2013

NATURAL RESOURCE INVENTORY

TOWNSHIP OF MONTVILLE

JUNE 10, 2013

ADOPTED BY
ENVIRONMENTAL COMMISION:
JULY 17, 2013

ADOPTED BY
PLANNING BOARD:

BURGIS
ASSOCIATES, INC.

COMMUNITY PLANNING
LAND DEVELOPMENT AND DESIGN
LANDSCAPE ARCHITECTURE

PRINCIPALS:
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2013 NATURAL RESOURCE INVENTORY
TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

PREPARED FOR:

TOWNSHIP OF MONTVILLE PLANNING BOARD
& ENVIRONMENTAL COMMISSION
BA #2465.26

The original document was appropriately signed and sealed on July 10, 2013 in accordance with Chapter 41 of Title 13 of the State Board of Professional Planners.

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1. INTRODUCTION

A Natural Resource Inventory (NRI) is a compilation of text and visual information about the natural resource characteristics and environmental features of an area. It is an objective index and description of features and their functions, rather than an interpretation or recommendation. The NRI is an important tool for environmental commissions, open space committees, planning boards and zoning boards of adjustment. Its purposes are wide-ranging and include the following:

- As a tool to increase the understanding of natural systems, and their limitations and opportunities for use;
- To help identify priority areas for open space, historic and farmland preservation;
- As a basis for a land capacity analysis, for determining the intensity and location of development;
- As a factual basis for municipal land use planning, including preparation of the land use element of the municipal master plan;
- As a comprehensive guide in the site plan review process;
- As a reference for developing municipal ordinances and establishing management practices for public lands and infrastructure; and
- As an educational tool for residents to learn more about their community and its environment.

New Jersey state law gives environmental commissions the authority and responsibility for preparing NRIs. The Environmental Commission Enabling Legislation (*N.J.S.A.* 40:56A) states that "A...commission organized under this act shall have power to conduct research into the use and possible use of the open land areas of the municipality.... It shall keep an index of all open marshlands, swamps and other wetlands, in order to obtain information on the proper use of such areas, and may from time to time recommend to the planning board, or, if none, to the mayor and governing body of the municipality, plans and programs for inclusion in a municipal master plan and the development and use of such areas."

The Montville Township Environmental Commission has previously prepared two Natural Resource Inventories for the Township, the first having been published in 1981 and the most recent having been published in 1992. Although some of the community's features have not changed much over the past two decades, such as topography and soils, other environmental features have experienced quite a bit of change due to development, land preservation and regulation. As such, this 2012 Natural Resources Inventory presents updated information about the Township. It has been prepared under the direction of the Township Environmental Commission and Planning Board, and with the assistance of a grant from the Association of New Jersey Environmental Commissions (ANJEC).

The document consists of ten basic sections. Following the Introduction, the document provides an overview of Land Use in Montville Township, consisting of its regional location, existing land use, preserved lands, and public and private recreation areas. Subsequently, the document explores five different categories of natural features, including Geology, Hydrology, Soils, Wetlands, and Vegetation. Next, social forces that have shaped the natural environment are

explored in the chapters covering Contaminated Sites and Historic and Cultural Features. Finally, the document concludes with an overview of the Township's Regional Relationships, which addresses Montville's intersection with the State Development and Redevelopment Plan, Highlands Regional Master Plan, and Morris County Master Plan Elements.

In summary, it is intended that this update to the NRI will add to the Township's knowledge about its rich natural and cultural heritage. Furthermore, it is envisioned that such recognition will help the Township's Environmental Commission, Planning Board and other Township bodies to preserve these assets and make sound decisions when it comes to land use planning.

2. LAND USE

2.1 Regional Location

The Township of Montville is located in the northeastern portion of Morris County, immediately adjacent to the border with Essex County. It is bounded to the north by the Borough of Kinnelon, to the west by the Township of Boonton, the Town of Boonton and the Township of Parsippany-Troy Hills, to the south by the Township of East Hanover, and to the east by the Borough of Lincoln Park and the Township of Fairfield, which is located in northwestern Essex County.

The Township occupies an area of 12,233 acres, or 19.1 square miles. It contains two unincorporated areas within its limits, Pine Brook, which is located in the southern portion of the municipality, and Towaco, which is located in the northeastern portion of the municipality.

Major regional traffic is carried through the Township on Interstate Routes 80 and 287 as well as Route 46. Interstate 80 and Route 46 run east-west across the southern portion of the municipality. Interstate 287 runs north-south and traverses the northern portion of the municipality.

The Towaco station offers New Jersey Transit train service along the Montclair-Boonton Line, which extends west-east through the Township, originating in Hackettstown and terminating in Hoboken. NJ Transit also owns and operates two park and ride facilities in proximity to the Towaco train station, including one located at Route 202 and Waughaw Road and the other located at Whitehall Road.

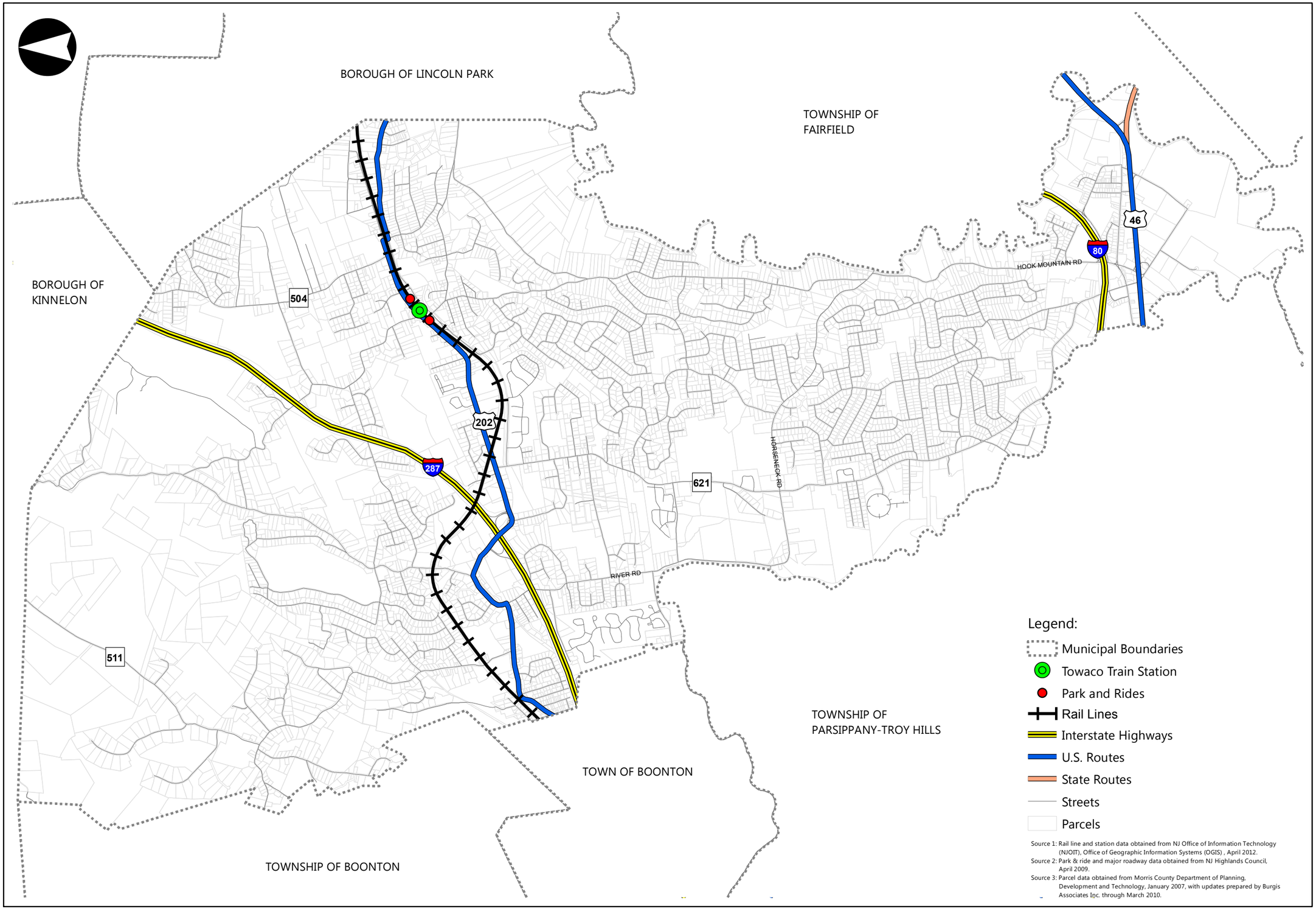
Figure 1, Regional Location, provides an illustration of the Township's regional location and physical layout, as well as a depiction of the Township's existing circulation network.

