BUTLER COUNTY

NATURAL HERITAGE INVENTORY

Lisa L. Smith, Natural Heritage Ecologist
Charles W. Bier, Associate Director, Natural Science and Stewardship Department
Paul G. Wiegman, Director, Natural Science and Stewardship Department
Chris J. Boget, Data Manager
Bernice K. Beck, Data Handler

Western Pennsylvania Conservancy
316 Fourth Avenue
Pittsburgh, Pennsylvania 15222

July 1991

BUTLER COUNTY NATURAL HERITAGE INVENTORY

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Butler County possesses a wealth of natural resources including its flora, fauna, and natural habitats such as forests, wetlands, and streams. Since its southern most border is within 15 miles of the City of Pittsburgh, it has become a popular place to visit and live. Cranberry Township, located in the southwest corner of the county was recently recognized as one of the most rapidly developing areas in the nation. The natural features that make this county so inviting are quickly being lost because of the rapid growth and disturbances to the landscape caused by continued development such as residential and commercial expansion, surface mining, and logging. If the natural environment and the plants and animals associated with it are to be maintained in Butler County, a balance between growth and the protection of natural resources must be found. This can only be accomplished by guiding development away from environmentally sensitive areas and by designing and providing the protective measures that will see these areas into the next century and beyond.

The first steps in ensuring protection of environmentally sensitive areas are to identify them and determine their importance. This information can help county, state, and municipal government, the public, and business interests plan development with the preservation of these environmentally important sites in mind. The Natural Heritage Inventory of Butler County is designed to identify and map important biotic (living) and ecological resources that make up the rich, natural heritage of Butler County. The biotic resources inherited by the citizens of Butler County include:

- exemplary natural areas
- habitats for species of special concern (endangered, threatened, etc.)
- significant natural plant communities (assemblages of plants and animals)
- areas important for open space, recreation, and wildlife habitat

The approach of the inventory was to identify sites that are of county significance. This includes sites which are unique or uncommon in the county, but are not necessarily uncommon in the state. For example, a 50 acre mature hemlock-northern hardwood ravine is common in many places in Pennsylvania, however, a forest community of this type and size is uncommon in Butler County. State significant sites are also included in the inventory.

The following classification provides the types of Natural Heritage Sites that are in this report:

NATURAL AREAS

I. Pristine Natural Area

A site that has the same ecological conditions that are believed to have existed prior to European settlement, and is large enough, and buffered enough, to support and permanently protect the natural community.

Example: A tract of virgin forest community ten or more acres in size, the surrounding landscape is only moderately disturbed, and the forest community has long term viability.

II. Recovering Natural Area

An area that is relatively undisturbed, or past disturbances are essentially minor, and the landscape has largely recovered to a pristine condition.

Example: A tract of forest that, although harvested a century ago, has regenerated so that it now supports a recovered old growth forest community and its associated qualities.

III. Managed Natural Area

An area that, although previously disturbed, is now managed as a natural area and human disturbances in the future are required to be kept at a minimum.

Example: A forested tract that was previously harvested, but is now under the ownership of a conservation organization that is dedicated to its future protection.

BIOLOGICAL DIVERSITY and
ECOSYSTEM CONSERVATION AREAS

I. Special Species Habitat

An area that includes natural or human influenced habitat that harbors one or more occurrences of plants or animals recognized as state or national species of special concern.

Examples: *A natural forested swamp that supports an endangered plant population.*
Agricultural land that provides nesting habitat for a threatened animal.

II. High Diversity Site

An area found to possess a high diversity of species of plants and animals native to the county.

Example: *A relatively large tract of land that provides a variety of habitats.*

III. Ecosystem Conservation Site

An area that supports a rare or exemplary natural community (assemblage of plants and animals), including the highest quality and least disturbed examples of relatively common community types.

Example: *A marshland that supports a wetland community found in no or few other sites in the county.*

LANDSCAPE CONSERVATION, SCIENTIFIC AND EDUCATIONAL AREAS

I. Habitat Conservation Site

A relatively large contiguous area that is only lightly to moderately disturbed by human influences.

Examples: A block of several hundred acres of public land managed for wildlife. An area of relatively undeveloped private lands that possess important wildlife and native plant habitats.

II. Recreation Conservation Site

A relatively large and reasonably undisturbed area that possesses qualities important for passive outdoor recreation (hiking, nature study, fishing, etc..) and/or as open space.

Example: A largely undisturbed valley often utilized by the public for hiking.

III. Scientific Area

An area that is consistently utilized for scientific monitoring of the environment, or other natural science studies.

Example: Conservation land that is regularly studied to monitor environmental changes.

IV. Educational Area

A park, nature preserve, or other area managed for natural resource conservation, and is utilized for environmental education.

Example: A relatively natural site that is regularly visited by school classes to study the species of plants and animals native to the county.

The sites identified in this report have been recognized because of one or more of the criteria listed. Sites

chosen are those which are believed to be of sufficient size and quality (i.e. the natural systems are relatively intact) to sustain their continued existence into the foreseeable future. Because of their role in managing natural resources, managed areas such as State Game Lands, State Parks, and private nature preserves, are identified and mapped in this report as well.

This report is presented in several sections. The county overview reviews county geology, soils, and past and present vegetation. The second section provides information on Pennsylvania Natural Diversity Inventory and the third section reviews the methodology used to conduct the inventory. The Results and Recommendations section is organized by USGS topographic map with a table, summary, and recommendation presented for each map of the county. Each of the tables in this section present summary information for heritage sites and managed natural areas. The appendices present additional background information on communities, species, and classification.

The inventory is a joint effort of the Western Pennsylvania Conservancy, the Pennsylvania Department of Community Affairs and the Butler County Planning Commission. Its purpose is to provide the county and state with a useful tool for planning development and for setting protection priorities for significant natural heritage sites in Butler County. It is, however, only a preliminary report of the important areas in Butler County. Further investigation is needed and therefore this inventory should not be viewed as the final word on this subject of natural heritage sites in the county.

Any questions concerning sites or updates should be addressed to the Western Pennsylvania Conservancy.

COUNTY OVERVIEW

Butler County is situated in west-central Pennsylvania and has an area of 794 square miles. The population of the county according to the 1990 census is 152,013. Approximately 50% of the land area is woodland, 22% is farmland, and 20% is urban, industrial, and residential (Smith, 1989). Essentially all of the forested land in the county was previously cut, leaving second growth woodlands. Many of these woodlands have matured and as a result, another round of logging is currently taking place in numerous places in the county. One of the largest industries in the county is coal mining. Since the 1930's the primary method of extracting bituminous coal from the ground has been strip mining. Strip mining results in a permanent alteration of the land and the natural communities that exist in an area. A large portion of Butler County has, or is currently being strip mined. In addition to logging and coal mining, petroleum production is common, especially in the northern part of the county. The landscape in this section of the county is interspersed with oil wells and oil storage tanks.

PHYSIOGRAPHY

Bedrock geology and soils are significant factors involved in the formation of natural vegetation and land use. Butler County is located in the Appalachian Plateaus Province which runs in a band from the southwestern to the northeastern part of the state. The county lies in the Pittsburgh Plateaus Section of the Province with the exception of the extreme northwest portion which has been glaciated and is therefore considered to be part of the Glaciated Section.

Northern Butler County can be described as having a rolling surface cut by many steep stream valleys formed by Slippery Rock and Wolf Creeks. The southern part of the county is gently rolling with several broad stream valleys such as the Connoquenessing Creek valley, which is subject to periodic flooding. This part of the county has considerable agricultural activity. Agricultural land is not as common in the northeastern portion of the county due to the more rugged terrain. Glaciers covered a portion of the northwestern part of the county and certain natural features and drainage patterns are characteristic of a landscape at the most southern reaches of glaciation.

BEDROCK AND SOILS

The bedrock underlying Butler County is divided into three major groups based upon the age of the rocks. They are, in chronological order, the Pottsville, Allegheny, and Conemaugh Groups (Sokolow, 1980).

The Pottsville Group underlies glacial and alluvial deposits in Wolf and Slippery Rock Creeks and is exposed in the valley walls of these streams and their tributaries, as well as along Bear Creek in the northern part of the county. This group consists of massive sandstone interbedded with shale and siltstone and thin lenses of coal.

The Allegheny Group underlies most of the northern third of the county north of Portersville, Muddy Creek, Hooker, and Karns City. Southward, it is found in valley bottoms and side slopes along Connoquenessing Creek and its major tributaries, Buffalo Creek, and Rough Run. This group consists of sequences of sandstone, siltstone, shale, and coal and a major limestone strata in the lower part. Most of the commercially available coal and limestone are in this group. The major coals are the Brookville, Clarion, Kittaning, and Freeport formations. The Vanport limestone, though not found in all places, averages about 10 feet in thickness and in places is as thick as 25 feet. The Conemaugh Group, consisting of the Glenshaw and Castleman Groups, is at the surface throughout most of the southern two-thirds of the county. It consists of repeated series of sandstone, red and gray shale and siltstone, and thin strata of limestone and coal. The red shale, as well as other rocks of this group, are the most landslide-prone in the county.

There are eleven major soils related to these three bedrock groups in Butler County as recognized by the U.S. Soil Conservation Service (Smith, 1989). The Gresham-Titusville-Frenchtown map unit is in the northwest part of the county on smooth to rolling uplands and in depressions and drainageways, all on till plains and moraines. This map unit is made up of deep soils that are formed in glacial till. Most areas of this unit are in agriculture. The Riverhead-Braceville-Wheeling map unit is also represented by deep soils formed from glacial outwash. These soils are located in northwest Butler County along Slippery Rock, Wolf, and Muddy Creeks and in the vicinity of Harrisville and West Liberty. It is on smooth to rolling uplands and drainageways on outwash plains, kames, terraces, and eskers. Most land with these soils is used for farmland. The Atkins-Canadice-Caneadea soil units are deep alluvium and lacustrine sediments which are found on flood plains, lowlands, and dissected low-lying benches in the northern half of the county. These soils are found near Slippery Rock Creek and its tributaries and along Muddy Creek. The areas of this soil unit are in woodland, brush, and wetland grasses. The Monongahela-Atkins-Caneadea soil unit is deep soil formed in alluvium and slackwater or lacustrine sediment along the Connoquenessing Creek and its tributaries and Brush Creek. It is on smooth to rolling terraces, flood plains, and small areas on adjacent uplands and foot slopes. Areas with these soil units are mostly used for farmland and woodland. The Hazleton-Cookport-Buchanan soil units are moderately deep to very deep soils formed in material weathered dominantly from

sandstone. This unit is throughout all but the northwest part of the county with the major areas in the vicinity of Connoquenessing and Prospect, on uplands near Buffalo Creek and Bear Creek, and near branches of Slippery Rock Creek. It is found on smooth or rolling, broad and narrow ridgetops, side slopes, and benches. Most areas are used for farmland or woodland. The Hazleton-Gilpin-Wharton soil units are moderate to very deep and formed in material weathered dominantly from sandstone and siltstone. This unit is throughout all but the northwest part of the county and is undulating to rolling on uplands, in depressions, and in drainageways. Most areas of this unit are used for farmland and woodland. The Gilpin-Wharton unit is moderately deep and formed of material weathered dominantly from siltstone and shale. This map unit is throughout all but the northwest Butler County and is found on undulating to hill uplands and associated drainageways. Most areas of this soil unit are used for farmland, woodland, and urban development. The Cavode-Wharton-Gilpin soil unit is moderately deep soil formed from weathered shale. These soils are found throughout all but the northwest part of the county on smooth to rolling uplands and in associated drainageways. Farmland and woodland are found on most areas of this unit. The Tilsit-Brinkerton-Gilpin map unit is moderately deep soil formed in material weathered from shale and siltstone. It is found throughout the southern half of the county. The unit is smooth and undulating on uplands, in depressions, and drainageways and is used mostly for farmland. The Udorthents-Wharton-Hazleton unit is moderately deep and formed during strip mining and in material weathered from sandstone, siltstone, and shale. This unit is found in the northern half of the county on ridgetops, slopes, and in drainageways. Many areas of this unit are in natural vegetation and woodland. The Hazleton-Buchanan-Gilpin map unit are moderately deep, stony soils formed in material weathered from sandstone, siltstone, and shale. These soils are found near the major streams and their tributaries in all but the glaciated section of the county. Woodland and brushland dominate this soil map unit.

VEGETATION

Butler County is a part of Pennsylvania that exhibits a diversity of vegetation across its landscape. This diversity is due, in part, by the variety of conditions that exist in the county. In addition to the characteristic physiography, bedrock, and soils of the region, land use patterns have had a great impact on the vegetation. Logging, as was previously mentioned, has significantly influenced the types of forests that are found in the county. Clearing of the land for farming in the past has an added influence on vegetation. In addition to logging and other unnatural disturbances, forests in Butler County have been impacted by the

gypsy moth (Lymantria dispar). This exotic forest pest recently invaded the northeastern portion of the United States. The insect poses a serious threat to forests of the northeast since its huge populations manage to defoliate thousands of acres of trees each summer. It is expected that the action of the gypsy moth will impact certain tree species in a similar fashion to the chestnut blight (Endothia parasitica). The chestnut blight is an introduced parasitic fungus that is responsible for the demise of the American chestnut (Castanea dentata) which was at one time a dominant species in the forests of this region. Disturbances such as those mentioned have played a major role in shaping the forest vegetation of Butler County.

The forests of Butler County have been characterized by many people. Braun (1950) suggested that Butler County lies within the Cumberland and Allegheny Plateaus Section of the original mixed mesophytic forest region. This region extends from southern West Virginia to unglaciated northeastern Pennsylvania. The dominant species of the climax forest are American beech (Fagus grandifolia), yellow poplar (Liriodendron tulipifera), basswood (Tilia sp.), sugar maple (Acer saccharum), American chestnut, sweet buckeye (Aesculus octandra), red oak (Quercus borealis), white oak (Q. alba), and eastern hemlock (Tsuga canadensis). Butler County lies in the Low Hills Belt, a subdivision of the Cumberland and Allegheny Plateaus Section. Here there was a larger proportion of oak than in other regions of the original mixed mesophytic forest. Since the settlement of the county almost all of the forest has been removed. That which has grown back has been logged and as a result, none of the original mixed mesophytic forest remains. Much of the second growth which represents the present forest communities of this county strongly suggests oak-hickory (Quercus-Carya).

Jennings (1927) described the forest vegetation of the rolling uplands or rounded hills of the county as dominantly white oak, with shagbark hickory (Carya ovata), red maple (Acer rubrum), shingle oak (Quercus imbricaria), scarlet oak (Q. coccinea), chestnut oak (Q. prinus), black oak (Q. velutina), red oak, American chestnut, and black cherry (Prunus serotina). In addition, Lull (1968) described the forest region of western Pennsylvania as the Oak-Yellow Poplar Forest Region which is divided into two sections. The northern section, where Butler County is located, is considered to have white oak, red oak, and hickory as dominants. He also points out that hemlock is common in the ravines and northern hardwoods may prevail on some north facing slopes. Küchler (1964 a,b) considered the potential forest vegetation of Butler County to be predominantly Appalachian Oak Forest dominated by white oak and northern red oak.

Presently, the most common forest type, as evidenced by the Natural Heritage Inventory and suggested by Henry (1971), is oak-hickory which is dominated by white oak, red oak, mockernut hickory (Carya

tomentosa), shagbark hickory, and subdominated by black cherry, white ash (Fraxinus americana), and red maple. The composition of this forest type is similar to the Low Hills Belt described by Braun (1950) and Jennings (1927), with the exception of American chestnut as a dominant.

Other examples of significant forest types presently exist in the county as well. These include eastern hemlock-northern hardwood forests, mesic central forests, floodplain forests, and several wetland types. The hemlock-northern hardwood forest type is generally found in cool steep sided ravines. An example of the mesic central forest type is found along Lake Arthur in areas that have been left undisturbed by logging for many years. Floodplain forests are abundant along Slippery Rock, Connoquenessing, and Wolf Creeks. Wetlands are scattered throughout the county, but are most common in the northern townships. These include such communities as robust emergent marshes and shrub swamps. Most have been heavily polluted by acid mine drainage resulting from coal mining.

PENNSYLVANIA NATURAL DIVERSITY INVENTORY

The Pennsylvania Natural Diversity Inventory (P.N.D.I.) was established in 1982 as a joint effort of the Western Pennsylvania Conservancy, 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 have now been established in each one of the 50 United States.

This computer indexed data base contains location and baseline ecological information about rare plants, rare animals, unique plant communities, significant habitats and geologic features in Pennsylvania. Presently, PNDI is Pennsylvania's chief storehouse of such information with over 7,000 detailed occurrence records that are stored in computer files and denoted on 7.5-minute United States Geologic Survey (USGS) topographic maps. Additional data are stored in extensive manual files covering over 150 natural community types, over 800 plant and animal species, and for about 650 managed areas. Separate files are maintained for each of Pennsylvania's 881 7.5-minute USGS quadrangle maps.

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 I (The Nature Conservancy, 1988). Note that the ranking system operates at global (range-wide) and state levels and does not provide insight as to the county significance of biotic resources. A separate ranking system is provided to accomplish this in Appendix II.

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 has been gathered from museums, universities, colleges, and recent field work by professionals throughout the state. From this basis, the Western Pennsylvania Conservancy focuses efforts on priority elements and systematic inventories to locate the best occurrences. This approach has also been used by the Conservancy to identify the areas of highest natural integrity and significance in Butler County.

NATURAL HERITAGE INVENTORY METHODS

Methods used in the inventory are based on those used by Anonymous (1985), Reese (1988) and Davis, et al. (1990) to conduct similar projects. The Butler County Natural Heritage Inventory proceeded in the following stages:

- gathering existing information
- map interpretation
- ground survey
- aerial photography/reconnaissance
- data analysis.

Gathering existing information

A list of the known natural features for Butler County was prepared from the PNDI data base and information was gathered from local individuals and organizations that were familiar with natural areas and habitats for species of special concern in the county. Some of these organizations are as follows: Pennsylvania Game Commission, Pennsylvania Fish Commission, Bartramian Audobon Society, Department of Environmental Resources, and E.C.O.Z. (Ecologically Concerned of Zelienople).

Three town meetings were held at the beginning of the inventory to inform citizens and to solicit their input on sites of potential natural quality. Recommended Natural Heritage Forms (Appendix IV) were made available to individuals for recommending sites. Information from other sources such as soil maps, field surveys, and published materials on soils, land forms, and vegetation was collected to gain a better understanding of the county's natural environment.

Map interpretation

Updated aerial photographs for the county were unavailable at the beginning of the project, therefore we relied solely on topographic maps and outdated aerial photographs for studying the land prior to ground survey. Following visits to known important areas, topographic maps were studied to determine the signature (visible characteristics) of known sites in order to compare them to unvisited sites. The areas that were denoted as strip mines (mottled pattern), agriculture lands (level topography and shaded white), or developed lands (buildings, roads, etc.) were eliminated.

Ground Survey

Areas that were identified on maps as potential sites were examined to evaluate the natural condition and quality of the habitat and to investigate the significance of the natural resources present. If the site was posted by a private land owner, the ecologist did not enter the property unless permission was granted. Field survey forms (Appendix III) were completed for each site and an evaluation of the quality of the site was made. Boundaries for each area were drawn on the USGS topographic maps. Site boundaries were drawn to include both the key features of the site and 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 descriptors recorded for each site. Sites for species of special concern were visited and the condition of the habitat and of the specie's population was evaluated.

Aerial Photography/Reconnaissance

After a majority of sites were visited, aerial photographs became available for use from the Soil Conservation Service. The photographs were used to compare the photographic signature of high quality areas to those of yet unvisited sites. These photograph, as well as the aerial reconnaissance flights, were useful in determining boundaries for sites, as well as potential threats and disturbances that were not always obvious during ground surveys. This information was particularly useful in making final decisions as to whether an area should be included or eliminated from the inventory based on comparison to other areas from the air. Disturbance to wetlands was much more evident from the air and therefore, wetland quality could be determined with more accuracy than field examination permitted.

Data Analysis

A file was prepared for each site describing its overall quality and characteristics such as its size, condition, recoverability and rarity. The quality of the site was determined by examining how well it fulfilled the criteria for consideration as one of the natural heritage site types described in the introduction. Each natural community and species of special concern (elements) was ranked by PNDI using factors of rarity and threat on a state-wide (state element ranking) and range-wide (global element ranking) basis (Appendix I and V). In addition, each site was ranked by inventory methods according to its relative significance in the county (Table 1, Appendix II).

Field data for natural communities and for all plant and animal species of special concern found were synthesized with existing data, summarized, and locations were transcribed on to mylar map overlays.

RESULTS AND RECOMMENDATIONS

Butler County is covered by 24, 7.5-minute USGS quadrangle maps (Fig. 1). These maps are arranged beginning with Grove City in the northwest and ending with Freeport in the southeast. The Natural Heritage Sites and managed areas in Butler County have been coded on these topographic maps. A summary table of sites with natural communities, species of special concern (endangered, threatened, etc.), other significant heritage sites, and managed areas precedes each map. Following each site name on this table is the sites relative county significance which is summarized in Table I. The "other" category includes sites that are significant for open space, but do not represent a significant community or species of special concern. The "managed area" category lists public lands such as state game lands.

The summary tables do not identify the names of the elements (natural communities or species of special concern). Natural communities are identified in a written summary that follows each table and includes descriptions, potential threats, and recommendations for preservation. The actual species of special concern, however, are not identified for a number of reasons. Since some of the species in Butler County are sensitive, or vulnerable to human disturbances, it is important that their identities not be provided. Threats to these species include collecting, removal, or disturbance caused by individuals attempting to locate the species. For this reason, a species could be endangered if it were identified. Since this inventory is to be used as a planning guide, there is no need for this information. This sort of technical information will only burden the use of this report. Further, leaving this information out of the report encourages the involvement of someone with a professional background in ecology to aid in the decision making process should a question arise concerning development of a site.

A map labeling and mapping system has been utilized to indicate the significant heritage sites on each topographic map. The labels are:

BOLD PRINT UPPER CASE LETTERS

--Natural communities that contribute significantly to the continuation of biological diversity. Site names are followed by natural community codes, e.g., **RING SWAMP NC003**; **COUNTY LINE RAVINE NC002**.

--Sites that provide habitat for species of special concern. Site names are followed by special plant or special animal codes, e.g., **HARMONY HOUSE FIELDS SA002**; **FENELTON SA002**.

--Private lands that are managed for the preservation of the biotic resources that exist at the

site, e.g., **TODD SANCTUARY NC001, NC002 ; CONNOQUENESSING CREEK NATURE RESERVE NC001, NC002.**

Bold Print Upper and Lower Case Letters

--Public managed areas such as Pennsylvania State Game Lands, and state and local parks, e.g., **State Game Lands #95**, **Moraine State Park**.

--Landscape Conservation Sites, which encompass larger areas of flora and fauna habitat and open space for recreation, e.g., **Trillium Hill Conservation Area, Buffalo Basin Conservation Area**.

Significant sites are mapped using the following conventions:

- Natural Areas and Biological Diversity-Ecosystem Conservation Areas are mapped using **solid lines** (——), which include both the site core (natural community or species of special concern habitat) and critical buffer lands surrounding the core.
- Landscape Conservation Sites are mapped using **dotted lines** (· · · · · · ·).
- Managed Areas are mapped using the standard convention of **dash-dot lines** (—·—).

A number of tables and figures precede the quadrangle summaries and have been included to help to summarize the information given in the reports for each quadrangle. A summary of sites arranged in three levels of relative county significance (high, medium, low) is included in Table 1. The significance of the sites is based on their importance to the biological diversity and ecological integrity of Butler County. Explanations for the three significance levels is given in Appendix II. Table 2 provides a list of the four managed natural areas in the county. These areas have been dedicated to the protection of the natural ecological systems and biological diversity within the property and are, therefore, regarded as the most important public and private natural heritage areas. The management and protection efforts of these areas should set examples for the establishment of other natural areas of this type in Butler County. A municipality summary for the county is presented in Table 3. This provides information for township and borough managers, or other interested individuals concerning sites that are located in each of the respective municipalities. A map depicting all of the townships, boroughs, and cities in Butler County (Fig. 2) precedes this table.

GENERAL RECOMMENDATIONS FOR NATURAL HERITAGE SITES

Natural Areas

These sites should be managed and protected to improve the natural qualities of the site under Natural Area guidelines which include preservation and complete protection. Disturbances to site cores or buffer zones should always be avoided. In the case of wetlands, springs, etc., this includes protection of the hydrology supporting the site. In addition, spraying pesticides, for example to exterminate the gypsy moth (Lymantria dispar), should not take place in these Natural Areas. A secondary effect of such spraying is the negative impact on other biota that also inhabit the site.

Biological Diversity and Ecosystem Conservation Areas

Protection of these sites should follow the recommendations given for Natural Areas except in the instance where management is used to sustain a specific habitat for a species of special concern.

Landscape Conservation, Scientific, and Educational Areas

Any potential disturbance should be reviewed in light of the natural, open space, educational, scientific qualities that the site possesses. State and local government agencies are encouraged to develop planning guidelines for use in future consideration of development in each Landscape Conservation Area in order to protect the significant qualities that the areas presently harbor.

Table 1: Summary of sites in order of relative county significance: High, Moderate, Low.

The natural heritage sites that have qualified for inclusion in this report have been classified into one of three categories regarding their significance as areas of importance to the biological diversity and ecological integrity of the county. Included in this evaluation is also the level of state and/or national significance. These ranks have been used to prioritize the significance of all identified sites and suggest the relative attention that sites should receive for the amount, degree and rate of protection. The sites are in alphabetical order for each level.

SITE	**QUADRANGLE**	**DESCRIPTION**
HIGH		
Boyers	West Sunbury	Habitat for state endangered animal.
Branchton Bottoms	West Sunbury	Unique natural communities.
Buffalo and Little Buffalo Creek Valleys	Curtisville Freeport Saxonburg	Unique forest and stream communities. High biodiversity.
Fenelton	East Butler Chicora Saxonburg Worthington	Habitat for state endangered animal.
The Glades Wildlife Area	East Butler Hilliards Mount Chestnut West Sunbury	Habitat for a federally endangered animal and a state endangered animal.
Hickey Bottom	Chicora	Habitat for state endangered animal
Lower Wolf Creek Valley	Slippery Rock	Unique wetland, forest, and stream communities. Habitat for plant species of special concern.
Moraine State Park Propagation Area	Prospect Mount Chestnut	Habitat for a state threatened animal
Muddy Creek	Mount Chestnut	Extensive wetland.

SITE	QUADRANGLE	DESCRIPTION
Redwing Floodplain Swamp	Butler	State significant forested wetland provides habitat for special plant of concern.
Ring Swamp	Slippery Rock	Unique wetland community.
Silver Creek	Hilliards	Exceptional Value stream.
Slippery Rock Creek Property	Slippery Rock	Significant forest and wetland communities.
Thorn Reservoir	East Butler	Habitat for state endangered animal. Additional investigation needed.

MODERATE

Buhls Channel	Evans City	Forest and wetland communities. Small in size.
Bear Creek and North Branch Valleys	Parker	Significant natural community. Disturbance in buffer zone.
Buffalo Basin Conservation Area	Curtisville Freeport Saxonburg	Significant open space and natural community.
Buffalo Creek Headwaters Conservation Area	Chicora	Significant open space and natural community. Recent logging.
Connoquenessing Creek Conservation Area	Butler Evans City	Extensive open space. High biodiversity.
Currys Mills Floodplain	Slippery Rock	Unique wetland community. Small in size.
Ferris Wetland	Hilliards	Wetland community. Small in size.
Greece City	East Butler	Habitat for state endangered animal. Additional investigation needed.
Harmony House Fields	Slippery Rock	Artificial habitat for a state threatened animal. Small population.

SITE	QUADRANGLE	DESCRIPTION
Harmony Junction Wetland	Evans City	Unique wetland communities. Small in size.
Kennedy/ Balanced Rocks	Barkeyville	Unique natural community.
Lake Arthur Tributary	Parker Portersville	Unique natural community. Small in size and somewhat degraded.
Lowrey Run Ravine	Emlenton	Significant natural community.
McMurray Run	West Sunbury	Habitat for state endangered animal. Habitat diminishing. Additional investigation needed.
Muskrat Cove Valley	Prospect	Significant natural community. Small in size.
North Branch Wetland	West Sunbury	Forested wetland community. Some disturbance.
Oneida Lake	East Butler	Habitat for state endangered animal. Habitat quality/condition poor. Additional investigation needed.
Park Office Valley	Prospect	Significant natural community.
Seaton Creek Wetland	Hilliards West Sunbury	Significant wetland community.
Slippery Rock Creek Gorge	Slippery Rock	Two significant natural communities.
Vic-Nor Valley	Evans City	Significant natural community. Past disturbance.
Waddell Floodplain	Evans City	Significant natural community. Past disturbance.
Wahlville Hillside	Evans City	Significant natural community. Small in size.

SITE	QUADRANGLE	DESCRIPTION
Whippoorwill Hill Conservation Area	Prospect	Significant open space.
Wolf Creek Conservation Area	Slippery Rock	Significant open space and natural community.

LOW

Alexander Ridge Conservation Area	Prospect	Open space. Past disturbance.
County Line Ravine	Emlenton	Significant natural community. Small and degraded.
Hogg Woods	Slippery Rock	Significant natural community. Small in size and little buffer zone.
Semiconon Valley Conservation Area	Evans City Prospect	Open space. Past disturbance.
Trillium Hill Conservation Area	Evans City	Open space. Past disturbance.

Table 2: Important managed areas protecting biotic resources in Butler County.

