosion is very rapid and difficult to prevent in these areas, and immediately along the banks of the creek. On more gradually sloping land, if activities are pursued which result in forest cover removal, great care should be taken to prevent the movement of eroding sediments away from the immediate area of operation.

Penn's Creek Hardwoods BDA

This BDA includes a unique forest community type, a seepage community, and habitats utilized by three animal species of special concern in Pennsylvania.

The Eastern small-footed bat (*Myotis leibii*) has been documented recently from an abandoned rail tunnel. This species utilizes forest habitat for food and various other behaviors. Although it

is highly likely the species is using forest in the area of the rail tunnel, specific areas utilized for food and traveling paths have not been documented. Please see description under Woodward Cave BDA for general information about this species.

The other two species were last documented within the BDA in 1963-4, but have been documented more recently elsewhere along Penn's Creek. The habitat for these species is the streams and the forested areas along their banks. They live part of their lives in the water, and during this phase they require fairly high water quality. In another part of their life cycle they inhabit the stream banks, and utilize vegetation that naturally occurs there.

The seepage area is at the base of a sandstone ridge and there is a fairly constant groundwater flow through much of the year. It contains a skunk cabbage – golden saxifrage forest seep community dominated by speckled alder and spicebush, with skunk cabbage and other typical herbaceous species in the understory.

The unique forest community occurs on flat creek deposits along Penns Creek gorge, and is dominated strongly by tulip tree (*Liriodendron tulipifera*) and American basswood (*Tilia americana*). Among the types described in Fike 1999, it most closely resembles the sugar maple – basswood terrestrial forest community, but its species composition and floodplain location diverge from what is typical for that type. The community is well-developed and mature, although several cabins have been built on the banks of the creek within the forest, and the understory vegetation is mechanically cleared in some areas. Somewhat more disturbed examples of the same community type can be found on flats downstream from Ingleby, where they occupy suitable areas along the creek for more than a mile. The most pristine and reportedly uncut stand is on a flat just outside the county line in Mifflin County; the site boundary has been drawn to include this area. The community may continue along the banks of Penns Creek as it flows east, but this was not investigated. This forest type has little understory, even in places where there has not been mechanical clearing, and are surprisingly free of weedy species given the various disturbances in the area. They are naturally restricted by the sides of Penns Creek gorge to a narrow strip of land, which probably floods periodically. An old railroad grade and a powerline cut have reduced the available habitat within this area.

It is the only site in the county with this type of community, and its similarity to the undisturbed site outside the county indicates it still has the character and species composition of a relatively pristine community.

Threats and Stresses

The contiguity of the forest community has been disturbed somewhat by the construction of many cabins. In some areas, the vegetation of the forest floor is mechanically removed, which prevents tree and shrub regeneration and also damages the herbaceous community. Continued disturbance of this nature may result in local elimination of some species. Cabins are very prevalent in these forests. Although the open nature of the forest canopy allows cabins to be built without cutting many surrounding trees, it would nevertheless be beneficial to restrict further construction in unaffected areas. The mechanical removal of underbrush limits natural regeneration.

The habitat currently appears to be in good condition for the animal species that utilize it. The eastern small-footed bat would be negatively impacted by a decline in contiguous forest area, and also by disturbance to the physical structure of the tunnel, and by traffic and noise in the tunnel during the winter. Species #1 and #2 require fairly high water quality to survive, and thus would be sensitive to increased nutrient or sediment pollution, as well as to chemical contaminants. As they utilize streambank vegetation, the streambank areas where native vegetation is removed will be unsuitable for them as habitat.

Recommendations

Large-scale removal of forest cover should be avoided in this area, especially along the stream banks. Habitat for the special animal species #1 and #2 can be enhanced through long-term landscape planning for the establishment of a corridor of natural vegetation along the stream, and for improvement of water quality in the stream. The old railroad tunnel should not receive human traffic during the months of November through March, in order to prevent potentially lethal disruption of the bats that hibernate there. Contact the Pennsylvania Game Commission for more information about the management requirements of the eastern small-footed bat.

Pine creek – Fiedler Road BDA

This BDA is designated around a population of the backwards sedge (*Carex retrorsa*). It includes the occupied habitat areas as well as a buffer area within which some activities may have impacts on the species. In this area, Pine Creek has a small forested buffer, and is otherwise surrounded by fields currently or formerly devoted to agricultural use.

Threats and Stresses

The backwards sedge plants would be most impacted by physical disturbances to the stream bank area or its vegetation. Removal of forest canopy in this area could also impact the backwards sedge; it is not known how the plant might respond to the changes in temperature and light levels that would result from loss of forest shade. Activities higher in the watershed could impact the plants if they result in nutrient or sediment runoff, such as excessive fertilizer application or any exposure of bare soil without sufficient erosion control.

Recommendations

It is recommended that within this BDA, the stream banks and the forest in its vicinity be left undisturbed. Although the specific response of this species to various types of pollution is not known, the most cautious provision for the safety of the backwards sedge plants would avoid generating these conditions; any alterations planned for areas higher in the watershed above the streambank and forest buffer should not expose bare soil without effective erosion control measures, and also should avoid the release of nutrients or chemicals.

Pine Creek Meadow BDA

This BDA is a wetland complex including several different community types. Along Pine Creek there is an alder – sphagnum shrub wetland community, upland and to the east there is an

herbaceous wetland that appears to have been mowed or pastured in the past, and further east up to the base of the mountain there is an extensive hemlock palustrine forest community. The alder – sphagnum wetland community, which does not appear to have been heavily disturbed, consists of thick stands of speckled alder (*Alnus rugosa*) with sedges (*Carex gynandra*, *Carex folliculata*, *Carex lupulina*, *Carex intumescens*, etc.) and mosses (*Sphagnum spp.*) in the understory. Local history holds that the whole wetland along Pine Creek, an area of approximately 500 acres, was once this type of community and has been slowly been converted to pasture. The remaining wet meadow area is roughly 20 acres in size. The hemlock palustrine forest is the most significant feature of this site, as it appears to be largely unimpacted by disturbance and is probably one of the larger examples of its type in the county. The canopy is almost exclusively dominated by hemlocks, and there is an extensive network of springs and seeps feeding into Pine Creek that results in a saturated or hydric substrate in many areas.

Threats and Stresses

This site does not appear to face any imminent threats.

Recommendations

The area should remain undisturbed to best safeguard the health of the natural communities it contains.

Rupp Hollow Vernal Pools BDA

This site is designated around several vernal pool communities, some of which are inhabited by the northeastern bulrush, a Federally Endangered plant species. The vernal pools themselves also comprise a habitat of unique ecological significance. The BDA boundary includes the area around the ponds within which some types of activities could damage the pond communities or the northeastern bulrush.

The northeastern bulrush is a sedge species that is only known to inhabit the northeastern Appalachian mountains. Furthermore, the portion of the Appalachians occurring in Pennsylvania appears to be the global center of this species' range, as over half (62%) of all known locations fall within Pennsylvania, and more locations are currently known from Centre County than from any other county in Pennsylvania. Although not all potential habitat areas in Pennsylvania have yet been surveyed, the Centre County populations currently make up 15% of all known locations globally. The species is frequently associated with vernal pools, although in other parts of its range it is known from other types of habitat. The various habitats all appear to share the characteristic of seasonally fluctuating water levels. Within Pennsylvania very few occurrences are known from habitats other than vernal pools. In the eastern portion of the county, as is the case with this site, vernal pools frequently develop in broad, flat mountain saddles as accumulation points for surface water runoff.

A variety of animal species utilize vernal pools, and some species require these habitats for survival. Jefferson and Slimy salamanders breed exclusively in vernal pools, laying their eggs in the spring, then migrating outwards up to 500 m away from the pools to spend much of the rest of the year living in the surrounding forest. Invertebrate species such as fairy shrimp also

depend upon vernal pools; the animal species composition is especially rich and unique because the absence of fish enables the survival of many smaller organisms which would otherwise be preyed upon by fish. While the habitat at these sites appears highly suitable for animal species typical of vernal pools, animal populations have not been surveyed, so no definitive information is available on species composition. The exact composition of plant communities is somewhat variable among the ponds; species that are often present include sharp-flowered manna grass (*Glyceria acutiflora*), woolgrass (*Scirpus cyperinus*), beggar-ticks (*Bidens* sp.), and fireweed (*Erechtites hieracifolia*).

Threats and stresses

Changes in hydrological pattern, light levels, and forest continuity would negatively impact the species and natural communities within this BDA. The vernal pools that are the significant features of this site are fed by surface runoff from the entire watershed area above them. Any activity resulting in earth disturbance would affect the current hydrological pattern at this site and potentially alter conditions within the vernal pools community. The northeastern bulrush appears to be very sensitive to alterations of the water regime in its habitat, although it is not known what conditions are optimal. The forest canopy should remain intact in the area immediately surrounding the ponds, because changes in light levels may also impact northeastern bulrush populations. Additionally, disruptions to the forest within 500 m of a pond may impact amphibian populations associated with the vernal pools. While amphibian surveys have not been conducted at this site, the habitat appears highly suitable and surveys should be conducted before any assumption is made that they are not present.

Recommendations

Activities that remove forest canopy or result in earth disturbance should be avoided within a 500 m buffer of the ponds, in order to avoid disrupting natural hydrological patterns in the ponds and to avoid impacts to potential amphibian populations. A fuller understanding of the animal species utilizing these vernal pools would be gained through invertebrate and amphibian surveys, and this knowledge would provide an important basis for site-specific conservation planning.

Stover's Cave #1 BDA

The small Stover's Cave #1 is a winter hibernation area for the eastern small-footed bat, one of the globally rare animals found in Centre County. Please see description under Woodward Cave BDA for general information about this species. The eastern small-footed bats had been previously documented, and were confirmed to still inhabit the cave during 2000 surveys by the Pennsylvania Game Commission. Additionally, the northern long-eared bat was documented during 1997 PGC surveys. These bats rely upon stored fat reserves to sustain them during their winter hibernation period. However, if disturbed during the winter, they will become active; this may cause them to use up fat reserves prematurely. The boundary line around this and other cave sites includes all the land above known passages plus a buffer zone. It should be noted, however, that some parts of the cave that are too small to be explored can still provide habitat for subterranean species.

Threats and Stresses

Traffic in the cave during the winter that is disturbing to the animals that live there may endanger their ability to survive the winter. Cave sites may be threatened by limestone mining and blasting which can interfere with the cave and the hydrology of the site. Since this cave is dry, protection of it is not as dependent on preservation of local groundwater as it is for aquatic (karst) systems.

Recommendations

Traffic and noise should be kept out of the cave during the winter to avoid threatening the animals that live there. Mining should be avoided within this BDA, in order to protect the cave habitat and the animals that inhabit it.

Stover Gap BDA

Stover Gap is a 90 acre northern hardwood forest community situated in the basin of a rocky gap. It is designated as a biodiversity area because it is exceptionally mature and diverse among the gap forests and among forest communities in the county generally. Sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), hemlock (*Tsuga canadensis*), black birch (*Betula lenta*), beech (*Fagus grandifolia*), and many species of hickories (*Carya spp.*) and oaks (*Quercus spp.*) make up this diverse, recovering forest. Although the vegetation does appear more stunted on the on rockier, drier soils higher up the mountain, the headwaters area seems to be the least disturbed by the logging that occurred here in the past. Downslope towards the valley, vegetation becomes denser and more diverse, with species like hemlock and cucumber magnolia (*Magnolia acuminata*) becoming more prominent. Tree diameter also increases in the lower part of the gap, although the stand is reportedly an even aged one. The lower western side of the ravine shows damage from a hurricane in the 1960's and the forest on the flat area east of the creek is reported to have been cut in 1944, but local records and recollections indicate the main forest has not been cut in 100 years, and probably even longer. Residents believe that the stand may have been overlooked because the rocky soil was too poor to produce quality timber, but as with every other gap forest in the county, signs of very old harvesting— a tram road that was probably once used to haul timber— persist.

Though there are many hemlock filled gaps in the Ridge and Valley Province providing clean water to valley farms and towns, few of them contained natural communities examined of this type or are as mature as the Stover Gap forest. The site is ranked as county significant because of the number of similar, but not quite as well grown stands all around the county, and because no species of special concern are known for the site.

Threats and Stresses

Landowners are aware and proud of this forest and appear willing to protect it.

Recommendations

The current management regime should continue.

Woodward Cave BDA

Woodward Cave is a large, commercially utilized cave that has been recorded to house two species of special concern, the eastern small-footed bat and the northern long-eared bat. This cavern was historically one of the most significant bat hibernacula in the state.