2.2 Existing Land Use

Existing land uses were analyzed as part of the 2010 update to the Township's Land Use Plan Element of the Master Plan. Land use data from the Township's tax office were recorded on the Township tax maps, the data were field verified to ensure accuracy, and subsequently recorded in mapped form as an Existing Land Use map.

A total of 16 categories were used in this survey. They include one- and two-family residential, multi-family residential, assisted living, retail/service commercial, business, office, automotive services, industrial, public use, public school, charitable, farmland, preserved open space, cemetery, parking and vacant land. It is noted that amendments to the preserved open space category since the adoption of the 2010 Land Use Plan Element are reflected herein.

The Township's existing land use pattern is illustrated on Figure 2, Existing Land Use, and its distribution is described in Table 1 below.



Source 1: Rail line and station data obtained from NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS) , April 2012.
Source 2: Park & ride and major roadway data obtained from NJ Highlands Council, April 2009.
Source 3: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.

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2013 Natural Resource Inventory

TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

Figure 1

Regional Location

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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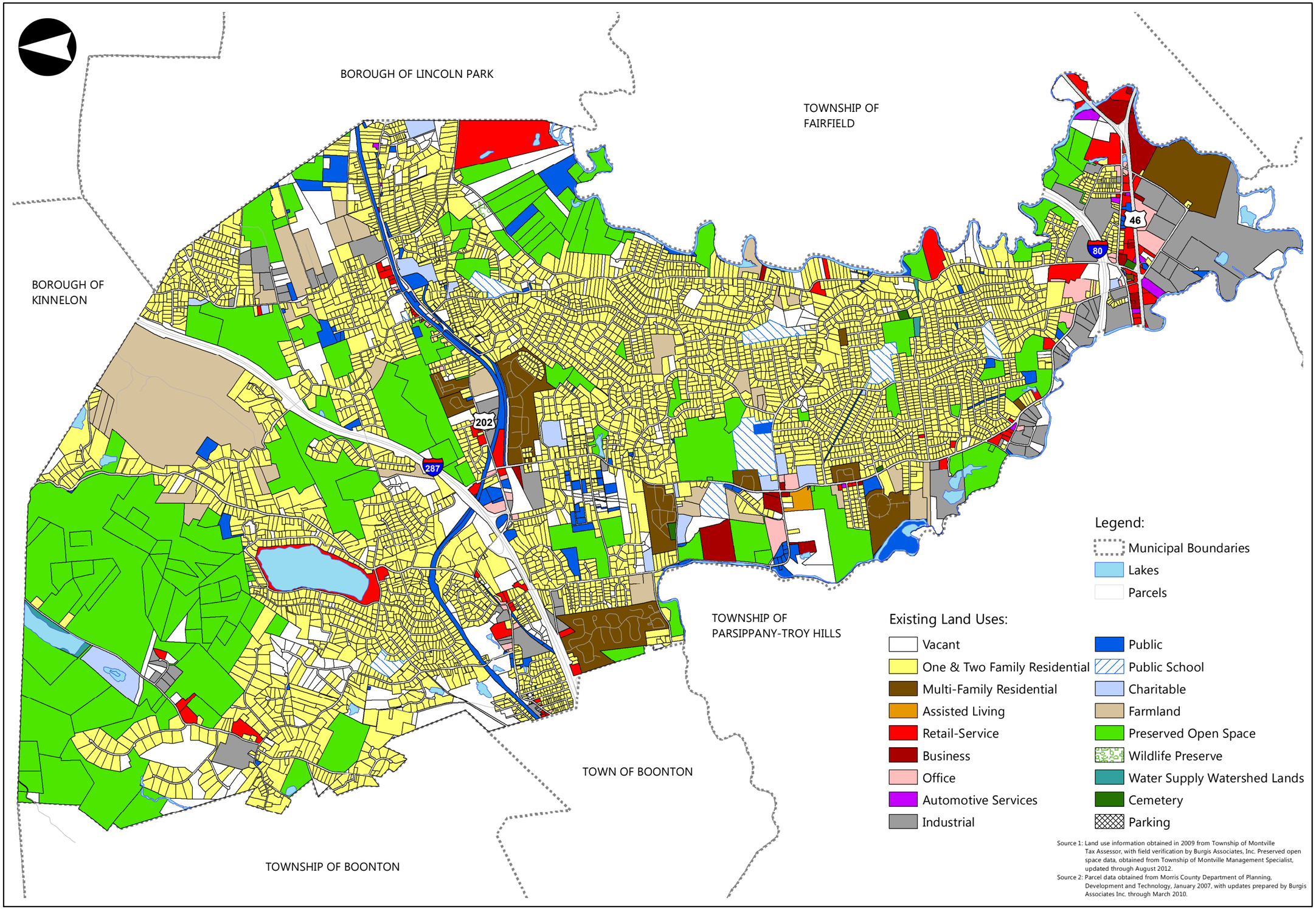

Source 1: Land use information obtained in 2009 from Township of Montville Tax Assessor, with field verification by Burgis Associates, Inc. Preserved open space data, obtained from Township of Montville Management Specialist, updated through August 2012.

Source 2: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.

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Figure 2

Existing Land Use

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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Table 1
Existing Land Use Distribution
Montville, New Jersey

Land Use Category	Parcels		Acreage	
	Number	Percent	Number	Percent
Residential				
One- and Two-Family Residential	5,330	84.31	4,619	37.76
Multi-Family Residential	12	0.19	421	3.44
Assisted Living	1	0.02	11	0.09
Non-Residential				
Retail/Service	90	1.42	382	3.12
Business	18	0.28	93	0.76
Office	34	0.54	81	0.66
Automotive Services	11	0.17	16	0.13
Industrial	80	1.27	562	4.59
Miscellaneous				
Public Use	153	2.42	312	2.55
Public School	11	0.17	145	1.19
Charitable	17	0.27	118	0.96
Farmland	36	0.57	659	5.39
Preserved Open Space	143	2.26	2,737	22.37
Wildlife Preserves	2	0.03	5	0.04
Water Supply Watershed Lands	3	0.05	36	0.29
Cemetery	4	0.06	7	0.06
Parking	1	0.02	1	0.01
Vacant	376	5.95	1,069	8.74
Water (Lakes)	N/A	N/A	418	3.42
Roads and Right-of-Way	N/A	N/A	541	4.42
Total	**6,322**	**100.0**	**12,233**	**100.0**

Source: Township of Montville tax records and Burgis Associates, Inc. field verification.

As shown in Table 1 above, Montville Township is primarily characterized by residential land uses. A total of 5,343 parcels and 5,051 acres are developed with residential uses. These figures represent nearly 85 percent of all parcels, and 41 percent of the Township's total land area. One- and two-family residential development comprise the majority of this total, with 4,619 acres, or 38 percent of the total land area, devoted to such uses. Multi-family residential and assisted living developments are far less prominent, comprising 3.4 percent and 0.1 percent of the total land area, respectively.

The second largest land use category in the Township, in terms of acreage, is preserved open space. Approximately 22 percent of Montville's total land area is preserved as open space, with ownership split between the federal, state, county and municipal governments. It is noted that there is an additional five acres of land owned by the private entity Wildlife Preserves, Inc. and another 36 acres of land utilized for water supply; although these lands are not permanently protected, they are currently restricted from future development.

Non-residential land uses occupy a total of 1,134 acres, or 9.3 percent of the Township's total land area. Industrial uses are the most dominant type of non-residential land use in Montville,

representing 4.6 percent of the total land area. Retail and service commercial uses are the second most dominant type of non-residential land use, representing 3.1 percent of the total land area. Business, office and automotive service uses comprise a significantly smaller area at 0.8 percent, 0.7 percent, and 0.1 percent of total land area, respectively.

Public and charitable lands occupy 575 acres of land in the Township, or 4.8 percent of its total land area. These lands include the New Jersey Transit rail line, municipal buildings and utilities, public schools, as well as religious institutions. When the Township's various roads and rights-of-way are added to these categories, public and quasi-public land uses make up 1,116 acres, or 9.2 percent of the total land area.

The Township also contains a considerable amount of farmland, which comprises 659 acres, or 5.3 percent of the Township's total land area. These parcels are scattered throughout the community and range in size from as high as 364 acres to as low as 1.2 acres. The average size of farmland parcels in Montville Township is 19 acres. It is noted that the "farmland" category contains one farm that is permanently preserved, which is the 29-acre Lotta Lettuce Farm, located at 53 Jacksonville Road.