The objective of the Butler County Natural Heritage Inventory is to provide information that can be utilized in planning for the protection of the biological diversity and ecological integrity of the county. Ultimately, the preservation of such resources will depend in part upon the establishment of areas that are managed primarily to protect these resources.

Presently, there are only four sites in Butler County that are largely dedicated to the protection of the natural ecological systems and biological diversity within the property. For this reason, the managed areas listed below are regarded as the most important public and private natural heritage areas. Efforts should be made to design protection for these areas, and to encourage the owners/managers to continue with their programs of biotic resources protection and management. For example, in every case, these areas are either facing foreseeable threats, or are presently too small to accomplish long term protection of the biotic resource that they harbor. County, local and private planning should recognize the role of these areas and also become aware of the requirements and needs of each so that they can continue to function as nature preserves for Butler County.

Managed Area Name / Owner	Comments and Recommendations
Connoquenessing Creek Nature Reserve / Ecologically Concerned of Zelienople (ECOZ)	Includes upland forest and floodplain habitats. Provides passive recreation to general public. Reserve is small and should be expanded where possible; perhaps with satellite reserves. Surrounding area is largely developed.
Jennings Environmental Education Center / Commonwealth of PA	Includes endangered species and diverse natural communities. Present management represents some of the strongest biodiversity biodiversity protection and natural resources management of any state property in w. PA, however, a stronger "official" dedication be established. Additional property should be added as buffer lands. Provides passive recreation and is a scientific research site.
Todd Sanctuary / Audubon Society of Western PA	Dedicated natural area management philosophy. Sanctuary is small and should be expanded to protect more of the Buffalo Creek site and to provide buffer areas. Immediate surroundings are being developed. Provides passive recreation and is a scientific research site.
Wolf Creek Narrows Natural Area / Western PA Conservancy	Dedicated natural area management philosophy. Part of thesignificant Lower Wolf Creek Valley site. Area is small and should be expanded protect more of the adjacent resources. Potentially threatened by mineral extraction. Provides passive recreation and is a site of scientific research.

BUTLER COUNTY

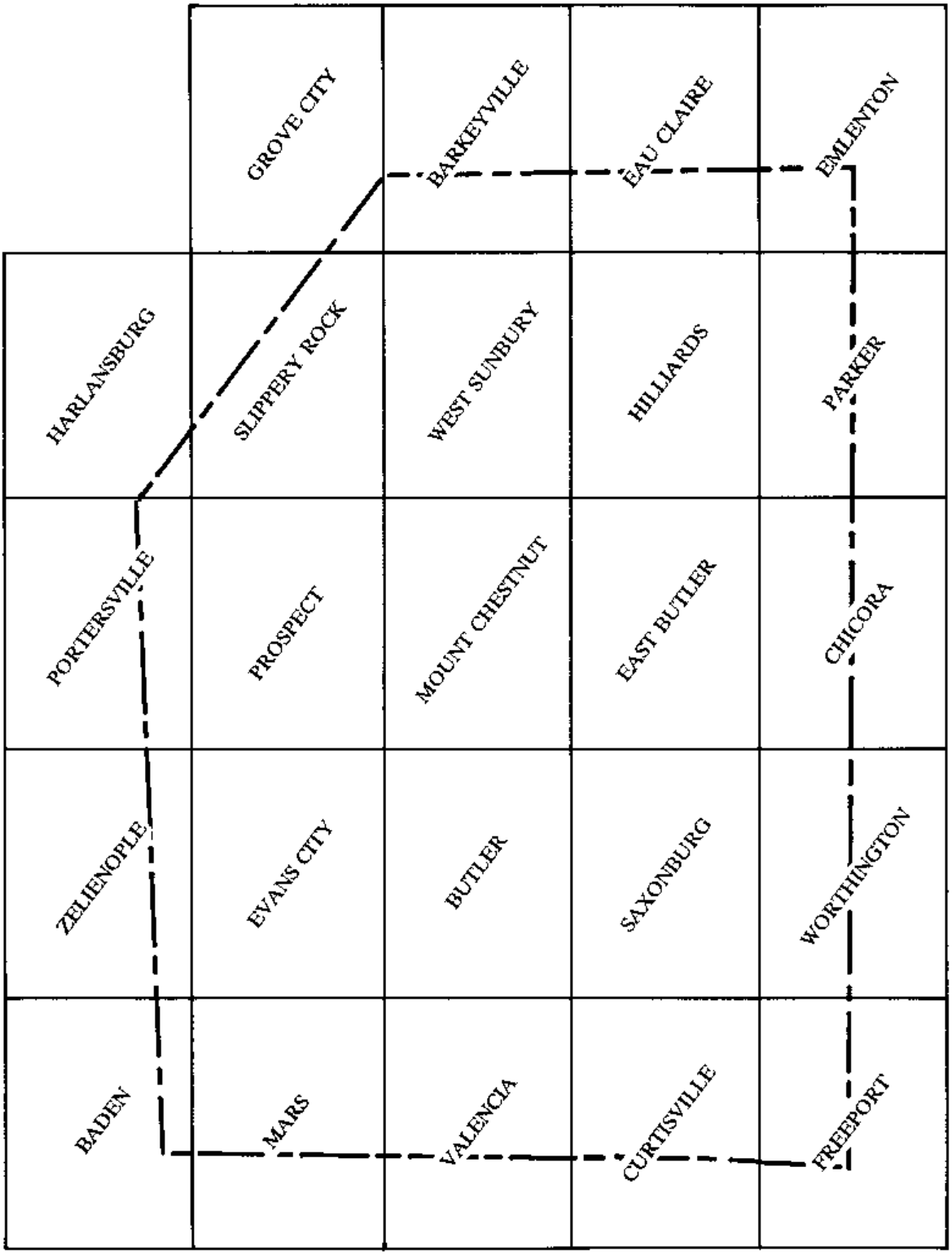


Fig. 1: USGS quadrangle map index of Butler County

BUTLER COUNTY

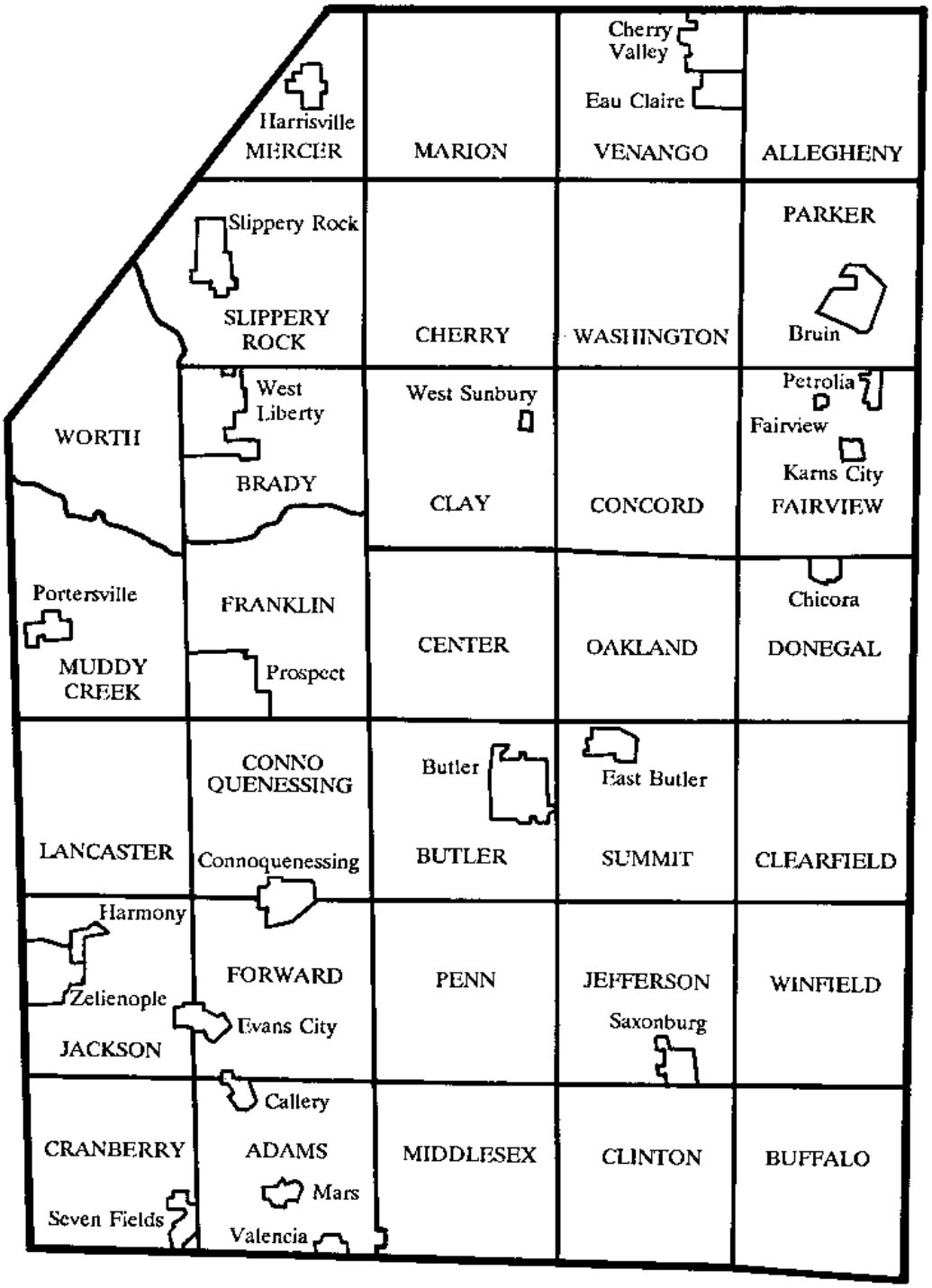


Fig 2: Municipalities of Butler County

Table 3: Butler County municipality summaries

Municipality	Site Name	U.S.G.S. Quadrangle	see page
Townships			
Adams	none		
Allegheny	County Line Ravine	Emlenton	48
	Lowrey Run Ravine	Emlenton	
Brady	Alexander Ridge Conservation Area	Prospect	85
	Jennings Environmental Education Center	Slippery Rock	67
		West Sunbury	61
	Moraine State Park	Mount Chestnut	90
		Slippery Rock	
	Old Stone House	Slippery Rock	
		West Sunbury	
	Ring Swamp	Slippery Rock	
Buffalo	Buffalo Basin Conservation Area	Curtisville	130
		Freeport	133
	Buffalo and Little Buffalo Creek Valleys	Freeport	
	Todd Sanctuary	Freeport	
Butler	Alameda Park	Butler	107
		Mount Chestnut	90
	Connoquenessing Creek Conservation Area	Butler	
	Deshon Woods	Butler	
Center	Muddy Creek	Mount Chestnut	90
Cherry	Branchton Bottoms	West Sunbury	61
	North Branch Wetland	West Sunbury	
	State Game Lands #95	West Sunbury	
	The Glades Wildlife Area	West Sunbury	

Municipality	Site Name	U.S.G.S. Quadrangle	see page
Townships (cont.)			
Clay	Moraine State Park	Mount Chestnut	90
	Muddy Creek	Mount Chestnut	
	The Glades Wildlife Area	Mount Chestnut	
		West Sunbury	61
Clearfield	Fenelton	Chicora	97
		East Butler	94
		Saxonburg	104
		Worthington	101
	State Game Lands #164	East Butler	
	State Game Lands #304	Chicora	
		Worthington	
Clinton	none		
Concord	Greece City	East Butler	94
	State Game Lands #95	Hilliards	55
	The Glades Wildlife Area	East Butler	
		Hilliards	
		Mount Chestnut	90
		West Sunbury	61
Connoquenessing	Connoquenessing Creek		
	Conservation Area	Butler	107
		Evans City	111
	Semiconon Valley		
	Conservation Area	Evans City	
		Prospect	85
	Trillium Hill		
	Conservation Area	Evans City	
Cranberry	none		
Donegal	Buffalo Creek Headwaters		
	Conservation Area	Chicora	97
	Hickey Bottom	Chicora	
	State Game Lands #164	East Butler	94
Fairview	none		

Municipality	Site Name	U.S.G.S. Quadrangle	see page
Townships (cont.)			
Forward	Buhls Channel	Evans City	111
	Connoquenessing Creek Conservation Area	Butler Evans City	107
	Redwing Floodplain Swamp	Butler	
	Vic-Nor Property	Evans City	
	Waddell Floodplain	Evans City	
	Wahlville Hillside	Evans City	
Franklin	Alexander Ridge Conservation Area	Prospect	85
	Moraine State Park	Mount Chestnut Prospect	90
	Moraine State Park Propagation Area	Mount Chestnut Prospect	
	Muskrat Cove Valley	Prospect	
	Park Office Valley	Prospect	
	Semiconon Valley Conservation Area	Prospect	
	Whippoorwill Hill Conservation Area	Prospect	
Jackson	Connoquenessing Creek Conservation Area	Evans City	111
	Connoquenessing Creek Nature Reserve	Zelienople	118
	Harmony Junction Wetland	Evans City	
	Trillium Hill Conservation Area	Evans City	
	Wahlville Hillside	Evans City	
Jefferson	none		
Lancaster	Trillium Hill Conservation Area	Evans City	111

Municipality	Site Name	U.S.G.S. Quadrangle	see page
Townships (cont.)			
Marion	Boyers	West Sunbury	61
	Kennedy/Balanced Rocks	Barkeyville	41
	McMurray Run	West Sunbury	
	North Branch Wetland	West Sunbury	
	Seaton Creek Wetland	West Sunbury	
Mercer	McMurray Run	West Sunbury	61
	Wolf Creek Conservation Area	Slippery Rock	67
Middlesex	Glade Run Lake	Valencia	127
Muddy Creek	Moraine State Park	Portersville	82
		Prospect	85
	Muskrat Cove Valley	Prospect	
	Whippoorwill Hill Conservation Area	Prospect	
Oakland	Oneida Lake	East Butler	94
	State Game Lands #164	East Butler	
	Thorn Reservoir	East Butler	
Parker	Bear Creek and North Branch Valleys	Parker	52
	Silver Creek	Hilliards	55
	State Game Lands #95	Hilliards	
		Parker	
Penn	Connoquenessing Creek Conservation Area	Butler	107
Slippery Rock	Branchton Bottoms	West Sunbury	61
	Currys Mills Floodplain	Slippery Rock	67
	Harmony House Fields	Slippery Rock	
	Hogg Woods	Slippery Rock	
	Lower Wolf Creek Valley	Slippery Rock	
	Miller Woods	Slippery Rock	
	Slippery Rock Creek Gorge	Slippery Rock	
	Wolf Creek Conservation Area	Slippery Rock	

Municipality	Site Name	U.S.G.S. Quadrangle	see page
Townships (cont.)			
Summit	State Game Lands #164	East Butler	94
Washington	Ferris Wetland	Hilliards	55
	Silver Creek	Hilliards	
	State Game Lands #95	Hilliards	
		West Sunbury	61
	The Glades Wildlife Area	Hilliards	
		West Sunbury	
Winfield	Buffalo Basin Conservation Area	Curtisville	130
		Freeport	133
		Saxonburg	104
Worth	Alexander Ridge Conservation Area	Prospect	85
	Lake Arthur Tributary	Portersville	82
		Prospect	
	Lower Wolf Creek Valley	Slippery Rock	67
	Moraine State Park	Portersville	
		Prospect	
	Slippery Rock Creek Gorge	Slippery Rock	
	Slippery Rock Creek Property	Slippery Rock	
	Whippoorwill Hill Conservation Area	Prospect	
	Wolf Creek Conservation Area	Slippery Rock	
	Miller Esker Natural Area	Slippery Rock	
Venango	Seaton Creek Wetland	Hilliards	55
		West Sunbury	61
	State Game Lands #95	Hilliards	
		West Sunbury	
Boroughs			
Bruin	none		
Callery	none		

Municipality	Site Name	U.S.G.S. Quadrangle	see page
Boroughs (cont.)			
Cherry Valley	none		
Chicora	none		
Connoquenessing	Vic-Nor Valley	Evans City	111
	Connoquenessing Creek Conservation Area	Evans City	
East Butler	none		
Eau Claire	none		
Evans City	none		
Fairview	none		
Harmony	none		
Harrisville	none		
Karns City	none		
Mars	none		
Petrolia	none		
Portersville	none		
Prospect	Semiconon Valley Conservation Area	Prospect	85
Saxonburg	none		
Seven Fields	none		
Slippery Rock	Currys Mills	Slippery Rock	67
	Wolf Creek Conservation Area	Slippery Rock	
Valencia	none		

Municipality	Site Name	U.S.G.S. Quadrangle	see page
Boroughs (cont.)			
West Liberty	Ring Swamp	Slippery Rock	67
West Sunbury	The Glades Wildlife Area	West Sunbury	61
Zelienople	Connoquenessing Creek Nature Reserve	Zelienople	118
Cities			
Butler	none		

GROVE CITY QUADRANGLE

	PNDI Rank		Legal Status	Last
	Global	State	Fed. State	Seen

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GROVE CITY QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

Mapped, edited, and published by the Geological Survey

Control by USGS, NOS/NOAA, and Pennsylvania Geodetic Survey

Topography by photogrammetric methods from aerial photographs taken 1958. Field checked 1961

Polyconic projection. 10,000-foot grid ticks based on Pennsylvania coordinate system, north and south zones. 1000-meter Universal Transverse Mercator grid ticks, zone 17 shown in blue. 1927 North American Datum To place on the predicted North American Datum 1983 move the projection lines 3 meters south and 18 meters west as shown by dashed corner ticks

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

Red tint indicates areas in which only landmark buildings are shown

Revisions shown in purple compiled in cooperation with Commonwealth of Pennsylvania agencies from aerial photographs taken 1977 and other sources. This information not field checked. Map edited 1981

UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY
DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
Interstate Route — U. S. Route — State Route

GROVE CITY, PA.

41080-B1-TF-024

1961
PHOTOREVISED 1981
DMA 4966 II NE–SERIES V831

GROVE CITY QUADRANGLE

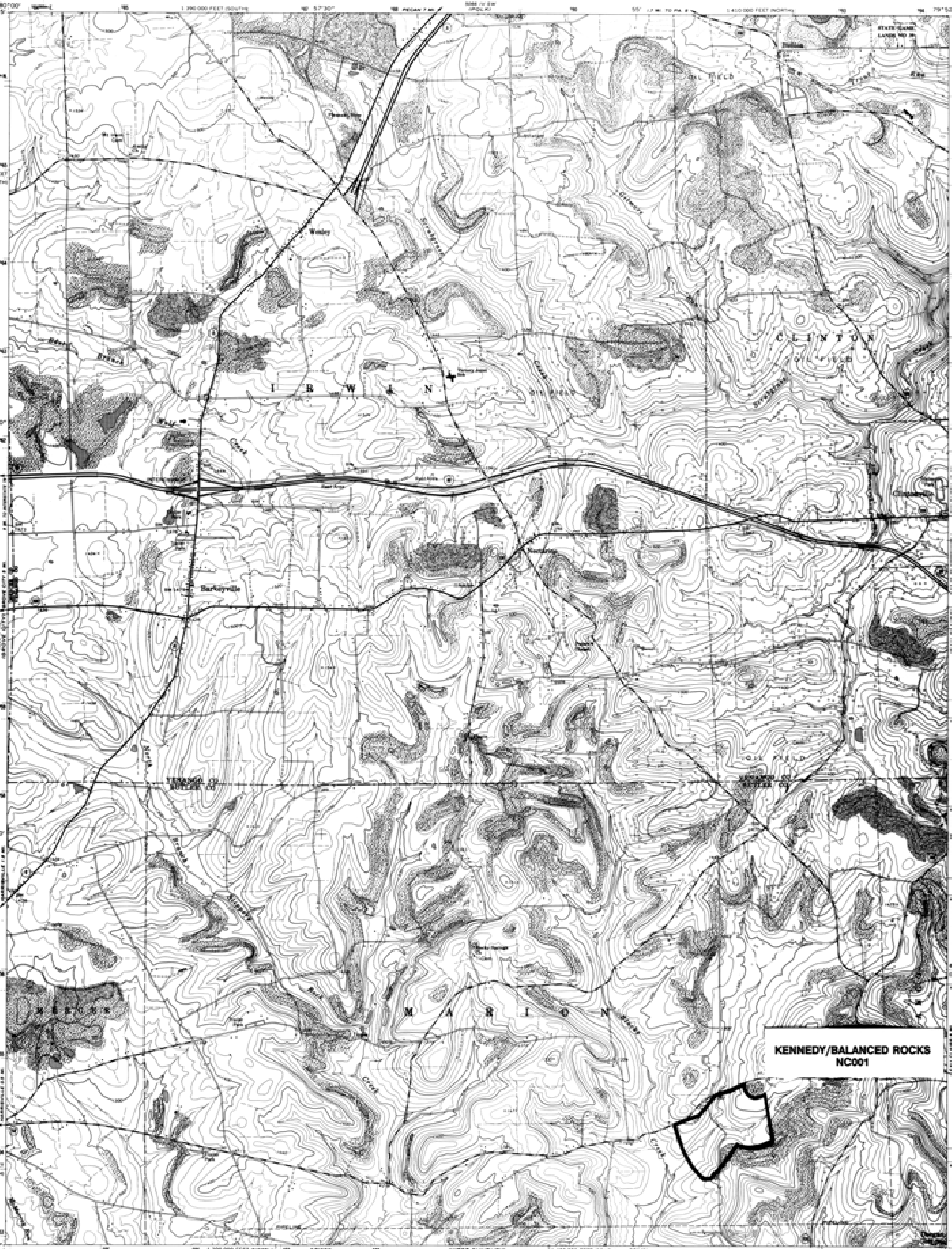
A very small portion of the northwestern section of Butler County is located on this quadrangle. This part of the county was subject to glacial activity during the Wisconsin and Illinoian glaciations. Although not on this quadrangle, many unique land formations resulted from this prehistoric activity. There are presently no known examples of quality natural communities or species of special concern in this quadrangle.

BARKEYVILLE QUADRANGLE

		PNDI Rank		Legal Status		Last
		Global	State	Fed.	State	Seen
KENNEDY/BALANCED ROCKS	*Moderate Significance*					
NATURAL COMMUNITY:	NC001	G?	S5	N	N	11/90

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

BARKEYVILLE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS, NOS/NOAA, and USCE

Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1963

Polyconic projection. 10,000-foot grid based on Pennsylvania coordinate system, north and south zones. 1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue. 1927 North American Datum. To place on the predicted North American Datum 1983 move the projection lines 3 meters south and 18 meters west as shown by dashed corner ticks

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

There may be private inholdings within the boundaries of the National or State reservations shown on this map

UTM GRID AND 1980 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1977 and other source data. This information not field checked. Map edited 1980

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
Interstate Route — State Route

BARKEYVILLE, PA.

N4107.5—W7952.5/7.5

1963
PHOTOREVISED 1980
DMA 5066 III NW—SERIES V831

BARKEYVILLE QUADRANGLE

This portion of northern Butler County occupies the lower half of this quadrangle map. Much of the land has been heavily impacted by strip mining. The forested, open space that still exists has been logged and second growth communities remain. One community was identified that appears to have been left relatively undisturbed with the exception of logging in the surrounding forest.

Kennedy and Balanced Rocks represent an acidic cliff community (**NC001**) along a tributary to Blacks Creek. These rock outcrops are of the Homewood Formation of the Pottsville sandstone and are located approximately one quarter of a mile apart. Since they provide habitat for the same types of vegetation they are ecologically linked and are therefore, included here as a single natural community within a common buffer zone. **Kennedy Rocks** are significant in that they represent a moist, northern habitat which is uncommon in the county. Plants such as rock polypody (Polypodium virginiana), wood sorrel (Oxalis sp.), white clintonia (Clintonia umbellata), Canada mayflower (Maianthemum canadense), wood fern (Dryopteris spinulosa), lycopodium (Lycopodium spp.), and many mosses and liverworts characterize these rock outcrops. This site represents the only known occurrence of goldthread (Coptis groenlandica), a wildflower typical of northern habitats. Moist conditions exist on the rocks as a result of seepage springs. This part of the community is located on a northwest exposure and is surrounded by a second growth mixed forest of black cherry (Prunus serotina), sugar maple (Acer saccharum), red oak (Quercus borealis), and yellow birch (Betula alleghaniensis) trees. The adjacent **Balanced Rocks** are located on a southwest exposure and are therefore drier. This rock outcrop is surrounded by a forest community similar to that at Kennedy Rocks. Similar vegetation is found growing on these rocks, as well.

NC001 represents a unique habitat for Butler County. One of the biggest threats to this site is altering the forest surrounding the rock outcrops. Removal or alteration of the forest canopy in the vicinity of the rocks would allow more light to penetrate to the rock community and thus, result in drier conditions. Influencing the moisture conditions on and around these rocks could result in drastic changes in the vegetation. Maintaining an undisturbed forested buffer zone will help to insure that the existing community remains.

Another potential threat to this community is the alteration of ground and/or surface water quality as a result of strip mine activity in the surrounding area. To change the water quality by contamination of ground water by acid mine drainage would be detrimental to the many plants that grow on and around the rocks. The

high diversity of mosses and liverworts, in particular, would be affected.

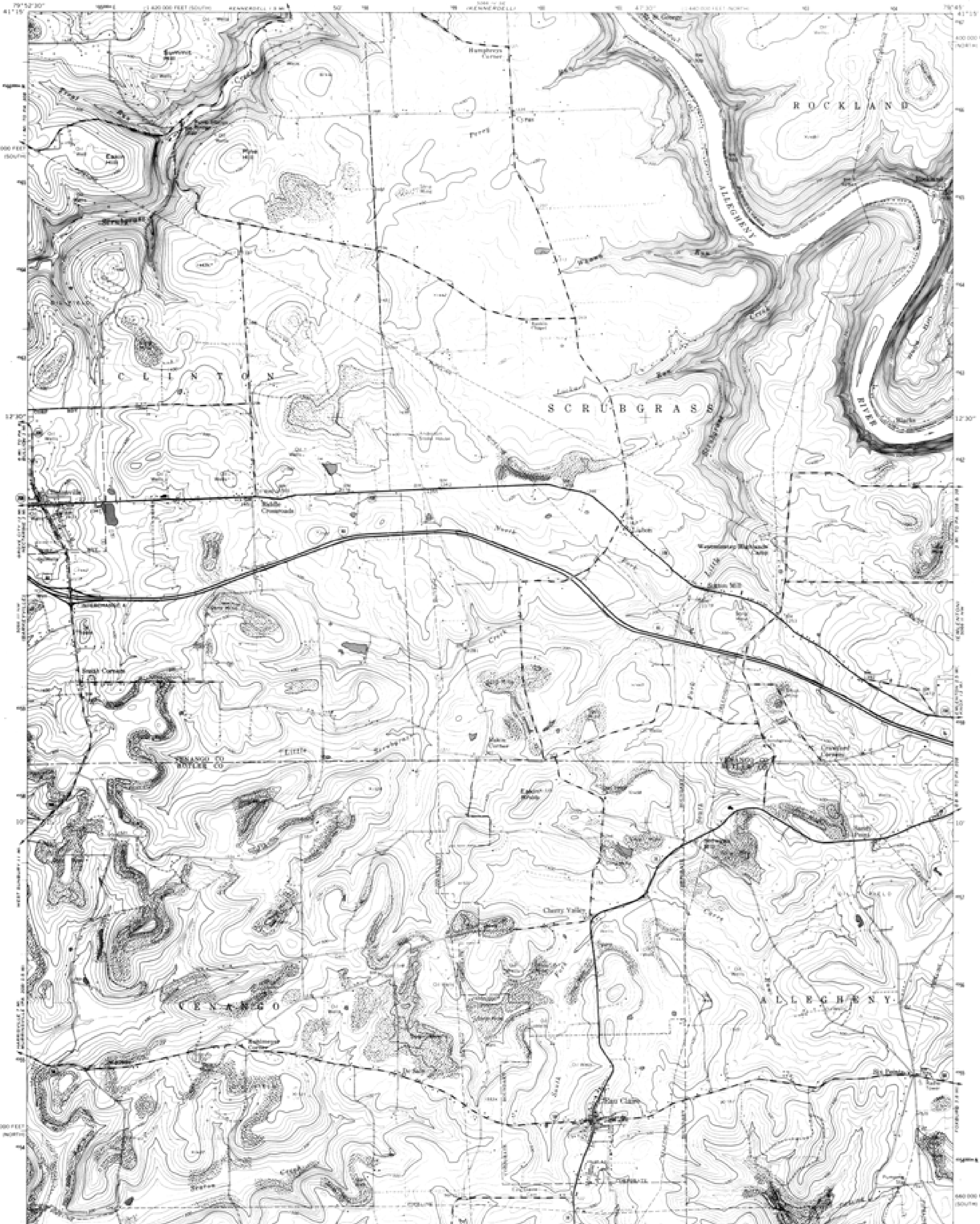
Illegally dumped trash and graffiti painted on the rocks are two existing problem at this site. More than anything else, this is aesthetically unpleasant, although spraying paint on the rock surface may alter habitat for mosses, lichens, and microorganisms. Therefore, attempts should be made by the property owners and other interested parties to eliminate and prevent littering and defacement of these rocks.

EAU CLAIRE QUADRANGLE

	PNDI Rank		Legal Status		Last
	Global	State	Fed.	State	Seen

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EAU CLAIRE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS, USC&GS, and USCE

Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1963

Polyconic projection. 1927 North American datum
10,000 foot grids based on Pennsylvania coordinate system, north and south zones
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1972. This information not field checked

UTM GRID AND 1972 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
Interstate Route — State Route

EAU CLAIRE, PA.