The eastern small-footed bat has a fairly wide range in eastern North America, but populations appear to be scattered and small throughout its range. Unlike bat species that form large hibernation colonies, this species usually hibernates alone or in very small groups. Because of the low number of individuals documented (3,000 in total) in fairly extensive survey work, the species is considered to be at risk globally. Although historical records for this species are scarce, its habits and current data suggest that it may always have been relatively rare. In Pennsylvania, historical survey data is available, and comparison to more recent data suggests a population decline occurred in Pennsylvania during the last century. Little is known about its habits or its requirements for food and summer habitat, except that it may be dependent on forests (NatureServe 2002).

The northern long-eared bat is also considered a species of special concern because a relatively low number of individuals have been documented, although it is not as rare as the eastern small-footed bat. It hibernates in relatively small groups compared to other bat species and thus is more difficult to locate than more colonial species.

Threats and Stresses

A common threat to all cave sites and the species they support is the potential for overuse and chronic degradation of the habitat by sport cavers, and in the case of commercial sites, visitors. Climbing around in delicate cave environments can destroy active formations, contaminate aquatic habitats, and disturb hibernating animals who depend on these sites to survive. Bats need to remain undisturbed during the winter months; energy used up in responding to disturbance can deplete their fat reserves before warm weather allows them to emerge from hibernation and begin to forage again. Littering or other physical disturbances to the cave environment can also impact the habitat quality. Another important consideration is that bats must have unrestricted access to their habitat.

As with other bat caves that are managed as tourist attractions, the use of the cave has resulted in a decline in the population of the bat colony.

Recommendations

It is recommended that the management of these areas be planned with the preservation of the natural communities in mind. Education of cavers and visitors should stress the importance and delicacy of the biota of caves, as well as the fragile nature of their geology. Additionally, installation of a "bat friendly" gate is a management technique that allows for control of tourist access to the attraction, while preserving natural air-flow patterns that are critical to the maintenance of the cave habitat.

Penns Creek Conservation Area LCA

This landscape conservation area is designated around the landscape of the Penns Creek gorge. The area has supported significant organisms in the past, but it has been many years since an in-depth study of the area has been undertaken. The LCA designation also recognizes this region as the most forested and ecologically intact portion of Penn's Creek in Centre County. Extensive forested areas around larger waterways that have good or even moderately good water quality are not common, which has led to a scarcity of habitat for aquatic organisms that depend on these conditions, such as some dragonflies and damselflies. Additionally, the area is used for recreation and is a first priority group "A" designee for the Pennsylvania Scenic Rivers Program. It has also reportedly been used as a migratory route for certain rare bird species.

The gorge is an extremely unusual landscape for Centre County. The steep slopes and relatively natural pass provide a wide variety of habitats not found in many other places. The landscape conservation area is important for biological diversity and should be protected as a significant landscape system.

Threats and Stresses

The major threats to this area are development along the creek or logging on steep slopes in the gorge. A large change in the amount of forest cover in the watershed will impact water quality and also decrease the available habitat area for forest species. Forest cover removal slopes greater than 15% would be a particular threat to water quality because erosion is rapid and difficult to control in these areas. As some of the unique organisms documented from the area are aquatic species, it is especially important to maintain or improve water quality in Penns Creek.

Recommendations

If possible, all lands inside this area should be managed to protect the ecological systems in the gorge. Reducing sediment and nutrient inputs higher in the watershed, as well as protecting against any chemical contamination events, will improve water quality. Additionally, as the immediate streambank area is important habitat for some aquatic species, a large-scale planning goal for the area should be to allow naturally vegetated streambanks to develop at regular intervals in the landscape. These tactics in combination should create an improved habitat for aquatic organisms.

MILES TOWNSHIP

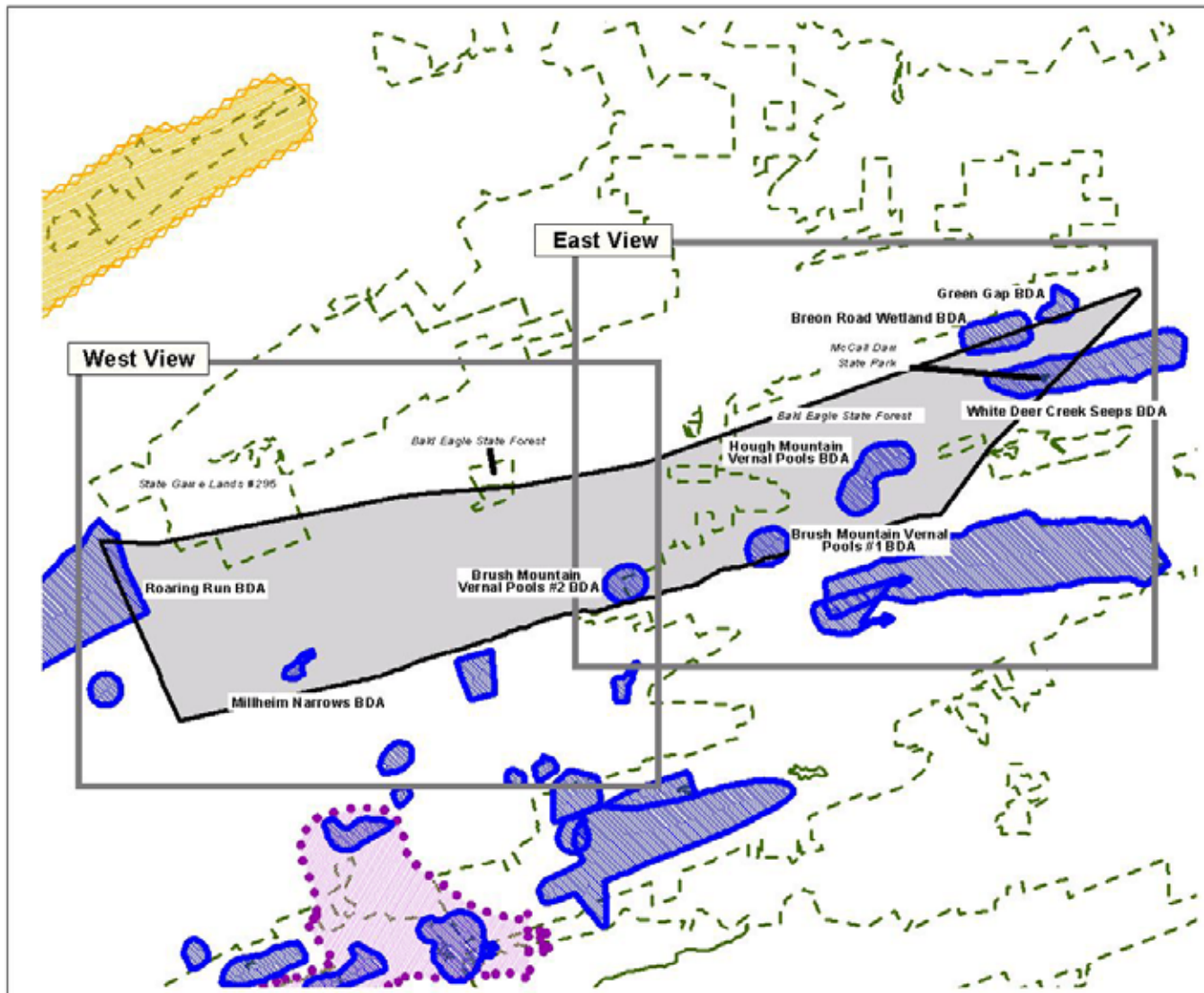
		<u>PNDI Rank</u>		<u>Legal Status</u>	
		Global	State	Fed.	State
<i>NATURAL HERITAGE AREAS:</i>					
BREON ROAD WETLAND BDA		<i>Notable Significance</i>			
BRUSH MOUNTAIN VERNAL POOLS #1 BDA		<i>Exceptional Significance</i>			
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)		G3	S3	LE	PE
BRUSH MOUNTAIN VERNAL POOLS #2 BDA		<i>Exceptional Significance</i>			
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)		G3	S3	LE	PE
HOUGH MOUNTAIN VERNAL POOLS BDA		<i>Exceptional Significance</i>			
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)		G3	S3	LE	PE
GREEN GAP BDA		<i>Notable Significance</i>			
MILLHEIM NARROWS BDA		<i>High significance</i>			
Backwards sedge (<i>Carex retrorsa</i>)		G5	S1		PE
White water crowfoot (<i>Ranunculus aquatilis</i> var. <i>diffusus</i>)		G5T5	S3		PR
ROARING RUN BDA		<i>Notable Significance</i>			
High-gradient clearwater creek		PA Exceptional Value			
WHITE DEER CREEK SEEPS BDA		<i>Notable Significance</i>			
<i>OTHER CONSERVATION AREAS: none</i>					
<i>MANAGED LANDS:</i>		<i>Bald Eagle State Forest</i> <i>McCall Dam State Park</i> <i>State Game Lands # 295</i>			
<i>GEOLOGIC FEATURES:</i>		<i>none</i>			



Miles Township (full view summary) **Centre County** **Natural Heritage Inventory**

Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Audubon Society Important Bird Area (IBA)
- Managed Area (MA)
- Municipal Boundary



Biological Diversity Areas:

Breon Road Wetland
 Brush Mountain Vernal Pools #1
 Brush Mountain Vernal Pools #2
 Green Gap
 Hough Mountain Vernal Pools
 Millheim Narrows
 Roaring Run
 White Deer Creek Seeps

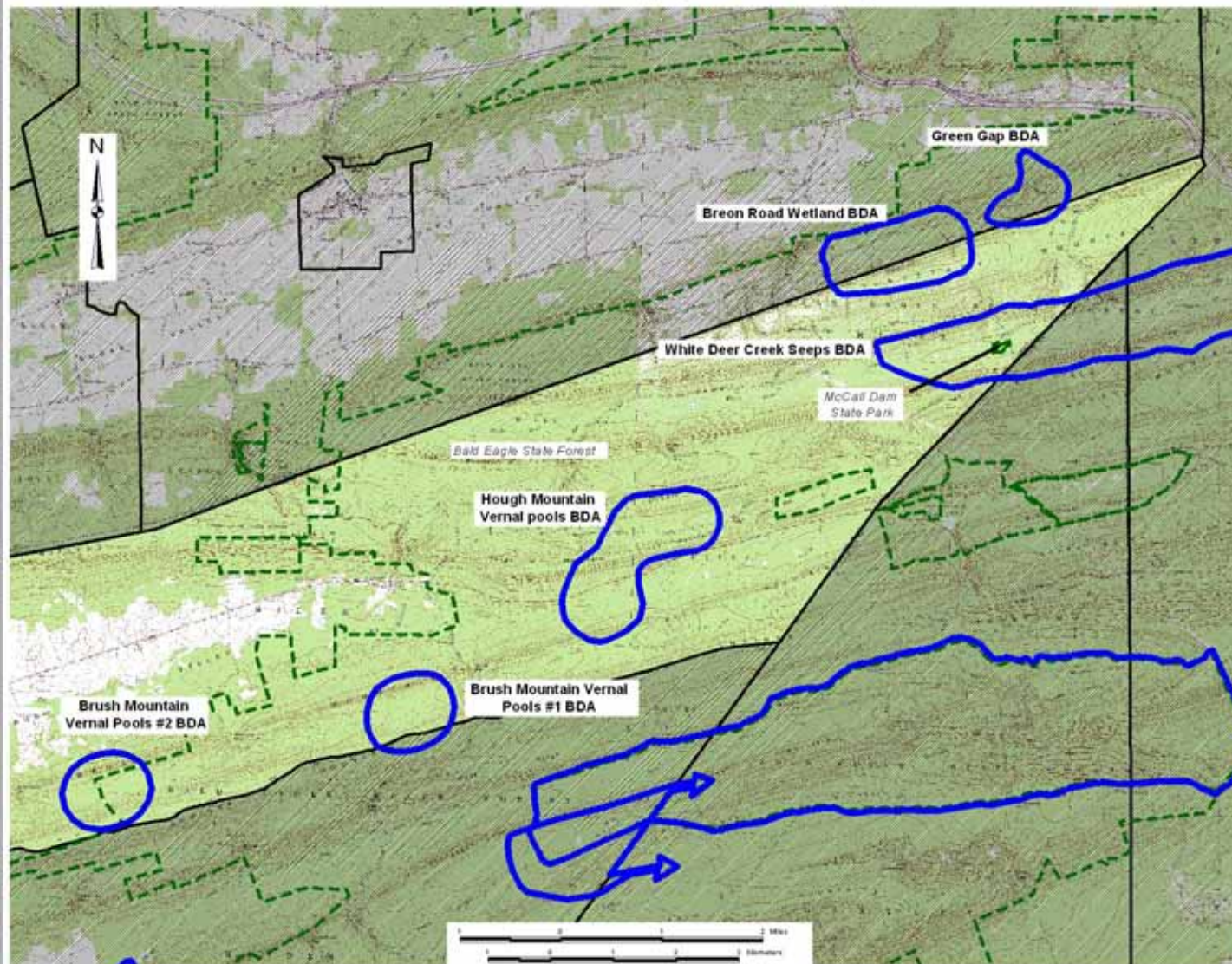
Landscape Conservation Areas:

None

Managed Areas:

Bald Eagle State Forest
 McCall Dam State Park
 State Game Lands #295

Miles Township (east view)



Miles Township (east view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Breon Road Wetland
Brush Mountain Vernal Pools #1
Brush Mountain Vernal Pools #2
Hough Mountain Vernal Pools
Green Gap
White Deer Creek Seeps

Landscape Conservation Areas:

None

Managed Lands:

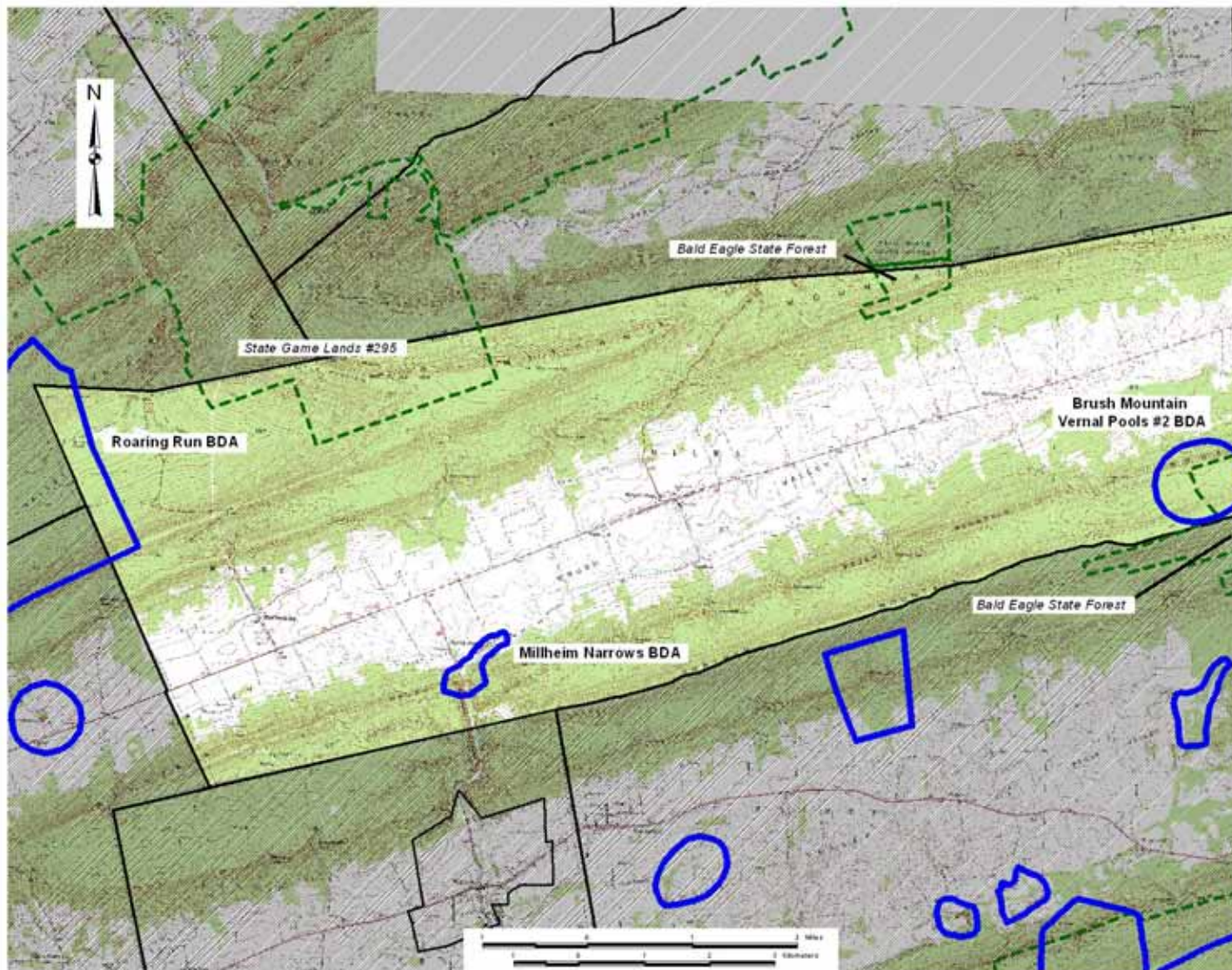
Bald Eagle State Forest
McColl Dam State Park



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

Miles Township (west view)



Miles Township (west view)

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Brush Mountain Vernal Pools #2
Millheim Narrows
Roaring Run

Landscape Conservation Areas:

None

Managed Lands:

Bald Eagle State Forest
State Game Lands #295



Map Legend

-  Biological Diversity Area (BDA)
-  Landscape Conservation Area (LCA)
-  Managed Area (MA)
-  Municipal Boundary
-  Audubon Society Important Bird Area (IBA)

MILES TOWNSHIP

Miles township includes the eastern segment of Brush Valley, and also the ridges to the north, south, and east of the valley. The valley is underlain by limestone, except at its edges, which are underlain by the Reedsville shale formation. The limestone results in mineral-rich soil with high pH. The central portion of the valley is mainly in agricultural use, and natural communities have been removed in most areas. Miles Township contains a large portion of Elk Creek, a major tributary to Penns Creek. As it flows west down Brush Valley, it is fed by seepage and the input of tributaries arising in the mountainous headwaters areas. Elk creek and those of its tributaries that flow through the limestone portions of the valley are rich in calcium and abundantly buffered against pH changes.

Breon Road Wetland BDA

This site falls across the border between Clinton and Centre County, and was documented during the Clinton County Natural Heritage Inventory in 1993. The following description is adopted from the Clinton CNHI report, with community classifications updated to follow the Fike 1999 system and formatting altered to reflect current conventions.

At the very southeastern end of Clinton County, Breon Road runs along the ridge between Eastville and Green Gaps. Just south of Breon Road on the flat area that separates the watersheds of the two gaps, lies a ribbon of wetlands that includes several vernal pool communities (listed as Fluctuating Natural Pools, NC001, in the Clinton CNHI report) and an extended section of dry oak – heath forest (listed as Acidic Broadleaf Swamp, NC002, in the Clinton CNHI report). The natural pools at the Eastville Gap end of the site are open, sparsely vegetated and during the spring of the surveys for this inventory, were dense with amphibian egg masses. The abundance of egg masses indicates that these pools are important breeding sites and consistently hold water, at least in the spring. The lack of vegetation this year was probably due to higher than normal water levels in the summer months. Contiguous with these pools and also included in the Breon Road Wetland BDA is a long band of saturated soils that in some places are densely covered with sphagnum moss (*Sphagnum spp.*). Open areas of sedge (*Carex sp.*), grass and scattered silky dogwood (*Cornus amomum*) grade into more closed canopy areas containing highbush blueberry (*Vaccinium corymbosum*), cinnamon fern (*Osmunda cinnamomea*) and rhododendron (*Rhododendron maximum*). The trees in this area include red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), white ash (*Fraxinus americana*), eastern hemlock (*Tsuga canadensis*), and yellow birch (*Betula alleghaniensis*). Eventually, the wetland constricts to a meandering channel flowing through a hemlock forest and forming the drainage into Green Gap.

Threats and Stresses

Generally, the Breon Road Wetland BDA has been recently undisturbed but some stumps indicate cutting in and around the wetland in the last 30-40 years. Some may have been related to road maintenance (Breon Road), some to stand improvement cuts, especially given that this site is within the Bald Eagle State Forest and is designated as commercial forest. Breon Road is

within the immediate watershed of the wetland and passes very close to the natural pools at the west end of the site. Channels plowed at angles to the road to provide drainage to the road may be impacting the pools by providing water they would not normally receive.

Recommendations

It is recommended that maintenance of the road be done keeping the possible impacts to the wetland in mind and that drainage cuts favor the opposite (north) side of the road. Those present near the pools should be moved to avoid feeding water directly toward the pools. No cutting should take place within the Breon Road Wetlands BDA, nor should spraying for gypsy moths.

Brush Mountain Vernal Pools #1 BDA

Brush Mountain Vernal Pools #2 BDA

Hough Mountain Vernal Pools BDA

These BDAs are all designated around areas where there are a series of vernal pools, some of which are inhabited by the northeastern bulrush, a Federally Endangered species. The vernal pools themselves also comprise ecologically significant communities.

The northeastern bulrush is a sedge species that is only known to inhabit the northeastern Appalachian mountains. Furthermore, the portion of the Appalachians occurring in Pennsylvania appears to be the global center of this species' range, as over half (62%) of all known locations fall within Pennsylvania, and more locations are currently known from Centre County than from any other county in Pennsylvania. Although not all potential habitat areas in Pennsylvania have yet been surveyed, the Centre County populations currently make up 15% of all known locations globally. The species is frequently associated with vernal pools, although in other parts of its range it is known from other types of habitat. The various habitats all appear to share the characteristic of seasonally fluctuating water levels. Within Pennsylvania very few occurrences are known from habitats other than vernal pools. In the eastern portion of the county, as is the case with this site, vernal pools frequently develop in broad, flat mountain saddles as accumulation points for surface water runoff.

A variety of animal species utilize vernal pools, and some species require these habitats for survival. Jefferson and Slimy salamanders breed exclusively in vernal pools, laying their eggs in the spring, then migrating outwards up to 500 m away from the pools to spend much of the rest of the year living in the surrounding forest. Invertebrate species such as fairy shrimp also depend upon vernal pools; the animal species composition is especially rich and unique because the absence of fish enables the survival of many smaller organisms which would otherwise be preyed upon by fish. While the habitat at these sites appears highly suitable for animal species typical of vernal pools, animal populations have not been surveyed, so no definitive information is available on species composition. The exact composition of plant communities is somewhat variable among the ponds; species that are often present include sharp-flowered manna grass (*Glyceria acutiflora*), woolgrass (*Scirpus cyperinus*), beggar-ticks (*Bidens* sp.), and fireweed (*Erechtites hieracifolia*).

The Brush Valley Pools #2 series of pools occurs in the most intact and remote landscape context of all the northeastern bulrush populations known in the county. The surrounding forest community is exceptionally mature and unfragmented. There are several large pools at this site; some are nearly bare, while others contain typical vernal pool vegetation, and some are inhabited by the northeastern bulrush.

The vernal wet area at the Brush Valley Pools #1 site is slightly different than the other wetlands in Centre County where the northeastern bulrush has been documented. Some of the pools are larger in area, more variable in composition, and have more shrub and tree cover than is typical of other sites. There are hemlocks and birches scattered throughout. While the wetland itself appears very intact, the surrounding forest is somewhat disturbed: it includes very young areas, clearings and several old roads.

Threats and stresses

Changes in hydrological pattern, light levels, and forest continuity would negatively impact the species and natural communities within this BDA. The vernal pools that are the significant features of this site are fed by surface runoff from the entire watershed area above them. Any activity resulting in earth disturbance would affect the current hydrological pattern at this site and potentially alter conditions within the vernal pools community. The northeastern bulrush appears to be very sensitive to alterations of the water regime in its habitat, although it is not known what conditions are optimal. The forest canopy should remain intact in the area immediately surrounding the ponds, because changes in light levels may also impact northeastern bulrush populations. Additionally, disruptions to the forest within 500 m of a pond may impact amphibian populations associated with the vernal pools. While amphibian surveys have not been conducted at this site, the habitat may be suitable and surveys should be conducted before any assumption is made that they are not present.

Recommendations

Activities that remove forest canopy or result in earth disturbance should be avoided within a 500 m buffer of the ponds, in order to avoid disrupting natural hydrological patterns in the ponds and to avoid impacts to potential amphibian populations. A fuller understanding of the animal species utilizing these vernal pools would be gained through invertebrate and amphibian surveys, and this knowledge would provide an important basis for site-specific conservation planning.