Finally, the table also shows that there are still a significant number of vacant parcels remaining in Montville. As shown, 376 parcels are currently vacant, comprising some 1,069 acres, or 8.7 percent of the total Township's land area. However, the majority of these parcels are environmentally constrained and/or isolated lots too small to accommodate development. As shown, the Township's vacant parcels are scattered throughout the community. Their sizes range from a high of 41 acres to a low of 1,200 square feet, with half of all vacant parcels 1.20 acres (52,272 square feet) or less in size.

2.3 Existing and Projected Population

According to United States Census Data, Montville's population increased 3.3 percent between 2000 and 2010, rising from 20,839 to 21,528 residents. In 2009, the Morris County Planning Department performed a build-out analysis of undeveloped or underdeveloped land in the Township as part of its Interim Draft Wastewater Management Plan (WMP). This build-out analysis estimates that the Township can accommodate approximately 573 units of new residential development and approximately 1.5 million square feet of new non-residential development. Based on the Township's current average household size of 2.99 persons per household, it can be expected that these 573 new dwelling units would translate to approximately 1,713 additional residents in the Township, or an eight percent increase over existing population levels. Given the rate of growth in recent years, it is anticipated that this population increase will likely occur over the next twenty years. These projections are consistent with those approved by the North Jersey Transportation Planning Authority (NJTPA) in August 2009, which estimates that Montville Township will grow to a population of 22,960 by 2035.

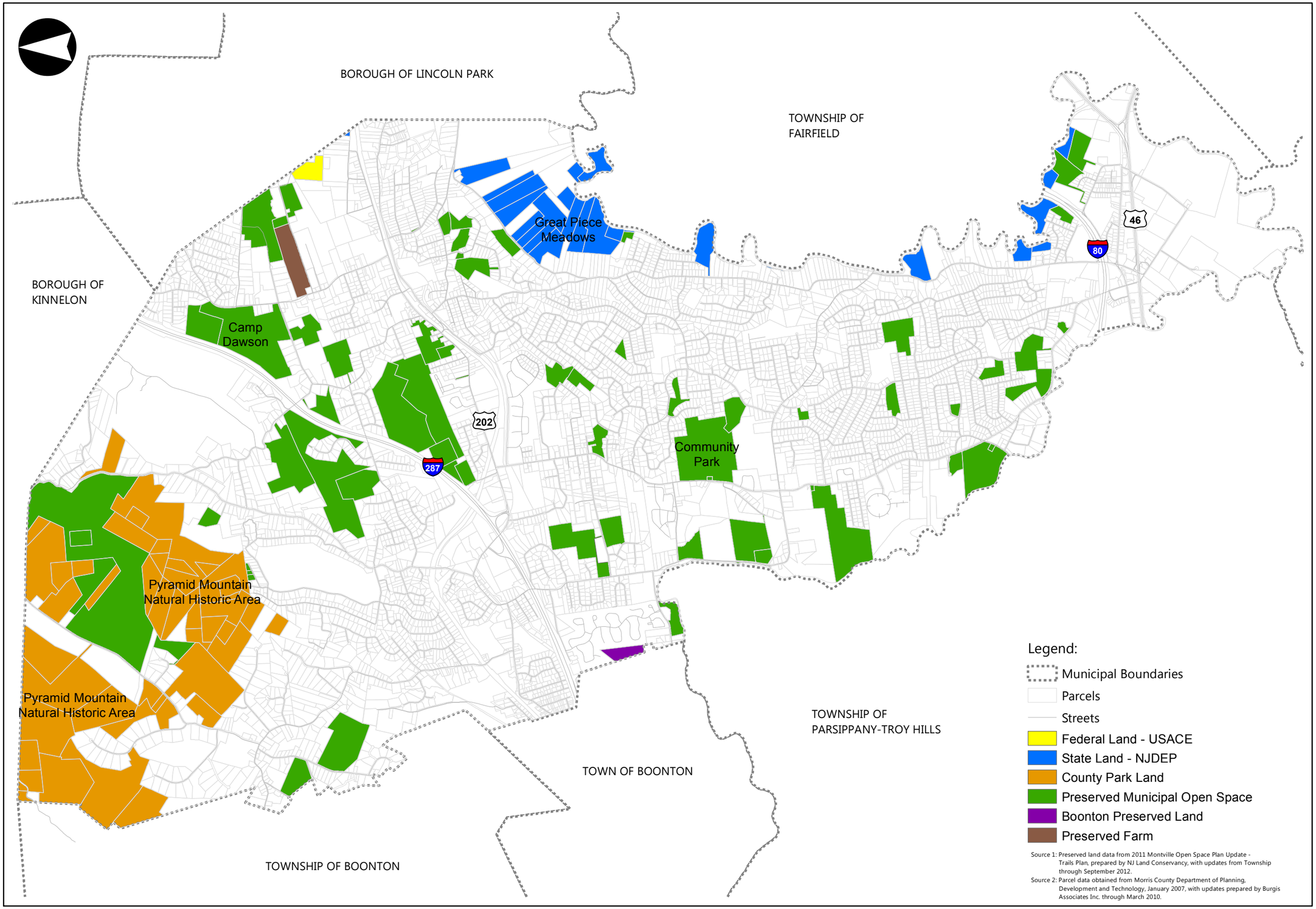
2.4 Preserved Lands

As discussed in the previous subsection, the Township contains 2,766 acres of permanently protected land, including 2,737 acres of preserved open space as well as 29 acres of preserved farmland. These preserved lands are shown on Figure 3, Preserved Lands, and their distribution by ownership/type of land and acreage are presented in Table 2 below. A detailed list of preserved lands by block and lot can be found in the Appendix of this document.

Table 2
Preserved Lands
Montville, New Jersey

Ownership/Type	Acreage*
Federal Land – US Army Corps of Engineers	12.93
State Land – NJ Department of Environmental Protection	259.67
County Park Land	1,021.82
Municipal Recreation & Open Space Inventory (ROSI)	1,433.04
Town of Boonton-Owned Preserved Land	10.08
Preserved Farmland	28.76
Total Preserved Lands	**2,766.30**

Source: Township of Montville Assistant Township Administrator, Tax Assessor and Land Use Administrator, September 2012.
***** Acreage calculated from ArcGIS software and therefore may vary slightly from municipal tax records.



Source 1: Preserved land data from 2011 Montville Open Space Plan Update - Trails Plan, prepared by NJ Land Conservancy, with updates from Township through September 2012.

Source 2: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.

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Figure 3

Preserved Lands

Rev	Description	Date	Dwn	Ckd

Graphic Scale

0 550 1,100 2,200 3,300 Feet

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2.5 Public and Private Recreation Areas

Montville Township contains a wide variety of opportunities for active and passive recreation, including both public and private facilities.

The major passive recreation areas in the Township are owned by State and County entities. These passive recreation areas are identified on Figure 3, Preserved Lands, and described in more detail below:

State

Great Piece Meadows Preserve

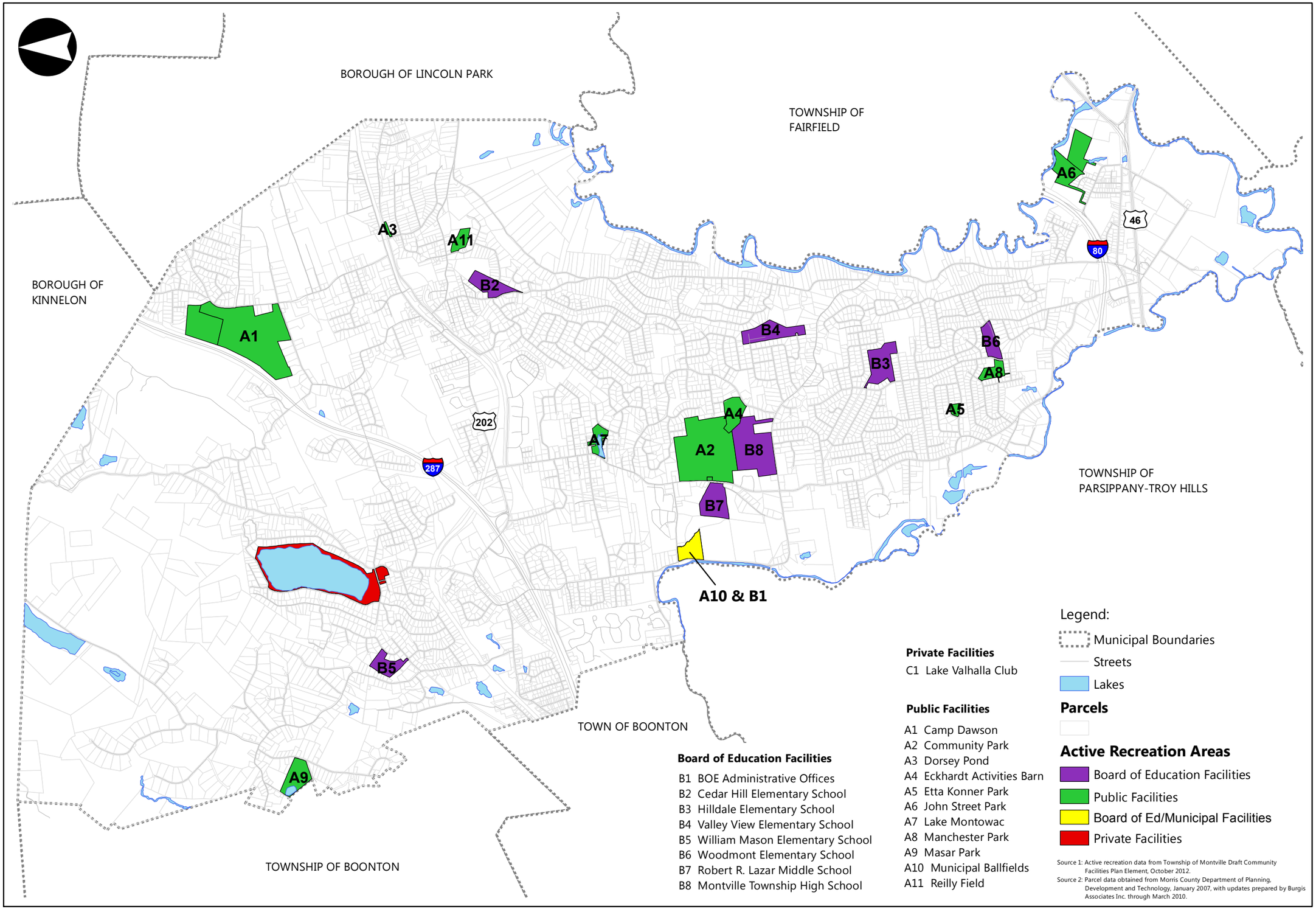
Owned by the New Jersey Department of Environmental Protection (NJDEP) and falling under the purview of the NJ Natural Lands Trust, this ever-expanding protected area is currently stewarded by Wildlife Preserves, Inc. conservation organization, which acquired portions of this land in the 1950s. Established in 2006, the Preserve is predominantly located outside Montville's borders, on the east side of the Passaic River, which forms the southeastern boundary of the Township, but also includes lands on the western banks of the Passaic, in Montville. Totaling more than 1,000 acres, this Preserve protects a portion of the 7,500 acre Great Piece Meadows freshwater wetland complex, identified as a Natural Heritage Priority Site. Providing habitat for endangered and threatened flora and fauna, this wetlands complex is available to the public for hiking, boating, birdwatching and fishing, although there are no formal access points or trails.

County

Pyramid Mountain Natural Historic Area

Encompassing more than 1,500 acres in northwestern Montville Township and southern Kinnelon Borough, this Morris County park owes its existence to local grassroots efforts, beginning first with the Tripod Rock area and extending across Boonton Avenue to Turkey Mountain. A portion of the park is owned by Montville Township but managed by the Morris County Park Commission. The park includes 30 miles of marked trails and an environmental education center. Park naturalists lead a series of hikes at various levels throughout the year.

The Township's active recreation areas are illustrated on Figure 4, Active Recreation Areas. Public active recreation facilities in Montville are detailed in Table 3, wherein the location, size and types of facilities offered at each are identified. It is noted that, in addition to the facilities listed below, the Township's various public schools also contain a number of recreation facilities. These are identified separately in Table 4.



Private Facilities

C1 Lake Valhalla Club

Public Facilities

A1 Camp Dawson
A2 Community Park
A3 Dorsey Pond
A4 Eckhardt Activities Barn
A5 Etta Konner Park
A6 John Street Park
A7 Lake Montowac
A8 Manchester Park
A9 Masar Park
A10 Municipal Ballfields
A11 Reilly Field

Board of Education Facilities

B1 BOE Administrative Offices
B2 Cedar Hill Elementary School
B3 Hilldale Elementary School
B4 Valley View Elementary School
B5 William Mason Elementary School
B6 Woodmont Elementary School
B7 Robert R. Lazar Middle School
B8 Montville Township High School

Legend:

Municipal Boundaries
Streets
Lakes

Parcels

Active Recreation Areas

Board of Education Facilities
Public Facilities
Board of Ed/Municipal Facilities
Private Facilities

Source 1: Active recreation data from Township of Montville Draft Community Facilities Plan Element, October 2012.
Source 2: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.

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Figure 4

Active Recreation Areas

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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Table 3
Active Recreation Facilities - Public
Montville, New Jersey

Park	Facilities	Size (Acres)
Camp Dawson 80 Jacksonville Road Block 24.02 Lots 34 & 51	2 lighted synthetic turf fields Playground Barn used by archers	113.20
Community Park 130 Changebridge Road Block 124 Lots 12 & 13	4 lighted natural turf fields 2 U10 synthetic turf soccer fields 3 lighted basketball courts (1 full, 2 half) 4 lighted bocce courts 3 lighted horseshoe pits Volleyball court Playground Community garden plots Youth Center & Field House Amphitheater Pavilion (picnic tables, grills)	84.73
Dorsey Pond 749 Route 202 Block 109 Lot 2	Pond previously used for skating in winter (no longer allowed)	0.89
Eckhardt Barn 91 Passaic Valley Road Block 124 Lot 6	Renovated barn used for karate, martial arts, indoor kiddie soccer, wrestling, and cheerleading	12.34
Etta Konner 12 Walnut Drive Block 147 Lot 1	Softball field Playground	2.55
John Street 10 Maple Avenue Block 167 Lots 15 & 26	Small play field Playground Basketball court	30.64
Lake Montowac 8 Daro Court Block 79 Lot 43	Lake used for catch and release fishing (with permit)	8.88
Manchester 33A Buckingham Circle Block 149.01 Lot 2	Playground	8.06
Masar 40 Boonton Avenue Block 2 Lot 12	Lighted softball field Playground	16.85
Municipal Ballfields 86 River Road Block 123 Lot 13	2 lighted baseball fields 1 lighted softball field Playground	10.20
Reilly 4 Hewlett Road Block 113 Lot 11	Baseball field Playground	7.24

Source: 2011 Open Space Plan Update – Trails Plan and Township of Montville Recreation Department.

The Montville Board of Education facilities with active recreation areas are detailed in Table 4 below.

Table 4
Active Recreation Facilities – Board of Education
Montville, New Jersey

School	Facilities
Cedar Hill Elementary 46 Pine Brook Road Block 113 Lot 45	2 playgrounds Blacktop for four-square, kickball, etc. Grass field for baseball, soccer, etc.
Hilldale Elementary 123 Konner Avenue Block 142 Lot 9	3 playgrounds Ball field for baseball and softball Outdoor basketball court
Valley View Elementary 30 Montgomery Avenue Block 125.9 Lot 17	2 playgrounds Ball field for baseball and softball
William Mason Elementary 5 Shawnee Trail Block 15.3 Lot 11.1	1 playground Blacktop for four-square, kickball, etc. Grass field for baseball, soccer, etc.
Woodmont Elementary 39 Woodmont Road Block 156 Lot 41	3 playgrounds Soccer field Ball field for baseball and softball Outdoor basketball court Blacktop for four-square, kickball, etc.
Robert R. Lazar Middle School 123 Changebridge Road Block 123 Lot 15	2 ball fields for baseball and softball Indoor basketball court Indoor volleyball court
Montville Township High School 100 Horseneck Road Block 124 Lot 12.1	2 indoor basketball courts Volleyball court 3 ball fields for baseball, softball, field hockey Field track Varsity field for football and lacrosse Practice field for football, lacrosse and soccer 6 tennis courts

Source: Township of Montville Board of Education and Land Use Department

In addition to the above listed public recreation facilities, the Township also contains one private recreation facility. The 120-acre Lake Valhalla Club is located along Vista Road and encompasses the 90-acre Lake Valhalla and the surrounding shoreline. It is identified by municipal tax records as Block 11 Lot 29, Block 20 Lot 1, and Block 20.1 Lot 1. The Club offers sports, including volleyball, softball, tennis, boating, fishing swimming and other water activities, a playground, picnic area and clubhouse facilities to members on a year-round basis.

Please refer to the Township's Open Space and Recreation Plan Element of the Master Plan, as amended, for more detailed information relating passive and active recreation opportunities in Montville.