N4107.5—W7945/7.5

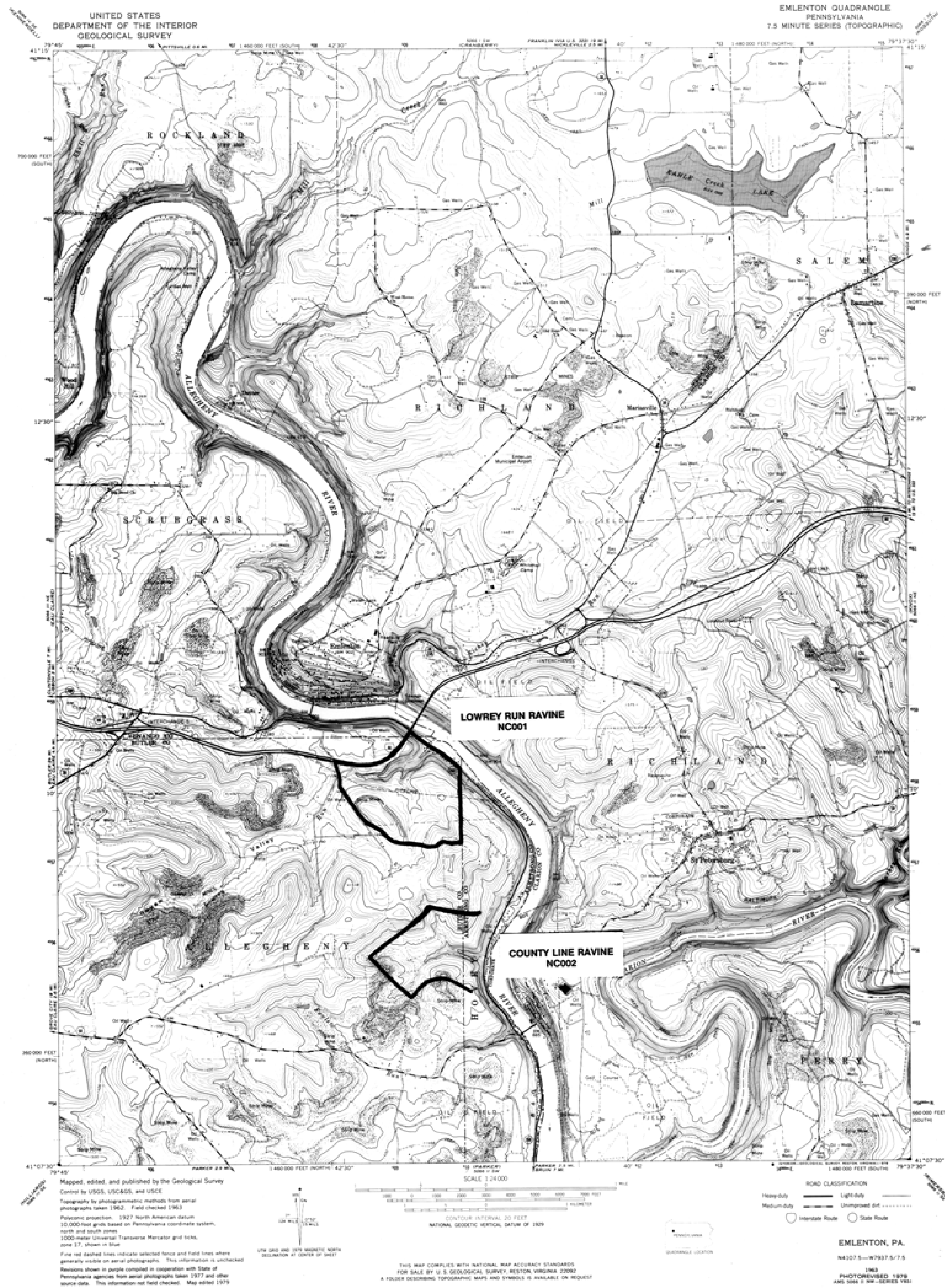
1963
PHOTOREVISED 1972
AMS 5066 III NE—SERIES V831

EAU CLAIRE QUADRANGLE

Very little significant open space exists in this northern quadrangle due to heavy strip mining activity. Those areas that have not been stripped for coal have been logged and, therefore, natural communities have not been identified, nor have habitats for species of special concern. Southwest of Kohlmeyer Corner is a sizeable wetland that probably provided quality habitat for many plants and animals at one time. Presently, this wetland is extremely polluted with acid mine drainage and filling that have resulted from strip mining activity.

EMLENTON QUADRANGLE

		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
LOWREY RUN RAVINE *Moderate Significance*						
NATURAL COMMUNITY:	NC001	G?	S3	N	N	11/90
COUNTY LINE RAVINE *Low Significance*						
NATURAL COMMUNITY:	NC002	G?	S3	N	N	4/91


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
EMLENTON QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
ROCKLAND
SALEM
RICHLAND
SCRUBGRASS
ALLEGHENY
RIVER
Marienville
Emlenton Municipal Airport
OIL FIELD
LOWREY RUN RAVINE
NC001
COUNTY LINE RAVINE
NC002
St Petersburg
PERRY
Mapped, edited, and published by the Geological Survey
Control by USGS, USC&GS, and USCE
Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1963
Polyconic projection. 1927 North American datum
10,000-foot grids based on Pennsylvania coordinate system, north and south zones
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1977 and other source data. This information not field checked. Map edited 1979
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
Interstate Route
State Route
QUADRANGLE LOCATION
EMLENTON, PA.
N4107.5—W7937.5/7.5
1963
PHOTOREVISED 1979
AMS 5066 II NW—SERIES V831

EMLENTON QUADRANGLE

This northeastern corner of the county touches the Allegheny River and, like other areas in northern Butler County, has been impacted by strip mining. Two areas that have not been too heavily disturbed by mining and logging are located along two tributaries to the Allegheny River. **Lowrey Run Ravine** and **County Line Ravine** are both examples of a northern hardwood-conifer forest community (**NC001** and **NC002**, respectively) which is dominated by eastern hemlock (Tsuga canadensis) and yellow birch (Betula alleghaniensis).

Lowrey Run Ravine is located in the northeast corner of Allegheny Township where the county is in close proximity to the Allegheny River. The cool, mesic, rocky northern forest of this ravine is the only known site in Butler County where painted trillium (Trillium undulatum) grows naturally. The hemlock-yellow birch forest grades into a more deciduous forest at higher elevations. Past logging activity is evident in the upland area, but it appears that the ravine has been left relatively undisturbed with the exception of some old, abandoned oil drilling machinery. Most of the evidence of oil operations (storage tank, well, and pipeline) is located at the head of the ravine, where a pipeline originates that traverses the valley along the south side of the stream. Potential threats from the abandoned oil drilling operation include leakage from an existing pipeline or well, which may result from pressure caused by geologic forces, and disturbance to the community if/when drilling machinery and the pipeline are removed. Upslope of the ravine on the south side is a strip mine that was not fully reclaimed when mining operations were completed. Erosion along the upper edge of the ravine from this activity has resulted. Suitable soil conditions in the area of this strip mine are needed in order for the forest to successfully recover on the slope above the ravine. These factors need to be taken into consideration when planning for the preservation of this site.

The community type that NC001 represents, as well as some of the species that grow there, is uncommon for Butler County. Disturbance in the ravine was minimal in the past and, therefore, the site has recovered. To help insure that the site continues to function ecologically as a northern hardwood-conifer forest community, a forested buffer along the perimeter of the ravine must be maintained. Continued disturbance up slope from the ravine could result in erosion and runoff into Lowrey Run. Presently strip mining in the Squaw Valley is the biggest threat to the site. This valley is located upstream from the ravine and is possibly the largest contiguous strip mine in Butler County. Pollution of the stream by acid mine drainage is a potential problem that should be prevented.

Directly south of Lowrey Run is another northern hardwood-conifer forest community (**NC002**) that has old-growth eastern hemlock dominating the steep ravine walls and mature oaks (Quercus spp.) dominating the upland slopes. County Line Ravine is dissected from north to south by the Butler/Armstrong County line. The open ended boundary technique for mapping this site demonstrates that the community continues into the adjacent county. Although the plant community appears to be of higher quality, as a whole, than Lowrey Run, the most pristine portion of this site lies within Armstrong County. A small portion of the high quality community does extend into Butler County, however, the upland areas and head of the valley have been degraded by recent logging operations and strip mining activity.

The site is similar to Lowrey Run in that the same threats are imposed upon it. In order for this site to recover, logging and coal mining operations must be reevaluated. In addition, ATV (all-terrain vehicle) use at this site should stop since the heavily used trails are causing an erosion problem for the stream at the head of the valley.

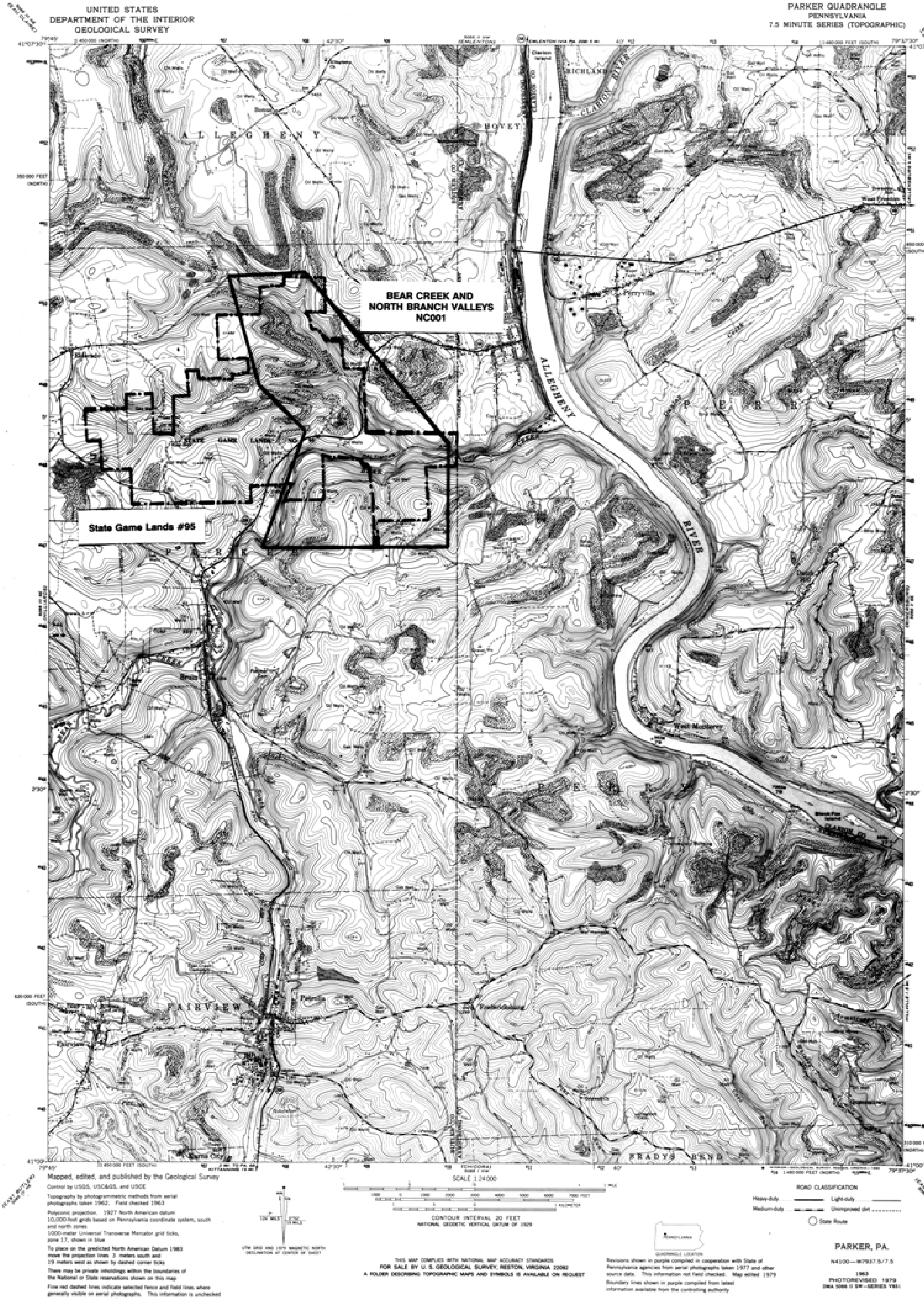
PARKER QUADRANGLE

		PNDI Rank		Legal Status		Last
		Global	State	Fed.	State	Seen

BEAR CREEK AND NORTH BRANCH VALLEYS *Moderate Significance*

NATURAL COMMUNITY:	NC001	G?	S3	N	N	4/91

MANAGED AREA: State Game Lands #95


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
PARKER QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
BEAR CREEK AND
NORTH BRANCH VALLEYS
NC001
State Game Lands #95
ALLEGHENY
RIVER
CLARION RIVER
RICHLAND
HOVEY
Perryville
PERRY
PARKER
FAIRVIEW
BRADYS BEND
Mapped, edited, and published by the Geological Survey
Control by USGS, USC&GS, and USCE
Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1963
Polyconic projection. 1927 North American datum
10,000-foot grids based on Pennsylvania coordinate system, south and north zones
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
To place on the predicted North American Datum 1983 move the projection lines 3 meters south and 19 meters west as shown by dashed corner ticks
There may be private inholdings within the boundaries of the National or State reservations shown on this map
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
QUADRANGLE LOCATION
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1977 and other source data. This information not field checked. Map edited 1979
Boundary lines shown in purple compiled from latest information available from the controlling authority
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
State Route
PARKER, PA.
N4100—W7937.5/7.5
1963
PHOTOREVISED 1979
DMA 5066 II SW—SERIES V831

PARKER QUADRANGLE

The effects of strip mining, logging, and petroleum production are apparent across the landscape of this eastern most portion of the county. Bear Creek, a tributary to the Allegheny River, runs north through the towns of Petrolia and Bruin. Petrolia continues to live up to its reputation as an oil town as evidenced by the refineries that are still present. Many years ago Bear Creek ran black as a result of the dumping of petroleum by-products from factories in Petrolia and Bruin. It has since been cleared of this pollution, however, with the onset of strip mining, the stream and many of its tributaries have become contaminated with acid mine runoff.

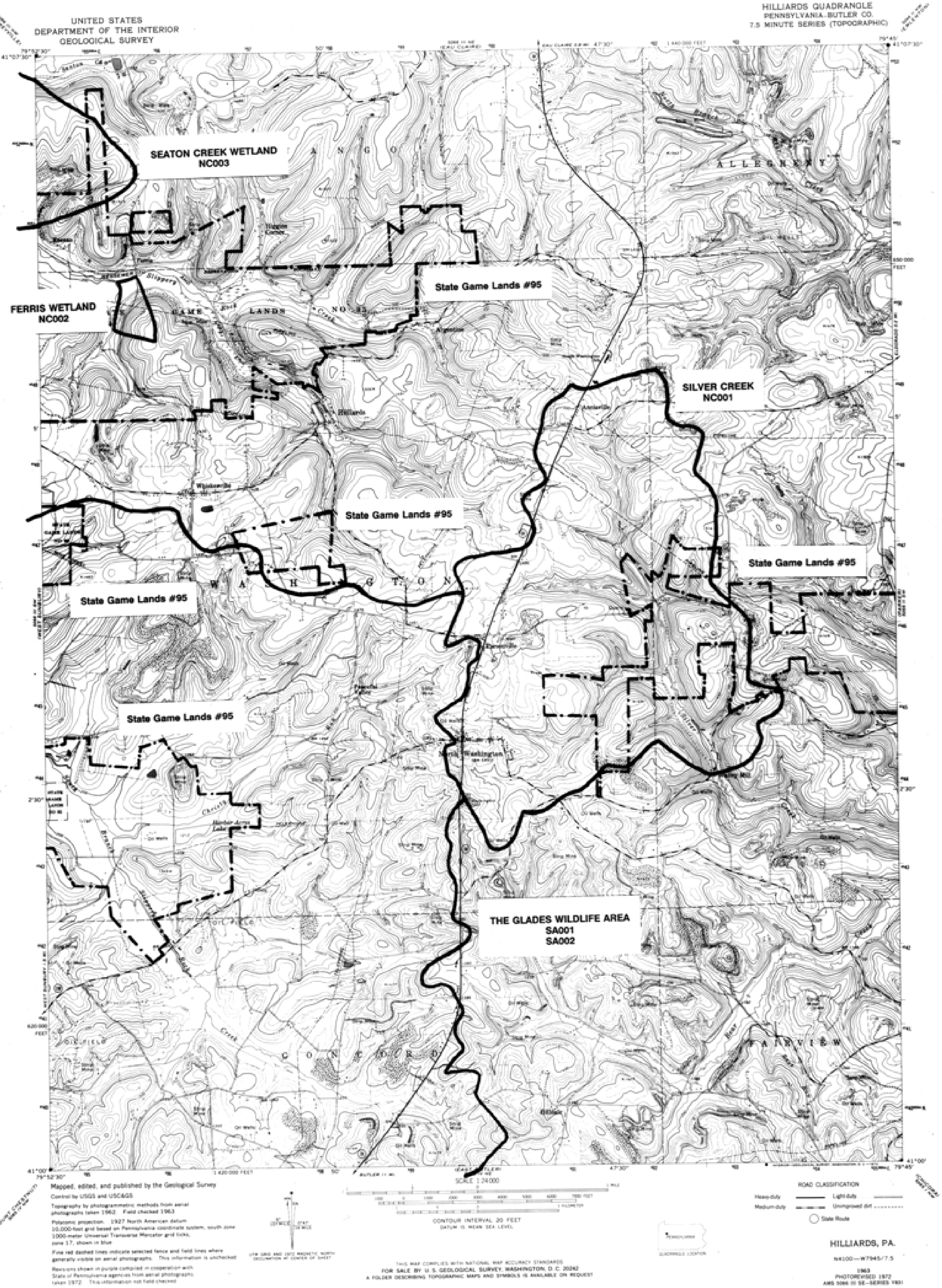
Bear Creek and North Branch Valleys are located northeast of Bruin along Bear Creek and its North Branch. These waterways flow through part of **State Game Lands #95**. Although the surrounding forest has been impacted by logging, much of it is recovering. The community that exists in these stream valleys, **NC001**, is a northern hardwood-conifer forest community dominated by eastern hemlock (Tsuga canadensis), sugar maple (Acer saccharum) and white oak (Quercus alba). The site is characterized by its rich, highly organic soils and diverse flora. Green violet (Hybanthus concolor) grows along the valley and is indicative of the rich conditions that exist at the site. In addition, large boulders and acid rock outcrops help to characterize the site.

The forest community itself has been restricted in some areas to within 100 ft. of Bear Creek and its North Branch. This fragmentation of the site has limited its recoverability. Factors that contributed to this in the past was heavy logging and strip mining on the valley slopes and uplands. Presently, the biggest threat to the Bear Creek Valley is an active strip mine on the south side of the stream. Expansion of the strip mine, or additional logging in the vicinity or upslope of the site will hinder its recoverability. To help insure that NC001 and its unique natural qualities continue to exist and fully recover, a suitable forested buffer zone should be maintained.

HILLIARDS QUADRANGLE

		PNDI Rank Global	PNDI Rank State	Legal Status Fed.	Legal Status State	Last Seen
THE GLADES WILDLIFE AREA *High Significance*						
SPECIAL ANIMAL:	SA001	G3	S1	LE	PE	5/91
SPECIAL ANIMAL:	SA002	G3G4	S2	C2	PE	7/90
SEATON CREEK WETLAND *Moderate Significance*						
NATURAL COMMUNITY:	NC003	G?	S2	N	N	4/91
FERRIS WETLAND *Moderate Significance*						
NATURAL COMMUNITY:	NC002	G5	S3	N	N	4/91
SILVER CREEK *High Significance*						
NATURAL COMMUNITY:	NC001	G?	S3	N	N	11/90

MANAGED AREA: State Game Lands #95


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
HILLIARDS QUADRANGLE
PENNSYLVANIA-BUTLER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SEATON CREEK WETLAND
NC003
FERRIS WETLAND
NC002
State Game Lands #95
SILVER CREEK
NC001
State Game Lands #95
State Game Lands #95
State Game Lands #95
State Game Lands #95
THE GLADES WILDLIFE AREA
SA001
SA002
ALLEGHENY
WASHINGTON
CONCORD
FAIRVIEW
Mapped, edited, and published by the Geological Survey
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
State Route
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
HILLIARDS, PA.
N4100—W7945/7.5
1963
PHOTOREVISED 1972
AMS 5066 III SE—SERIES V831

HILLIARDS QUADRANGLE

A large portion of this part of the county is occupied by **State Game Lands #95**. Logging and surface coal mining have changed the appearance of the landscape both within and outside of these public lands. Wetlands such as forest swamps and open canopy marshes are common along Slippery Rock Creek and its tributaries. The largest, most recognizable feature on this quadrangle is **The Glades Wildlife Area** which is located in State Game Lands #95.

Glade Dam Lake (evident on the West Sunbury quadrangle) was formed by damming the South Branch of Slippery Rock Creek to form a large fluctuating impoundment. In addition to the lake and associated wetlands, the State Game Lands are composed of second growth woodlands, old fields, and mowed fields which provide diverse habitats for many game and non-game species. The Glades, as this area is commonly referred to, provides habitat for two animal species of special concern. One of these species is a federally endangered animal (**SA001**) and is monitored and protected by the Pennsylvania Game Commission. This species relies on the water quality and conditions provided by the Glades. Human disturbance poses a threat to this species and therefore public access to the site of this species must be carefully controlled. Knight and Knight (1984) recommend that a 500 m buffer around the site of this animal and a 250 m buffer between humans and the animal be maintained.

The Glades also provides habitat for a state endangered animal (**SA002**). This species requires wet meadow and marsh conditions that are found along Glade Dam Lake. Prior to the damming of the South Branch of Slippery Rock Creek, this species was common, however, construction of the impoundment resulted in the loss of much of its habitat. A good population of the species remains even though threats do exist from humans. Continued preservation of this species can be accomplished as long as its existing habitat is not altered in any way.

Activities such as changing the water level of the lake could have a detrimental effect on the habitat of his species since it depends on an appropriate amount of moisture. In addition, forest succession may threaten the existence of the species. Since the species depends on wet open conditions for survival, the Game Commission should keep some areas mowed or burned so that the area does not become too overgrown. Additionally, it is recommended that the wet meadows along the impoundment and elsewhere not be plowed for cropland and that, in general, croplands be situated back from any wetlands.

Presently, the Game Propagation Area, in which public entry is prohibited, affords both of these species

some protection. Both animals depend on the quality of the water in the wetland areas at the Glades for survival and, therefore, anything that occurs within this watershed, such as residential or industrial development, surface mining, etc., should be avoided. To insure that the habitats of these species be protected, watershed boundaries have been used to designate the site. The critical areas within this watershed include the lowlands at elevations below 1360 ft. and areas within a 3 km. radius outside of the impoundment. The watershed boundaries provide a buffer zone for the critical areas. Any activities within the watershed that could alter the landscape or its hydrology should be carefully reviewed.

That portion of Slippery Rock Creek that runs through this part of Butler County abounds with wetlands along its banks. Unfortunately, disturbance from strip mining and logging is prevalent in this part of the county and the impact to the natural systems, particularly wetlands, is obvious. Since wetlands are recognized as being important ecosystems for their water purifying qualities and unique flora and fauna, we have made an attempt to recognize the highest quality wetlands in this area. Two wetlands that were determined to be impacted the least by pollution in this area were **Seaton Creek Wetland** and **Ferris Wetland**.

The Seaton Creek Wetland is surrounded in the upland areas by active and abandoned coal mining activities, however, little acid mine drainage has impacted the site. This is probably due to the drainage patterns in the watershed. This wetland community can be described as a robust emergent marsh (**NC003**) dominated by cattail (Typha spp.) and sedges (Carex spp.). Its significance lies in the fact that it provides somewhat undisturbed habitat for wetland flora and fauna in an area that has been devastated by acid mine drainage. Much of the investigation of this particular wetland was done by aerial reconnaissance and since the property owner has this site posted, ground observations were made from railroad tracks that border the site to the south. For this further investigation of the site is needed.

The boundaries for this site have been drawn to include the wetland, as well as the upslope areas that drain into the wetland. These areas have been included as a buffer for protection of the site since any impact upslope may directly affect the water draining into the wetland. Partial protection is given to the east of the wetland by State Game Lands #95. In order for the wetland system to recover completely and return to its pristine condition, attempts should be made to alleviate any pollution that is seeping into the wetland. Any activity on the railroad tracks could impact the wetland and therefore, a careful review of any plans for the railroad tracks is necessary.

The Ferris Wetland is located upstream on Slippery Rock Creek from Seaton Creek Wetland at the

intersection of a tributary stream in State Game Lands #95. This wetland is an example of an acidic shrub swamp community (**NC002**). It is related to a beaver dam that was built approximately 0.75 miles downstream. This site is surrounded by old strip mines and other wetlands that have been heavily degraded by acid mine drainage. Because of the location and water source of this wetland system, it has been left relatively unpolluted.

Boundaries for this site have been drawn to include those areas upslope that are part of the wetland system. The site is bordered by a road that could threaten the wetlands with runoff and sedimentation. Attempts should be made by the Pennsylvania Game Commission to protect this site from any disturbances, such as acid mine drainage, that might affect the hydrology or quality of the site.

Another significant natural feature in the Hilliards quadrangle is **Silver Creek**, the only exceptional value stream in Butler County. This high-gradient clearwater creek community (**NC001**), has very high water quality as evidenced by its flora and fauna. The creek supports self-sustaining populations of brown (Salmo trutta) and native brook trout (Salvelinus fontinalis) and a diverse population of pollution sensitive species of macroinvertebrates, such as several species of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera). The brook trout in this stream represent the only documented native population in Butler County and exist from the headwaters downstream to Walley Mill (D.E.R., Bureau of Water Quality Management, 1983). The same boundaries are given for the exceptional value portion of Silver Creek. From Walley Mill to its confluence with Bear Creek, Silver Creek has been designated a high quality-coldwater fishery by the D.E.R, Bureau of Water Quality Management (1979). Three quarters of the Silver Creek watershed is covered by second growth oak (Quercus sp.)-maple (Acer sp.) forest and the remainder by brushland, pasture, and farmland. Approximately 17% of the watershed is located in State Game Lands #95.

NC001 is a unique habitat for Butler County and to insure that this stream remains a high-quality, exceptional value stream, a protection plan for the watershed should be established and implemented. Drastic physical disturbances to the watershed, such as erosion and sedimentation caused by logging should be restricted in this buffer zone. Any activities such as strip mining, dumping of treated wastewater, use of chemical fertilizers in bordering agricultural fields, spraying pesticides for gypsy moths etc., should be avoided. The pipeline that crosses NC001 just northeast of township road 721 is a potential threat to the stream. Any activity on the pipeline should be reviewed to determine the impact on the stream. The Game Commission should attempt to acquire more of the land surrounding Silver Creek and manage it with the

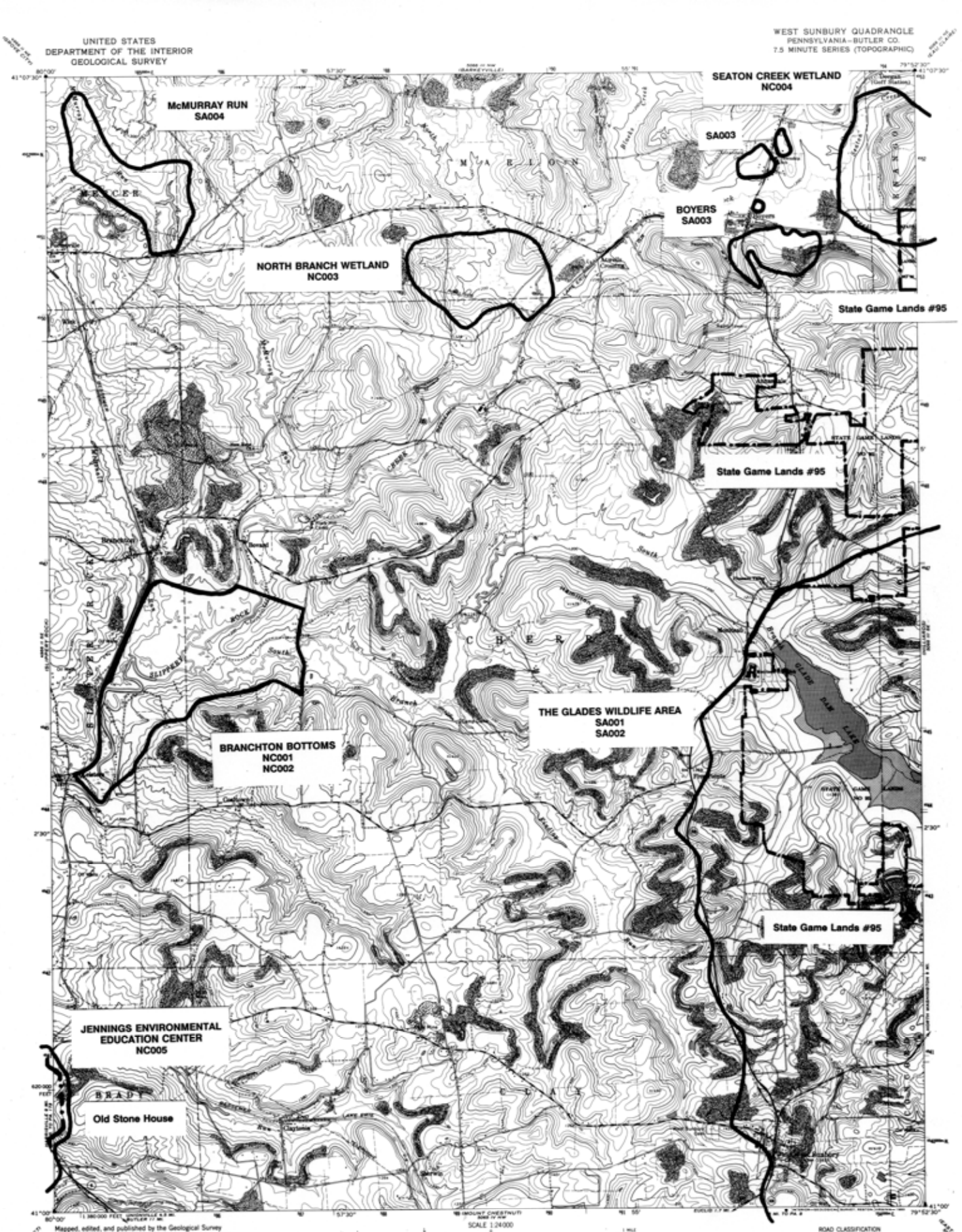
protection of the stream community in mind.