Green Gap BDA

Green gap drains a portion of the Breon Road BDA and channels water into Fishing Creek east of Eastville, PA. Dropping about 400 feet in elevation from 1700 to 1300 feet, Green Gap funnels cooling air from the ridge into the valley and remains relatively cool and moist throughout the year, in contrast to the dry ridges and slopes of Nittany Mountain. Rather than the dry forests of mixed oak and birch, the gap supports a forest of eastern hemlock and white pine (*Pinus strobus*). A good example of a hemlock - (white pine) terrestrial forest (listed as a Northern Conifer Forest Community NC002 following Smith 1991 in the Clinton County NHI) sits in the central part of the gap and extends along the stream. An understory of rhododendron

with scattered patches of wood aster (*Aster acuminatus*) and clearweed (*Pilea sp.*) grow near the stream, but in most places the understory is open and herbs are few under the shade of the conifers.

Threats and Stresses

This second growth forest is on its way toward maturity. A plantation of red pine (*Pinus resinosa*) exists below this site and an old logging road (now a foot trail) runs through the site. As part of commercial forest within the Bald Eagle State Forest, this site receives no special protection.

Recommendations

It is recommended that this area be removed from commercial forest designation and that timber sales not occur within the BDA.

Millheim Narrows BDA

This area contains two populations of Plant Species of Special Concern in Pennsylvania, the backwards sedge (*Carex retrorsa*), and the white water crowfoot (*Ranunculus aquatilis* var. *diffusus*). The backwards sedge population is small and occupies low moist areas, while the white water crowfoot is a semi-aquatic plant inhabiting the stream and its banks. The BDA includes the habitats for these species as well as a buffer area within which some activities may detrimentally impact the success of the populations. The surrounding landscape context is somewhat disturbed and the natural communities it hosts are generally either fragmented or composed mainly of disturbance tolerant species.

Threats and Stresses

The area within this BDA is inhabited and sees varying degrees disturbance from human activities. There are risks that some of these activities may impact individuals of the plants of special concern. The backwards sedge population is especially vulnerable because it is small and localized.

Recommendations

A good first step in working to safeguard these plants will be to inform landowners of occupied habitat or nearby areas of the plants' locations and significance.

Roaring Run BDA

Please see discussion of this BDA under Gregg Township.

White Deer Creek Seeps BDA

The significant features of this BDA are several seepage communities found along White Deer Creek. Two that have been documented are skunk cabbage – golden saxifrage forest seeps. One is mainly herbaceous, with strong perennial water flow and New York fern (*Thelypteris noveboracensis*), jewelweed (*Impatiens capensis*), fowl manna grass (*Glyceria melicaria*), and sedge species (*Carex spp.*) as dominant species. The other has a more diffuse and intermittent water flow, and more shrub cover by speckled alder (*Alnus incana*); herbaceous species here include sphagnum moss (*Sphagnum umbricatum*), soft rush (*Juncus effusus*), prickly bog sedge (*Carex atlantica*), and marsh fern (*Thelypteris palustris*). Other seepage communities occur scattered along the creek at similar positions in the landscape. The area within the BDA that is above the seepage communities is mainly forested; it includes the recharge zone for the groundwater aquifer that feeds the seeps (The Western PA Conservancy & The Nature Conservancy 1998).

Threats and Stresses

This BDA is within Bald Eagle State Forest, and faces few threats. If forest cover were removed extensively within this BDA, it might change rainfall runoff patterns and alter the amount of water percolating into the aquifer that feeds the seeps. Forest cover removal or other disturbance in close proximity to the seeps would change light availability and temperature conditions, which might impact their species composition.

Recommendations

Extensive forest cover removal should be avoided in the recharge zone to the seeps. Forest cover should also remain intact where seeps occur in the stream valley in order to preserve the natural environmental conditions under which these communities have developed.

PENN TOWNSHIP & MILLHEIM BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

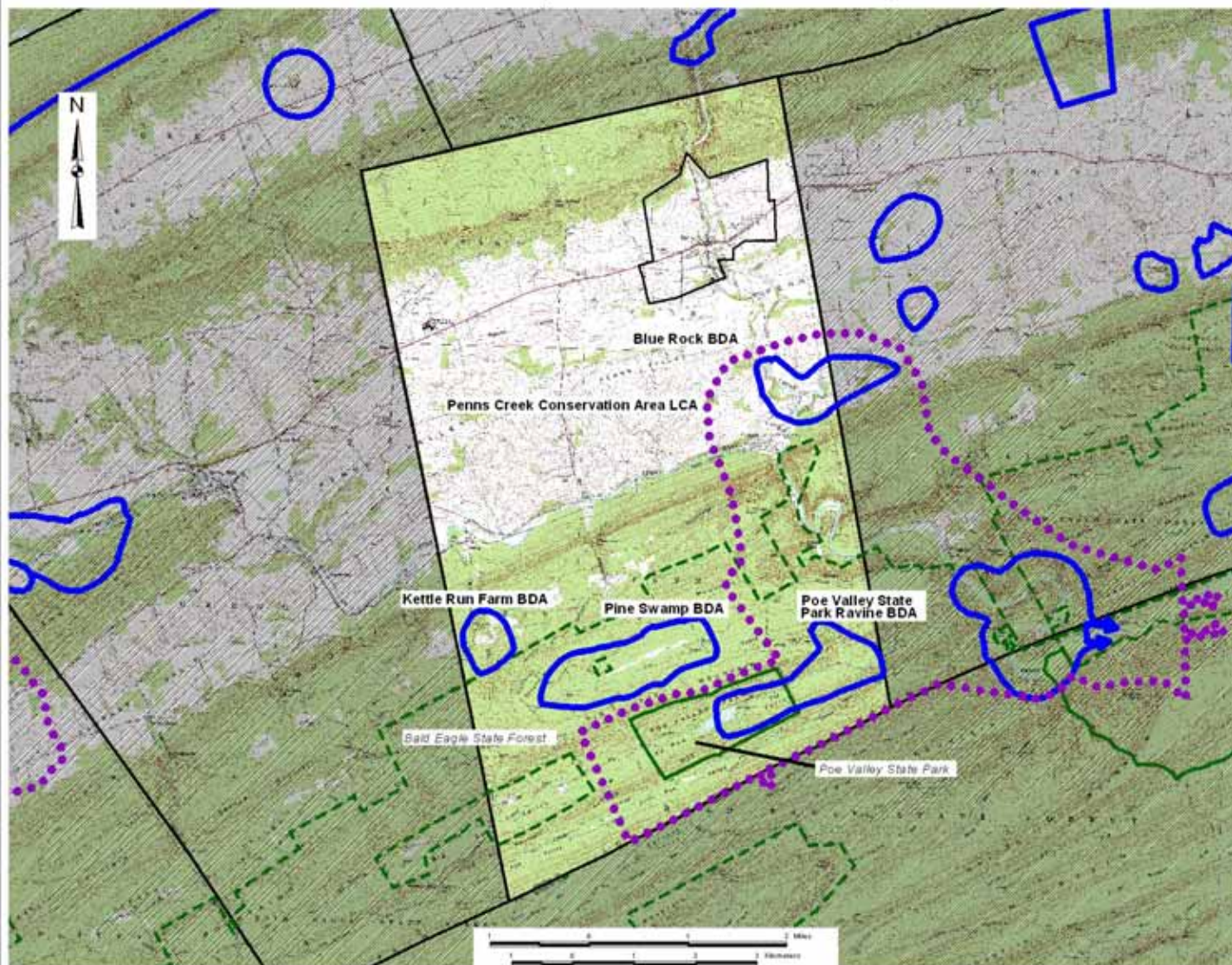
BLUE ROCK BDA	<i>Exceptional Significance</i>		
Backwards sedge (<i>Carex retrorsa</i>)	G5	S1	PE
KETTLE RUN FARM BDA	<i>Notable Significance</i>		
Lupine (<i>Lupinus perennis</i>)	G5	S3	PR
PINE SWAMP BDA	<i>County Significance</i>		
Hemlock palustrine forest community	S3		
POE VALLEY STATE PARK RAVINE BDA	<i>County Significance</i>		
PENNS CREEK CONSERVATION AREA LCA	<i>Notable Significance</i>		

OTHER CONSERVATION AREAS: *none*

MANAGED LANDS: *Bald Eagle State Forest*
Poe Valley State Park

GEOLOGIC FEATURES: *erosional remnant (Slide Mountain)*

Penn Township & Millheim Borough



Penn Township & Millheim Borough

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Blue Rock
Poe Valley State Park Ravine
Pine Swamp
Kettle Run Farm

Landscape Conservation Areas:

Penns Creek Conservation Area

Managed Areas:

Bald Eagle State Forest
Poe Valley State Park



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

PENN TOWNSHIP

The most northern portion and the southern half of the township are largely forested, mountainous topography defined by the sandstone ridges than run nearly east-west in this area. The center of the township includes a portion of Penns Valley. The valley is underlain by limestone geology, which has resulted in mineral-rich soil with high pH, and waterways that are also rich in calcium and abundantly buffered against pH changes. However, the valley is mainly used for agriculture, and most of the natural communities have been removed. Penns Creek flows east along the southern edge of the valley, and turns south through the Penns Creek gorge at the eastern edge of the township. The forested area surrounding the creek in this area is notable as the most intact landscape along Penns Creek within the county, and is recognized as the Penns Creek Conservation Area LCA. Other ecological features that are uniquely important in the county are the Pine Swamp wetland, the calcareous cliff communities near Blue Rock, and two populations of Plant Species of Special Concern in Pennsylvania. There is one significant geologic feature noted for the township, an erosional remnant rock outcropping on Slide Mountain.

Blue Rock BDA

Please see discussion of this BDA under Haines Township.

Kettle Run Farm BDA

Kettle Run Farm is a nature center and summer camp near the headwaters of Zerby Gap. It is an old farm with several old fields, plantations of white pine (*Pinus strobus*), and a hemlock (white pine) - northern hardwoods community in the ravine. In one of the successional fields there are lupine plants (*Lupinus perennis*) growing.

Threats and Stresses

This species prefers open, sandy soil, and if unmanaged, might be shaded out by advancing forest.

Recommendations

The population should be mapped and counted every few years to detect any changes in numbers or movement across the landscape. If declines in the population are noted, and are found to correspond to an increase in forest cover over time, the population may benefit from clearing woody growth in its vicinity.

Pine Swamp BDA

This BDA is designated around the 85 acre coniferous wetland community at the headwaters of Pine Swamp Run. The site is classified as county significant because while it is a very large wetland community, it has probably been cut and burned. The community is classified as a hemlock palustrine forest, a type which is often dominated by hemlocks but can also include

significant components of other native conifers, as is case here. Pine Swamp is surrounded by a nearly pure stand of even aged white pine (*Pinus strobus*). The basin of the wetland is shrubby with equal amounts of highbush blueberry (*Vaccinium corymbosum*), scrub oak (*Quercus ilicifolia*) and speckled alder (*Alnus rugosa*) scattered among low mounds of sedges (*Carex spp.*) and moss (*Sphagnum spp.*). Charred white pine stumps indicate that in the past this area was probably a white pine dominated community that was cut and then burned over. The site is included in the inventory because of its size and its recovery potential.

Threats and Stresses

There are few threats to this wetland, except perhaps timbering in the buffer zone. It is not visible from roads and has no obvious trail system in it. In the whole watershed area of this wetland, there are only three cabins, which means there is limited potential for pollutant release. The road closest to the wetland is buffered by a hundred feet of pine forest and normal maintenance should not affect the community unless it disturbs large areas upslope of the site.

Recommendations

Present management is effectively providing for the continued ecological integrity of the area and should continue.

Poe Valley State Park Ravine

The Poe Valley State Park Ravine is an area east of an artificial lake at the park. It is a flat ravine bottom and although it has experienced past disturbance, it contains a recovering hemlock – northern hardwoods terrestrial forest community. Though there are other sites in the county of comparable quality, this is one of the largest, nearly 100 acres, and on this basis is designated as a BDA. The community is hemlock (*Tsuga canadensis*) dominated, with mature beech (*Fagus grandifolia*), white pine (*Pinus strobus*) and northern red oak (*Quercus borealis*) included as well. It has few exotic species. Two cabin clearings that do not support the community are included within the site boundary.

Threats and Stresses

Threats to this community are few. It is partly located within a State Park boundary and the rest of it is directly adjacent to Poe Creek.

Recommendations

Forest canopy removal should be avoided in this area because mature examples of its type are uncommon. Purchase of the privately held lands within the BDA by the park would be a way to ensure consistent management and protection of the community.

Penns Creek Conservation Area LCA

Please see discussion of this LCA under Haines Township.

MILLHEIM BOROUGH

Millheim Borough is in Brush Valley where Elk Creek enters the valley from the Millheim Narrows. As the valley is underlain by limestone, the area likely once contained rich-soil forest type such as sugar maple - basswood, and also may have contained floodplain or streambank communities along Elk Creek. All of the land in the borough drains into Elk Creek. Today, the land is mainly residential and agricultural. No Natural Heritage Areas have been identified within Millheim Borough.