3. GEOLOGY

This chapter explores the geologic processes that have shaped Montville Township into the landscape we inhabit today. An understanding of geologic history not only contributes to an understanding of the evolutionary history of life and past climates, but it is also important for the prediction and understanding of natural hazards, the remediation of environmental problems, and the location of certain land uses and economic activities.

3.1 Physiography

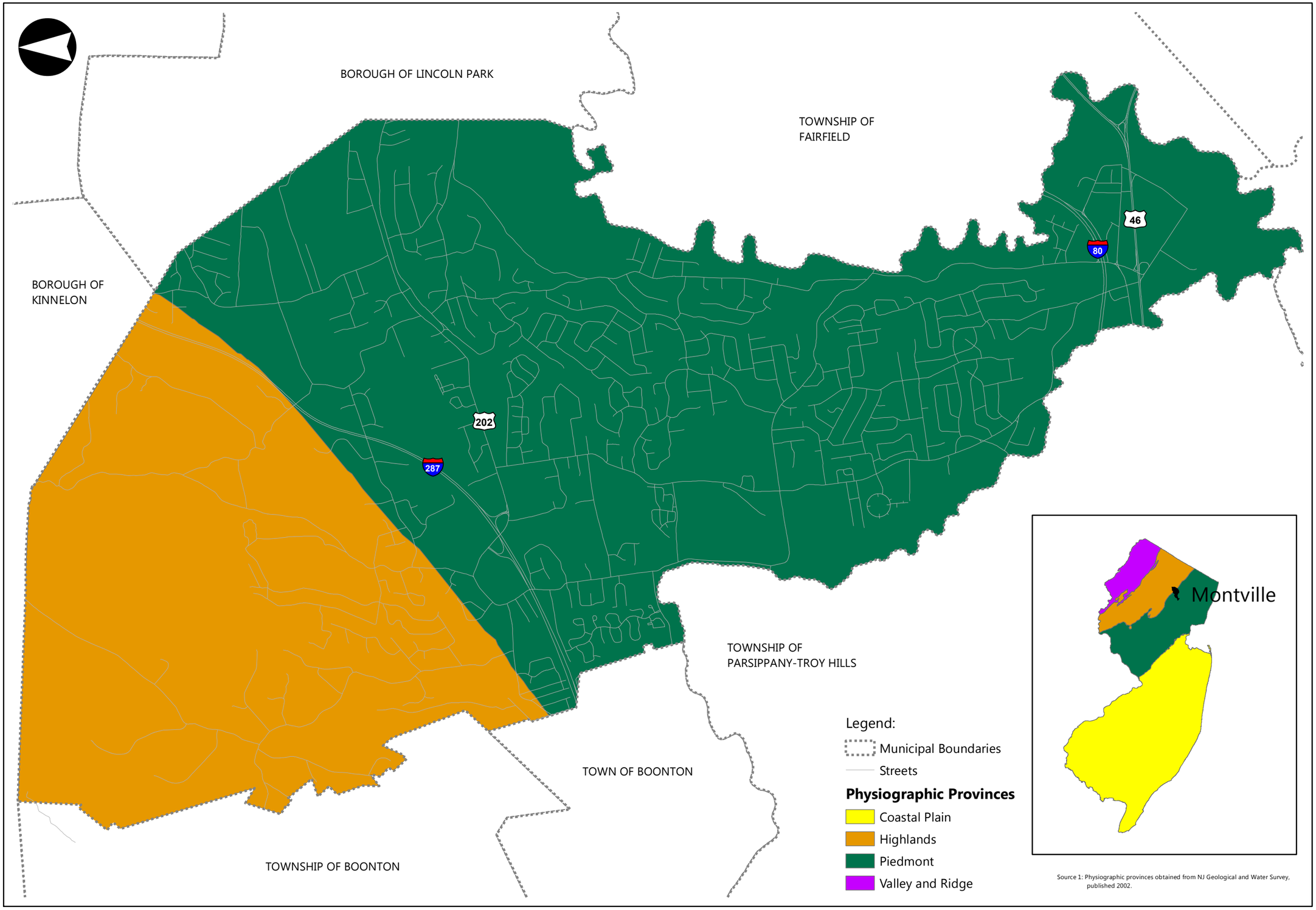
New Jersey's physical landscape can be divided into four distinct regions, known as physiographic provinces. These provinces, starting in the northwest portion of the State and heading to the southeast, are as follows: Valley and Ridge, Highlands, Piedmont, and Coastal Plain. As shown on Figure 5, Physiographic Provinces, Montville Township is located within two of these provinces. Whereas the majority of the Township is located in the Piedmont Province, the northernmost portion of the Township (generally the area north of Interstate 287) is located in the Highlands Province.

The Highlands Province is characterized by rugged topography, consisting of a series of discontinuous rounded ridges separated by deep narrow valleys. The Highlands is mainly underlain by highly metamorphosed igneous and sedimentary rocks of Middle Proterozoic age (1.2 billion to about 900 million years old). There are also small areas of Late Proterozoic age metasedimentary rocks and diabase dikes. Many of the elongate northeast trending valleys within the Highlands are underlain with sedimentary rocks similar to those in the Valley and Ridge Province. Middle Paleozoic sandstone and quartzite form some of the higher ridges in the Highlands.

The Piedmont Province is characterized as a low rolling plain divided by a series of higher ridges. The Piedmont is mainly underlain by slightly folded and faulted sedimentary rocks of Triassic and Jurassic age (240 to 140 million years old) and igneous rocks of Jurassic age. The major linear ridges are underlain by igneous rocks (lava flows and diabase intrusive rocks) and have steep front faces with long back slopes.

The Piedmont Province is generally characterized as a low rolling plain divided by a series of higher ridges. The Piedmont is mainly underlain by slightly folded and faulted sedimentary rocks of Triassic and Jurassic age (240 to 140 million years old) and igneous rocks of Jurassic age. The major linear ridges in the region are underlain by igneous rocks (lava flows and diabase intrusive rocks) and have steep front faces with long back slopes. The igneous rocks that are found in the Piedmont area of Montville are primarily extrusive basalts identified as the Hook Mountain Basalts.

The boundary between the Highlands and Piedmont Provinces is where the crystalline rocks are in contact with significantly younger sedimentary and igneous rocks. This boundary follows the Ramapo Fault, which bisects the Township from east to west and is coincident with the approximate length of Interstate 287, dividing the northwesterly region of the Township from the remainder.



Source 1: Physiographic provinces obtained from NJ Geological and Water Survey, published 2002.

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Figure 5

Physiographic Provinces

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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3.2 Topography

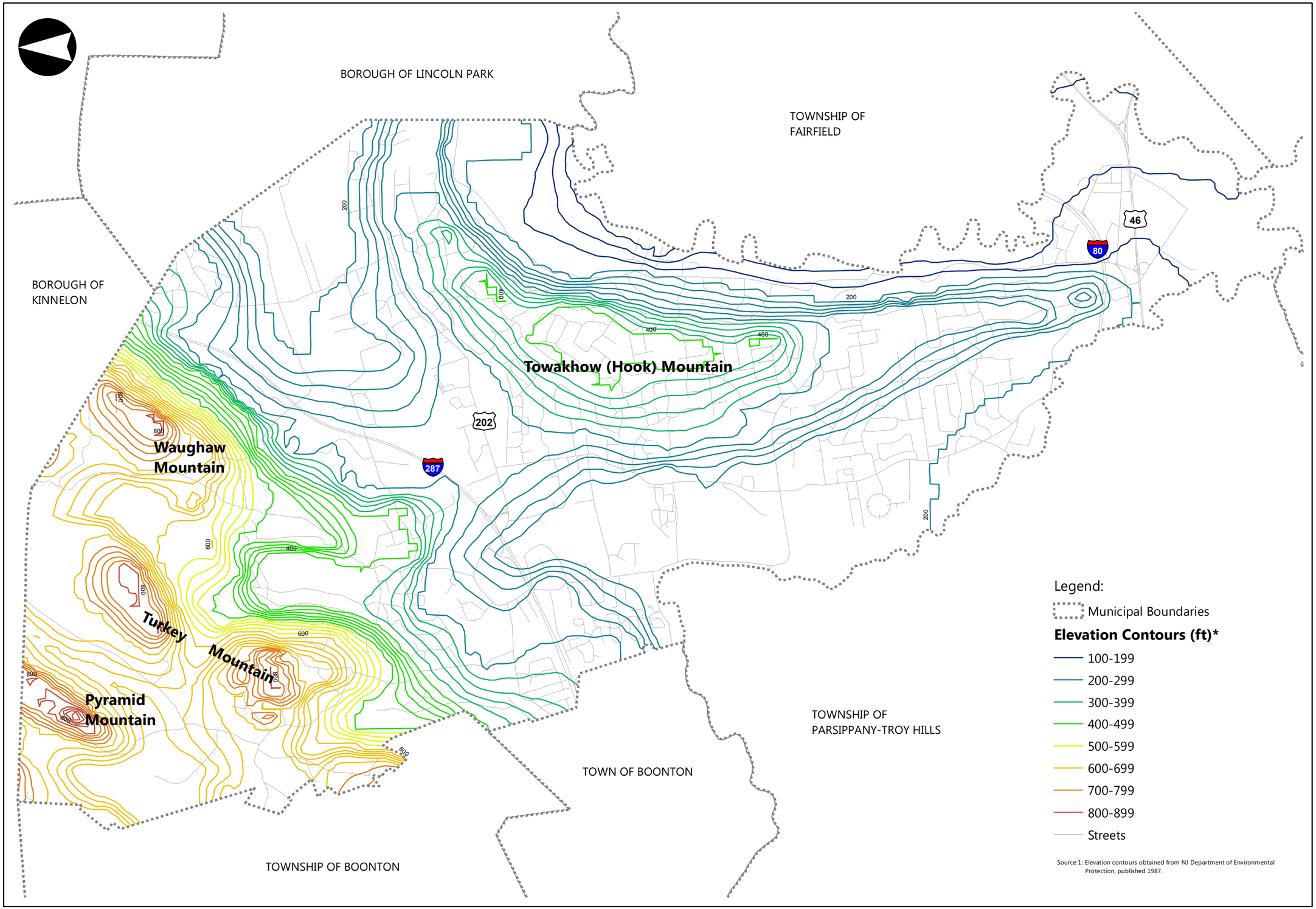
The topography of Montville Township is illustrated in Figure 6, Topography. As shown, elevation ranges from a high of 879 feet above sea level, at Pyramid Mountain in the northwestern portion of the Township, to a low of 160 feet, in the southeastern portion of the Township, adjacent to the municipal borders of Fairfield and East Hanover. The major peaks include Pyramid Mountain, Turkey Mountain and Waughaw Mountain, all of which lie north of the Ramapo Fault, and the Towakhow (Hook) Mountain range along the Township's eastern border.