WEST SUNBURY QUADRANGLE

		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
THE GLADES WILDLIFE AREA *High Significance*						
SPECIAL ANIMAL:	SA001	G3	S1	LE	PE	5/91
SPECIAL ANIMAL:	SA002	G3G4	S2	C2	PE	7/90
SEATON CREEK WETLAND *Moderate Significance*						
NATURAL COMMUNITY:	NC004	G?	S2	N	N	4/91
BOYERS *High Significance*						
SPECIAL ANIMAL:	SA003	G3G4	S2	C2	PE	1987
NORTH BRANCH WETLAND *Moderate Significance*						
NATURAL COMMUNITY:	NC003	G?	S2	N	N	4/91
BRANCHTON BOTTOMS *High Significance*						
NATURAL COMMUNITY:	NC001	G?	S1	N	N	8/90
NATURAL COMMUNITY:	NC002	G?	S2S3	N	N	8/90
McMURRAY RUN *Moderate Significance*						
SPECIAL ANIMAL:	SA004	G3G4	S2	C2	PE	7/90
JENNINGS ENVIRONMENTAL EDUCATION CENTER *High Significance*						
NATURAL COMMUNITY:	NC005	G?	S5	N	N	9/90

MANAGED AREA: State Game Lands #95

Old Stone House


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WEST SUNBURY QUADRANGLE
PENNSYLVANIA–BUTLER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
McMURRAY RUN
SA004
SEATON CREEK WETLAND
NC004
SA003
BOYERS
SA003
NORTH BRANCH WETLAND
NC003
State Game Lands #95
State Game Lands #95
THE GLADES WILDLIFE AREA
SA001
SA002
BRANCHTON BOTTOMS
NC001
NC002
State Game Lands #95
JENNINGS ENVIRONMENTAL
EDUCATION CENTER
NC005
Old Stone House
M A R I O N
C H E R R Y
C L A Y
BRADY
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
ROAD CLASSIFICATION
WEST SUNBURY, PA.
N4100—W7952.5/7.5
1963
PHOTOREVISED 1979

WEST SUNBURY QUADRANGLE

This portion of the county, like that to the east, is scattered with wetlands. Although subject to a good deal of disturbance in the form of strip mining and logging, this area exhibits a variety of natural qualities. Slippery Rock Creek and its main tributaries are significant features in this area. The wetlands along the South Branch of Slippery Rock Creek in the vicinity of **The Glades Wildlife Area** in **State Game Lands #95** provide habitat for two endangered animal species (**SA001** and **SA002**). This important site extends into the Hilliards quadrangle and has been described in detail in the summary on page 55. The **Seaton Creek Wetland** is a robust emergent marsh community (**NC004**) that is located on both the West Sunbury and Hilliards quadrangles. This site and recommendations for its protection are explained in more detail in the Hilliards quadrangle summary (p. 55).

Downstream from Seaton Creek Wetland on Slippery Rock Creek is the town of **Boyers**. Habitat for an animal of special concern (**SA003**) exists in the vicinity of this town, both along Slippery Rock Creek and upslope from the creek. This special animal requires open canopy, wet meadow conditions for survival. More of this type of habitat is found in this area, however, only documented occurrences of the species have been included on the Hilliards quadrangle map. Present threats that exist at the site include residential development and loss of habitat. Coal mining operations in the vicinity of the sites also pose a threat to the water quality of the wetland areas that this species inhabits. Recommendations for protection of the populations include avoiding upslope activity that might affect the water quality in the wetland. Alteration in the flow or level of Slippery Rock Creek would be detrimental to the habitat that exists along the banks of the stream and therefore, should be avoided.

West of Boyers along Slippery Rock Creek is a floodplain forest community (**NC003**) referred to as the **North Branch Wetland**. This second growth forest dominated by red maple (Acer rubrum) and elm (Ulmus sp.) is located at the intersection of the North Branch of Slippery Rock Creek and Slippery Rock Creek. It has relatively rich soils and an abundance of herbaceous flora. Vernal pools, which are located throughout the floodplain, add to the diversity of the site by providing conditions that are suitable for certain wetland plant and animal species.

The forested wetlands surrounding this site have been heavily impacted by surface coal mining operations and, like Seaton Creek and Ferris Wetlands, this wetland has been left relatively undisturbed. Attempts should be made to help restore these forested wetland communities to their original conditions prior to the

onset of surface mining. Future applications for mining, or any other activity in this area, should by carefully reviewed. Since this wetland is a system relying on all of the drainage into it, activity upslope or within the watershed should be examined for any effects that they might have on the wetland itself. The hydrology of Slippery Rock Creek should not be altered in any way, such as by building a dam or levee on the creek. Alterations such as these could change the water table or flood event period and result in drastic changes to the communities supporting this floodplain.

Another significant wetland in the vicinity of the confluence of Slippery Rock Creek at the South Branch of Slippery Rock Creek after it leaves the Glades is referred to as **Branchton Bottoms**. Two natural communities exist at this site, which has been noted for qualities that are unique in Butler County. The most significant of the two natural communities is a forested floodplain swamp community (**NC001**) dominated by swamp white oak (Quercus bicolor). This moderately diverse wetland community is characterized by the large old growth oak that dominate the site and the vernal floodplain pools that are scattered throughout the floodplain. This section of the floodplain appears to be relatively undisturbed, with the exception of some excessive seasonal flooding and an abandoned railroad. Some of the bordering areas, however, have been disturbed by logging and grazing in the past, as well as the continued presence of a pipeline.

A mosaic of natural pond communities (**NC002**) exist within NC001. These relatively undisturbed small wetlands are remnant oxbow pools that resulted many years ago when Slippery Rock Creek repeatedly changed its course through this area. They have remained through the years as a result of periodic flooding to provide a unique habitat for certain plant and animal species in this wetland.

Both NC001 and NC002 provide unique examples of sites high in biodiversity in Butler County and therefore they should be protected. A forested buffer around the perimeter of the site will help to ensure that the communities continue to function ecologically as a wetland system. It is recommended that any drastic changes to the buffer, such as logging, be avoided. In addition, the hydrology of this wetland system, Slippery Rock Creek and its south branch, should not be altered in any way. This would include the building of a dam or levee on either of the streams. Such alterations could change the water table and flood event period and result in a major change in the present habitats comprising the wetland. There are no active threats to the floodplain at this time, however, any development on the existing railroad grade could result in such disturbance as erosion and sedimentation of the wetland. Also, any accidental spills of hazardous materials on the railroad could pollute the wetlands.

McMurray Run, a tributary to Slippery Rock Creek, provides suitable habitat within its valley for a state endangered animal (**SA004**). Much of the land along McMurray Run consists of shrub swamps and wet meadows, which are suitable habitat for this animal. Hay fields on adjacent farms are also utilized as habitat during part of the year. This habitat was apparently more abundant at one time, however, forest succession and an increase in strip mining have resulted in a loss of habitat. Future strip mining applications should be carefully reviewed for potential impact to the remaining habitat.

A portion of **Jennings Environmental Education Center** and the dry-mesic acidic central forest community (**NC005**) that is located throughout the managed area extends into this quadrangle. This community and other special features at Jennings are described in more detail in the Slippery Rock quadrangle summary (p. 67).

The **Old Stone House** also extends partially into this quadrangle. This property is managed by the Pennsylvania Historic and Museum Commission. Although it has no significant natural qualities, it has been included in this inventory for the buffer land that it provides for the communities and special plants and animals at Jennings.

SLIPPERY ROCK QUADRANGLE

		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
WOLF CREEK CONSERVATION AREA *Moderate Significance*						
NATURAL COMMUNITY:	NC013	G?	S3	N	N	5/91
LOWER WOLF CREEK VALLEY *High Significance*						
NATURAL COMMUNITY:	NC009	G?	S1S2	N	N	4/91
NATURAL COMMUNITY:	NC010	G?	S3	N	N	5/91
NATURAL COMMUNITY:	NC011	G?	S3S4	N	N	5/91
NATURAL COMMUNITY:	NC012	G?	S3	N	N	5/91
NATURAL COMMUNITY:	NC013	G?	S3	N	N	5/91
MILLER WOODS *High Significance*						
NATURAL COMMUNITY:	NC011	G?	S3S4	N	N	5/91
NATURAL COMMUNITY:	NC013	G?	S3	N	N	5/91
WOLF CREEK NARROWS NATURAL AREA *High Significance*						
NATURAL COMMUNITY:	NC011	G?	S3S4	N	N	8/90
NATURAL COMMUNITY:	NC012	G?	S3	N	N	8/90
NATURAL COMMUNITY:	NC013	G?	S3	N	N	8/90
SPECIAL PLANT:	SP003	G3G5	S1	N	TU	8/90
CURRYS MILLS FLOODPLAIN *Moderate Significance*						
NATURAL COMMUNITY:	NC014	G?	S3?	N	N	10/90
SLIPPERY ROCK CREEK PROPERTY *High Significance*						

NATURAL COMMUNITY:	NC006	G?	S2	N	N	4/91
NATURAL COMMUNITY:	NC007	G?	S2	N	N	4/91
NATURAL COMMUNITY:	NC008	G5	S3	N	N	4/91

SLIPPERY ROCK CREEK GORGE *Moderate Significance*

NATURAL COMMUNITY:	NC004	G?	S3	N	N	4/91
NATURAL COMMUNITY:	NC005	G?	S2	N	N	4/91

RING SWAMP *High Significance*

NATURAL COMMUNITY:	NC003	G?	S3	N	N	7/90

JENNINGS ENVIRONMENTAL EDUCATION CENTER *High Significance*

NATURAL COMMUNITY:	NC001	*	*	*	*	9/90
NATURAL COMMUNITY:	NC002	G?	S5	N	N	9/90
SPECIAL PLANTS:	SP001	G3G5?	S1	N	PE	7/84
SPECIAL PLANTS:	SP002	G5	S1	N	TU	1990
SPECIAL ANIMALS:	SA001	G3G4	S2	C2	PE	1987

HARMONY HOUSE FIELDS *Moderate Significance*

SPECIAL ANIMAL:	SA002	G5	S2	N	PT	5/91

HOGG WOODS *Low Significance*

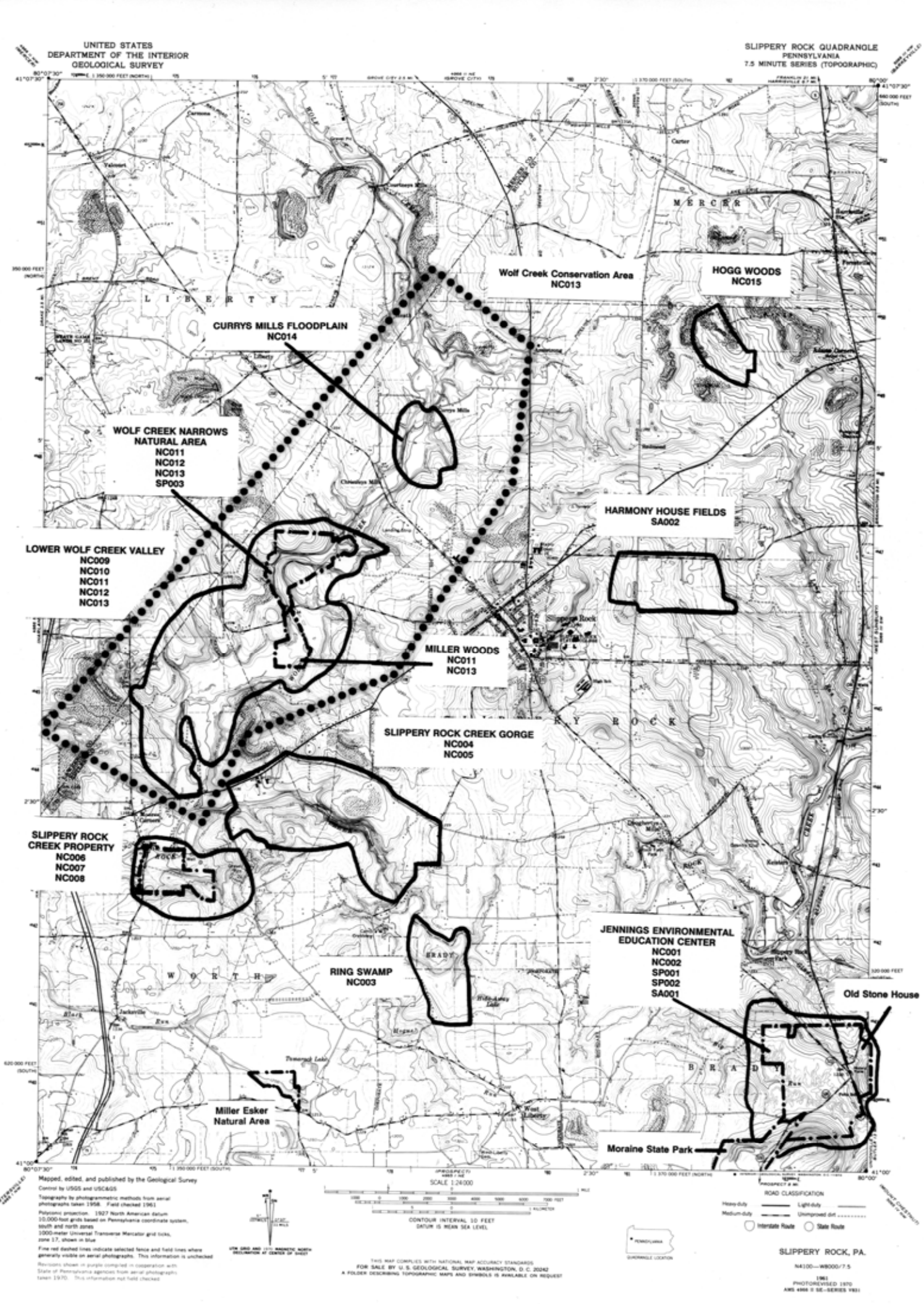
NATURAL COMMUNITY:	NC015	G?	S3S4	N	N	6/90

MANAGED AREA: Old Stone House

Moraine State Park

Miller Esker Natural Area

* Classification for this community is not available at the present time.


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
SLIPPERY ROCK QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
Wolf Creek Conservation Area
NC013
HOGG WOODS
NC015
CURRYS MILLS FLOODPLAIN
NC014
WOLF CREEK NARROWS
NATURAL AREA
NC011
NC012
NC013
SP003
HARMONY HOUSE FIELDS
SA002
LOWER WOLF CREEK VALLEY
NC009
NC010
NC011
NC012
NC013
MILLER WOODS
NC011
NC013
SLIPPERY ROCK CREEK GORGE
NC004
NC005
SLIPPERY ROCK
CREEK PROPERTY
NC006
NC007
NC008
RING SWAMP
NC003
JENNINGS ENVIRONMENTAL
EDUCATION CENTER
NC001
NC002
SP001
SP002
SA001
Old Stone House
Miller Esker
Natural Area
Moraine State Park
MERCER
LIBERTY
SLIPPERY ROCK
WORTH
BRADY
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography by photogrammetric methods from aerial photographs taken 1958. Field checked 1961
Polyconic projection. 1927 North American datum
10,000-foot grids based on Pennsylvania coordinate system, south and north zones
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1970. This information not field checked
SCALE 1:24000
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
Interstate Route
State Route
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
SLIPPERY ROCK, PA.
N4100—W8000/7.5
1961
PHOTOREVISED 1970
AMS 4866 II SE—SERIES V831

SLIPPERY ROCK QUADRANGLE

The glaciers that once covered this northwest portion of the county account for many of its unique natural qualities. The majority of the land in this quadrangle is farmland. Mineral extraction is also common and includes not only strip mining, but also limestone and gravel mining. Wolf Creek and Slippery Rock Creek are the most prominent natural features in this area. These streams exhibit and number of unique habitats along their banks including ravines, floodplain forests, oxbow formations, and wetlands. A large number of the quality natural heritage sites in Butler County are located in this quadrangle.

Wolf Creek is a medium gradient-clearwater creek community (**NC013**) that flows from Mercer County into Butler County and empties into Slippery Rock Creek in the vicinity of Moores Corners. The section of Wolf Creek that flows within Butler County, in addition to the land that borders it has been designated the **Wolf Creek Conservation Area**. Wolf Creek and the large tracts of land that surround it are significant for Butler County in that they provide unique habitats and undeveloped space that merit protection.

Wolf Creek is an important ecosystem and, therefore, it should be protected. A potential threat to the stream is the rapidly developing residential areas outside of the town of Slippery Rock. As these areas grow, the buffer area around Wolf Creek will be reduced. Erosion, sedimentation, and pollution of the stream will result. Other activities such as mineral extraction and logging within the Wolf Creek Conservation Area or upstream outside of Butler County can also have a detrimental impact on the stream and its associated communities. Altering the flow of Wolf Creek, by creating a dam or levee, would not only impact the aquatic resources, but would have a damaging effect on the floodplain and wetland communities that exist along the stream.

The **Lower Wolf Creek Valley** is a large site located at the southern end of the Wolf Creek Conservation Area. This site is significant for its biodiversity, which is represented by five communities. One of these communities is Wolf Creek (**NC013**). Wetland communities are prevalent in this lower portion of Wolf Creek in old channel scars created by the stream hundreds of years ago when it ran closer to the hillsides. Along the base of the slope on both the east and west sides of Wolf Creek wetlands have formed on the floodplain. Most of these have been degraded by acid mine drainage and surface runoff and sedimentation from farm fields. Two communities exist, however, that have been left relatively undisturbed.

NC009 is a spring run community that originates in limestone bedrock. This results in alkaline water that cascades down the slope and produces unusual pools of calcareous deposits. The spring run and associated

pools are teaming with aquatic life: algae, mosses and invertebrates. The spring waters flow into both Wolf Creek and an emergent marsh wetland at the base of the slope. The clean calcareous spring water is important to the maintenance of water quality in both Wolf Creek and the marsh, the latter being one of the most diverse marsh communities in the county. Unfortunately, sedimentation runoff from the higher agricultural fields nearby is deposited in the marsh and is damaging its quality. Additionally, it appears as though the entire spring run may have flowed into the adjacent marsh, however, and that a portion of its discharge was then diverted to Wolf Creek. If further investigation indicates that this is true, the flow of the spring run should be returned to its original course into the marsh. Even more important is the protection of the quality and quantity of the water in the aquifer that produces the spring. More information is needed regarding the limestone layer and how much drainage basin produces the aquifer and thus the spring. Certainly any limestone mines near this area should be carefully reviewed. The spring, spring run and wetland should all be protected from agricultural runoff of any kind.

Farther upstream from NC009 is a series of seepage wetlands that result from the out flow of groundwater at the base of the northern slope of the Wolf Creek valley. These wetlands exhibit a wide variety of natural community types that are moderately diverse in both species and habitat, although most have been damaged to some degree by adjacent mining and agriculture. However, the condition of the western-most wetland is relatively high. This wetland is a circumneutral shrub swamp community (**NC010**) in which the herbaceous plants and shrub species grow on peaty humic soils that appear calcareous in chemistry. Groundwater seeps and rivulets are visible. Although the dominant vegetation consists of willows (Salix spp.), alder (Alnus sp.), sedges (Carex spp.) and marsh marigold (Caltha palustris), a few of the plants, for example starry Solomon's-seal (Smilacina stellata), which known from no other locality in Butler County, indicate that some of the habitat here is similar to that of a rare wetland community type known as a "calcareous fen".

Threats to the wetlands include surface runoff from surrounding agricultural fields, as well as contamination from acid mine drainage. Protection should include maintenance of the upland areas that are hydrologically linked to the wetlands and any alteration in the hydrology of the floodplain should be avoided. This includes changing the level or flow of Wolf Creek. Any disturbance to the forested buffer should also be avoided.

Within the boundaries of the Lower Wolf Creek Valley are two managed areas. **Miller Woods** is owned by Slippery Rock University and is used for outdoor education purposes by classes at the university. Miller

Woods is located along the northwest bank of Wolf Creek (**NC013**). The site can be described as a maturing northern hardwood forest community (**NC011**), which is dominated by American beech (Fagus grandifolia), sugar maple (Acer saccharum), red oak (Quercus borealis), white oak (Q. alba), and yellow poplar (Liriodendron tulipifera). Although the site had been selectively logged in the past and planted with exotic trees in some sections, it has retained the qualities of a diverse forest community. The site is characterized by its rich, mesic soil that harbors an abundance of herbaceous species, as well as remnant oxbow ponds and vernal pools that have resulted from flooding and a change in the streams path. These small wetlands add to the diversity of this site and to the rest of the Lower Wolf Creek Valley by providing habitats for plants and animals that require a source of standing water.

There are no serious threats to Miller Woods with the exception of those factors that threaten the entire Wolf Creek Conservation Area and the Lower Wolf Creek Valley. One recommendation for the protection of this area includes dedicating it to the preservation of the natural qualities that exist there. That is, to officially designate this site as a natural area so that it and the areas surrounding it may be protected into the future. Slippery Rock University should make an effort to expand Miller Woods by purchasing adjacent land. This would help to enlarge and buffer the community that exists at the site.

Wolf Creek Narrows Natural Area is a second managed area located just north of Miller Woods within the Lower Wolf Creek Valley. This site is owned and managed by the Western Pennsylvania Conservancy, which has dedicated the natural area to the preservation of the natural qualities found there. Three natural communities are recognized at this site, one of which is Wolf Creek (**NC013**), which flows through the western portion of the natural area. A mature northern hardwood community (**NC011**) is found on the floodplain and portions of the slope at this site. A portion of the site was logged approximately 100 years ago, but it has since recovered and is presently in the latter stages of secondary succession. A northern hardwood-conifer forest community (**NC012**) occupies the steep slopes of the main valley and the tributaries leading to Wolf Creek. This community is dominated by eastern hemlock (Tsuga canadensis) and represents a remnant of the virgin forest and is evident in other places along the creek. Wolf Creek Narrows Natural Area provides habitat for a plant species of special concern in Pennsylvania (**SP003**). The population of this plant is small and is found growing in an open canopy floodplain area along the creek. Protection of this species is important, as is the entire Natural Area. Adequate buffer should be provided to the site of this species especially since it is in close proximity to road.

Community boundaries and buffer zones have been drawn outside of the managed area boundaries as they were for Miller Woods. Because these communities extend outside of the managed area boundaries, an effort should be made by the Conservancy to expand the natural area. Protection efforts should be aimed at buffering the communities that exist at this site by purchasing surrounding lands and carefully reviewing, any activity that takes place within the boundaries of the Wolf Creek Conservation Area.

Upstream from Wolf Creek Narrows Natural Area is a site that is unique for Butler County. This site is referred to as **Currys Mills Floodplain** and is in the vicinity of Currys Mills. The significant community that exists at the site is a circumneutral seep community (**NC014**) at the base of the eastern slope along Wolf Creek. The wetland conditions are supported by seepage that flows out of the base of the slope. Skunk cabbage (Symplocarpus foetidus), sedges (Carex sp.), and alder (Alnus sp.) dominate this rich, mesic site. The surrounding floodplain forest which helps to buffer the site is a mature stand of eastern hemlock (Tsuga canadensis) and yellow birch (Betula alleghaniensis). Second growth northern hardwoods such as sugar maple (Acer saccharum) and American beech (Fagus grandifolia) border the site on the slope. This site is unique for Butler county and, although small in size, it should be preserved as an example of this natural community type.

At the present time, the biggest threat to the site is logging and runoff from agricultural fields in the upland areas. Markings on trees and the establishment of a road in the upland forest buffering the site suggests that the area might be logged in the near future. Logging in the vicinity of this floodplain could be detrimental since logging practices sometimes result in erosion and sedimentation. Other threats to this site include those that threaten the entire Wolf Creek Conservation Area. Efforts should be made to preserve land surrounding the site so that the community can expand and sustain itself into the future.

Slippery Rock Creek, like Wolf Creek, also harbors significant communities along its banks. Just west of the confluence of these two streams in the area of Moores Corners is a site referred to as the **Slippery Rock Creek Property**, which is owned and managed by the Department of Environmental Resources-Bureau of State Parks. Three relatively undisturbed communities exist at this site.

A floodplain forest community (**NC006**) dominated by maturing sugar maple (Acer saccharum), black maple (A. nigra), and black cherry (Prunus serotina) borders the south side of Slippery Rock Creek. This community extends along the stream edge to the base of the slope in the southern portion of the site where it grades into open canopy wetlands. The floodplain forest is characterized by its rich, highly organic soils that

provide suitable conditions for a huge variety of herbaceous species. This forest community helps to buffer the wetland communities that are located at the base of the slope of the southern side of the Slippery Rock Creek valley. The slope, which is formed of glacial rubble, and the uplands harbor a fairly diverse mesic central forest community **(NC007)**. Included are northern red oak (Quercus borealis), American basswood (Tilia americana) and American beech (Fagus grandifolia) on the slope, while a drier forest of white oak (Q. alba) and black oak (Q. velutina) grows on the uplands. In some portions of the site the forest is young and more recently disturbed, while more mature stands with colonies of spring wildflowers occur elsewhere. Also included is a rare shrub for the county: running strawberry-bush (Euonymus obovatus). The small stream flowing north through the eastern side of the site appears to be of good quality as indicated by its sandy bottom and stonefly population.

The wetlands, referred to previously, at the base and mid-points of the forested slope are several small springs and seeps that emerge from the glacial till and drain to form seepage wetlands of various descriptions. The small wetlands that form at seep and spring heads along the mid-slope harbor several wetland plants and numerous invertebrate animals that indicate good water quality. At the base of the slope these waters merge to form a larger wetland dominated by alder (Alnus sp.) and skunk cabbage (Symplocarpus foetidus). A separate adjacent wetland to the west provides a more acidic habitat and is dominated by several shrubs, herbaceous plants and mosses, including spiraea (Spiraea sp.), highbush blueberry (Vaccinium corymbosum), sedges (Carex spp.) and mosses, especially peatmoss (Sphagnum sp.). This unusual wetland community is considered an acidic shrub swamp (**NC008**) and has been left relatively undisturbed.

The natural resources at this site will be best protected by an expansion of the present state park holdings to include more of the area. Some of the area has been disturbed by recent logging and pasturing, and past quarrying on the east side. In any case, the state park land at this site should be dedicated as a natural area and managed as such. Protection for the wetlands should include the maintenance of the glacial till uplands hydrologically linked to them. Quarrying, or other earth disturbances in this area will potentially impact the quality and quantity of the water supporting the wetland communities. Forested land will most effectively protect this hydrology.

Downstream from the Slippery Rock Creek Property along Slippery Rock Creek is a site referred to as **Slippery Rock Creek Gorge**. The forest along both sides of the stream is a northern hardwood-conifer forest community (**NC004**) with eastern hemlock (Tsuga canadensis) and sugar maple (Acer saccharum)

dominating the steep gorge sides and more northern hardwoods, particularly sugar maple and yellow birch (Betula alleghaniensis), dominating the upland areas. The gorge is underlain by limestone, as is evidenced by the numerous rock outcrops and herbaceous vegetation growing on them. These calcareous cliff communities (**NC005**) are uncommon in Butler County and help to characterize the gorge and its smaller tributary valleys. NC005 provides habitat for vegetation that requires calcareous conditions to grow.

The quality of the site is high although land for grazing and farming extends, in many places along the gorge, to the very edge of the upper slope, thereby restricting the forest community (NC004) to the sides of the gorge. Some of the bordering areas of the site have been impacted by recent logging practices. To accommodate these logging practices, roads have been built and this has resulted in increased erosion and sedimentation in the gorge. Another threat to the Slippery Rock Creek Gorge communities is a strip mine that borders the northern section of this site. This strip mine was not reclaimed properly and as a result non-native species of conifers have established themselves.

To protect the gorge and the limestone communities, a substantial buffer zone should be maintained so that these habitats continue to function ecologically as a northern hardwood-conifer forest and calcareous cliff community. In order to provide a larger area for regeneration and expansion of the forest community, logging and any other activities such as grazing and strip mining should be avoided. An evaluation of the strip mined area to the north of NC005 should by made to determine if conditions are suitable for the successful regeneration of native species that comprise this community. An analysis should be made of the soil to determine if the topsoil is suitable or if it needs to be developed in order to sustain a forest community.