POTTER TOWNSHIP & CENTRE HALL BOROUGH

<u>PNDI Rank</u>		<u>Legal Status</u>	
Global	State	Fed.	State

NATURAL HERITAGE AREAS:

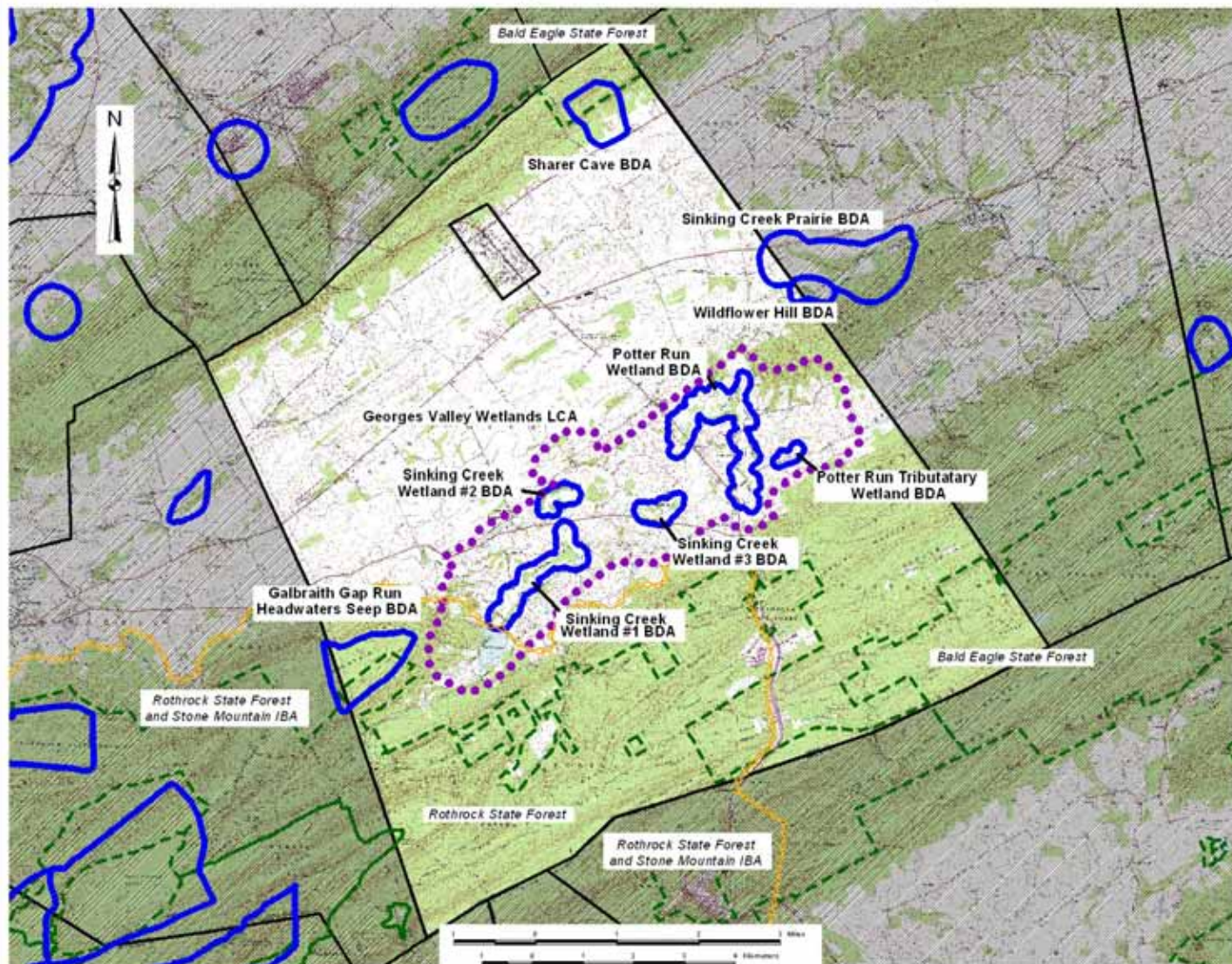
GEORGES VALLEY WETLANDS LCA	County Significance		
POTTER RUN WETLAND BDA	County Significance		
POTTER RUN TRIBUTARY WETLAND BDA	County Significance		
SHARER CAVE BDA	Exceptional Significance		
Eastern small-footed bat (<i>Myotis leibii</i>)	G3	S1	PT
Northern long-eared bat (<i>Myotis septentrionalis</i>)	G4	S3	CR
SINKING CREEK WETLAND #1 BDA	County Significance		
SINKING CREEK WETLAND #2 BDA	County Significance		
SINKING CREEK WETLAND #2 BDA	County Significance		
GALBRAITH GAP RUN HEADWATERS SEEP BDA	Notable Significance		

OTHER CONSERVATION AREAS: Rothrock State Forest and Stone Mountain Important Bird Area

MANAGED LANDS: Bald Eagle State Forest
Rothrock State Forest

GEOLOGIC FEATURES: none

Potter Township & Centre Hall Borough



Potter Township & Centre Hall Borough

Centre County Natural Heritage Inventory

Biological Diversity Areas:

Galbraith Gap Run Headwaters Seep
Potter Run Tributary Wetland
Potter Run Wetland
Sharer Cave
Sinking Creek Prairie
Sinking Creek Wetland #1
Sinking Creek Wetland #2
Sinking Creek Wetland #3
Wildflower Hill

Landscape Conservation Areas:

Georges Valley Wetlands

Managed Areas:

Bald Eagle State Forest
Rothrock State Forest



Map Legend

- Biological Diversity Area (BDA)
- Landscape Conservation Area (LCA)
- Managed Area (MA)
- Municipal Boundary
- Audubon Society Important Bird Area (IBA)

POTTER TOWNSHIP

Thickhead Mountain and First Mountain, part of the Tussey Ridge formation, occupy the southern third of the township. This area is mostly forested, and much of it forms part of Rothrock State Forest. Part of the forested area is included in the Rothrock State Forest and Stone Mountain Important Bird Area (IBA), a designation by the PA Audubon Society to recognize the value of this habitat for bird biodiversity in the state and region (pg. 37 provides further description of this IBA). The Georges and Penns Valleys occupy the upper two-thirds of the township areas; while these areas are primarily in agricultural and residential use, the landscape does have habitat value for a wide variety of species, some of which utilize agricultural settings and some of which depend upon the remnant natural areas present in the valley.

Galbraith Gap Headwaters Seep BDA

This area is designated around the watershed of an extensive forested wetland community high on the slope of Tussey Mountain. Two of the bedrock components of Tussey Mountain are the Juniata sandstone formation and the Reedsville shale formation. As the sandstone layer is highly porous, water drains through this layer readily. The shale layer beneath it is much less porous, and water draining through the sandstone accumulates just above the shale layer, to flow along this layer until it reaches the surface along the slope of the mountain. At the intersection of these two geologic layers along the surface of the mountain, seepages and springs occur. This wetland arises because of an extensive grouping of seeps and springs.

The surrounding forest is mainly chestnut oak (*Quercus montana*) that has suffered fairly heavy mortality due to gypsy moths, with an understory of dense huckleberry (*Gaylussacia baccata*). In the seepage area, tussocks of cinnamon fern or interrupted fern (*Osmunda* sp.) are the most common component of the herbaceous layer, and black gum (*Nyssa sylvatica*) dominates the tree canopy; other tree species are smooth shadbush (*Amelanchier laevis*), yellow birch (*Betula allegheniensis*), white pine (*Pinus strobus*), hemlock (*Tsuga canadensis*), and red maple (*Acer rubrum*). In occasional wetter, more open patches the vegetation was more diverse, including sphagnum moss, screwstem (*Bartonia virginica*), spikerushes (*Eleocharis* sp.), rushes (*Juncus* sp.), goldthread (*Coptis trifolia*), other sedges (*Carex folliculata*, *Carex trisperma*, *Scirpus cyperinus*), and green wood orchids (*Platanthera clavellata*). The degree of saturation of these wetlands varies, with some years of extensive standing water earning the area the local name of “the lake.” Other species groups, such as insects and amphibians, have not been assessed at this area.

Threats and Stresses

Canopy removal would alter the character of this wetland, whose species composition is currently heavily influenced by the high degree of shading it experiences. Physical disturbance of the soil would damage the community and the substrate that supports it.

Recommendations

Canopy removal should not be undertaken extensively in the wetland area, and care should be taken not to damage the wetland vegetation and soils. Further assessments are recommended to document amphibian and insect diversity in this community. Pesticide spraying in the area should be avoided because of its potential to harm these sensitive species groups.

Sharer Cave BDA

At the base of Nittany Mountain east of Centre Hall Borough is a highly significant site, Sharer Cave. This small cavern is the entry point for a creek coming off the mountain and supports a large solutional cave terrestrial community. Pennsylvania Game Commission surveys found two bat species of special concern—the eastern small-footed bat and the northern long-eared bat—using this cave as winter hibernation grounds in 1987 and 1988.

The eastern small-footed bat has a fairly wide range in eastern North America, but populations appear to be scattered and small throughout its range. Unlike bat species that form large hibernation colonies, this species usually hibernates alone or in very small groups. Because of the low number of individuals documented (3,000 in total) in fairly extensive survey work, the species is considered to be at risk globally. Although historical records for this species are scarce, its habits and current data suggest that it may always have been relatively rare. In Pennsylvania, historical survey data is available, and comparison to more recent data suggests a population decline occurred in Pennsylvania during the last century. Little is known about its habits or its requirements for food and summer habitat, except that it may be dependent on forests (NatureServe 2002).

The northern long-eared bat is also considered a species of special concern because a relatively low number of individuals have been documented, although it is not as rare as the eastern small-footed bat. It hibernates in relatively small groups compared to other bat species and thus is more difficult to locate than more colonial species.

The site is partially protected by its location on private land; access is controlled by the regional caving club, Nittany Grotto, and the owners.

Threats and Stresses

Bat populations in the cave, including the species of special concern, will be negatively impacted by disturbance in the cave during the winter months. Even small amounts of light, noise, or heat will be enough to bring the animals out of hibernation. Any physical alteration to the cave entrance or the rock surrounding the cave could alter the patterns of air and water flow that currently create a suitable microclimate for the species, and render the habitat unusable. The frequency of visitors to the cave is not known, but the cave does not show wear from recreational activities. Access to the cave by cave dwelling animals has not been restricted. As the cave entrance and several sinkholes that may input to the cave are in a cattle pasture, organic waste and sediments from the fields above can wash directly into the cave. There is some evidence that this has begun to occur. Excessive sediment accumulation could potentially be detrimental to the

habitat quality of the cave for the special animals. This is a very extensive system and it is possible it may intersect with subterranean aquifers, in which case any pollutants entering the cave could threaten groundwater quality.

Recommendations

It is recommended that the cave be left undisturbed during the months of November through March. If human traffic is a problem, the installation of a special bat gate can be a deterrent. However, the gate must be carefully installed or it may render the cave unusable by bats. More information on bat gate installation can be found through the Pennsylvania Game Commission. Because of the possibility of this cave's connection to groundwater, care should be taken to avoid pollutants entering the cave. Blasting and other activities disruptive to bedrock should be avoided within this BDA.

Georges Valley Wetlands LCA

The Georges Valley Wetlands LCA was designated around a landscape which contains an unusually high concentration of wetlands for Centre County. It includes these wetlands, and also those lands upon which the wetlands are hydrologically dependent. Although not all of the wetlands currently contain natural communities, the landscape is a significant ecological resource for Centre County because of the prevalence of wetland hydrological conditions, without which natural wetland communities cannot develop.

In most of the Georges Valley, the surface geology contains a layer of Reedsville Shale. This geologic condition is the reason for the area's unusual concentration of wetlands. The low permeability of the shale layer causes water to accumulate in the bedrock and soil layers above the shale, and in many low areas, the accumulation is sufficient to waterlog soil to the surface during at least part of the year. Human inhabitation has resulted in variously extensive alteration to the natural condition throughout the land in the valley, ranging from selective timber removal to agricultural cultivation and residential development. However, the seasonally wet areas within the valley likely all supported natural wetland communities in the past; in some areas that have been minimally disturbed or allowed to regenerate in recent years, natural communities are currently present or redeveloping. The presence of wetland hydrology confers a potential for these areas to support natural wetland communities in the future.