Figure 7, Steep Slopes, identifies the areas within Montville Township that contain slopes in excess of 15 percent. This map was prepared using NJDEP's 10-meter Digital Elevation Grid, which is based on USGS terrain elevation sets. The map identifies steep slopes as between 15 and 20 percent, as well as those greater than 20 percent. As is evident, the most significant slopes are located in the northwestern portion of the township, in the vicinity of Pyramid, Turkey and Waughaw Mountain. The majority of these parcels are preserved in perpetuity as open space, as discussed in greater detail in the Land Use chapter of this document. The map also shows a continuous band of steep slopes along the eastern border of the Township, which represents the Towakhow (Hook) Mountain range. This section is almost fully developed, primarily with residential uses.

3.3 Bedrock Geology

The landscape of Montville Township is shaped by its underlying bedrock. Bedrock is the solid rock beneath unconsolidated surface materials, such as soil and rock fragments. The bedrock that underlies Montville can be categorized into three different types based on geologic age: Middle Proterozoic (1.2 billion to 900 million years ago), Lower and Middle Silurian (440-425 million years ago), and Lower Jurassic (200 to 176 million years ago). The bedrock of the Middle Proterozoic era is concentrated in the northernmost portion of the Township, within the boundaries of the Highlands Province. The Lower Jurassic bedrock underlies the majority of the rest of the Township, corresponding with the boundaries of the Piedmont Province. Only a small area along the Ramapo Fault, in the vicinity of Old Lane and Mulbrook Lane, contains bedrock dating back to the Lower and Middle Silurian.

The major stratigraphic map units in each category are shown on Figure 8, Bedrock Geology, and described in Table 5 below.



Source 1: Elevation contours obtained from NJ Department of Environmental Protection, published 1987.

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Figure 6

Topography

Rev	Description	Date	Dwn	Ckd

Graphic Scale
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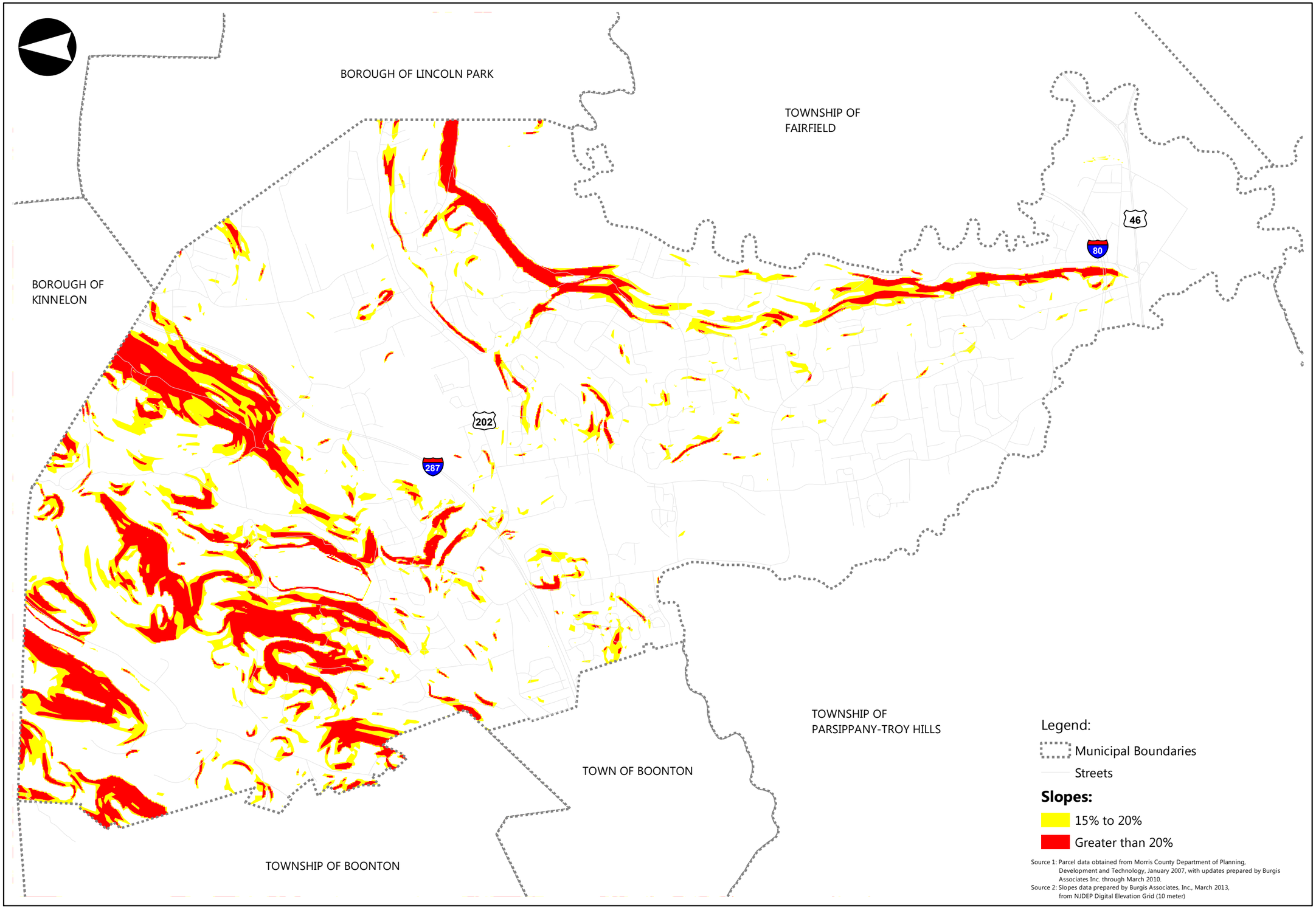

Source 1: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.
Source 2: Slopes data prepared by Burgis Associates, Inc., March 2013, from NJDEP Digital Elevation Grid (10 meter)