East of Slippery Rock Creek Gorge is an oxbow wetland that was formed in an abandoned stream bend which has become separated from Slippery Rock Creek by a change in the course of the creek. **Ring Swamp** is a circumneutral shrub swamp **(NC003)** along the southern edge of Slippery Rock Creek just southeast of Camp Crestview. Such flora as high bush blueberry (Vaccinium corymbosum), poison sumac (Rhus vernix), water parsnip (Sium suave), and winterberry holly (Ilex verticillata) characterize this site. This wetland is very diverse and represents a unique habitat for Butler County. At one time it served as a nesting habitat for the rare Prothonotary warbler (Protonotaria citrea). Recent logging in the surrounding forest may contribute to the absence of this species. Disturbances to the surrounding second growth red maple (Acer rubrum) forest pose a threat to the wetland area. A change in the surrounding canopy caused by logging would allow more light to penetrate to the forest floor, thus having an adverse effect on the wetland by making conditions

suitable for weedy species to grow and unsuitable for species already inhabiting the site. Additional impacts to this buffer caused by logging include erosion and sedimentation. Such impacts could be detrimental to the quality of the wetland. Attempts should be made to protect this small swamp by maintaining a forested buffer zone.

Jennings Environmental Education Center is owned and managed by the Pennsylvania Department of Environmental Resources (D.E.R.), Bureau of Parks. The site of the Center was originally agricultural land that was set aside to protect a relic prairie community (**NC001**). It has been suggested that this prairie represents the prairie that at one time stretched eastward from the Rockies to the Appalachian Mountains. The community provides habitat for a number of species, including a population of blazing star (Liatris spicata), a plant which is uncommon in the state and for which the prairie was originally protected. It is also habitat for a plant species of special concern (**SP001**) and a state endangered animal (**SA001**). This is the only known site for this plant species in the county. The population of SA001 at Jennings appears to be in good condition. Both of these species require the types of habitat conditions provided by the prairie. To help this prairie community continue to function as an ecological unit, it is mowed and burned periodically to keep trees and weedy species from taking over. The mowing and burning of this site help to mimic the action of fires and grazing animals that are once thought to have existed at the original site. Even though these disturbances are unnatural, they are being carried out as a means of keeping this community viable and suitable for the survival of the two species of special concern. The disturbance regimes, therefore, lower the natural condition of this site, but increase its natural quality.

The Jennings Environmental Education Center also includes many acres of a maturing second growth dry-mesic acidic central forest community (**NC002**) which extends into many areas outside of the Environmental Center boundaries. This forest is dominated by red oak (Quercus borealis), shagbark hickory (Carya ovata), red maple (Acer rubrum), and black cherry (Prunus serotina). Within the confines of this forest exist openings that are remnants of old agricultural fields. These openings provide habitat for another plant species of special concern **(SP002)**. The population of this species is quite large and is currently being monitored by the Jennings Environmental Education Center and the Western Pennsylvania Botanical Society. Efforts should be made to maintain the habitat for this species by restricting forest succession.

Since Jennings is owned and operated by the D.E.R., Bureau of State Parks, the prairie, as well as the rest of the Environmental Center land, is protected. Current management practices are working to effectively

maintain and protect the prairie and forest ecosystems and the endangered species that depend on these for habitat. Potential threats to the species at Jennings include route 528 which dissects Jennings and route 173 which comes in close proximity to the prairie. In order to buffer Jennings, the boundary lines for this site have been drawn to include the managed area, as well as the natural community and biodiversity site which extend outside of the managed area boundaries. The solid line encompasses a portion of the land outside of Jennings which serves to protect and buffer the prairie and woodland community. The **Old Stone House** property and portions of **Moraine State Park** are part of this buffer zone.

Habitat for another species of special concern is also located on this quadrangle at a site referred to as the **Harmony House Fields**. Populations of this animal species (**SA002**) require a variety of different agricultural habitats to complete their breeding cycle. Farmer's fields in the vicinity of the town of Slippery Rock have been chosen by this species for adequate breeding grounds. These habitat requirements include a mixture of short grass areas for feeding and courtship, interspersed with taller grasses and forbs for nesting and brood cover. Potential threats to this animal include loss of habitat due to changes in farming practices, forest succession, and livestock trampling and mowing which cause nest mortality.

To protect this species and preserve its habitat, haying operations in nesting fields should be curtailed until after chicks have hatched (May 1-July 15). Cutting operations conducted during this period should be done with cutting parts elevated 3-6" above the ground to avoid damage to nest contents. To maintain habitat for SA002, grass in the nesting fields should be short in height (6-8") at the time of spring arrival. In addition, protection and maintenance of this species habitat should be included in Slippery Rock University's management plans.

Hogg Woods provides an example of a remnant old growth northern hardwood forest community (**NC015**) which is located northeast of Slippery Rock. This community is dominated by American beech (Fagus grandifolia) and is one of two examples of a climax forest in the county, the other one being Deshon Woods in the Butler quadrangle (p. 107). For this reason, it is frequently used as an outdoor laboratory by Slippery Rock University biology classes. The community itself is less than ten acres and it is buffered by a second growth mixed deciduous forest community that has been selectively logged. Potential threats to the site include and inactive strip mine that lies in close proximity to the northern edge of the community and the use of ATVs which have caused some erosion within and around the community. To help preserve NC015 a forested buffer around the forest community should be maintained. The use of ATVs and any other

motorized vehicles should be restricted from the area.

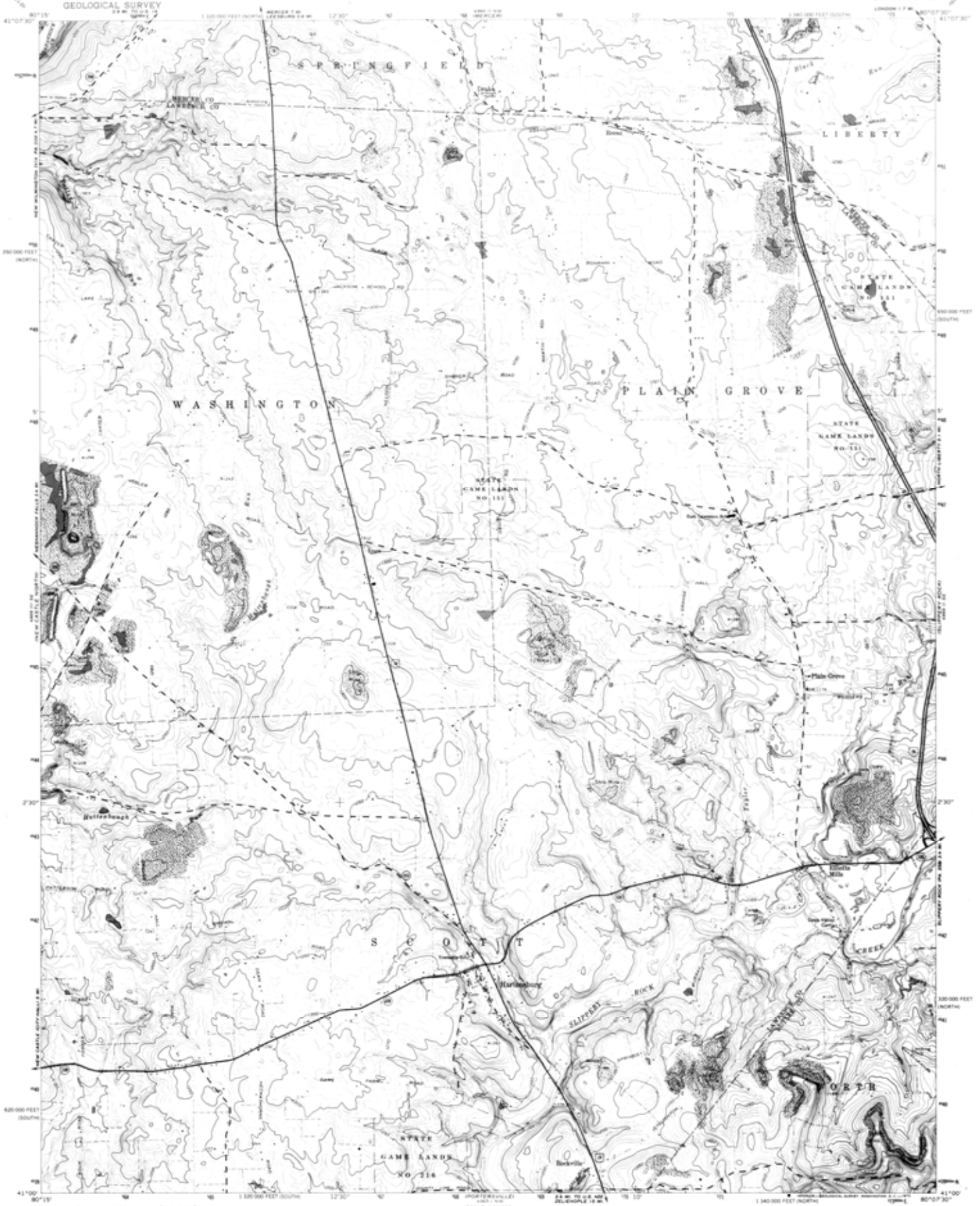
The **Miller Esker Natural Area** represents one of the best examples of a glacial esker in western Pennsylvania. The esker itself is nearly 5 km long, however much of the total formation has been excavated or otherwise disturbed. The least disturbed portion of the esker is preserved within the 32 acre Natural Area. This site is owned and managed by the Western Pennsylvania Conservancy.

HARLANSBURG QUADRANGLE

	PNDI Rank	Legal Status	Last
	Global State	Fed. State	Seen

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

HARLANSBURG QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1958. Field checked 1961

Polyconic projection. 1927 North American datum
10,000-foot grids based on Pennsylvania coordinate system, south and north zones
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1970. This information not field checked

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty - - - Unimproved dirt
Interstate Route U. S. Route State Route

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

HARLANSBURG, PA.

N4100—W8007.5/7.5

1961
PHOTOREVISED 1970
AMS 4966 II SW—SERIES V831

HARLANSBURG QUADRANGLE

A small section of the northwestern glaciated portion of Butler County is located on this quadrangle. Approximately 1.25 miles of Slippery Rock Creek is located in this area where it flows out of the county. There are no known significant natural heritage sites in this quadrangle.

PORTERSVILLE QUADRANGLE

		PNDI Rank		Legal Status		Last
		Global	State	Fed.	State	Seen
LAKE ARTHUR TRIBUTARY	*Moderate Significance*					
NATURAL COMMUNITY:	NC001	G?	S2	N	N	9/90

MANAGED AREA: Moraine State Park


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
PORTERSVILLE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
LAKE ARTHUR TRIBUTARY
NC001
Moraine State Park
SLIPPERY ROCK
WORTH
MUDDY CREEK
WAYNE
LANCASTER
McCONNELLS MILL
STATE PARK
Portersville
Great City
Kennedy Mill
Princeton Station
Princeton
Lake Arthur
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
ROAD CLASSIFICATION
PORTERSVILLE, PA.
N4052.5—W8007.5/7.5
1961
PHOTOREVISED 1979

PORTERSVILLE QUADRANGLE

This quadrangle comprises the western most section of **Moraine State Park**. Moraine, one of the largest state parks in western Pennsylvania, is situated near the terminal moraines of the Wisconsin and Illinoian glaciers. During the glacial period a large lake was formed as a result of the damming of Muddy Creek. Lake Arthur is a partial reconstruction of that glacier formed lake. Areas surrounding Moraine in this quadrangle are characterized by many unnatural features such as strip mines and major roadways. Routes 79, 19, and 422 intersect in this portion of the county and provide major arteries for future growth and development in the area.

There are no recent records of species of concern for this portion of the county, however, a calcareous cliff community (**NC001**) is located along a northern tributary stream to Lake Arthur and is referred to as the **Lake Arthur Tributary**. A portion of this stream and the cove that is formed where it meets Lake Arthur is bordered on the northern bank by outcrops of limestone. The rock face of these outcrops serves as habitat for a large number of plants some of which are often found growing in calcareous conditions such as early saxifrage (Saxifraga virginiensis), walking fern (Camptosorus rhizophyllus), and bulblet fern (Cystopteris fragilis). The outcrops are in good condition, the only form of disturbance being a periodic fluctuation of the water level of the lake. This community is unique for Butler County and because it represents a good biologically diverse habitat it should be preserved. Any disturbance, such as logging, to the forest on top of the rocks could impact the plants that grow on the face of the rocks. Changes in the conditions, such as the amount of moisture, on the rock surface may alter the vegetation that depends on the rock substrate for survival. Protection of this site should be included in the management plans for Moraine State Park.

PROSPECT QUADRANGLE

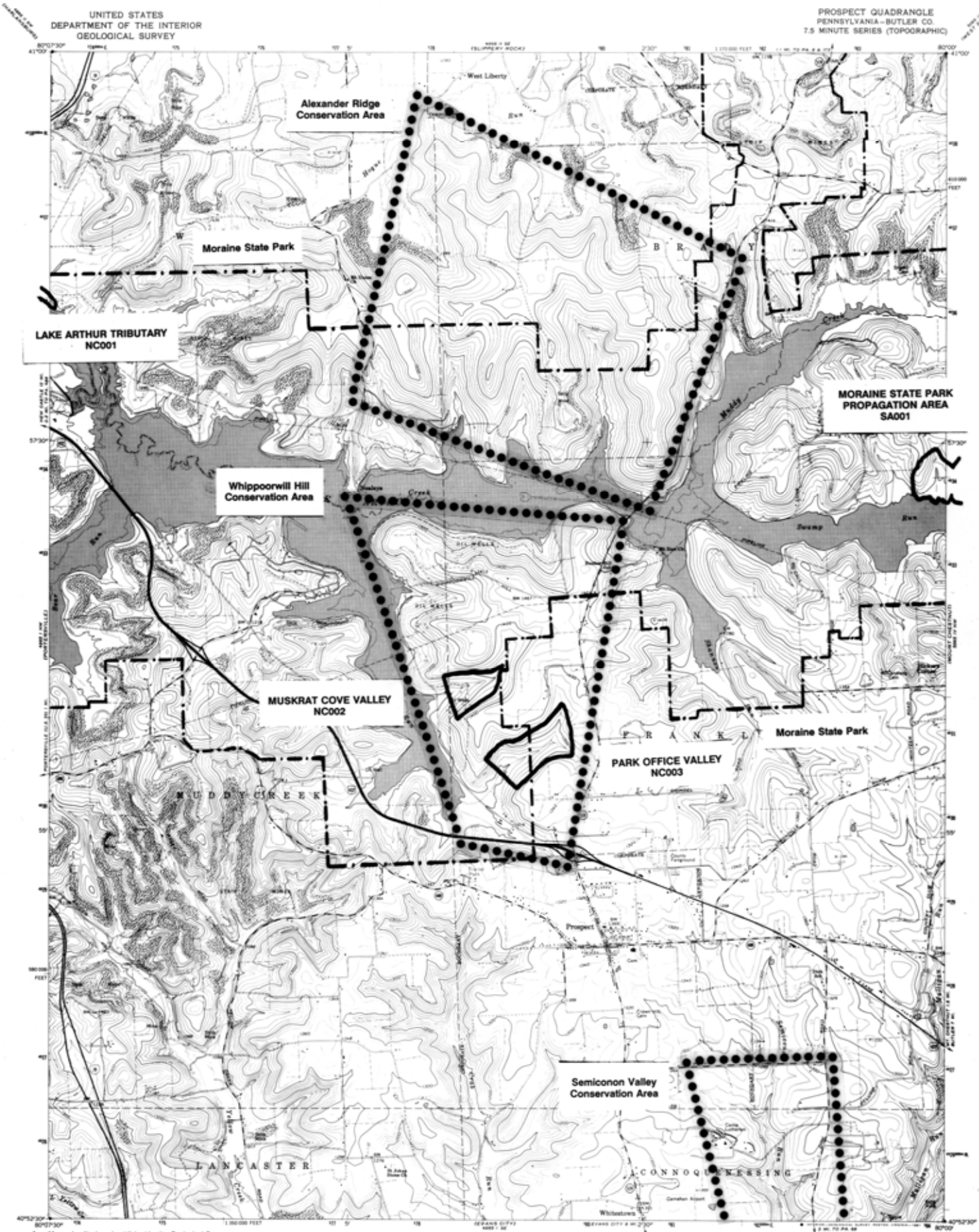
		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
MORAINE STATE PARK PROPAGATION AREA *High Significance*						
SPECIAL ANIMAL	SA001	G5	S1	N	PT	1988
MUSKRAT COVE VALLEY *Moderate Significance*						
NATURAL COMMUNITY:	NC002	G?	S2	N	N	10/90
PARK OFFICE VALLEY *Moderate Significance*						
NATURAL COMMUNITY:	NC003	G?	S2	N	N	10/90
LAKE ARTHUR TRIBUTARY *Moderate Significance*						
NATURAL COMMUNITY:	NC001	G?	S2	N	N	9/90

OTHER: *ALEXANDER RIDGE CONSERVATION AREA* *Low Significance*

WHIPPOORWILL HILL CONSERVATION AREA *Moderate Significance*

SEMICONON VALLEY CONSERVATION AREA *Low Significance*

MANAGED AREA: Moraine State Park


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
PROSPECT QUADRANGLE
PENNSYLVANIA—BUTLER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
Alexander Ridge Conservation Area
Moraine State Park
LAKE ARTHUR TRIBUTARY NC001
MORAINE STATE PARK PROPAGATION AREA SA001
Whippoorwill Hill Conservation Area
MUSKRAT COVE VALLEY NC002
PARK OFFICE VALLEY NC003
Moraine State Park
Semiconon Valley Conservation Area
West Liberty
Prospect
Whitestown
BRADY
FRANKLIN
MUDDY CREEK
LANCASTER
CONNOQUENESSING
Mapped, edited, and published by the Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken 1958. Field checked 1961
Polyconic projection. 10,000-foot grid ticks based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue. 1927 North American Datum
To place on the predicted North American Datum 1983 move the projection lines 3 meters south and 18 meters west as shown by dashed corner ticks
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
Revisions shown in purple compiled in cooperation with Commonwealth of Pennsylvania agencies from aerial photographs taken 1970. This information not field checked
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
Map photorevised 1977
No major culture or drainage changes observed
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
U.S. Route
State Route
Interstate Route
PROSPECT, PA.
N4052.5—W8000/7.5
PHOTOINSPECTED 1977
1961
PHOTOREVISED 1970

PROSPECT QUADRANGLE

The most significant feature in this quadrangle is **Moraine State Park**. Most of the area surrounding Lake Arthur within the state park has been altered, either by logging, strip mining, or by clearing for agriculture. For this reason, a variety of plant communities exist within and around the state park boundary, some of which are good quality communities.

Prior to the flooding of the Muddy Creek valley one of the largest wetlands in western Pennsylvania was located in an area that part of Lake Arthur now occupies. The marsh community has started to reestablish itself in areas where tributaries enter Lake Arthur. The wetlands provide excellent habitat for waterfowl and many other wetland species. A large portion of the Swamp Run Branch has been designated a Propagation Area where public entry is prohibited. The **Moraine State Park Propagation Area** provides habitat for a state threatened animal (**SA001**). This species is found nesting along the north shore of Swamp Run. It generally nests inland from the waters edge in a short grass-sedge (Poa-Carex) community. A potential threat to this species would be fluctuation of the water level of Lake Arthur. If the water level of the lake were to be raised this species habitat would be destroyed. Efforts should be made by Moraine State Park to collect more data on this animal and to protect it from habitat destruction. In addition, Moraine State Park should incorporate the habitat for this species into its management plan.

North of Lake Arthur is a huge expanse of forested land, referred to as the **Alexander Ridge Conservation Area**, which lies on both Moraine State Park property and private property. A mosaic of forest community types exists in this area, ranging from dry-mesic acidic central forests in the dry uplands to northern hardwoods on the slopes to mesic central forests in the stream valley. These communities are all second growth, but vary in their successional stages. They range from young second growth to small tracts of more mature second growth. The significance of the site lies in the fact that it is one of the largest contiguous forests in Butler County and it provides flora and fauna habitat and land for passive recreation (e.g. hiking). To protect this area, as well as the entire north tract of Moraine State Park, all of the Alexander Ridge should be preserved. Logging, as well as strip mining and residential development, should be prohibited and efforts should be made by Moraine State Park to acquire that portion of Alexander Ridge that is privately owned. This would add significant buffer to the northern part of Moraine, as well as add more land for recreational activities.

Another landscape conservation site just south of Alexander Ridge Conservation Area is **Whippoorwill**

Hill Conservation Area. This is also a large, forested tract of land that is suitable for wildlife habitat and recreation. The majority of this site is located within Moraine State Park boundaries. Similar forest communities exist in this area as exist on Alexander Ridge, however, the communities located on Whippoorwill Hill are in later stages of succession overall. This is understandable since the forested land is protected by Moraine State Park and logging practices have ceased since the establishment of the park.

Within the Whippoorwill Hill Conservation Area are two significant natural communities that are uncommon in Butler County. The sites for these communities are two valleys that are tributaries to the Big Run Branch of Lake Arthur. **Muskrat Cove Valley**, the northernmost of the two valleys, is occupied by a mature mesic central forest community (**NC002**). The core of this community is small in size and is dominated by a variety of tree species and herbaceous species. Some of the dominant trees include yellow poplar (Liriodendron tulipifera), American basswood (Tilia americana), American beech (Fagus grandifolia), red oak (Quercus borealis), white oak (Q. alba), and sugar maple (Acer saccharum). Because this community is unique for Butler County in that it presents such a high diversity of plant species it should be protected. Existing threats to the site include abandoned oil drilling equipment. In the event that the oil pipelines and other equipment are removed from the site special precautionary measures should be taken so that the forest community is not damaged in any way. This includes physical damage to trees, erosion caused by disturbance to the landscape, or seepage of any petroleum products into the soil as a result of broken pipelines. Hiking trails that cross through the site should be monitored for possible overuse or impact to the site.

Park Office Valley is located just south of Muskrat Cove Valley and is the site of another mesic central forest community (**NC003**). This forest community is slightly larger in size than that in the Muskrat Cove Valley. The only apparent threat to this community is a powerline that borders its southwestern boundary. Any disturbance to this powerline or areas upslope from the community could impact the forest community. Logging in the community or in bordering areas would impact the site by causing a change in species composition. This also applies to NC002.

Both NC002 and NC003 are provided protection by the Whippoorwill Hill Conservation Area boundaries and the Moraine State Park boundaries. To help insure protection of the site, however, Moraine State Park should add to its management plans the protection of both of the sites.

The northern section of **Semiconon Valley Conservation Area** is located in this quadrangle south of

Moraine State Park. This landscape conservation site is owned by Camp Lutherlyn which is a church camp that uses the forested site for educational and recreational purposes. This second growth northern hardwood forest is in a mid-successional stage and it provides a good deal of open space for wildlife habitat and recreational purposes. The biggest threat to this site is strip mining which is occurring to the south of the site. Efforts should be made to protect the site from surface coal mining.

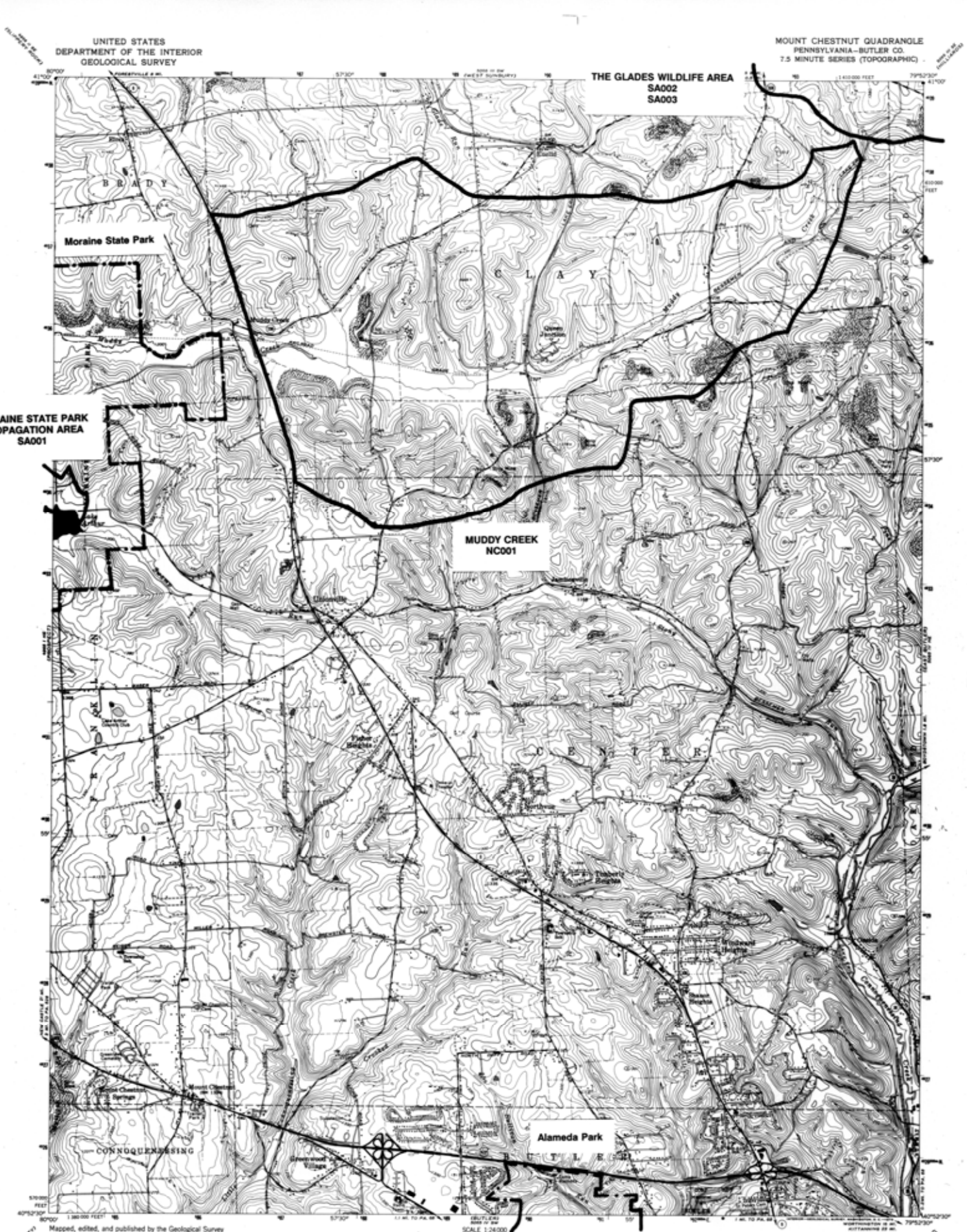
The **Lake Arthur Tributary** calcareous cliff community (**NC001**) extends into this quadrangle. Information for this site can be found in the preceding Portersville quadrangle summary (p. 82).

MOUNT CHESTNUT QUADRANGLE

		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
MORAINE STATE PARK PROPAGATION AREA *High Significance*						
SPECIAL ANIMAL:	SA001	G5	S1	N	PT	1988
MUDDY CREEK *High Significance*						
NATURAL COMMUNITY:	NC001	G?	S3	N	N	8/90
THE GLADES WILDLIFE AREA *High Significance*						
SPECIAL ANIMAL:	SA002	G3	S1	LE	PE	5/91
SPECIAL ANIMAL:	SA003	G3G4	S2	C2	PE	7/90

MANAGED AREA: Moraine State Park

Alameda Park


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MOUNT CHESTNUT QUADRANGLE
PENNSYLVANIA—BUTLER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
THE GLADES WILDLIFE AREA
SA002
SA003
Moraine State Park
MORAINE STATE PARK
PROPAGATION AREA
SA001
MUDDY CREEK
NC001
Alameda Park
BRADY
CLAY
CENTER
CONNOQUENESSING
BUTLER
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1963 and 1964
Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1972. This information not field checked
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
U. S. Route
State Route
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
MOUNT CHESTNUT, PA.
N4052.5—W7952.5/7.5
1964
PHOTOREVISED 1972
AMS 5060 IV NW—SERIES V851

MOUNT CHESTNUT QUADRANGLE

This quadrangle encompasses that area just north of the town of Butler. The northern suburbs of Butler are somewhat developed and are continuing to grow at a rapid rate. As a result, forested land that provides open space is quickly being converted to cropland and urban development sites. The eastern most part of **Moraine State Park** extends into this quadrangle and includes the eastern tip of the Swamp Run Branch of Lake Arthur and **Moraine State Park Propagation Area**. Part of the habitat for **SA001** extends into this quadrangle. Information and recommendations for protection of this animal can be found in the Prospect quadrangle summary (p. 85).

Muddy Creek forms one of the largest wetland systems in the country just east of Moraine State Park before it enters Lake Arthur. The site includes that portion of the wetland between Routes 8 and 308. The dominant wetland community along Muddy Creek is considered a circumneutral shrub swamp community (**NC001**), however, other wetland community types exist as well. Although the construction of roads and railroad tracks across the wetland has impacted the flow of water through the site, the wetland appears to be in good condition. The alteration of the water flow has no doubt changed the original vegetative composition of the wetland.

The preservation of this site is important since it represents such a large and important ecosystem and habitat for both wetland plants and animals. Neighboring farmlands pose a big threat to the quality of the site. In some cases, farm animals have been permitted to graze along the edge of the wetland. This can result in the elimination of certain plants in an area. In addition, runoff of chemical fertilizers or pesticides from agricultural fields could have a detrimental effect on the wetland if these substances make their way into the water system. Any physical or chemical alteration of Muddy Creek upstream from, or at, the site may cause irreversible damage. This also applies to any activities upslope of the wetland such as surface mining for coal, logging, or residential development. For this reason a boundary line which incudes both the core of the community and a buffer zone has been drawn. This buffer zone includes a large portion of the watershed and upslope areas which are part of the entire wetland system. It is recommended that any activity that would alter the landscape such as logging, strip mining or residential development should be reviewed carefully to determine the potential impacts to the site. In addition, any alteration of Muddy Creek, including its water quality, water level, or water flow rate, could have a detrimental effect on the quality of the wetland.