In the past, these seasonally wet areas likely supported natural wetland communities. However, human inhabitation has resulted in variously extensive alteration to the natural condition throughout the land in the valley, ranging from selective timber removal to agricultural cultivation and residential development. In areas that have not been recently maintained, natural vegetation has regrown. The largest and most natural of these areas, which occur along Sinking Creek and Potter Run, have been designated as Biological Diversity Areas to recognize their especial significance to the ecological integrity of the area. However, other areas which are more disturbed but not completely altered also have ecological significance. Any land in the immediate watershed of a wetland is likely to be hydrologically contiguous with the wetland, meaning that water drains through the surrounding land into the wetland. Also, areas which are perennially wet and support some native vegetation provide habitat for a range of animal species, including insects, amphibians, reptiles and mammals. The concentration of wetlands in this

valley is important because it may provide enough habitat in close proximity to enable contiguous populations across the general landscape.

Threats and Stresses

Further disturbance to wetland areas may limit the ability of these areas to serve as habitat for the variety of plant and animal species currently present. Disturbances to vegetation will inhibit regeneration into high-quality natural communities, while earth-moving disturbances may additionally impact water quality and hydrological flow at the areas. Invasive exotic plants species are also very prevalent at many sites. These include multiflora rose (*Rosa multiflora*), autumn olive (*Elaeagnus umbellata*), Russian olive (*Elaeagnus angustifolia*), teasel (*Dipsacus sylvestris*), purple loosestrife (*Lythrum salicaria*), and Japanese barberry (*Berberis thunbergii*). These species crowd out native species and prevent the establishment of a full complement of native plant and animal diversity.

Furthermore, the significance of impacts to any particular wetland area extends beyond that area. A patch of forest or wetland area that is isolated among agricultural or urban land is significantly more vulnerable to losing native species than is a patch that has natural communities adjacent to it. The wetlands and forest patches remaining in the valley serve as a reservoir of natural diversity for regeneration in other areas, and the decline of these communities or loss of native biodiversity within them will impair the potential for natural regeneration throughout the valley.

Recommendations

Further disturbance to wetland areas and their immediate buffer areas should be minimized. Consideration of the extent of these ecologically sensitive areas during planning of land usage or development projects can minimize impacts upon these areas. If future developments are planned, stormwater management, landscaping, and other earthmoving activities should be carefully designed to avoid altering wetland hydrology or impacting the natural areas themselves. There are also many areas in the valley which could serve as good locations for wetland restoration projects, as they are hydrologically suitable but currently not in natural condition due to recent utilization. The ecological value of these areas could be enhanced through efforts to restore a complement of native plant species that typically occur in natural communities in similar physical conditions. A good objective for large-scale planning efforts in the area would be the development of a naturally vegetated riparian corridor along Sinking Creek and its tributaries. Such a corridor will help protect water quality and the health of aquatic natural resources, and generally enhance the potential for these natural communities to mature and continue to sustain native biodiversity in the future due to increased habitat contiguity.

Potter Run Wetland

This area contains several wetland communities along Potter Run, as well as surrounding areas that are likely to be hydrologically contiguous with the wetlands and the stream. Although many portions of the stream corridor today have been cleared, the flat topography and the underlying Reedsville shale geology suggest it once supported wetland communities along a broad extent of Potter Run. Today, the regrowth of wetland plants in patches left unmown confirms that many

areas still experience wetland hydrological conditions and might be capable of supporting wetland communities in the future.

The wetland communities that have developed today include a mosaic of forested, shrub, and herbaceous types. Generally, where communities have been left to mature a diverse open-canopy forest has developed with black walnut (*Juglans nigra*), American elm (*Ulmus americana*), hackberry (*Celtis occidentalis*), green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), smooth shadbush (*Amelanchier laevis*), and black cherry (*Prunus serotina*). Dogwood (*Cornus sp.*), witch hazel (*Hamamelis virginiana*), alder (*Alnus sp.*), and the invasive non-native species bush honeysuckle (*Lonicera sp.*) and multiflora rose (*Rosa multiflora*) form the shrub cover. This community most closely matches the red maple – elm – willow type. Prevalent herbaceous species are goldenrod (*Solidago sp.*), and the invasive exotic species reed canarygrass (*Phalaris arundinacea*).

Along Potter Run on either side of Old Fort Road are wetland areas that have some woody cover and also include substantial herbaceous-dominated portions. Cattail (*Typha latifolia*) is a dominant in some portions, forming a cattail marsh community. The exotic invasive species purple loosestrife (*Lythrum salicaria*) is very prevalent, especially on the west side of the road.

Threats and Stresses

Purple loosestrife has formed a large enough population here to represent a substantial threat to native species. Other threats are road runoff in areas where the wetlands are very near to roads, and runoff of nutrients and pesticides from adjacent agricultural areas. Excessive nutrient enrichment may substantially alter the plant and animal species composition of wetlands, while road runoff and pesticides can be toxic to a variety of species, especially insects and amphibians.

Recommendations

The health of these streams and wetland communities can be best safeguarded by careful attention by surrounding landowners to prevent pollutants from entering rainwater runoff. Excessive fertilizer application and pesticides generally present the largest problems, which can be reduced by limiting application of fertilizer to amounts that can be absorbed during the growing season, and utilizing pest management strategies that do not rely on compounds of high toxicity. These wetlands might also benefit from a program to control purple loosestrife; please see appendix I for sources that can be consulted for further information about control options.

Potter Run Tributary Wetland

This is a wetland area along a tributary to Potter Run that contains a young forest wetland community type. Species composition is similar to that described for Potter Run Wetlands. Invasive species are very prevalent in the shrub layer here.

Threats and Stresses

Threats are similar to those described for the Potter Run Wetland BDA, although purple loosestrife is not as prevalent here.

Recommendations

These areas may benefit from programs to control the exotic invasive species that are very prevalent; sources for further information are listed in appendix I. Additionally, the recommendations given in the Potter Run Wetlands regarding runoff and surrounding lands are applicable here too.

Sinking Creek Wetland #1

This area is a riparian corridor along Sinking Creek which contains many wetlands. The area delineated includes the wetland areas as well as immediately adjacent lands which are likely to be hydrologically contiguous with the wetlands. The significance of this site arises from the presence of natural communities that are relatively intact in comparison to other wetland areas within the Georges Valley LCA, and also from the contiguity of the naturally vegetated areas along Sinking Creek. Immediately downstream of Colyer Lake and also near the confluence of Boal Gap Run and Sinking creek are two areas of hemlock forest, which are the most intact natural communities of the area. They contain native plant species typical of this community, including Canada mayflower (*Maianthemum canadense*) and partridgeberry (*Mitchella repens*) and are minimally invaded by exotic species. Some portions of these forests are palustrine, due to the influence of seepage, and these areas contain plant species such as marsh marigold (*Caltha palustris*), jewelweed (*Impatiens capensis*), jack-in-the-pulpit (*Arisaema triphyllum*). The intervening area immediately along the creek has broadleaf forest; although native plant species typical of riparian areas are still present, invasive exotic species including multiflora rose and Japanese barberry have become very prevalent. Above the forested area there are extensive and somewhat variable wet meadows with graminoid vegetation including a variety of native and exotic species. The plant communities of these areas are not highly unique, but the areas do provide habitat and food for a variety of wetland-dependent animal species.

Threats and Stresses

Invasive exotic species currently form a large portion of the vegetation at this site. Their presence crowds out native plant species, and may also affect the quality of the habitat for some animal species. In forested areas multiflora rose and Japanese barberry are the worst threats, while reed canarygrass (*Phalaris arundinacea*) forms dense stands in some portions of the wet meadows, excluding almost all other species where it occurs. Cattle grazing may prevent regeneration of woody species.

Recommendations

The ecological value of these wetlands depends upon the condition of hydrologically contiguous areas. Land uses that disturb the current hydrology in these areas or result in sediment input will be detrimental. The potential for future development of this site into a high quality natural community may be enhanced if land in a contiguous corridor along the creek is allowed to revegetate naturally, and also by efforts to reduce the dominance of invasive exotic species. In areas where the establishment of a forested corridor is desirable, cattle grazing should be avoided.

Sinking Creek Wetland #2

Some of this area was previously designated as the “Tusseyville/Sinking Creek Hillside” in the 1991 CNHI report due to the presence of an exceptionally mature and intact forest community on the slope above the north bank of Sinking Creek. Due to timber removal in this area, this forest is no longer an especially significant example of its type. The area still has some ecological significance, however, because the remnants of this community and the adjacent forest on the opposite bank of Sinking Creek together form a forested area that is relatively large and intact within the Georges Valley LCA.

The forest is of the sugar maple - basswood type, and along the south bank of Sinking Creek portions of the forest are riparian wetlands. Canopy species include sugar maple, basswood, ash, walnut, and American elm, shrub species include spicebush (*Lindera benzoin*), elderberry (*Sambucus canadensis*), and the invasive exotic species Japanese barberry (*Berberis thunbergii*), and herbaceous species were a fairly diverse assemblage including jewelweed (*Impatiens capensis*), sedges (*Carex spp.*), turtlehead (*Chelone glabra*), Silvery glade fern (*Athyrium filix-femina*), whorled wood aster (*Aster divaricatus*), and sensitive fern (*Onoclea sensibilis*). Although somewhat disturbed in places, the natural community is generally contiguous, has fairly low cover by exotic invasive species, and supports a fairly diverse native plant community. These conditions are unusual among the natural communities of the Georges Valley LCA, and its relative integrity suggests this area may be an important source of plant and animal species for developing natural communities in other portions of the Georges Valley.

Threats and Stresses

Further loss of the tree canopy or other land use changes reducing forest cover would be detrimental to this community, and reduce its ecological value as uniquely intact habitat within the valley. Exotic species, some of which are often invasive, were observed growing at this site. Garlic mustard (*Alliaria petiolata*) was fairly prevalent in the herbaceous layer and may pose a threat to native herbaceous species. The invasive shrubs multiflora rose and Japanese barberry were present but not dominant; further disturbance or removal of canopy may favor the spread of these species.

Recommendations

The site should be monitored periodically to determine whether the invasive exotic species present are spreading. Further canopy removal should be avoided, as increased light levels or decreased competition from other woody plants might spur the growth of these species.

Sinking Creek Wetland #3

This area was designated to recognize the naturally vegetated areas in the Sinking Creek floodplain on either side of Red Mill road. While the Sinking Creek floodplain is rather broad through much of this portion of the valley, in many areas the land is cleared to the creek bank. These areas contain a floodplain forest-shrub type community with a diverse hardwood canopy that includes willow (*Salix alba*), black walnut (*Juglans nigra*), hickory (*Carya sp.*), hackberry

(*Celtis occidentalis*), swamp white oak (*Quercus bicolor*), American basswood (*Tilia americana*), box elder (*Acer negundo*), and American elm (*Ulmus americana*). Invasive shrub species are very prevalent.

Threats and Stresses

Invasive exotic plant species are very prevalent at this site; they have almost certainly reduced populations of native species, and may threaten the ability of some native species to persist.

CENTRE HALL BOROUGH

Centre Hall Borough is in the Penns Valley and underlain by limestone bedrock. Previous to extensive settlement, it likely contained a rich-soil forest type such as a sugar-maple basswood community. Today most of the land is in residential land use. It is in the Sinking Creek watershed. No Natural Heritage Areas have been identified in Centre Hall Borough.

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APPENDIX I: INVASIVE SPECIES INFORMATION SOURCES

Mid-Atlantic Exotic Plant Pest Council (MA-EPPC)

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

www.ma-eppc.org

Several excellent webpages exist to provide information about invasive exotic species.

The following sources provide individual species profiles for the most troublesome invaders, with information such as the species' country of origin, ecological impact, geographic distribution, as well as an evaluation of possible control techniques.

The Nature Conservancy's Weeds on the Web at

<http://tncweeds.ucdavis.edu/>

The Virginia Natural Heritage Program's invasive plant page at

<http://www.dcr.state.va.us/dnh/invinfo.htm>

The Missouri Department of Conservation's Missouri Vegetation Management Manual at

<http://www.conservation.state.mo.us/nathis/exotic/vegman/>

The following site is a national invasive species information clearinghouse listing numerous other resources on a variety of related topics

<http://www.invasivespecies.gov/>

APPENDIX II: PENNSYLVANIA NATURAL DIVERSITY INVENTORY (PNDI)

PENNSYLVANIA NATURAL DIVERSITY INVENTORY (PNDI)

The Pennsylvania Natural Diversity Inventory (PNDI) Program was established in 1982 as a joint effort of the Western Pennsylvania Conservancy, the Pennsylvania Department of Conservation and Natural Resources, formerly the Pennsylvania Department of Environmental Resources (D.E.R.), Bureau of Forestry, and the Pennsylvania Science Office of The Nature Conservancy. PNDI is part of a network of "Natural Heritage Programs" that utilize methodology developed and constantly refined by The Nature Conservancy. Heritage Programs are established in each of the 50 United States, as well as in Canada and Latin America.