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Figure 7

Steep Slopes

Rev	Description	Date	Dwn	Ckd

Graphic Scale
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SLOPE 2

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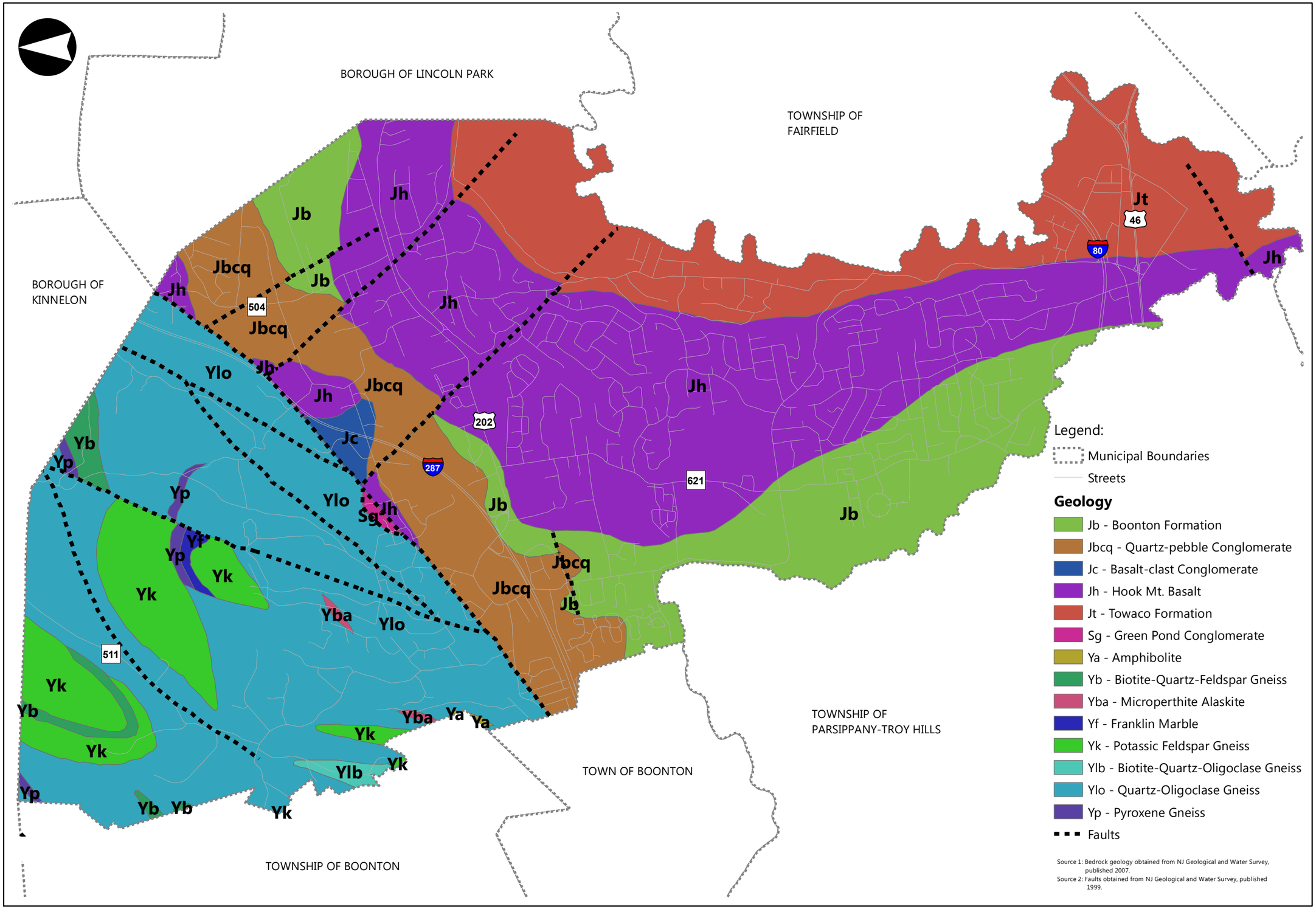

Source 1: Bedrock geology obtained from NJ Geological and Water Survey, published 2007.
Source 2: Faults obtained from NJ Geological and Water Survey, published 1999.

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Figure 8

Bedrock Geology

Rev	Description	Date	Dwn	Ckd

Graphic Scale
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Table 5
Bedrock Types and Characteristics
Montville, New Jersey

Geologic Age	Type	Name	Description
Lower Jurassic	Jb	Boonton Formation	Reddish-brown to brownish-purple, fine-grained sandstone, siltstone, and mudstone; sandstone commonly micaceous, interbedded with siltstone and mudstone in fining-upward sequences mostly 1.5 to 4 m (5-13 ft) thick. Red, gray and brownish-purple siltstone and black, blocky, partly dolomitic siltstone and shale common in lower part. Irregular mudcracks, symmetrical ripple marks, and burrows, as well as gypsum, glauberite, and halite pseudomorphs are abundant in red mudstone and siltstone. Gray, fine-grained sandstone may have carbonized plant remains and reptile footprints in middle and upper parts of unit. Max. thickness is about 500 m (1,640 ft).
	Jbcq	Quartz-pebble Conglomerate	
	Jc	Basalt-clast Conglomerate	Dark to very-dark-gray conglomerate with clasts mostly of sub-angular to subrounded greenish-black basalt cobbles and boulders. Other clasts (about 10 to 15%) are pebbles to boulders of hornblende granite with pink feldspar. Matrix is dark-pinkish-gray arkosic sand. Locally onlaps the Hook Mountain Basalt along the Ramapo Fault in northeast part of map area. Max. thickness of unit unknown.
	Jh	Hook Mountain Basalt	Light- to dark-greenish-gray, medium- to coarse-grained, amygdaloidal basalt composed of plagioclase (typically Anorthite 65% and porphyritic), clinopyroxene (augite and pigeonite), and iron-titanium oxides such as magnetite and ilmenite. Locally contains small spherical to tubular cavities (gas-escape vesicles), some filled by zeolite minerals or calcite. Consists of two major flows. Base of lowest flow is intensely vesicular. Tops of flows are weathered and vesicular. Max. thickness is about 110 m (360 ft).
	Jt	Towaco Formation	Reddish-brown to brownish-purple, fine- to medium-grained micaceous sandstone, siltstone, and silty mudstone in upward-fining sequences 1 to 3 m (3-10 ft) thick. Distributed throughout formation are eight or more sequences of gray to greenish- or brownish-gray, fine-grained sandstone, siltstone and calcareous siltstone and black, microlaminated calcareous siltstone and mudstone containing diagnostic pollen, fish and dinosaur tracks. Sandstone is commonly trough cross laminated; siltstone is commonly planar laminated or bioturbated, but can be indistinctly laminated to massive. Max. thickness is about 380 m (1,250 ft).
Lower (?) and Middle Silurian	Sb	Green Pond Conglomerate	Medium- to coarse-grained quartz-pebble conglomerate, quartzitic arkose and orthoquartzite, and thin- to thick-bedded reddish-brown siltstone. Grades downward into gray, very dark-red, or grayish-purple, medium- to coarse-grained, thin- to very thick bedded pebble to cobble conglomerate containing clasts of red shale, siltstone, and chert; yellowish-gray sandstone and chert; dark-gray shale and chert; and white-gray and pink milky quartz. Quartz cobbles are as long as 10 cm (4 in.), and rare red shale clasts as much as 46 cm (18 in.) across. Milky quartz pebbles average 2.5 cm (1 in.) in length. Red arkosic quartz-pebble conglomerate and quartzite are more abundant than gray and grayish-green quartzite. About 305 m (1000 ft) thick.

Geologic Age	Type	Name	Description
Middle Proterozoic	Ya	Amphibolite	Gray- to grayish-black, medium-grained amphibolite composed of hornblende and andesine. Some phases contain biotite and (or) clinopyroxene. Ubiquitous and associated with almost all other Middle Proterozoic units. Some amphibolite is clearly metavolcanic in origin, some is metasedimentary, and some appears to be metagabbro.
	Yb	Biotite-Quartz-Feldspar Gneiss	Gray-weathering, locally rusty, gray to tan or greenish-gray, fine- to medium-coarse-grained, moderately layered and foliated gneiss that is variable in texture and composition. Composed of oligoclase, microcline microperthite, quartz, and biotite. Locally contains garnet, graphite, sillimanite, and opaque minerals.
	Yba	Microperthite Alaskite	Pink- to buff-weathering, light-pinkish-gray or pinkish-white, medium- to coarse-grained, gneissoid to indistinctly foliated granite composed principally of microcline microperthite, quartz and oligoclase. Includes small bodies of amphibolite (not shown).
	Yf	Franklin Marble	White- to light-gray-weathering, white, grayish-white, or, less commonly pinkish-orange, coarse- to locally fine-crystalline calcite marble with accessory amounts of graphite, phlogopite, chondrodite, clinopyroxene, and serpentine. Contains pods and layers of clinopyroxene-garnet skarn, hornblende skarn, and clinopyroxene-rich rock. Thin layers of metaquartzite occur locally. Franklin Marble is host to the Franklin and Sterling Hill zinc ore bodies.
	Yk	Potassic Feldspar Gneiss	Light-gray- to pinkish-buff-weathering, pinkish-white to light-pinkish-gray, fine- to medium-grained, moderately foliated gneiss and lesser amounts of granofels composed of quartz, microcline, microcline microperthite and local accessory amounts of biotite, garnet, sillimanite, and opaque minerals.
	Ylb	Biotite-quartz-oligoclase Gneiss	White- to light-gray-weathering, light- to medium-gray or greenish-gray, fine- to coarse-grained, massive to moderately well layered, foliated gneiss composed of oligoclase or andesine, quartz, biotite, and, locally, garnet. Commonly interlayered with amphibolite.
	Ylo	Quartz-Oligoclase Gneiss	White-weathering, light-greenish-gray, medium- to coarse-grained, moderately layered to indistinctly foliated gneiss and lesser amounts of granofels composed of quartz, oligoclase or andesine, and, locally, biotite, hornblende and (or) clinopyroxene. Contains thin amphibolite layers.
	Yp	Pyroxene Gneiss	White- to tan-weathering, greenish-gray, fine- to medium-grained, well-layered gneiss containing oligoclase, clinopyroxene, variable amounts of quartz, and trace amounts of opaque minerals and titanite. Some phases contain scapolite and calcite. Commonly interlayered with pyroxene amphibolite or marble.