The northernmost section of **Alameda Park** is located in the quadrangle. This managed area is located in

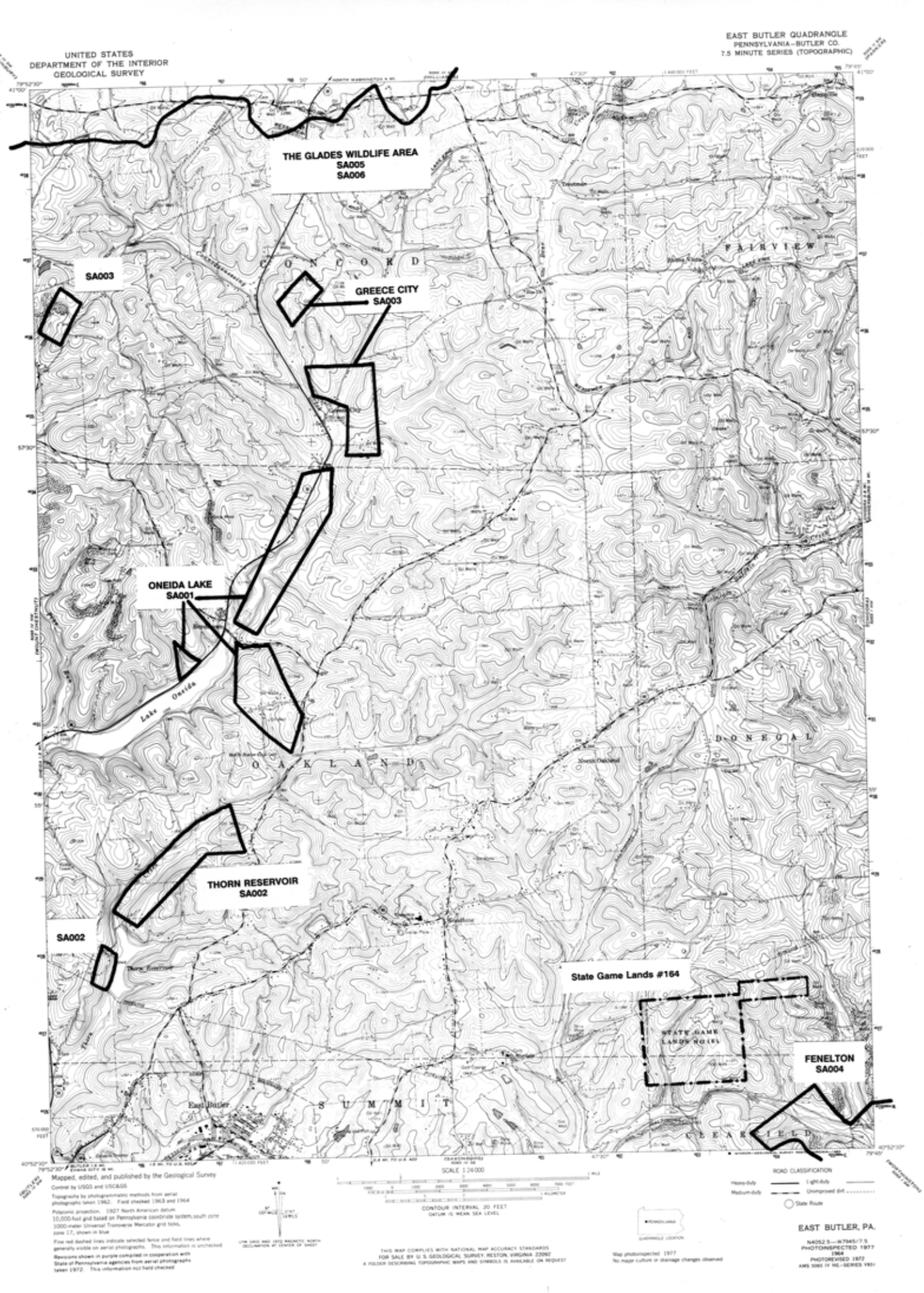
the wooded Sullivan Run Valley adjacent to the city of Butler (located in the Butler quadrangle). The upland flat area that borders route 356 and the original amusement park area have been developed for recreational use, however, the rest of the Sullivan Run Valley has been left undeveloped. The wooded area in the valley consists of a maturing upland forest of white oak (Quercus alba), red oak (Q. borealis), shagbark hickory (Carya ovata), and red maple (Acer rubrum) and provides forested open space for this part of the county. Much of the valley has been heavily used as is evidenced by dirt bike trails that have caused a good bit of erosion in the stream valley as well as areas where trees have been cut to provide space for camping. To preserve the Sullivan Run Valley for its open space and recreation qualities, efforts should be made to control the overuse of the trails and to repair the site, by planting native vegetation on trails that have been the cause of erosion and sedimentation problems.

The Glades Wildlife Area extends into the northeastern section of this quadrangle. This site provides important habitat for two endangered animal species (**SA002** and **SA003**). A description of this site and recommendations for the protection of these species can be found in the Hilliards quadrangle summary (p. 55).

EAST BUTLER QUADRANGLE

		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
ONEIDA LAKE *Moderate Significance*						
SPECIAL ANIMAL:	SA001	G3G4	S2	C2	PE	1987
THORN RESERVOIR *High Significance*						
SPECIAL ANIMAL:	SA002	G3G4	S2	C2	PE	1987
GREECE CITY *Moderate Significance*						
SPECIAL ANIMAL:	SA003	G3G4	S2	C2	PE	1987
FENELTON *High Significance*						
SPECIAL ANIMAL	SA004	G3G4	S2	C2	PE	1987
THE GLADES WILDLIFE AREA *High Significance*						
SPECIAL ANIMAL:	SA005	G3	S1	LE	PE	5/91
SPECIAL ANIMAL:	SA006	G3G4	S2	C2	PE	7/90

MANAGED AREA: State Game Lands #164


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
EAST BUTLER QUADRANGLE
PENNSYLVANIA—BUTLER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
THE GLADES WILDLIFE AREA
SA005
SA006
SA003
GREECE CITY
SA003
ONEIDA LAKE
SA001
THORN RESERVOIR
SA002
SA002
State Game Lands #164
FENELTON
SA004
CONCORD
PAIRVIEW
OAKLAND
DONEGAL
SUMMIT
CLEARFIELD
Lake Oneida
East Butler
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1963 and 1964
Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1972. This information not field checked
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
State Route
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
Map photoinspected 1977
No major culture or drainage changes observed
EAST BUTLER, PA.
N4052.5—W7945/7.5
PHOTOINSPECTED 1977
1964
PHOTOREVISED 1972

EAST BUTLER QUADRANGLE

The two most significant features in this quadrangle are **Oneida Lake** and **Thorn Reservoir**. Both are artificial lakes formed by the damming of Connoquenessing Creek and Thorn Run, respectively. They function as water supplies for the town of Butler and its suburbs. Wetlands which provide habitat for many species of plants and animals have formed at the northernmost ends of both lakes. These areas, as well as other places around the lakes, provide habitat for populations of an animal species of special concern (**SA001** and **SA002**). Areas around the towns of **Greece City** and **Fenelton** also provide suitable habitat for populations of this animal species (**SA003** and **SA004**, respectively). Part of the habitat requirements for this species include relatively undisturbed, wet meadows, and open canopy wetland areas. Those sites that function as habitat for this species should be protected and maintained.

The biggest threat to these populations is habitat destruction. A fluctuation in the water level at Oneida Lake and Thorn Reservoir could result in the flooding or drying out of habitat. In addition, activities such as mineral extraction and residential development destroy habitat for this species. Both of these activities are prevalent in this part of Butler County. Recommendations for the protection of this species include guiding development away from these sites and carefully monitoring any activities such as strip mining for coal or other minerals, or clearing land for development or farming, that are planned to occur in the vicinity of the species habitat. In addition, the appropriate authorities should be advised to limit the fluctuation of the water level of the two impoundments. Future data collecting and monitoring of this species are recommended.

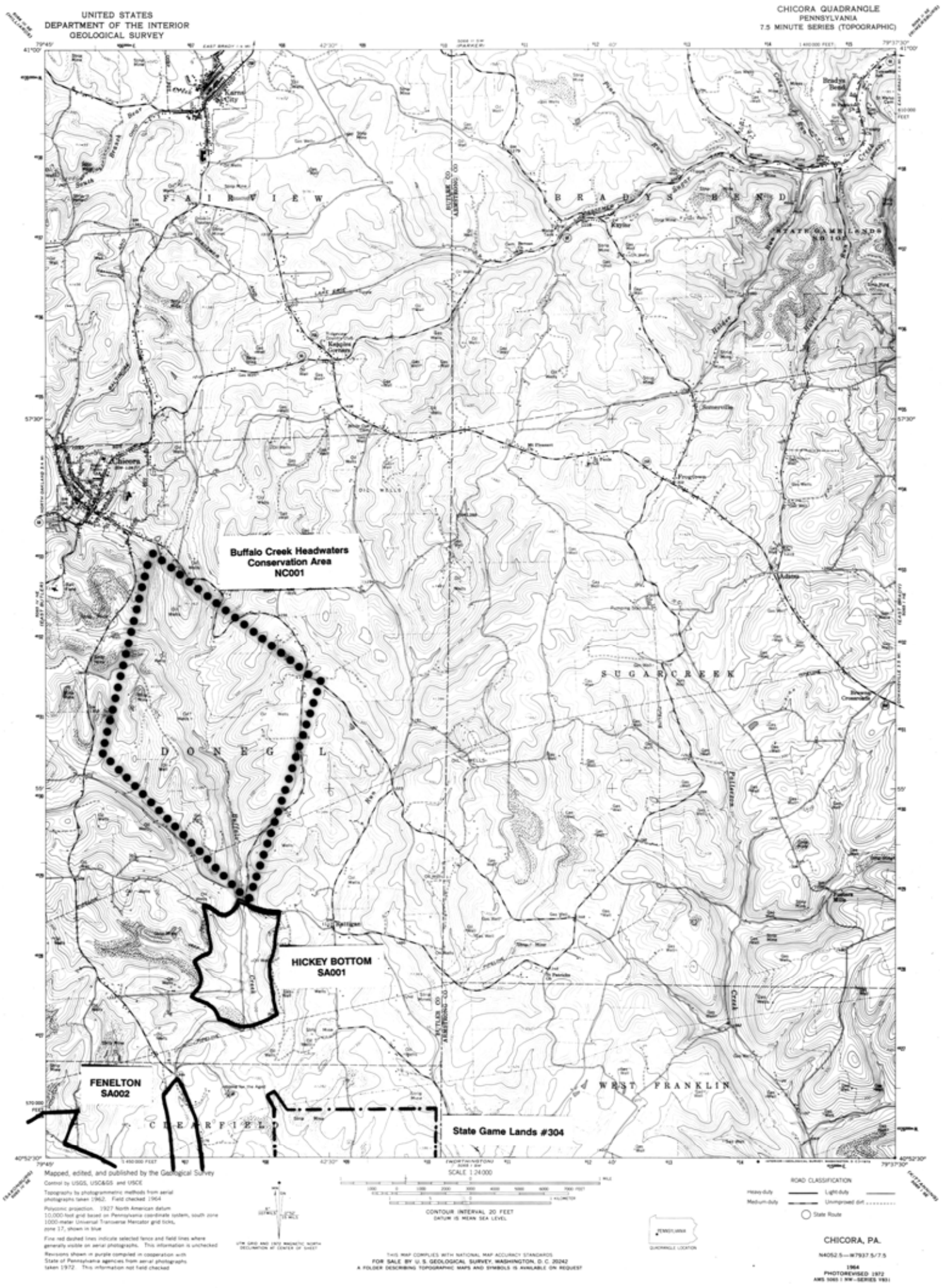
The smallest of the three State Game Lands in Butler County, **State Game Lands #164**, are located in the southeast portion of this quadrangle. This 399 acre tract contains second growth woodland and fields that provide habitat for both game and nongame species.

The southeast corner of **The Glades Wildlife Area** is located in this quadrangle. This site provides habitat for two endangered animal species (**SA005** and **SA006**). Information and recommendations for protection of these species is given in the Hilliards quadrangle summary (p. 55).

CHICORA QUADRANGLE

		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
BUFFALO CREEK HEADWATERS CONSERVATION AREA *Moderate Significance*						
NATURAL COMMUNITY:	NC001	G?	S3	N	N	9/90
HICKEY BOTTOM *High Significance*						
SPECIAL ANIMAL:	SA001	G3G4	S2	C2	PE	1987
FENELTON *High Significance*						
SPECIAL ANIMAL:	SA002	G3G4	S2	C2	PE	1987

MANAGED AREA: State Game Lands #304


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CHICORA QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
Buffalo Creek Headwaters
Conservation Area
NC001
HICKEY BOTTOM
SA001
FENELTON
SA002
State Game Lands #304
FAIRVIEW
BRADYS BEND
DONEGAL
SUGAR CREEK
WEST FRANKLIN
CLEARFIELD
BUTLER CO
ARMSTRONG CO
Mapped, edited, and published by the Geological Survey
Control by USGS, USC&GS and USCE
Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1964
Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1972. This information not field checked
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
State Route
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
CHICORA, PA.
N4052.5—W7937.5/7.5
1964
PHOTOREVISED 1972
AMS 5063 I NW—SERIES V851

CHICORA QUADRANGLE

This quadrangle has been heavily impacted by recent logging and strip mining operations. Very few natural features exist in this eastern most portion of the county, however, the **Buffalo Creek Headwaters Conservation Area** provides a relatively large tract of forested land significant for recreational purposes and wildlife habitat. This landscape conservation site is composed of a second growth forest community that has been selectively logged and clearcut in places. Because it is such an extensive area, it is recovering and gaining back some of its natural qualities. Buffalo Creek, a medium gradient-clearwater creek community (**NC001**), originates at this site and flows into the Allegheny River near Freeport. This portion of the stream, from its source to the Little Buffalo Run near Fenelton, has been given a high quality-cold water fisheries designation by the D.E.R., Bureau of Water Quality Management (1979). The protection of this stream is vital to the flora and fauna that depend on its high water quality. Therefore, attempts should be made to monitor all activities within the watershed of this stream for their potential impact to the water system. Threats to the stream include erosion and sedimentation caused by logging, acid mine drainage from strip mining, and pollution from residential development. In addition, spraying pesticides to curb the gypsy moth populations, which are present in the surrounding forest, would also impact the stream. The Buffalo Creek Headwaters Conservation Area is also important in that it helps to buffer this portion of Buffalo Creek. Therefore, protection of this site has added importance.

Just south of this area along Buffalo Creek is an area referred to a **Hickey Bottom**. This low-lying bottomland floodplain along Buffalo Creek has been disturbed in the past by logging, strip mining and flooding. The poorly drained soils support typical wetland tree species including black willow (Salix nigra), swamp white oak (Quercus bicolor), and silver maple (Acer saccharinum). Although this wetland has been disturbed, portions of it serve as habitat for a special animal of concern **(SA001)**. In particular, the species has been found in open canopy, wet meadow areas on the floodplain. The biggest threat to this species is the loss of habitat. Housing developments and strip mining in the near vicinity of this site pose threats to the quality of the water supporting the habitat. Influencing the flow of Buffalo Creek, or the hydrology of this site in any way, could result in a major alteration of the habitat supporting the population of SA001 . This includes building a dam or levee on the stream. Efforts should be made by the county to inform private land owners about the needed protection of this species so that the landscape is not altered in any way. Other recommendations for protection of the species include future monitoring and data collection.

Other habitat for this same species (**SA002**) includes that found in the area of **Fenelton**, which is part of the habitat on the East Butler quadrangle. Information regarding this site and recommendations for protection of the species can be found in the East Butler quadrangle summary (p. 94).

A recent addition to this portion of Butler County is **State Game Lands #304**. This 460 acre Game Lands provides added buffer for a portion of Buffalo Creek which flows through the western end of the Game Lands. Buffalo Creek is considered a high quality-cold water fishery until is meets Little Buffalo Run just south of this site.

WORTHINGTON QUADRANGLE

		PNDI Rank		Legal Status		Last
		Global	State	Fed.	State	Seen
FENELTON	*High Significance*					
SPECIAL ANIMAL:	SA001	G3G4	S2	C2	PE	5/91

MANAGED AREA: State Game Lands #304


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
STATE OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS
TOPOGRAPHIC AND GEOLOGIC SURVEY
WORTHINGTON QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
State Game Lands #304
FENELTON
SA001
SA001
C L E A R F I E L D
W E S T F R A N K L I N
N O R T H B U F F A L O
W I N F I E L D
S O U T H B U F F A L O
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1952. Field check 1958
Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
Fine red dashed lines indicate selected fence and field lines visible on aerial photographs. This information is unchecked
Unlabeled wells are oil wells
Unchecked elevations are shown in brown
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
U.S. Route
State Route
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1977 and other source data. This information not field checked. Map edited 1979
WORTHINGTON, PA.
N4045—W7937.5/7.5
1958
PHOTOREVISED 1979

WORTHINGTON QUADRANGLE

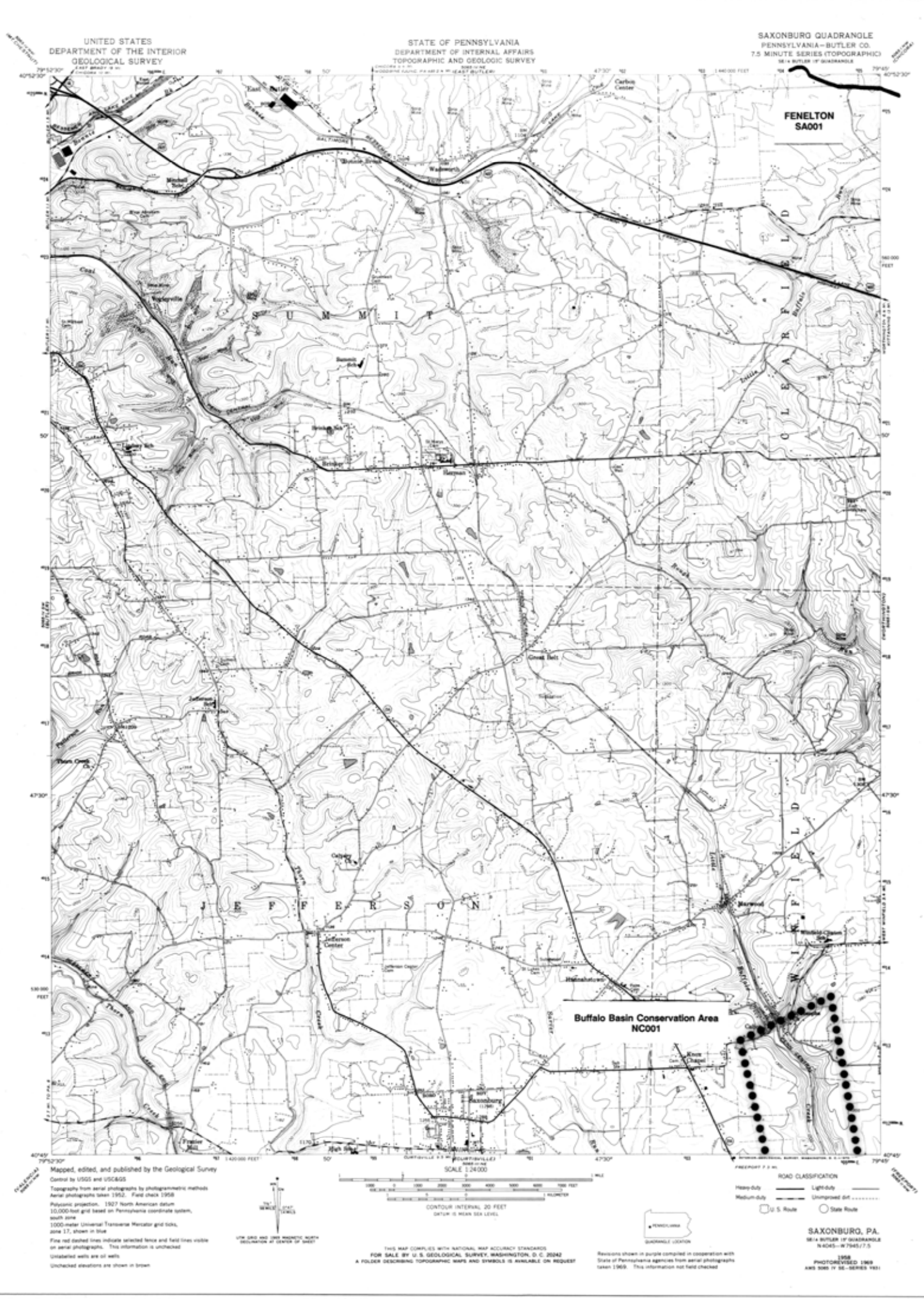
A large portion of this quadrangle, which lies along the eastern edge of the county, is forested land. Unfortunately, recent logging in most cases has reduced the natural quality of these forests. Strip mining has also played a part in the degradation of the landscape in the quadrangle. Much of the land in the southern portion of this quadrangle has been converted to farmland.

Little Buffalo Run, a tributary to Buffalo Creek, is located in the northern part of this quadrangle near the town of **Fenelton**. The floodplain communities and fields bordering this stream provide habitat for a special animal of concern **(SA001)**. Recent reports confirm that the population of this species exists at sites along the stream. Similar recommendations for this species can be made for this site as were made for the Fenelton site in the East Butler quadrangle summary (p. 94). An additional recommendation for this particular population, however, would be to restrict any alteration in the flow of Little Buffalo Run since the wetlands that provide habitat are associated with this stream. In general, any disturbance to the wetlands or the hydrology of the wetlands could impact the survival of this species.

North of the confluence of Little Buffalo Run and Buffalo Creek is **State Game Lands #304**. This managed area is discussed in the Chicora quadrangle summary (p. 97)

SAXONBURG QUADRANGLE

		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
FENELTON *High Significance*						
SPECIAL ANIMAL:	SA001	G3G4	S2	C2	PE	1987
BUFFALO BASIN CONSERVATION AREA *Moderate Significance*						
NATURAL COMMUNITY:	NC001	G?	S3	N	N	5/91


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
STATE OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS
TOPOGRAPHIC AND GEOLOGIC SURVEY
SAXONBURG QUADRANGLE
PENNSYLVANIA—BUTLER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
FENELTON
SA001
Buffalo Basin Conservation Area
NC001
SUMMIT
CLEARFIELD
JEFFERSON
WINFIELD
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1952. Field check 1958
Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
Fine red dashed lines indicate selected fence and field lines visible on aerial photographs. This information is unchecked
Unlabelled wells are oil wells
Unchecked elevations are shown in brown
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
U. S. Route
State Route
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1969. This information not field checked
SAXONBURG, PA.
SE/4 BUTLER 15' QUADRANGLE
N.4045—W.7945/7.5
1958
PHOTOREVISED 1969
AMS 5065 IV SE.—SERIES V851

SAXONBURG QUADRANGLE

The land covered by this quadrangle, like much of the southern portion of Butler County, is in agriculture. Areas around the town of Saxonburg and along major roadways in this quadrangle appear to be rapidly developing. Two sites exist in the quadrangle; one is located along Little Buffalo Run and the other along Little Buffalo Creek.

SA001 is an endangered animal that is found in areas around the town of **Fenelton**. This site is an extension of that sight described in the East Butler quadrangle summary (p. 94). Information and recommendations for SA001, therefore, can be found in the East Butler summary.

The landscape conservation site identified in the southern portion of this quadrangle, **Buffalo Basin Conservation Area**, is part of a larger site which is identified in the Freeport quadrangle summary (p. 133). This portion of the site is along Little Buffalo Creek and contains portions of mature forest along the stream. The stream itself is a medium gradient-clearwater creek community (**NC001**). It has been designated a high quality-trout stocked fishery by the D.E.R., Bureau of Water Quality Management (1979). Efforts to protect this stream by maintaining a buffer zone should be made. Any disturbance in the watershed of this stream such as mineral extraction operations, logging, or residential or commercial development could impact the quality of the stream.

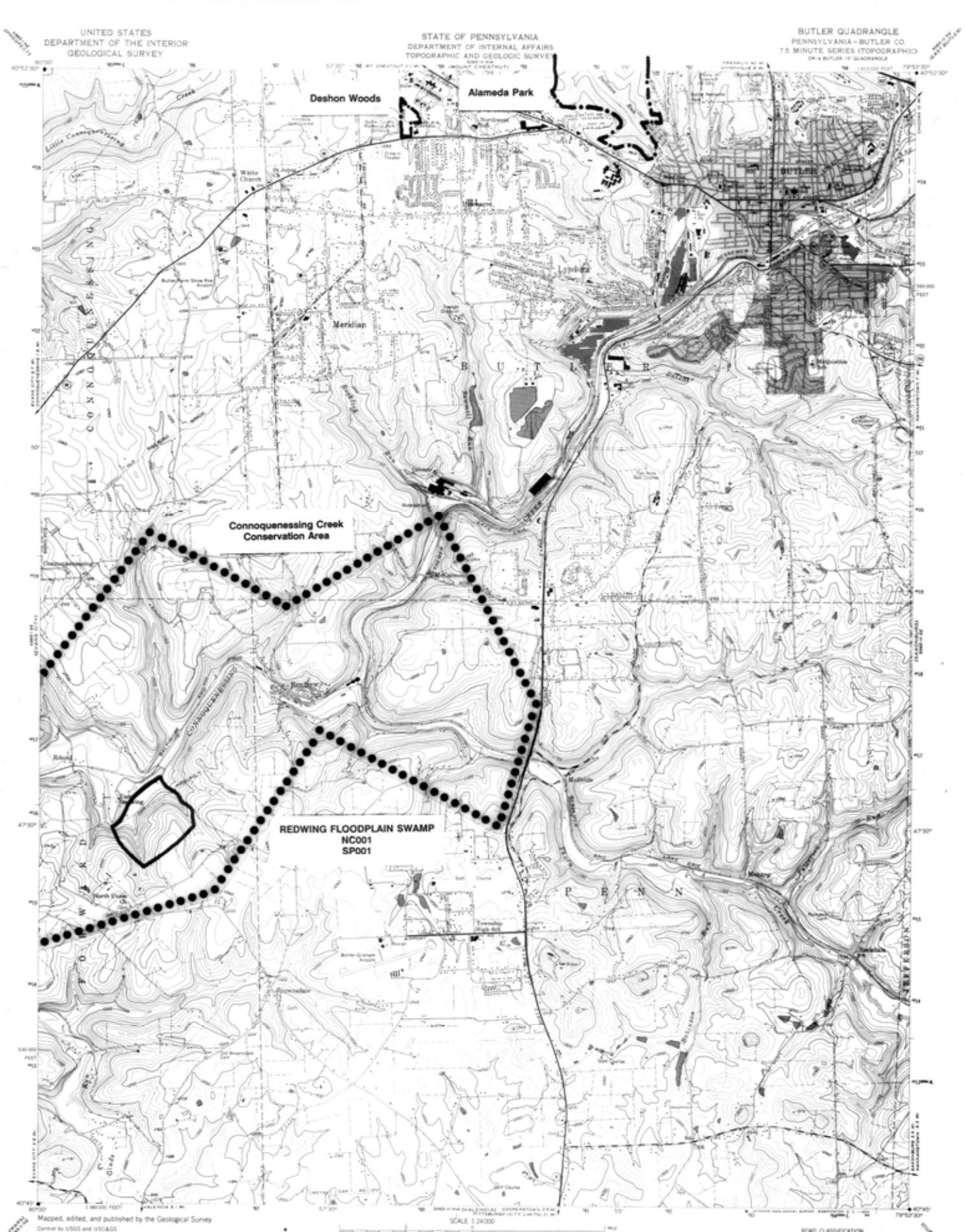
BUTLER QUADRANGLE

		PNDI Rank		Legal Status		Last
		Global	State	Fed.	State	Seen
REDWING FLOODPLAIN SWAMP	*High Significance*					
NATURAL COMMUNITY:	NC001	G4	S2	N	N	10/90
SPECIAL PLANT:	SP001	G5	S3	N	TU	6/90

OTHER: CONNOQUENESSING CREEK CONSERVATION AREA *Moderate Significance*

MANAGED AREA: Alameda Park

Deshon Woods


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
STATE OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS
TOPOGRAPHIC AND GEOLOGIC SURVEY
BUTLER QUADRANGLE
PENNSYLVANIA—BUTLER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
Deshon Woods
Alameda Park
BUTLER
Lyndora
Meridian
Connoquenessing Creek
Conservation Area
REDWING FLOODPLAIN SWAMP
NC001
SP001
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Culture and drainage in part compiled from aerial photographs taken 1952. Topography from aerial photographs by photogrammetric methods and by planetable surveys 1957-1958
Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
Fine red dashed lines indicate selected fence and field lines visible on aerial photographs. This information is unchecked
Red tint indicates area in which only landmark buildings are shown
Unlabeled wells are oil wells
Unchecked elevations are shown in brown
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
U.S. Route
State Route
UTM GRID AND 1955 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1969. This information not field checked
Purple tint indicates extension of urban areas
BUTLER, PA.
SW/4 BUTLER 15' QUADRANGLE
N 4045—W 7952.5/7.5
1958
PHOTOREVISED 1969
AMS 5080 IV SW—SERIES V851

BUTLER QUADRANGLE

The only city in Butler County is located in this quadrangle. Butler and its suburbs dominate the top one-third of the land in this quadrangle. Most of the land in the southcentral portion of the county has been cleared and used for industry and residential and commercial development. The Connoquenessing Creek Valley, which is located southwest of Butler, helps to balance out the effects of habitat fragmentation by providing a large open space corridor through the southwestern portion of the county.