PNDI collects and stores locational and baseline ecological information about rare plants, rare animals, unique plant communities, significant habitats and geologic features in Pennsylvania. Presently, the PNDI database is Pennsylvania's chief storehouse of such information with approximately 9,000 detailed occurrence records that are stored as computer files. Additional data are stored in extensive manual files covering over 150 natural community types, over 800 plant and animal species, and about 1100 managed areas.

As part of the information maintained by PNDI, a system of "global ranks" and "state ranks" is used to describe the relative degree of rarity for species and natural communities. This system is especially useful in understanding how imperiled a resource is throughout its range, as well as understanding the state rarity for resources that do not have official state status such as invertebrate animals and natural communities of organisms. A summary of global and state ranks can be found in Appendix V.

PNDI is valuable for its ability to supply technically sound data that can be applied in making natural resource decisions, thereby streamlining the decision making process. Information on the occurrences of elements (species and natural communities) of special concern gathered from museums, universities, colleges, and recent fieldwork by professionals throughout the state is used by Western Pennsylvania Conservancy to identify the areas of highest natural integrity and significance in Lawrence County.

APPENDIX III

CENTRE COUNTY NATURAL HERITAGE INVENTORY SITE SURVEY FORM

Site Name:

County: _____ Municipality:

Quad Name: _____ Quad Code: _____ 10,10: _____

Reference:

Land Owners (include best method of contact, date contacted, and method of permission):

Directions to Site:

Site Elevation: _____ Site Size: _____ Aspect: _____

Aerial Photo Int. Air Photo #: _____ Photo Type: _____

Comments from Aerial Photo Interpretation:

Aerial Reconnaissance Date: _____ Team: _____

Comments from Aerial Survey:

Ground Survey Date: _____ Team: _____

Community(s) Type:

Setting of Community(s):

Conditions:

Description of site (quality, vegetation, significant species, aquatic features, notable landforms, natural hazards, age, etc.):

APPENDIX III (CONT.)

Evidence of Disturbance (logging, grazing, mining, past agriculture, erosion, sedimentation, filling, draining, exotic flora, etc.):

Recovery Potential:

Surrounding Land Use:

Threats to Site and Management/Protection:

Previously Identified EO's:

Species:

Accepted for inclusion in report: _____ Rejected: _____ Date: _____
Reason: _____

APPENDIX IV

CLASSIFICATION OF NATURAL COMMUNITIES IN PENNSYLVANIA

CNHIs and the status of natural community classification in Pennsylvania:

Terrestrial & Palustrine Plant Communities of Pennsylvania (Fike 1999) is the most current community classification system for Pennsylvania's palustrine and terrestrial plant communities. This report was developed by the Pennsylvania Natural Diversity Inventory (PNDI) to update and refine Smith's 1991 report Classification of natural communities in Pennsylvania (draft), the first effort dedicated specifically to the classification of natural communities in Pennsylvania. Work is ongoing to improve the current classification system. Future editions may define new community types or alter currently defined types. Aquatic communities (lakes, streams, and rivers), communities where vegetation is absent or not a definitive characteristic (caves, scree slopes), and communities resulting from extensive human disturbance (early stages of forest regrowth, old agricultural fields, manmade wetlands, etc.), are not addressed in this classification. Until more extensive classification work can be completed to define these types of communities and incorporate them into a single state-wide framework, the County Natural Heritage Inventory reports will provisionally refer to features of ecological interest that fall outside the Fike 1999 system using categories described in Smith 1991.

Community Ranks

As with species that are of concern, ranks have been assigned to rate the rarity of each natural community type identified for Pennsylvania. Appendices Vc and Vd list criteria for global and state ranks. In most cases, the global extent of these communities has yet to be fully evaluated, and no global rarity rank has been assigned. Work is ongoing to refine these ranks and to further develop the ranking system to rate the relative quality of communities within a type.

FIKE 1999 TYPES

COMMUNITY NAME	GLOBAL RANK	STATE RANK
<u>TERRESTRIAL FORESTS</u>		
Hemlock (white pine) forest	G5	S4
Serpentine pitch pine – oak forest	G2	S1
Serpentine Virginia pine – oak forest	G2	S1
Pitch Pine – mixed oak forest	G?	S4
Virginia pine – mixed hardwood forest	G?	S5
Dry white pine (hemlock) – oak forest	G?	S4
Hemlock (white pine) – northern hardwood forest	G?	S5
Hemlock (white pine) – red oak – mixed hardwood forest	G?	S4

APPENDIX IV (CONT.)

COMMUNITY NAME	GLOBAL RANK	STATE RANK
Hemlock – tuliptree – birch forest	G?	S4
Rich hemlock – mesic hardwoods forest	G?	S2S3
Dry oak –heath forest	G?	S4S5
Dry oak – mixed hardwood forest	G?	S3
Red oak – mixed hardwood forest	G?	S5
Northern hardwood forest	G?	S4
Black cherry – northern hardwood forest	G?	S4
Tuliptree – beech – maple forest	G?	S4
Sugar maple – basswood forest	G?	S4
Mixed mesophytic forest	G?	S1S2
Sweet gum – oak coastal plain forest	G?	S1
Red maple (terrestrial) forest	G?	S5
Black-gum ridgetop forest	G?	S3
Aspen/gray (paper) birch forest	G?	S?
Black locust forest	G?	SW

PALUSTRINE FORESTS

Black Spruce- tamarack peatland forest	G?	S3
Red Spruce palustrine forest	G?	S3
Hemlock palustrine forest	G5	S3
Hemlock – mixed hardwood palustrine forest	G?	S3S4
Red spruce – mixed hardwood palustrine forest	G?	S3
Bottomland oak – hardwood palustrine forest	G5	S2
Red maple – black-gum palustrine forest	G5	S3S4
Red maple – black ash palustrine forest	G?	S2S3
Red maple – magnolia Coastal Plain palustrine forest	G?	S1
Great Lakes Region lakeplain palustrine forest	G?	S1
Sycamore – (river birch)- box elder floodplain forest	G?	S3
Silver maple floodplain forest	G?	S3
Red maple – elm – willow floodplain swamp	G?	S2

TERRESTRIAL WOODLANDS

Pitch pine – heath woodland	G4	S2
Pitch pine – scrub oak woodland	G4	S2
Red spruce rocky summit	G?	S1
Pitch pine – rhodora – scrub oak woodland	G?	S1
Pitch pine – mixed hardwood woodland	G4	S2S3
Virginia pine – mixed hardwood shale woodland	G?	S2
Red-cedar – mixed hardwood rich shale woodland	G?	S1S2

APPENDIX IV (CONT.)

COMMUNITY NAME	GLOBAL RANK	STATE RANK
Dry oak – heath woodland	G4	S3
Birch (black-gum) rocky slope woodland	G?	S2
Yellow oak – redbud woodland	G?	S2
Great Lakes Region scarp woodland	G?	S1S2
Great Lakes Region bayberry – cottonwood community	G?	S1
<u>PALUSTRINE WOODLANDS</u>		
Pitch pine – leatherleaf woodland	G?	S2
Black spruce – tamarack palustrine woodland	G?	S2
Red spruce palustrine woodland	G?	S2S3
Red maple – highbush blueberry palustrine woodland	G5	S4
Red maple – sedge palustrine woodland	G5	S4
Red maple – mixed shrub palustrine woodland	G?	S4
<u>TERRESTRIAL SHRUBLANDS</u>		
Red-cedar – prickly pear shale shrubland	G?	S2
Red-cedar – pine serpentine shrubland	G2	S1
Red-cedar – redbud shrubland	G?	S2
Low heath shrubland	G4	S1
Low heath – mountain ash shrubland	G?	S2
Scrub oak shrubland	G4	S3
Rhodora – mixed heath – scrub oak shrubland	G?	S1
<u>PALUSTRINE SHRUBLANDS</u>		
Buttonbush wetland	G?	S4
Alder – ninebark wetland	G?	S3
Alder – sphagnum wetland	G5	S4
Highbush blueberry – meadow-sweet wetland	G5	S5
Highbush blueberry – sphagnum wetland	G?	S5
Leatherleaf – sedge wetland	G?	S3
Leatherleaf – bog rosemary	G?	S2
Leatherleaf – cranberry peatland	G?	S2S3
Water-willow (<i>Decodon verticillatus</i>) shrub wetland	G?	S3
River birch – sycamore floodplain scrub	G?	S4
Poison sumac – red-cedar – bayberry fen	G2	S1
Buckthorn – sedge (<i>Carex interior</i>) – golden ragwort fen	G2G3	S1
Great Lakes Region scarp seep	G?	S1
Great Lakes Region bayberry – mixed shrub palustrine shrubland	G?	S1

APPENDIX IV (CONT.)

COMMUNITY NAME	GLOBAL RANK	STATE RANK
<u>TERRESTRIAL HERBACEOUS OPENINGS</u>		
Side-oats gramma calcareous grassland	G2	S1
Calcareous opening/cliff	G?	S2
Serpentine grassland	G?	S1
Serpentine gravel forb community	G?	S1
Great Lakes Region dry sandplain	G?	S1
<u>HERBACEOUS WETLANDS</u>		
Bluejoint – reed canary grass marsh	G?	S5
Cat-tail marsh	G?	S5
Tussock sedge marsh	G?	S3
Mixed forb marsh	G3G4	S3
Herbaceous vernal pond	G?	S3S4
Wet meadow	G?	S5
Bulrush marsh	G?	S3
Great Lakes Region palustrine sandplain	G?	S1
Prairie sedge – spotted joe – pye – weed marsh	G?	S1S2
Open sedge (<i>Carex stricta</i> , <i>C. prairea</i> , <i>C. lacustris</i>) fen	G?	S1
Golden Saxifrage – sedge rich seep	G?	S2
Skunk cabbage – golden saxifrage forest seep	G?	S4S5
Serpentine seepage wetland	G?	S1
Golden saxifrage – Pennsylvania bitter-cress spring run	G?	S3S4
Sphagnum – beaked rush peatland	G?	S3
Many fruited sedge – bladderwort peatland	G?	S2
Water-willow (<i>Justicia americana</i>) – smartweed riverbed community	G?	S4
Riverside ice scour community	G?	S1S2
Big bluestem – Indian grass river grassland	G?	S3
Pickerel-weed – arrow-arum – arrowhead wetland	G3G4	S4
Spatterdock – water lily wetland	G?	S4
<u>COMMUNITY COMPLEXES</u>	Complexes not ranked	
Acidic Glacial Peatland Complex		
Great Lakes Region Scarp Complex		
Erie Lakeshore Beach-Dune-Sandplain Complex		
Mesic Till Barrens Complex		
Serpentine Barrens Complex		
Ridgetop Acidic Barrens Complex		
River Bed-Bank-Floodplain Complex		

APPENDIX IV (CONT.)

COMMUNITY NAME	GLOBAL RANK	STATE RANK
SMITH 1991 TYPES		
<u>SUBTERRANEAN COMMUNITIES</u>		
Solution Cave Terrestrial Community	G?	S3
Solution Cave Aquatic Community	G?	S3
Tectonic Cave Community	G?	S3S4
Talus Cave Community	G?	S2S4
<u>DISTURBED COMMUNITIES</u>		
Bare Soil	G?	S?
Meadow/Pastureland	G?	S?
Cultivated Land	G?	S?
Successional Field	G?	S?
Young Miscellaneous Forest	G?	S?
Conifer Plantation	G?	S?
<u>ESTUARINE COMMUNITIES</u>		
Deepwater Subtidal Community	G?	S1
Shallow-Water Subtidal Community	G?	S1
Freshwater Intertidal Mudflat	G3G4	S1
Freshwater Intertidal Marsh	G3G4	S1
<u>RIVERINE COMMUNITIES</u>		
Low-Gradient Ephemeral/Intermittent Creek	G?	S5
Low-Gradient Clearwater Creek	G?	S3S4
Low-Gradient Clearwater River	G?	S2S3
Low-Gradient Brownwater Creek	G?	S2S3
Medium-Gradient Ephemeral/Intermittent Creek	G?	S5
Medium-Gradient Clearwater Creek	G?	S3
Medium-Gradient Clearwater River	G?	S?
Medium-Gradient Brownwater Creek	G?	S3
High-Gradient Ephemeral /Intermittent Creek	G?	S5
High-Gradient Clearwater Creek	G?	S3
High-Gradient Clearwater River	G?	S?
High-Gradient Brownwater Creek	G?	S?