The **Connoquenessing Creek Conservation Area** offers a variety of habitats along the banks of the Connoquenessing Creek between Route 8 and Harmony Junction (Evans City quadrangle). These habitats include second growth deciduous forests, remnant oxbow ponds, old growth floodplain forests, and old growth hillside forests. Since this site is located in the southern portion of the county it is subject to rapid growth and development that is spreading northward from the city of Pittsburgh in Allegheny County. Because this site exhibits such a high degree of biodiversity it is important that it be protected from such impacts that accompany residential and commercial development. The more significant sites that are found within the conservation area should be preserved since they are the only representatives of such habitats in Butler County. The boundaries that have been mapped for this site serve not only to aid in the protection of the significant natural communities, but to protect the entire Connoquenessing Creek Valley.

One of the highest quality habitats within the Connoquenessing Creek Conservation Area in this quadrangle is the **Redwing Floodplain Swamp**, a state significant relic forested floodplain swamp community (**NC001**) along the southeastern bank of Connoquenessing Creek. This diverse wetland community is dominated by large swamp white oak (Quercus bicolor) trees and is characterized by the presence of several vernal floodplain pools. The edges of these pools are habitat for a plant species of special concern **(SP001)**. Presently, this habitat is the only known site for this species in the county and in western Pennsylvania. With the exception of a small area in the southwest corner of the floodplain, there is no evidence of logging. The over-all appearance of this wetland suggests that the majority of this community is in pristine condition. This wetland is not included on the maps of the National Wetlands Inventory (NWI), however it should be highlighted as a wetland in county files.

Redwing Floodplain Swamp represents an important habitat for Butler County and the state of Pennsylvania and, therefore, it should be preserved. An existing threat to this community is a pipeline which borders the southeastern edge of the floodplain. The use of horses and ATV's on this pipeline has resulted in

an erosion and sedimentation problem which needs to be corrected. In doing so, it is suggested that only native wild plants, instead of exotic species, be planted on the pipeline, or that the right-of-way be heavily mulched and natural colonization be allowed to take place in most areas. Recommendations for this site include maintaining a forested buffer along the entire perimeter of the swamp and floodplain to ensure that the site continues to function ecologically as a pristine wetland and that the sensitive plant species found there continues to survive. Drastic disturbances to the buffer, such as logging within 100 meters of the floodplain or anywhere upslope of the wetland will potentially damage the quality of this site. Any developments in the area that might alter the hydrology upon which the wetland is supported should also be avoided. Additionally, the buffer zone up slope of the wetland should be protected so that disturbances such as erosion and sedimentation do not impact the site and the wetland community. Furthermore, influencing the flow of Connoquenessing Creek, such as the construction of a dam or levee, could change the water table and flood event period on the floodplain, resulting in a major alteration of the present habitat supporting the floodplain swamp wetland.

Although the northern portion of this quadrangle is occupied by Butler and its suburbs, two managed areas that exhibit some natural qualities are located here. The southern half of **Alameda Park** is located outside of the Butler city limits. A description for this site can be found in the Mount Chestnut quadrangle summary (p. 90).

Deshon Woods is a township park located just west of Butler which consists of a small (16 acre) stand of old growth white oak (Quercus alba) and red oak (Q. borealis) trees that had been selectively logged around 1910. The small remnant forest at this managed area serves as an approximation of the climax forest in this part of the state prior to European settlement. This is not a good quality site, however, since the stand is very small and no buffer zone is present. It is surrounded by an asphalt parking lot, a cemetery. and a road. As a result, the community has no potential for growth or to sustain itself into the future. Partial protection is provided to the site by Butler Township and it is currently being used for passive recreation (hiking, nature study, etc.). It is recommended that Deshon Woods be maintained in its present state and that the township protect it against further encroachments.

\

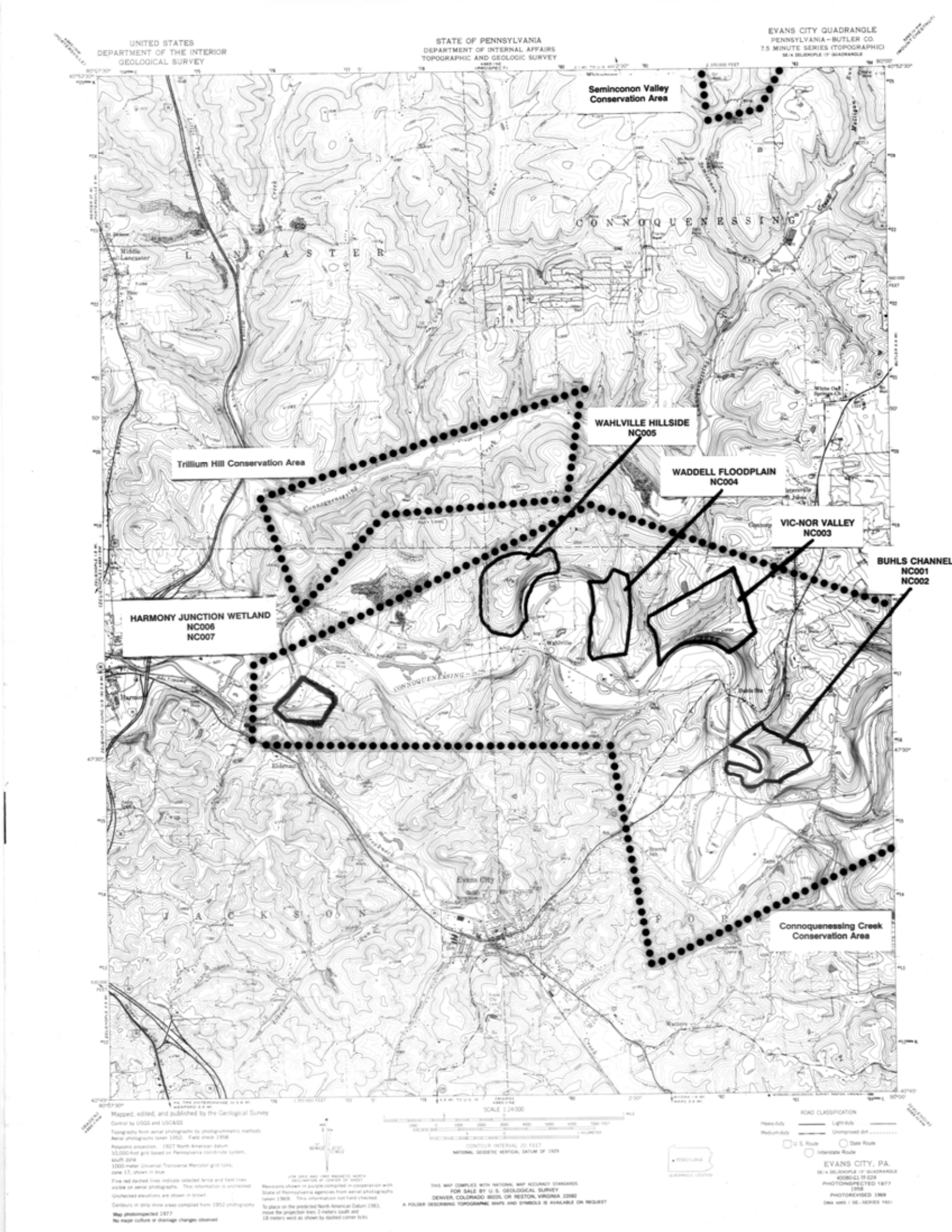
EVANS CITY QUADRANGLE

		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
BUHLS CHANNEL *Moderate Significance*						
NATURAL COMMUNITY:	NC001	G?	S2S3	N	N	4/91
NATURAL COMMUNITY:	NC002	G?	S5	N	N	4/91
VIC-NOR VALLEY *Moderate Significance*						
NATURAL COMMUNITY:	NC003	G?	S2	N	N	5/91
WADDELL FLOODPLAIN *Moderate Significance*						
NATURAL COMMUNITY:	NC004	G?	S2	N	N	4/91
WAHLVILLE HILLSIDE *Moderate Significance*						
NATURAL COMMUNITY:	NC005	G?	S2	N	N	4/91
HARMONY JUNCTION WETLAND *Moderate Significance*						
NATURAL COMMUNITY:	NC006	G?	S2	N	N	6/91
NATURAL COMMUNITY:	NC007	G?	S2	N	N	6/91

OTHER: CONNOQUENESSING CREEK CONSERVATION AREA *Moderate Significance*

TRILLIUM HILL CONSERVATION AREA *Low Significance*

SEMICONON VALLEY CONSERVATION AREA *Low Significance*


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
STATE OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS
TOPOGRAPHIC AND GEOLOGIC SURVEY
EVANS CITY QUADRANGLE
PENNSYLVANIA–BUTLER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
Seminconon Valley Conservation Area
WAHLVILLE HILLSIDE NC005
Trillium Hill Conservation Area
WADDELL FLOODPLAIN NC004
VIC-NOR VALLEY NC003
BUHLS CHANNEL NC001 NC002
HARMONY JUNCTION WETLAND NC006 NC007
Connoquenessing Creek Conservation Area
CONNOQUENESSING
LANCASTER
JACKSON
Evans City
Mapped, edited, and published by the Geological Survey
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
ROAD CLASSIFICATION
EVANS CITY, PA.
40080-G1-TF-024
PHOTOINSPECTED 1977
1958
PHOTOREVISED 1969

EVANS CITY QUADRANGLE

Like most of this southwestern portion of the county, the area covered by this quadrangle has experienced the effects of increased residential and commercial development as a result of the northward expansion of Pittsburgh. In addition, sections of the landscape in the northern portion of this quadrangle have been disturbed by strip mining.

The Connoquenessing and Little Connoquenessing Creeks are the two most significant natural features in this southwestern quadrangle. Both harbor significant natural features along their banks and help to provide this portion of the county with open space. The **Connoquenessing Creek Conservation Area** extends from Route 8 in the Butler quadrangle to Harmony Junction east of Harmony. This site is significant since it has within its borders a number of unique communities. A more detailed description of this landscape conservation site is given in the Butler quadrangle summary (p. 107).

South of Buhls Station is a natural feature referred to as **Buhls Channel**. This remnant oxbow lake was formed in an abandoned stream bend which has become separated from Connoquenessing Creek by a change in the course of the creek. This natural pond community (**NC001**), along with the robust emergent marsh which has formed at its northern end, provides habitat for aquatic animals and plants, as well as breeding habitat for waterfowl. The oxbow pond is located at the base of a steep hillside which appears to have been cut by the forces of the Connoquenessing Creek prior to changing its course. The dry-mesic acidic central forest community (**NC002**) on this hillside is composed primarily of old growth red oak (Quercus borealis), white oak (Q. alba), and chestnut oak (Q. prinus). The community exists in an environment that is very dry which is due in part to the southwestern exposure and its steep terrain. The community is also characterized by the acidic rock outcrops that line the hillside. With the exception of the top edge of the hillside and the bordering forests, there is no evidence of logging or other disturbances. The community appears to be in pristine condition and is considered one of the few natural areas in Butler County. The oxbow has been somewhat impacted by development pressures along its western edge. Forest has been cleared and summer homes have been built in the area between the oxbow and Connoquenessing Creek. As a result the oxbow has not been very well buffered and erosion and sedimentation have occurred in areas where the land is being cleared for construction. Although it remains a significant community, it appears that part of the wetland has been drained to a certain extent at its northern end.

Since NC001 and NC002 represent unique, naturally formed features in the county they should be

preserved as examples of these features. Any disturbance in the near vicinity of Buhls Channel could be detrimental to either of the two communities. An existing threat to the oxbow pond is the drainage that is occurring at its northern end as well as the pressure that is produced by the presence of the cottages. The gypsy moth is currently a threat to the hillside forest community. Oak is the dominant species and therefore, this community is very vulnerable to the impact of gypsy moth since oak is a preferred food. Although there is potential for alteration of this forest, spraying pesticides is not recommended.

Recommendations for this site include maintaining a forested buffer around the entire site so that the communities there can continue to function as an ecologically pristine forest and an associated wetland. Drastic disturbances to the upper edge of the hillside, such as logging, could impact the community by causing erosion or physical disturbance to the trees. Logging could also have a serious impact on the wetland by causing erosion and sedimentation. Any disturbance to the floodplain such as residential development, would also cause problems for the wetland.

Downstream from Buhls Channel on the Connoquenessing Creek is an area that is referred to as the **Vic-Nor Valley**. This valley is characterized by a high diversity of vegetation and a mesic central forest community (**NC003**) of maturing second growth that occupies the valley and valley slopes. An intermittent stream that is bordered by sandstone outcrops adds to the diversity of the site. In addition, an unusual geologic feature sometimes called a "hogback" is situated between the valley and the Connoquenessing Creek and forms the valleys southern slope. The maturing mixed mesic forest community extends up the southern slope of the hogback, but the side facing the creek has been recently logged and is composed of a young second growth mixed deciduous community. The valley community extends onto a floodplain which also adds to the diversity of the site.

Land use practices upslope from the valley to the north pose a potential threat to the valley. A majority of the upland has been planted for sod. Since this sort of farming practice requires continuous removal of the sod and part of the topsoil, erosion is a problem. Although no evidence exists that the valley is being impacted by such practice, expansion of the sod fields would cause erosion and sedimentation in the tributary stream and valley and ultimately in Connoquenessing Creek. A forested buffer zone should be maintained far enough upslope of the valley and stream so that they are not impacted by farming practices and so that the forest may recover.

West of Vic-Nor Valley around the bend on the Connoquenessing Creek is the **Waddell Floodplain**. This

site is significant for the high level of biodiversity that is represented. Rich, mesic soils and an abundance of vernal pools and herbaceous vegetation help to characterize this floodplain forest community (**NC004**). The forest community on the floodplain is a maturing second growth mixed deciduous forest dominated by red oak (Quercus borealis), red maple (Acer rubrum), and black cherry (Prunus serotina). With the exception of logging in the past and periodic flooding, the floodplain appears to be undisturbed, high quality wetland. There are no apparent threats to the site. It is buffered on one side by the creek and on the upland by a contiguous forest. Recommendations for protection include maintaining the forested buffer and restricting any logging activities to approximately 100 meters of the floodplain. In addition, any manipulation of the stream such as building a dam or levee could change the habitat of the floodplain as would any disturbance to the hydrology of the wetland.

Another significant natural feature in this quadrangle is the **Wahlville Hillside**. This site is one of two examples of steep slope communities, the other being NC002, along Connoquenessing Creek that have been left undisturbed because of their inaccessibility for logging. Since the conditions are relatively harsh, the size of the old growth trees is stunted and therefore, does not appear to represent the trees ages. The forest community that exists on the steep slopes of this site is a mesic central forest community (**NC005**) that is dominated by white oak (Quercus alba), sugar maple (Acer saccharum), and shagbark hickory (Carya ovata). The hillside community is characterized by moist seepage areas and many downed trees which are likely the result of forest succession. The upland forest has been logged and impacted by erosion caused by ATV use. A township road exists along the bottom edge of the hill and summer cottages are scattered along the floodplain between the road and Connoquenessing Creek. It does not appear that the road is used very often and therefore, does not pose much of a threat to the site. The biggest threat to the site, however, is logging. A forested buffer should be maintained around the hillside community so that it may enlarge and sustain itself into the future.

Harmony Junction Wetland is a relatively small site the represents two significant natural communities for this portion of the county. The wetland at this site is an oxbow wetland similar to NC001, but on a much smaller scale. This robust emergent marsh community (**NC006**) is relatively undisturbed with the exception of southern end in which a culvert has been placed under a railroad bed. The construction of the railroad on the southern edge of this wetland has resulted in some filling and erosion, but it appears that the wetland is recovering. Wetland species of plants and animals are successfully inhabiting the oxbow. Associated with

the oxbow is a floodplain forest community (**NC007**) that is located along the northwestern edge of the oxbow. This wetland is dominated by very large, mature red oaks (Quercus borealis). Rich, moist, conditions, vernal pools, and a high diversity of typical floodplain herbaceous species help to characterize this part of the site. Both communities are bordered by active railroad tracks to the northwest, second growth upland forest to the southeast, and a disturbed robust emergent marsh community to the northeast. Present threats to the site include loss of suitable habitat for expansion and recovery and impact from surrounding farms and land use practices. Since the communities at this site represent significant biodiversity for the county, they should be afforded protection. A substantial buffer zone should be maintained and should include all of the forested area surrounding the site. Since these wetlands are vulnerable to pollution, efforts should be made to evaluate any activities upslope of, or in, the vicinity of the site for potential disturbance of the wetland or its hydrology.

Little Connoquenessing Creek provides significant land along its banks just upstream from its confluence with Connoquenessing Creek. **Trillium Hill Conservation Area** is located along the south shore of Little Connoquenessing Creek. Although this area has been logged in the past, most of it is maturing second growth woodland. Little development has occurred on the top of the hill along Swain Hill Road, probably because of its steepness. The small valleys and hillside along the creek are occupied by maturing northern hardwood forest communities and the entire area is known for its spectacular wildflower display in the spring. Trillium Hill is important for the open space that it provides for wildlife and recreational purposes in a location that is within a short distance of the highly developed areas of Butler County and the Pittsburgh suburbs. Its preservation, therefore, is important. An existing threat to this site is the erosion and sedimentation that has resulted from heavy ATV and horse use. Landowners should be made aware of the impact that these have on the natural qualities of Trillium Hill and they should be encouraged to forbid such activity. It is recommended that a forested buffer be maintained around this landscape conservation sight so that it may improve and sustain its qualities into the future.

The southern edge of the **Semiconon Valley Conservation** is located in the northeastern corner of this quadrangle. This site is described in more detail in the Prospect quadrangle summary (p. 85).

ZELIENOPLE QUADRANGLE

		PNDI Rank		Legal Status		Last
		Global	State	Fed.	State	Seen
CONNOQUENESSING CREEK NATURE RESERVE	*High Significance*					
NATURAL COMMUNITY:	NC001	G?	S2	N	N	7/90
NATURAL COMMUNITY:	NC002	G?	S2	N	N	7/90

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS
TOPOGRAPHIC AND GEOLOGIC SURVEY

ZELIENOPLE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 ZELIENOPLE 15' QUADRANGLE

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by ER-55
Aerial photographs taken 1952. Field check 1958

Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue

Fine red dashed lines indicate selected fence and field lines visible on aerial photographs. This information is unchecked

Unchecked elevations are shown in brown

Contours in strip mine areas compiled from 1952 photography

Map photoinspected 1977
No major culture or drainage changes observed

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
U.S. Route
State Route
Interstate Route

ZELIENOPLE, PA.
SW/4 ZELIENOPLE 15' QUADRANGLE
N4045—W8007.5/7.5
PHOTOINSPECTED 1977
1958
PHOTOREVISED 1969
AMS 4963 I SW—SERIES V851

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1969. This information not field checked

ZELIENOPLE QUADRANGLE

This quadrangle encompasses the western edge of Butler County is the vicinity of the town of Zelienople. Much of this area is experiencing rapid growth from industry and residential and commercial development. Most of the land that hasn't been developed has suffered the effects of surface mining and extensive logging. Although this portion of the county lacks any natural qualities, one section of land has survived much of this disturbance. The **Connoquenessing Creek Nature Reserve** is located directly north of the town of Zelienople along the Connoquenessing Creek. This forested natural area is owned and managed by E.C.O.Z. (Ecologically Concerned of Zelienople) and has been dedicated to the preservation of the natural qualities that exist at the site. Two natural communities exist in the nature reserve and extent into the surrounding areas. The floodplain forest community (**NC001**) along the Connoquenessing Creek is dominated by maturing silver maple (Acer saccharinum) and American basswood (Tilia americana). The moist, rich soils on this floodplain support a wide variety of herbaceous floodplain species. The steep, wooded slopes to the north of the floodplain have a more mature forest of red oak (Quercus borealis), white oak (Q. alba), American basswood, yellow poplar (Liriodendron tulipifera), and sugar maple (Acer saccharum). This mesic central forest community (**NC002**) is found in the upland areas above the slope as well. Presently the only threat to the site is the loss of suitable forested buffer zone for expansion of the forest communities. The only direction that NC002 has to expand is to the north and the west. The reserve is bordered by commercial development along its eastern border and, to a certain degree, along its western border. To protect this site, forested buffer should be maintained in the surrounding area so that the forest can mature and sustain itself into the future.

BADEN QUADRANGLE

	PNDI Rank		Legal Status	Last
	Global	State	Fed. State	Seen

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

COMMONWEALTH OF PENNSYLVANIA
STATE PLANNING BOARD
TOPOGRAPHIC AND GEOLOGIC SURVEY

BADEN QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1952. Field check 1953

Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17
shown in blue

There may be private inholdings within the boundaries of the National or State reservations shown on this map

Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1977 and other source data. This information not field checked. Map edited 1979

Purple tint indicates extension of urban areas

SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
Interstate Route — State Route

QUADRANGLE LOCATION

BADEN, PA.

N4037.5—W8007.5/7.5

1953
PHOTOREVISED 1979
AMS 4965 II NW—SERIES V851

BADEN QUADRANGLE

This southwest corner of Butler County is in part of Cranberry Township, an area bordering on the northern suburbs of Pittsburgh. This township is well known for being, at on time, the most rapidly developing area in the nation. Growth and development in this part of the county continues to increase and for this reason, little significant open space exists. In addition there are no known existing sites for species of special concern in this area. However, local officials are encouraged to review the remaining relatively natural areas as part of a plan to protect some open space in this area.

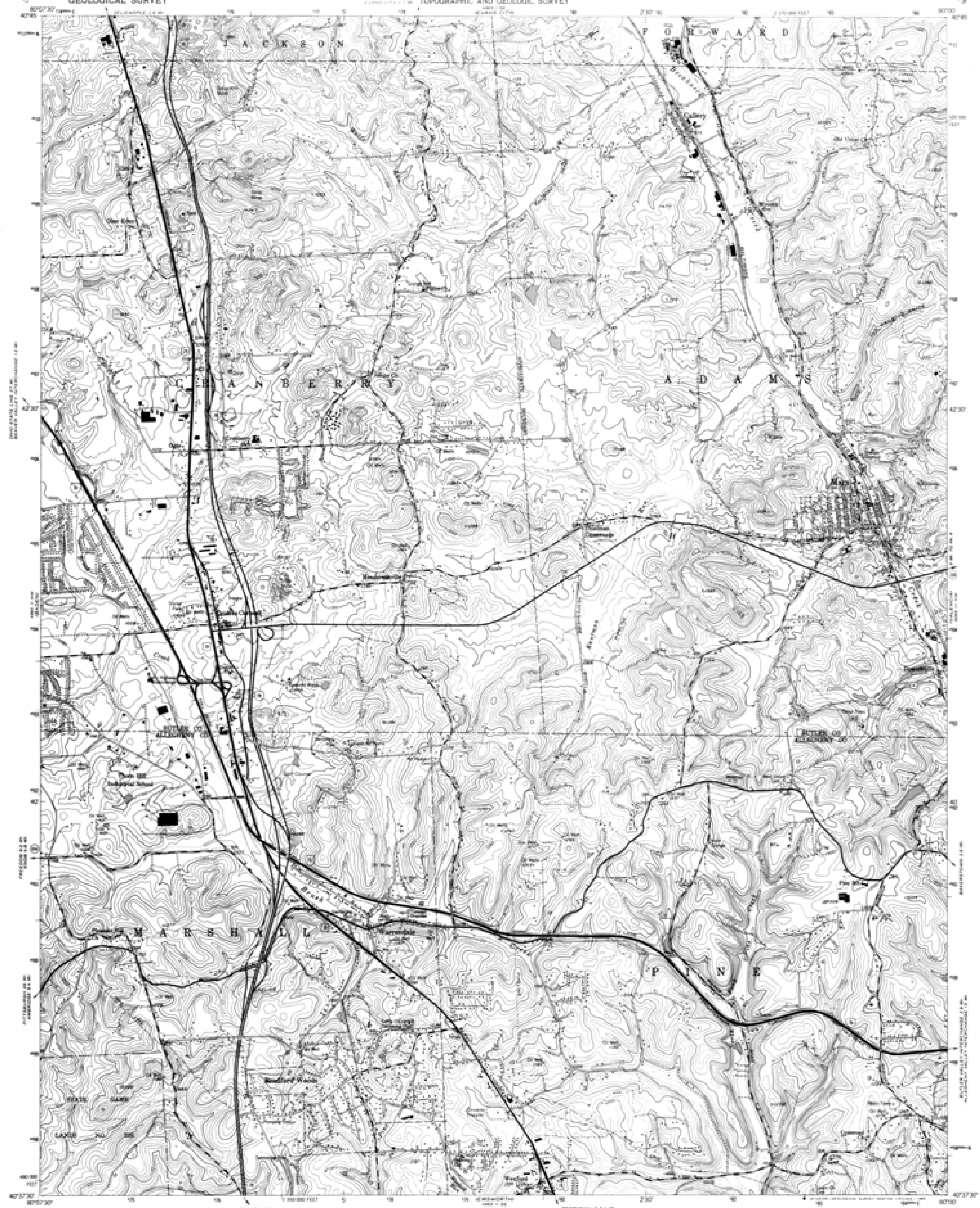
MARS QUADRANGLE

	PNDI Rank		Legal Status		Last
	Global	State	Fed.	State	Seen

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS
TOPOGRAPHIC AND GEOLOGIC SURVEY

MARS QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1952. Field check 1953

Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue

To place on the predicted North American Datum 1983 move the projection lines 3 meters south and 18 meters west as shown by dashed corner ticks

There may be private inholdings within the boundaries of the National or State reservations shown on this map

UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

Revisions shown in purple compiled in cooperation with the State of Pennsylvania from aerial photographs taken 1977 and other source data. This information not field checked. Map edited 1979

Purple tint indicates extension of urban areas.

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
U. S. Route — State Route
Interstate Route

MARS, PA.

N4037.5—W8000/7.5

1953
PHOTOREVISED 1979
DMA 4965 II NE—SERIES V831

MARS QUADRANGLE

This southern part of Butler County includes a large portion of the Cranberry Township area, as well as the town of Mars. Growth and development in this southern portion of the county are occurring at a rapid rate and as a result no significant natural heritage have been found to date. Township managers are encouraged to review the relatively natural areas that exist in Cranberry Township and consider them for protection.

VALENCIA QUADRANGLE

	PNDI Rank		Legal Status		Last
	Global	State	Fed.	State	Seen

MANAGED AREA: Glade Run Lake

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS
TOPOGRAPHIC AND GEOLOGIC SURVEY

VALENCIA QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
NW/4 NEW KENSINGTON 15' QUADRANGLE

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1947. Field check 1950

Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone

1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue

Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1969
This information not field checked

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
U.S. Route — State Route
Interstate Route

VALENCIA, PA.
NW/4 NEW KENSINGTON 15' QUADRANGLE
N4037.5—W7952.5/7.5

1950
PHOTOREVISED 1969
AMS 5965 III NW—SERIES V851

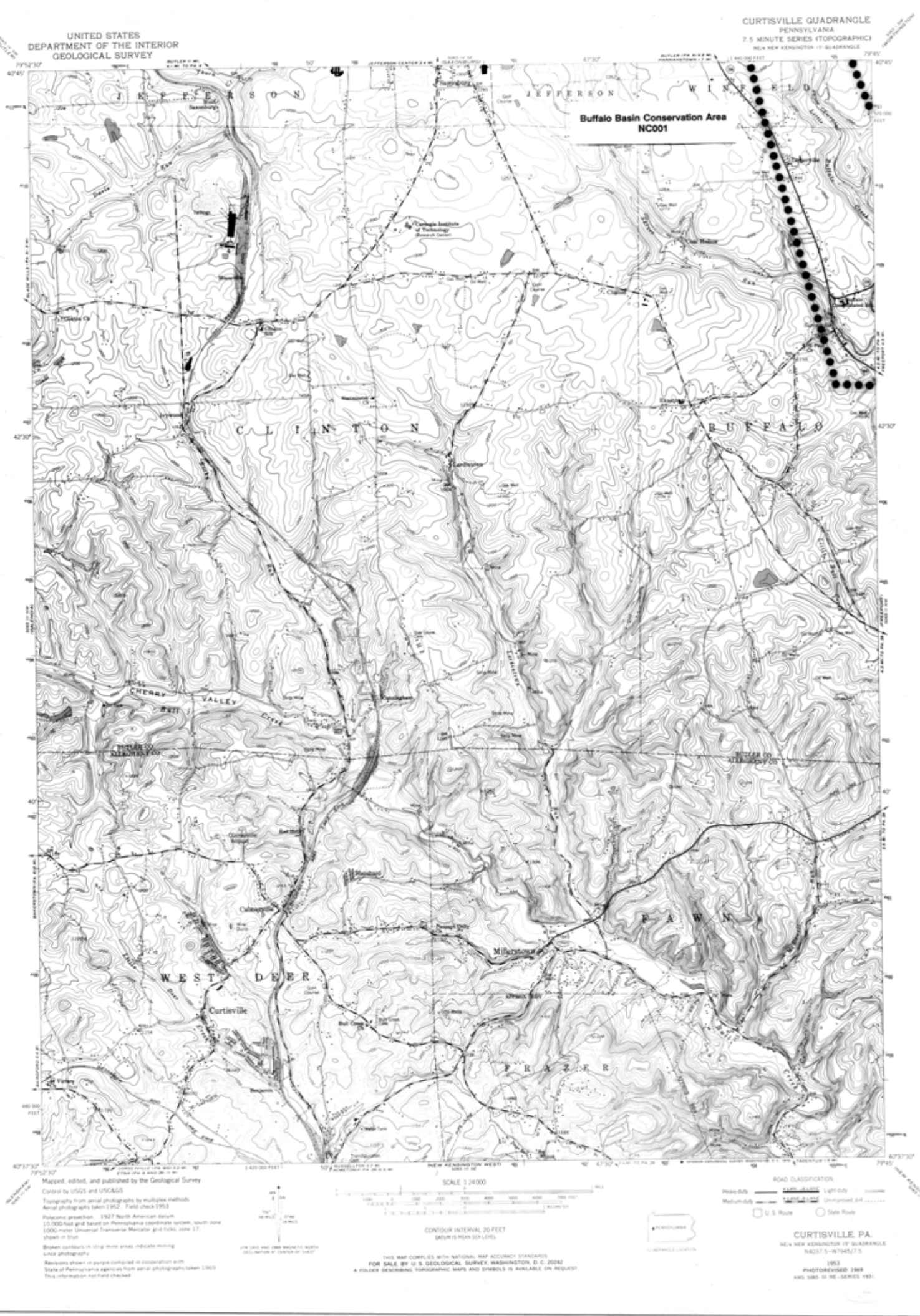
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

VALENCIA QUADRANGLE

Like most of the southern part of Butler County, much of the land in this quadrangle has been cleared for development or agriculture. One area that provides a small amount of open space is along Glade Run in Forward and Adams Townships. **Glade Run Lake** is a 55-acre artificial fishing lake owned and managed by the Pennsylvania Fish Commission. The lake, along with it's forested perimeter and small cattail (Typha spp.) marshes formed by it's tributaries, provides habitat for waterfowl and other animals. The forest along the edge of the lake is fragmented and is impacted by surrounding development. Attempts should be made to acquire more land and expand this recreational area. Glade Run Lake is especially important because it provides open space for wildlife habitat and recreation in a part of Butler County that is heavily impacted by development.