Waterfall and Plungepool	G?	S3S4
Spring Community	G?	S1S2
Spring Run Community	G?	S1S2

LACUSTRINE COMMUNITIES

Glacial Lake	G?	S1
Nonglacial Lake	G?	S2
Artificial Lake		
Natural Pond	G?	S2S3
Artificial Pond		
Stable Natural Pool	G?	S?
Ephemeral/Fluctuating Natural Pool	G?	S1
Artificial Pool		
Ephemeral/Fluctuating Limestone Sinkhole	G?	S1

APPENDIX Va

FEDERAL AND STATE ENDANGERED SPECIES CATEGORIES, GLOBAL AND STATE ELEMENT RANKS

Several federal and state legislative acts have provided the authority and means for the designation of endangered, threatened, rare, etc. species lists. Those acts and status summaries follow. However, not all of the species or natural communities considered by conservation biologists (e.g., Pennsylvania Biological Survey) as "special concern resources" are included on the state or federal lists. In this county inventory report, "N" denotes those special concern species that are not officially recognized by state or federal agencies. Therefore: N = No current legal status, but is considered to be of special concern in Pennsylvania, or is under review for such consideration, by conservation biologists. Contact the Pennsylvania Natural Diversity Inventory for more information.

FEDERAL STATUS

All Plants and Animals: Legislative Authority: U.S. Endangered Species Act (1973), U.S. Fish and Wildlife Service, February 21, 1990, 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 throughout all or a significant portion of their ranges.

PE = Proposed Endangered - Taxa already proposed to be listed as endangered.

PT = Proposed Threatened - Taxa already proposed to be listed as threatened.

{N = No current legal status, but is considered to be of special concern in Pennsylvania, or is under review for such consideration, by conservation biologists. Contact the Pennsylvania Natural Diversity Inventory for more information.}

APPENDIX Vb

PENNSYLVANIA STATUS

Native Plant Species: Legislative Authority: Title 25 Chapter 82, Conservation of Native Wild Plants, January 1, 1988; 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 are classified as Pennsylvania Extirpated, but which subsequently are found to exist in this Commonwealth.
- PT = Pennsylvania Threatened - Plant species which may become endangered throughout most or all of their natural range within this Commonwealth, if critical habitat is not maintained to prevent their future decline, or if the species is greatly exploited by man.
- PR = Pennsylvania Rare - Plant species which are uncommon within this Commonwealth because they may be found in restricted geographic areas or in low numbers throughout this Commonwealth.
- PX = Pennsylvania Extirpated - Plant species believed by the Department to be extinct within this Commonwealth. These plants may or may not be in existence outside the Commonwealth.
- PV = Pennsylvania Vulnerable - Plant species which are in danger of population decline within this Commonwealth 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 - A classification of 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 = No current legal status, but is considered to be of special concern in Pennsylvania, or is under review for such consideration, by conservation biologists. Contact the Pennsylvania Natural Diversity Inventory for more information.}

APPENDIX Vb (CONT.)

Wild Birds and Mammals - Legislative Authority: Title 34 Chapter 133, Game and Wildlife Code, revised Dec. 1, 1990 Pennsylvania Game Commission.

PE = Pennsylvania Endangered - 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 is so drastically reduced or degraded that immediate action is required to prevent their extirpation from the Commonwealth; or 2) species whose extreme rarity or peripheralness places them in potential danger of precipitous declines or sudden extirpation throughout their range in Pennsylvania; or 3) species that are 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.

PT = Pennsylvania Threatened - Species that may become endangered within the foreseeable future throughout their range in Pennsylvania unless the casual factors affecting the organism are abated. These are: 1) species whose population within the Commonwealth are decreasing or are heavily depleted by adverse factors and while not actually endangered, are still in critical condition; 2) species whose populations may be relatively abundant in the Commonwealth but are under severe threat from serious adverse factors that are 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".

{N = No current legal status, but is considered to be of special concern in Pennsylvania, or is under review for such consideration, by conservation biologists. Contact the Pennsylvania Natural Diversity Inventory for more information.}

APPENDIX Vb (CONT.)

Fish, Amphibians, Reptiles, and Aquatic Organisms - Legislative Authority: Title 30 Chapter 75, Fish and Boat Code, revised February 9, 1991; Pennsylvania Fish and Boat Commission

PE = Pennsylvania Endangered - All species declared by: 1) 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) are declared by the Pennsylvania Fish and Boat Commission, Executive Director to be threatened with extinction and appear on the Pennsylvania Endangered Species List published by the Pennsylvania Bulletin.

PT = Pennsylvania Threatened - All species declared by: 1) 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) are declared by the Pennsylvania Fish and Boat Commission Executive Director 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.

Internal Fish and Boat Commission Status Category:

PC = Pennsylvania Candidate - Species that exhibit the potential to become Endangered or Threatened in the future. Pennsylvania populations of these taxa are: 1) "rare" due to their decline, distribution, restricted habitat, etc.; 2) are "at risk" due to aspects of their biology, certain types of human exploitation, or environmental modification; or, 3) are considered "undetermined" because adequate data is not available to assign an accurate status.

This category is unofficial and has no basis in any law (i. e., Chapter 75, Fish and Boat Code), as do the Endangered and Threatened categories.

{N = No current legal status, but is considered to be of special concern in Pennsylvania, or is under review for such consideration, by conservation biologists. Contact the Pennsylvania Natural Diversity Inventory for more information.}

APPENDIX Vb (CONT.)

Invertebrates - Pennsylvania Status: No state agency is assigned to develop regulations to protect terrestrial invertebrates, although a federal status may exist for some species. Aquatic invertebrates are regulated by the Pennsylvania Fish And Boat Commission, but have not been listed to date.

Although no invertebrate species are presently state listed, conservation biologists unofficially assign numerous state status and/or state rank designations. NOTE: Invertebrate species are regularly considered under the U.S. Endangered Species Act for federal status assignments.

{N = No current legal status, but is considered to be of special concern in Pennsylvania, or is under review for such consideration, by conservation biologists. Contact the Pennsylvania Natural Diversity Inventory for more information.}

APPENDIX Vc

GLOBAL AND STATE RANKING

Global and State Ranking is a system utilized by the network of 50 state natural heritage programs in the United States. Although similar to the federal and state status designations, the ranking scheme allows the use of one comparative system to "rank" all species in a relative format. Unlike state or federal status designation guidelines, the heritage ranking procedures are also applied to natural community resources. Global ranks consider the imperilment of a species or community throughout its range, while state ranks provide the same assessment within each state. Although there is only one global rank used by the heritage network, state ranks are developed by each state and allow a "one-system" comparison of a species or communities imperilment state by state. For more information, contact the Pennsylvania Natural Diversity Inventory.

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.

APPENDIX Vc (CONT.)

G? = Not ranked to date.

NOTE: The study of naturally occurring biological communities is complex and natural community classification is unresolved both regionally and within Pennsylvania. The Global and State Ranking of natural communities also remains difficult and incomplete. Although many natural community types are clearly identifiable and are ranked, others are still under review and appear as G? and/or S?.

APPENDIX Vd

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 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 (occurring only once or a few times) or casual (occurring more regularly But not every year) 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 or catalpa in eastern states).
- SH = Of historical occurrence in the state, perhaps having not been verified in the past 20 years, and suspected to be still extant.
- 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.
- SU = Possibly in peril in state but status uncertain; need more information.
- SX = Apparently extirpated from the state.
- SZ= Not of significant conservation concern in the state, invariably because there are no (zero) definable element occurrences in the state, although the taxon is native and appears regularly in the state.
- S? = Not ranked to date.

NOTE: The study of naturally occurring biological communities is complex and natural community classification is unresolved both regionally and within Pennsylvania. The Global and State Ranking of natural communities also remains difficult and incomplete. Although many natural community types are clearly identifiable and are ranked, others are still under review and appear as G? and/or S?

APPENDIX VI

PLANTS AND ANIMALS OF SPECIAL CONCERN IN CENTRE COUNTY

Documented by the Pennsylvania Natural Diversity Inventory since 1960

Scientific Name

Common Name

ANIMALS

AESHNA MUTATA	SPRING BLUE DARNER
ANAX LONGIPES	LONG-LEGGED GREEN DARNER
ANISOTA STIGMA	SPINY OAKWORM MOTH
CAECIDOTEA FRANZI	FRANZ'S CAVE ISOPOD
CALEPHELIS BOREALIS	NORTHERN METALMARK
CALOPTERYX AEQUABILIS	BLACK-BANDED BANDWING
CALOPTERYX ANGUSTIPENNIS	APPALACHIAN JEWELWING
CICINDELA FORMOSA	A TIGER BEETLE
CICINNUS MELSHEIMERI	MELSHEIMER'S SACK BEARER
COENAGRION RESOLUTUM	RESOLUTE DAMSEL
ERYNNIS LUCILIUS	COLUMBINE DUSKYWING
ERYNNIS PERSIUS PERSIUS	PERSIUS DUSKYWING
GLAUCOPSYCHE LYGDAMUS LYGDAMUS	SILVERY BLUE
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE
HEMILEUCA MAIA	BARRENS BUCKMOTH
INCISALIA IRUS	FROSTED ELFIN
MEROLONCHE DOLLI	DOLL'S MEROLONCHE
MYOTIS LEIBII	EASTERN SMALL-FOOTED MYOTIS
MYOTIS SEPTENTRIONALIS	NORTHERN LONG-EARED BAT
NEOTOMA MAGISTER	ALLEGHENY WOODRAT
OLIGIA HAUSTA	NORTHERN BROCADE MOTH
PAPILIO CRESPHONTES	GIANT SWALLOWTAIL
PHOBERIA ORTHOSIOIDES	AN OAK MOTH
STYGOBROMUS ALLEGHENIENSIS	ALLEGHENY CAVE AMPHIPOD
STYGOBROMUS STELLMACKI	STELLMACK'S CAVE AMPHIPOD
TACHOPTERYX THOREYI	THOREY'S GRAYBACK DRAGONFLY
XYLOTYPE CAPAX	BROAD SALLOW MOTH
ZALE SUBMEDIANA	A ZALE MOTH

PLANTS

AMELANCHIER HUMILIS	SERVICEBERRY
AMELANCHIER SANGUINEA	ROUNDLEAF SERVICEBERRY
ANEMONE CYLINDRICA	LONG-FRUITED ANEMONE
BOUTELOUA CURTIPENDULA	TALL GRAMMA
BROMUS KALMII	BROME GRASS
CAREX BEBBII	BEBB'S SEDGE
CAREX EBURNEA	EBONY SEDGE
CAREX FORMOSA	HANDSOME SEDGE
CAREX GEYERI	GEYER'S SEDGE
CAREX LASIOCARPA	SLENDER SEDGE
CAREX OLIGOSPERMA	FEW-SEEDED SEDGE

CAREX RETRORSA
CYPERUS HOUGHTONII
CYSTOPTERIS LAURENTIANA
GLYCERIA BOREALIS
ISOTRIA MEDEOLOIDES
LIATRIS SCARIOSA
LINUM SULCATUM
LISTERA CORDATA
LISTERA SMALLII
LONICERA VILLOSA
LUPINUS PERENNIS
LYGODIUM PALMATUM
ONOSMODIUM MOLLE VAR HISPIDISSIMUM
PLATANThERA CILIARIS
POA LANGUIDA
POTAMOGETON OAKESIANUS
PRUNUS ALLEGHANIENSIS
PRUNUS PUMILA VAR SUSQUEHANAE
RANUNCULUS AQUATILIS VAR DIFFUSUS
RANUNCULUS FASCICULARIS
RHAMNUS LANCEOLATA
SCIRPUS ANCISTROCHAETUS
SOLIDAGO RIGIDA

BACKWARD SEDGE
HOUGHTON'S FLATSEdge
LAURENTIAN BLADDER-FERN
SMALL-FLOATING MANNA-GRASS
SMALL WHORLED-POGONIA
ROUND-HEAD GAYFEATHER
GROOVED YELLOW FLAX
HEART-LEAVED TWAYBLADE
KIDNEY-LEAVED TWAYBLADE
MOUNTAIN FLY HONEYSUCKLE
LUPINE
HARTFORD FERN
FALSE GROMWELL
YELLOW-FRINGED ORCHID
DROOPING BLUEGRASS
OAKES' PONDWEED
ALLEGHANY PLUM
SAND CHERRY
WHITE WATER-CROWFOOT
TUFTED BUTTERCUP
LANCE-LEAVED BUCKTHORN
NORTHEASTERN BULRUSH
HARD-LEAVED GOLDENROD