CURTISVILLE QUADRANGLE

		PNDI Rank		Legal Status		Last
		Global	State	Fed.	State	Seen
BUFFALO BASIN CONSERVATION AREA	*Moderate Significance*					
NATURAL COMMUNITY:	NC001	G?	S3	N	N	5/91

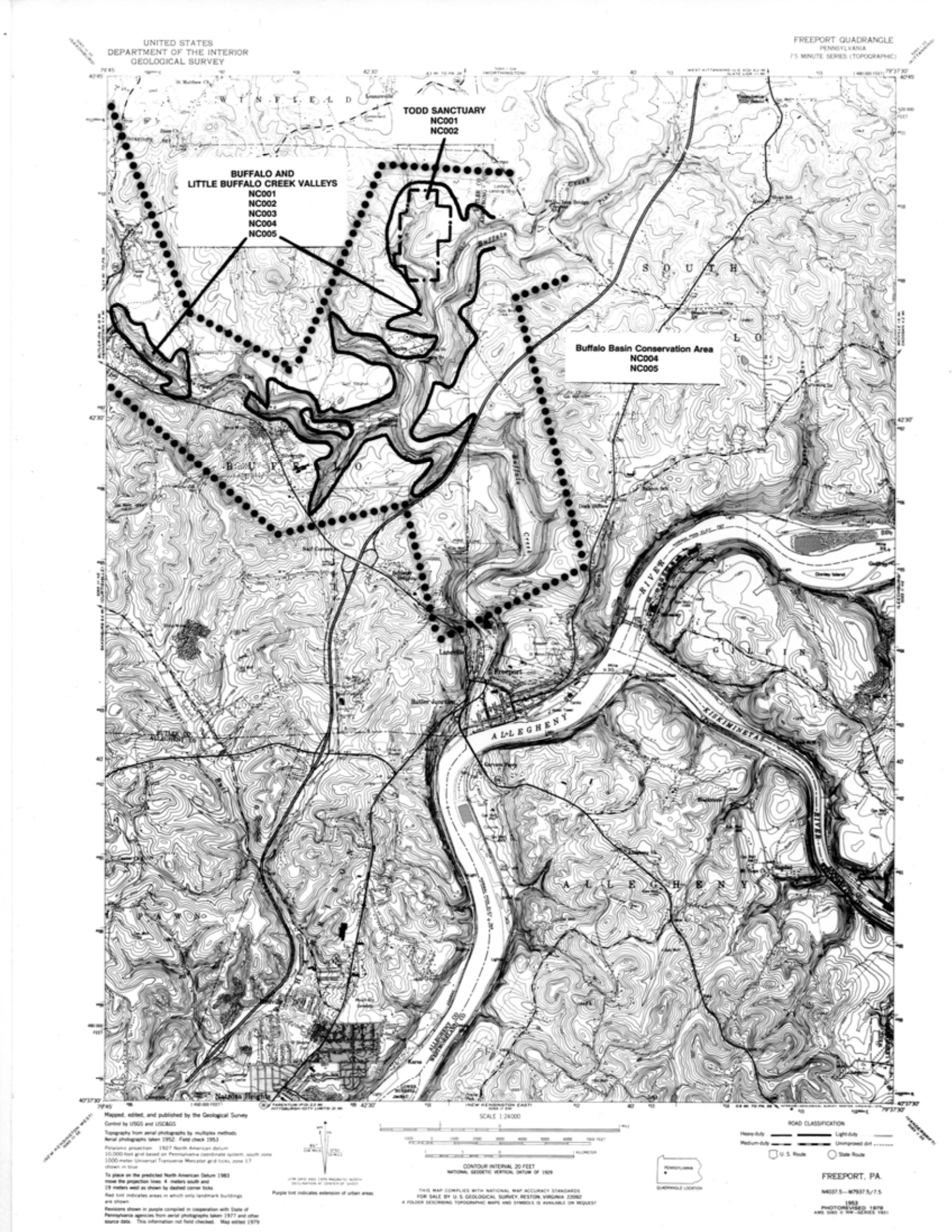

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CURTISVILLE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
Buffalo Basin Conservation Area
NC001
JEFFERSON
WINFIELD
CLINTON
BUFFALO
FAWN
WEST DEER
FRAZER
Curtisville
Millerstown
Cherry Valley Creek
Carnegie Institute of Technology (Research Center)
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1952. Field check 1953
Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
Broken contours in strip mine areas indicate mining since photography
Revisions shown in purple compiled in cooperation with State of Pennsylvania agencies from aerial photographs taken 1969. This information not field checked
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
U. S. Route
State Route
CURTISVILLE, PA.
NE/4 NEW KENSINGTON 15' QUADRANGLE
N4037.5—W7945/7.5
1953
PHOTOREVISED 1969
AMS 5065 III NE—SERIES V851

CURTISVILLE QUADRANGLE

For the most part, land in this southern Butler County quadrangle is primarily used for agriculture. Portions of the area have been strip mined as well. Therefore, little exists in the way of natural communities or habitats for species. A part of the **Buffalo Basin Conservation Area** extends into this portion of the county along the Little Buffalo Creek. This landscape conservation site is part of a larger tract that is located in the Freeport quadrangle (p. 133). Little Buffalo Creek harbors a high quality, medium gradient-clearwater creek community (**NC001**) that provides this area with a quality habitat. Efforts should be made to protect this high quality stream by maintaining a buffer zone. Any development within the watershed should be carefully reviewed to determine the potential impacts that such activities could have on the stream. In addition, erosion, sedimentation, and runoff of chemicals from farmers fields are potential threats to the quality of this stream and its bordering land.

FREEPORT QUADRANGLE

		PNDI Rank Global	State	Legal Status Fed.	State	Last Seen
BUFFALO BASIN CONSERVATION AREA *Moderate Significance*						
NATURAL COMMUNITY:	NC004	G?	S3	N	N	5/91
NATURAL COMMUNITY:	NC005	G?	S3	N	N	5/91
BUFFALO AND LITTLE BUFFALO CREEK VALLEYS *High Significance*						
NATURAL COMMUNITY:	NC001	G?	S3	N	N	5/91
NATURAL COMMUNITY:	NC002	G?	S5	N	N	5/91
NATURAL COMMUNITY:	NC003	G?	S2	N	N	5/91
NATURAL COMMUNITY:	NC004	G?	S3	N	N	5/91
NATURAL COMMUNITY:	NC005	G?	S3	N	N	5/91
TODD SANCTUARY *High Significance*						
NATURAL COMMUNITY:	NC001	G?	S3	N	N	7/90
NATURAL COMMUNITY:	NC002	G?	S5	N	N	7/90


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
FREEPORT QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
TODD SANCTUARY
NC001
NC002
BUFFALO AND
LITTLE BUFFALO CREEK VALLEYS
NC001
NC002
NC003
NC004
NC005
Buffalo Basin Conservation Area
NC004
NC005
W I N F I E L D
S O U T H
B U F F A L O
G I L P I N
A L L E G H E N Y
A L L E G H E N Y
K I S K I M I N E T A S
Buffalo Creek
Freeport
Natrona Heights
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1952. Field check 1953
Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17
shown in blue
To place on the predicted North American Datum 1983
move the projection lines 4 meters south and
19 meters west as shown by dashed corner ticks
Red tint indicates areas in which only landmark buildings
are shown
Revisions shown in purple compiled in cooperation with State of
Pennsylvania agencies from aerial photographs taken 1977 and other
source data. This information not field checked. Map edited 1979
Purple tint indicates extension of urban areas
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
U.S. Route
State Route
PENNSYLVANIA
QUADRANGLE LOCATION
FREEPORT, PA.
N4037.5—W7937.5/7.5
1953
PHOTOREVISED 1979
AMS 5065 II NW—SERIES V851

FREEPORT QUADRANGLE

This quadrangle is located in the southeastern corner of Butler County, where it comes in close proximity to the Allegheny River. Buffalo Creek, a high quality stream, empties into the Allegheny River at the intersection of Butler, Armstrong, and Allegheny Counties, in the town of Freeport. In this part of the county portions of Buffalo Creek, Little Buffalo Creek, and the land surrounding the two streams forms a large landscape conservation site referred to as the **Buffalo Basin Conservation Area**. The open ended boundaries for this site suggest that its qualities extend into Armstrong County. The significance of this site lies in the open space that it provides along the two streams for flora and fauna habitat, and for recreation purposes. In addition, this site has a number of significant natural features within its borders. In this part of its watershed, Buffalo Creek, as well as Little Buffalo Creek, are both examples of high quality, medium gradient-clearwater creek communities (**NC004** and **NC005**, respectively). Buffalo Creek is considered high quality from its source to the mouth of Little Buffalo Creek. Since these high quality-trout stocked fishery streams (D.E.R., Bureau of Water Quality Management, 1979) are uncommon in Butler County, every effort should be made to protect both of these communities.

Within this large landscape conservation site is a site referred to as **Buffalo and Little Buffalo Creek Valleys** which is noted for its significant contribution to the biodiversity of Butler County. Five natural communities including NC004 and NC005, the stream communities, are represented at this site. The northern hardwood-conifer forest community (**NC001**) is found throughout the Buffalo and Little Buffalo Creek Valleys in areas that exhibit cool, moist, conditions. The upland forest is composed of f dry-mesic acidic central forest community (**NC002**). Most south facing slopes and upland areas in the valleys have this community type represented. A fifth community type is represented along the hillsides and floodplains of the stream valleys. This is referred to as a mesic central forest community (**NC003**). The forest stands of this type are mature growth in several locations and are dominated by a variety of tree species including yellow popular (Liriodendron tulipifera), sugar maple (Acer saccharum), American basswood (Tilia americana), red oak (Quercus borealis), and ash (Fraxinus spp.).

Another interesting feature within the Buffalo and Little Buffalo Creek Valleys biodiversity site is **Todd Sanctuary**. Todd Sanctuary is a managed area in Buffalo Township that was established by the Audobon Society of Western Pennsylvania in 1942. The Audobon Society has dedicated Todd Sanctuary to the preservation of its natural qualities. The sanctuary and the surrounding areas in the Buffalo Creek Valley

provide examples of several habitat types. One of the significant natural communities in the sanctuary is found along "Watsons Run", a tributary to Buffalo Creek. This community is an example of a maturing northern hardwood-conifer forest community (**NC001**), dominated by eastern hemlock (Tsuga canadensis) and yellow birch (Betula alleghaniensis) which is generally found in the cool moist ravines of the Buffalo Creek region. This community grades into the dry-mesic acidic central forest community (**NC002**) in which white oak (Quercus alba), red oak (Q. borealis), black oak (Q. velutina), scarlet oak (Q. coccinea), and hickories (Carya spp.) become dominant. This community is found on the warmer slopes and upland areas above the ravine. Both NC001 and NC002 extend outside of Todd Sanctuary into other areas of the Buffalo and Little Buffalo Creek Valleys.

Because of its relatively small size (160 acres) the biggest threats to Todd Sanctuary and the surrounding areas are logging and residential development. Since much of the forest in the Buffalo Basin Conservation Area is mature second growth, many private landowners have decided to have their property logged. Logging in the vicinity of the sanctuary could impact the recovery and quality of NC001 and NC002. The southeastern corner of Butler County is also experiencing increased residential development. This conversion of open lands to other uses is now beginning to impact the natural qualities for this area. A forested buffer surrounding the ravine and uplands should be maintained and attempts should be made by the Audobon Society to purchase more land for protection of the natural features. Todd Sanctuary, like the entire Buffalo Basin Conservation Area, has been heavily impacted by the effects of the gypsy moth. As an example of the Audobon Society's dedication to natural area management of the Sanctuary, Audobon has decided not to resort to insecticides as a means of combating the gypsy moth. Such action could have a drastic impact on the quality of the streams in this area, as well as the biodiversity that is exhibited by the flora and fauna of the stream valleys. Local officials and the public should take the negative impacts of pesticide spraying into account when considering the protection of the biological diversity of this and other important areas.

These natural communities and the flora and fauna associated with them in the Buffalo and Little Buffalo Creek Valleys represent a significant level of biodiversity for this portion of Butler County. For this reason, efforts should be made to protect this area which represents one of the largest and wildest high quality landscapes in the county..

Since the Buffalo Basin Conservation Area extends into Armstrong County, planning and protection of this site needs to be a cooperative effort between both Butler and Armstrong Counties. Efforts should be

made to evaluate such activities as logging and spraying pesticides that disrupt the natural quality of a an area. A proposed Rails-To-Trails system is scheduled to be instituted on the abandoned railroad line that runs from Laneville to Butler. The portion of the trail that goes through the Buffalo Basin Conservation Area parallels the west side of Buffalo Creek and the north side of Little Buffalo Creek. This trail will introduce more people into the area, but it should not be a problem for the ecological integrity of the valleys if the trail is managed carefully. Motorized vehicles such as ATVs should not be permitted on the trail. In addition, any activity that would cause disruption of the trail, will result in damage to the high quality streams or surrounding natural communities that border the trail. The stream systems in these valleys are particularly vulnerable to any activity on the old railroad bed since they are in close proximity. Any activity that would disturbed the present condition of the trail should not be permitted. The trail should be used only for passive recreation such as hiking, nature study, bird watching, etc.. County and township governments should consider protection measures for the entire Buffalo Basin Conservation Area as part of their overall management and development master plans for southeastern Butler County and adjacent Armstrong County. Consideration should be given to purchasing land along the trail to insure that this area's significant natural qualities will be protected.

ACKNOWLEDGMENTS

This study was developed in part with financial assistance provided through the Recreational Improvement and Rehabilitation Act Program, as administered by the Pennsylvania Department of Community Affairs, Bureau of Recreation and Conservation.

The Western Pennsylvania Conservancy would like to thank the Butler County Planning Commission and the members of those agencies who contributed time and expertise to the study. Special thanks are extended to Fred Lochner of the Butler County Planning Commission for his assistance with field work and his contribution of valuable information to the inventory and the PNDI data base.

Other individuals representing several organizations (e.g. Ned Weston, Pennsylvania Game Commission; Gene Wilhelm, Bartramian Audobon Society; and Dave Johnson, Bureau of State Parks) have contributed valuable information regarding species of special concern in Butler County. Scott Renny of the Soil Conservation Service in Butler provided the use of aerial photographs of the county for examination. In addition, many citizens of Butler County also volunteered information, time, and effort to the inventory. It would be impossible to name and thank all individuals that contributed, but without their help much of the inventory would not have been completed.

The cover design and graphics were created by John Blumen, Blumen and Associates.

Any errors or omissions from the text or the maps are solely the responsibility of the senior author.

LITERATURE CITED

Anonymous, 1985. A preliminary inventory of natural areas of the Hoosier National Forest. Indiana Department of Natural Resources, Indianapolis, Indiana. Unpublished report. 197 p.

Braun, E.L. 1950. Deciduous forests of eastern North America. The Free Press, MacMillan Publ. Co., New York. 596 pp.

Davis, A.F., T.L. Smith, A.M. Wilkinson, E.B. Drayton, and G.J. Edinger. 1990. A natural areas inventory of Lancaster County, Pennsylvania. Pennsylvania Science Office of the Nature Conservancy, Middletown, Pennsylvania. 165 p.

Department of Environmental Resources. 1983. Technical Report: Silver Creek, Butler County. Division of Water Quality and Bureau of Water Quality Management. 18 p.

Department of Environmental Resources. 1979. Rules and Regulations. D.E.R.. Protection of Natural Resources. Water Resources. Chapter 93: Water Quality Standards. Division of Water Quality and Bureau of Water Quality Management. 141 pp.

Henry, L.K. 1971. An annotated list of the vascular flora of Butler County, Pennsylvania. Annals of Carnegie Museum. 43:115-178.

Jennings, O.E. 1927. Classification of the plant societies of central and western Pennsylvania. Proceedings of the Pennsylvania Academy of Science 1:23-55.

Knight, R.L., and S.K. Knight. 1984. Responses of wintering bald eagles to boating activity. Journal of Wildlife Management. 48:999-1004.

Küchler, A.W. 1964a. Manual to accompany the map potential natural vegetation of the conterminous United States. Special Publication Number 36. American Geographical Society, N.Y. 156 p.

--------- 1964b. Potential natural vegetation of the conterminous United States. Special Publication Number 36. American Geographical Society, N.Y.

Lull, H.W. 1968. A forest atlas of the Northeast. Northeastern Forest Experiment Station. Forest Service U.S. Dept. of Agriculture, Upper Darby, PA.

The Nature Conservancy. 1988. Natural heritage operations manual. The Nature Conservancy, Arlington, VA.

Reese, G.A., D.A. Albert, S.R. Crispin, L.A. Wilsmann, and S.J. Ouwinga. 1988. A natural areas inventory of Oakland County, Michigan. Volume I: Technical Report: Michigan Natural Features Inventory, Lansing, Michigan. 242 p.

Sokolow, A.A. 1980. Geologic Map of Pennsylvania. Department of Environmental Resources. Topographic and Geologic Survey.

Smith, R.V. 1989. Soil survey of Butler County, Pennsylvania. U.S. Department of Agriculture. Soil Conservation Service. Washington, D.C..

APPENDIX I

FEDERAL AND STATE ENDANGERED SPECIES CATEGORIES,
GLOBAL AND STATE ELEMENT RANKS

FEDERAL STATUS

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

The following definitions are extracted from the February 21, 1990 U.S. Fish and Wildlife Service notice in the Federal Register:

LE = Taxa in danger of extinction throughout all or a significant portion of their ranges.

LT = Taxa that are likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges.

PE = Taxa already proposed to be listed as endangered.

PT = Taxa already proposed to be listed as threatened.

C1 = Taxa for which the Service has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species. Taxa of known vulnerable status in the recent past that may already have become extinct.

C2 = Taxa for which there is some evidence of vulnerability but for which there are not enough data to support listing proposals at this time.

C3 = Taxa that once were considered for listing as threatened or endangered but are no longer under such consideration. Such taxa are further divided into three subcategories, to indicate the reason(s) for their removal from consideration.

- 3A = Taxa for which the Service has persuasive evidence of extinction.
- 3B = Names that, on the basis of current taxonomic understanding (usually as represented in published revisions and monographs) do not represent distinct taxa meeting the Act's definition of "species".
- 3C = Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.

APPENDIX I (Cont.)

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 of their natural range within this Commonwealth, if critical habitat is not maintained or if the species is greatly exploited by man. This classification shall also include any populations of plant species that have been classified as Pennsylvania Extirpated, but which subsequently are found to exist in this Commonwealth.

PT = Pennsylvania Threatened - Plant species which may become endangered throughout most or all of their natural range within this Commonwealth, if critical habitat is not maintained to prevent their future decline, or if the species is greatly exploited by man.

PR = Pennsylvania Rare - Plant species which are uncommon within this Commonwealth. All species of the native wild plants classified as Disjunct, Endemic, Limit of Range and Restricted are included within the Pennsylvania Rare classification.

Disjunct - Significantly separated from their main area of distribution.

Endemic - Confined to a specialized habitat.

Limit of Range - At or near the periphery of their natural distribution.

Restricted - Found in specialized habitats or habitats infrequent in Pennsylvania.

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 exists, but is under review for future listing.

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

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 have been 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 have been identified and documented; or 3) species whose populations are rare or peripheral and in possible danger of severe decline throughout their range in Pennsylvania; or 4) species determined to be "Threatened" pursuant to the Endangered Species Act of 1973, Public Law 93-205 (87 Stat. 884), as amended, that are not listed as "Pennsylvania Endangered".

N = No current legal status, but is under review for future listing.

APPENDIX I (Cont.)

FISH, AMPHIBIANS, REPTILES, AND AQUATIC ORGANISMS - Legislative Authority: Title 30 Chapter 75, Fish and Boat Code, revised February 9, 1991; Pennsylvania Fish 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) have been declared by the Pennsylvania Fish 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) have been declared by the Pennsylvania Fish 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.

PC = PENNSYLVANIA CANDIDATE - Animals that could become endangered or threatened in the future. All of these are uncommon, have restricted distribution or are at risk because of certain aspects of their biology.

N = No current legal status, but is under review for future listing.

INVERTEBRATES: No state agency has been 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 Commission, but have not been listed to date.

N = No current legal status, but is under review for future listing.

-- = No status recommended by PBS, but is being studied by the Pennsylvania Natural Diversity Inventory (PNDI).

APPENDIX I (Cont.)

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 I (Concluded)

State Element Ranks

S1 = Critically imperiled in state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation from the state.

S2 = Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.

S3 = Rare or uncommon in state (on the order of 21 to 100 occurrences).

S4 = Apparently secure in state, with many occurrences.

S5 = Demonstrably secure in state and essentially ineradicable under present conditions.

SA = Accidental (occurring only once or a few times) or casual (occurring more regularly although not every year) in state; a few of these species (typically long-distance migrants such as some birds, butterflies, and cetaceans) may have even bred on one or more of the occasions when they were recorded.

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.

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

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

SX = Apparently extirpated from the state.

SZ = Not of significant conservation concern in the state, invariably because there are no (zero) definable EO's in the state, although the taxon is native and appears regularly in the state.

APPENDIX II

COUNTY SIGNIFICANCE RANKS

The natural heritage sites that have qualified for inclusion in this report have been classified regarding their significance as areas of importance to the biological diversity and ecological integrity of the county. Included in this evaluation is also the level of state and/or national significance. These ranks have been used to prioritize the significance of all identified sites and suggest the relative attention that sites should receive for the amount, degree and rate of protection.

Significance Rank	Explanation
HIGH	Outstanding county significance. Sites that represent areas of great importance for the biological diversity and ecological integrity of the county, state and/or region. One or more occurrences of state or national species of special concern, a rare natural community type, a relatively undisturbed natural area, or high quality biological diversity area, is present at the site. Sites of high county significance merit quick, strong and complete protection.
MODERATE	Important county significance. Sites that represent vital areas of the county's biological and ecosystem resources and have not been overly disturbed by human activities. Also occasionally included are sites that have less important occurrences of state or nationally imperiled species and/or natural communities. These sites represent notable areas harboring important natural resources that merit complete protection in the near future.
LOW	General county significance. Sites that harbor many of the flora, fauna and natural community resources in the county, and although somewhat disturbed by human activities, still represent areas that provide habitat, open space, educational lands and general landscape and/or watershed protection. These sites will be increasingly important to the future quality of the county's overall environment, and merit the attention of planners and conservationists so that their present condition can be maintained.

APPENDIX III

POTENTIAL NATURAL HERITAGE INVENTORY FORM

Site Name:_____
Ground Survey Date:_____ Air Survey Date:_____
Reference:_____
County: Butler Township:_____
Quadrangle Name:_____ Quadrangle Number:_____ 10,10: _____
Directions to Site:_____
_____
Site Elevation:_____ Site Size:_____
Land Owners (include best method of contact):_____
_____
Air Survey Team:_____ Air Photo Number:_____
Typed by Aerial Photo: Y N Photo Types: _____
Additional Comments from Aerial Survey:_____
_____
Ground Survey Team:_____
Community Type:_____
Conditions:_____
Setting of Community:_____
Description of Community:_____
_____
Age:_____ Cutting:_____
Grazing:_____ Deer:_____
Other Impacts:_____

Recovery Potential:_____ Quality Rank:_____

Additional Comments:_____
_____
_____
_____
_____
Previously Recorded Element Occurrences:_____
_____
_____
Species List:_____
_____
_____

APPENDIX IV

RECOMMENDED NATURAL HERITAGE FIELD SURVEY FORM

Surveyor:_____ Phone:_____

Address:_____

Site Name:_____ Date of Observation:_____

U.S.G.S. Quadrangle Name:_____

Exact Location of Site (please be specific and include a map or sketch if possible):_____

_____

Owner:_____ Owners Attitude Toward Conservation:_____

Site Size (approximate acreage):_____ Site Elevation:_____Current Land Use:_____

Type of Area:

___ Old Growth Forest
___ Marsh
___ Swamp
___ Shrub Swamp
___ Forested Swamp
___ Bog
___ Natural Pond
___ Limestone Rock Outcrop
___ Other (please explain):

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

_____

_____

_____

Disturbance History: _____

_____

Please attach any additional information, species list, etc.. Send completed report forms to Lisa Smith, Western Pennsylvania Conservancy, 209 Fourth Avenue, Pittsburgh, Pennsylvania, 15222, (412)288-2777. Additional forms may be obtained from this office. Thank you for your contribution.

APPENDIX V

CLASSIFICATION OF NATURAL COMMUNITIES
IN PENNSYLVANIA
(DRAFT)

COMMUNITY NAME	GLOBAL RANK	STATE RANK
ESTUARINE COMMUNITIES		
Deepwater Subtidal Community	G?	S1
Shallow-Water Subtidal Community	G?	S1
Freshwater Intertidal Mudflat	G3G4	S1
Freshwater Intertidal Marsh	G3G4	S1
RIVERINE COMMUNITIES		
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		
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 V (Cont.)

COMMUNITY NAME	GLOBAL RANK	STATE RANK
PALUSTRINE COMMUNITIES		
Acidic Broadleaf Swamp	G5	S1S2
Circumneutral Broadleaf Swamp	G?	S2S3
Boreal Conifer Swamp	G?	S2
Northern Conifer Swamp	G?	S3S4
Broadleaf-Conifer Swamp	G?	S3S4
Floodplain Swamp	G?	S1
Calcareous Seepage Swamp	G?	S1
Acidic Shrub Swamp	G5	S3
Circumneutral Shrub Swamp	G?	S3
Graminoid Marsh	G?	S3
Robust Emergent Marsh	G?	S2
Mixed Graminoid-Robust Emergent Marsh	G?	S2S3
Calcareous Marsh	G?	S1
Glacial Bog	G?	S2S3
Nonglacial Bog	G?	S3
Reconstituted Bog		
Shrub Fen	G2G3	S1
Basin Graminoid-Forb Fen	G?	S1
Hillside Graminoid-Forb Fen	G?	S1
Circumneutral Seep Community	G?	S3?
Calcareous Seep Community	G?	S1
Acidic Seep Community	G?	S3?
Riverside Seep Community	G?	S2?
TERRESTRIAL COMMUNITIES		
Boreal Forest	G?	S?
Northern Conifer Forest	G5	S3S4
Northern Hardwood Forest	G?	S3S4
Northern Hardwood-Conifer Forest	G?	S3
Xeric Central Hardwood Forest	G?	S5
Xeric Central Conifer Forest	G?	S3S4
Xeric Central Hardwood-Conifer Forest	G?	S3
Pitch Pine-Scrub Oak Barrens	G2G3	S1S2
Dry-Mesic Acidic Central Forest	G?	S5
Dry-Mesic Calcareous Central Forest	G?	S2S3
Mesic Central Forest	G?	S2

Appendix V (Cont.)

COMMUNITY NAME	GLOBAL RANK	STATE RANK
Talus Slope Forest	G?	S2?
Coastal Plain Forest	G?	S1
Floodplain Forest	G?	S2
River Gravel Community	G?	S4S5
Eastern Serpentine Barrens	G2	S1
Appalachian Shale Barren	G?	S1
Appalachian Sand Barren	G?	S?
Boulder Field	G?	S5
Calcareous Cliff Community	G?	S2
Acidic Cliff Community	G?	S5
Shale Cliff Community	G?	S2
Riverside Outcrop Community	G?	S2S2
Calcareous Riverside Outcrop Community	G?	S1
Acidic Rocky Summit Community	G?	S1S2
Calcareous Rocky Summit Community	G?	S1
SUBTERRANEAN COMMUNITIES		
Solution Cave Terrestrial Community	G?	S3
Solution Cave Aquatic Community	G?	S3
Tectonic Cave Community	G?	S3S4
Talus Cave Community	G?	S2S4
DISTURBED COMMUNITIES		
Bare Soil		
Meadow/Pastureland		
Cultivated Land		
Successional Field		
Young Miscellaneous Forest		
Conifer Plantation		