Source: United States Department of the Interior, United States Geological Survey (2012). *Geologic Units in Morris County, New Jersey*. Mineral Resources On-Line Spatial Data. Last updated May 8, 2012.

3.4 Surficial Geology

Surficial materials are the unconsolidated glacial, river, wetland, windblown, marine, estuarine, and hillslope sediments and weathered rock materials that overlie bedrock formations and that are the parent material for soils. An understanding of surficial geology allows for assessing and

protecting aquifers, assessing water quality, and providing a framework for evaluating hazards and resources.

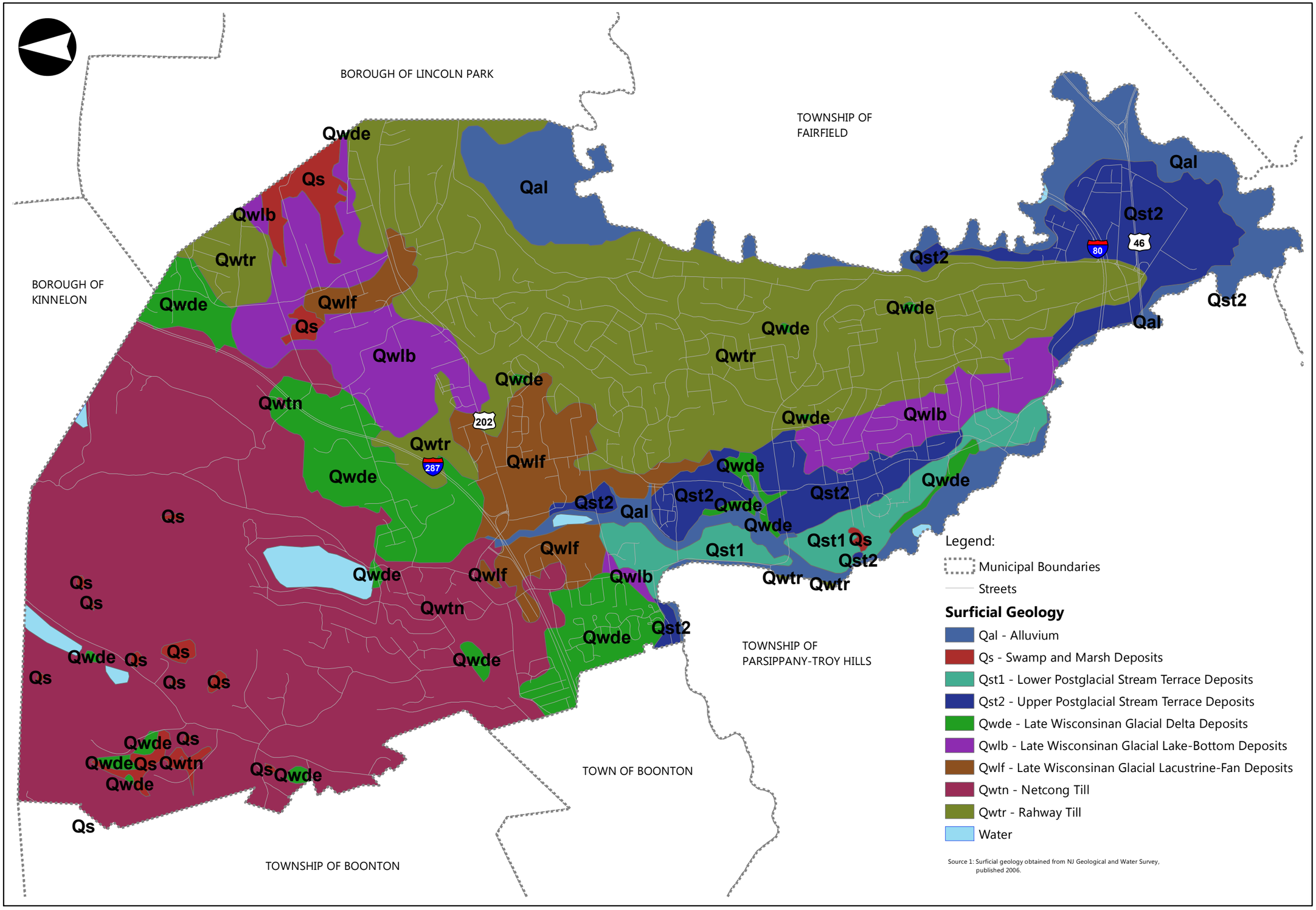
In Montville Township, surficial geologic materials can be categorized into two different types based on geologic age: Holocene (10,000 years ago to the present) and Late Pleistocene (1.8 million to 10,000 years ago). The surficial materials of the Holocene epoch are associated with and underlie modern floodplain, stream terrace and wetland areas. The surficial materials of the Late Pleistocene epoch cover the majority of the Township, and consist of both glacial deposits and till (non-sorted sediments deposited from ice).

The distribution of surficial geologic materials in Montville Township is depicted on Figure 9, Surficial Geology, and described in Table 6 below.

Table 6
Surficial Materials and Characteristics
Montville, New Jersey

Geologic Age	Type	Name	Description
Holocene	Qal	Alluvium	Sand, gravel, silt, minor clay, and peat; reddish brown, yellowish brown, brown and gray. As much as 20 feet thick. Deposited by modern streams. In the area of late Wisconsinan glacial deposits, alluvium locally includes and grades laterally into swamp and marsh deposits.
	Qs	Swamp and Marsh Deposits	Peat and organic clay, silt, and minor sand; gray, brown and black. As much as 40 feet thick.
	Qst1	Lower Postglacial Stream Terrace Deposits	Stream terrace deposits (Qst) forming stream terraces with surfaces 5 to 15 feet (Qst1) or 15 to 30 feet (Qst2) above the modern floodplain. Stream terrace deposits (Qst) consist of sand, with lesser amounts of gravel and silt; includes sediment derived from adjacent glacial, meltwater, weathered-bedrock, or colluvial materials; sand is moderately sorted. Deposited by meteoric (nonglacial meltwater) streams.
	Qst2	Upper Postglacial Stream Terrace Deposits	
Late Pleistocene	Qwde	Late Wisconsinian Glacial Delta Deposits	Sand, pebble-to-cobble gravel, minor silt; yellowish brown, reddish brown, light gray. As much as 150 feet thick.
	Qwlb	Late Wisconsinian Glacial Lake-Bottom Deposits	Silt, clay, fine sand; gray, brown, yellowish brown, reddish brown. As much as 200 feet thick.
	Qwlf	Late Wisconsinian Glacial Lacustrine-Fan Deposits	Sand, pebble-to-cobble gravel, minor silt; yellowish brown, reddish brown, light gray. As much as 200 feet thick.
	Qwtn	Netcong Till	Silty sand to sandy silt with some to many pebbles and cobbles and some to many boulders; pale brown, yellowish brown, light gray. As much as 200 feet thick, generally less than 30 feet thick.
	Qwtr	Rahway Till	Clayey silt to sandy silt with some to many pebbles and cobbles and few boulders; reddish brown, reddish yellow, yellowish brown, brown. As much as 100 feet thick, generally less than 40 feet thick.

Sources: New Jersey Geological Survey: *Surficial Geology of New Jersey.* Digital data. Published January 1, 2006.
Stone, Byron D., Scott D. Stanford, and Ron W. Witte: *Surficial Geologic Map of the Northern Sheet, New Jersey.* 1995.



Source 1: Surficial geology obtained from NJ Geological and Water Survey, published 2006.

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Figure 9

Surficial Geology

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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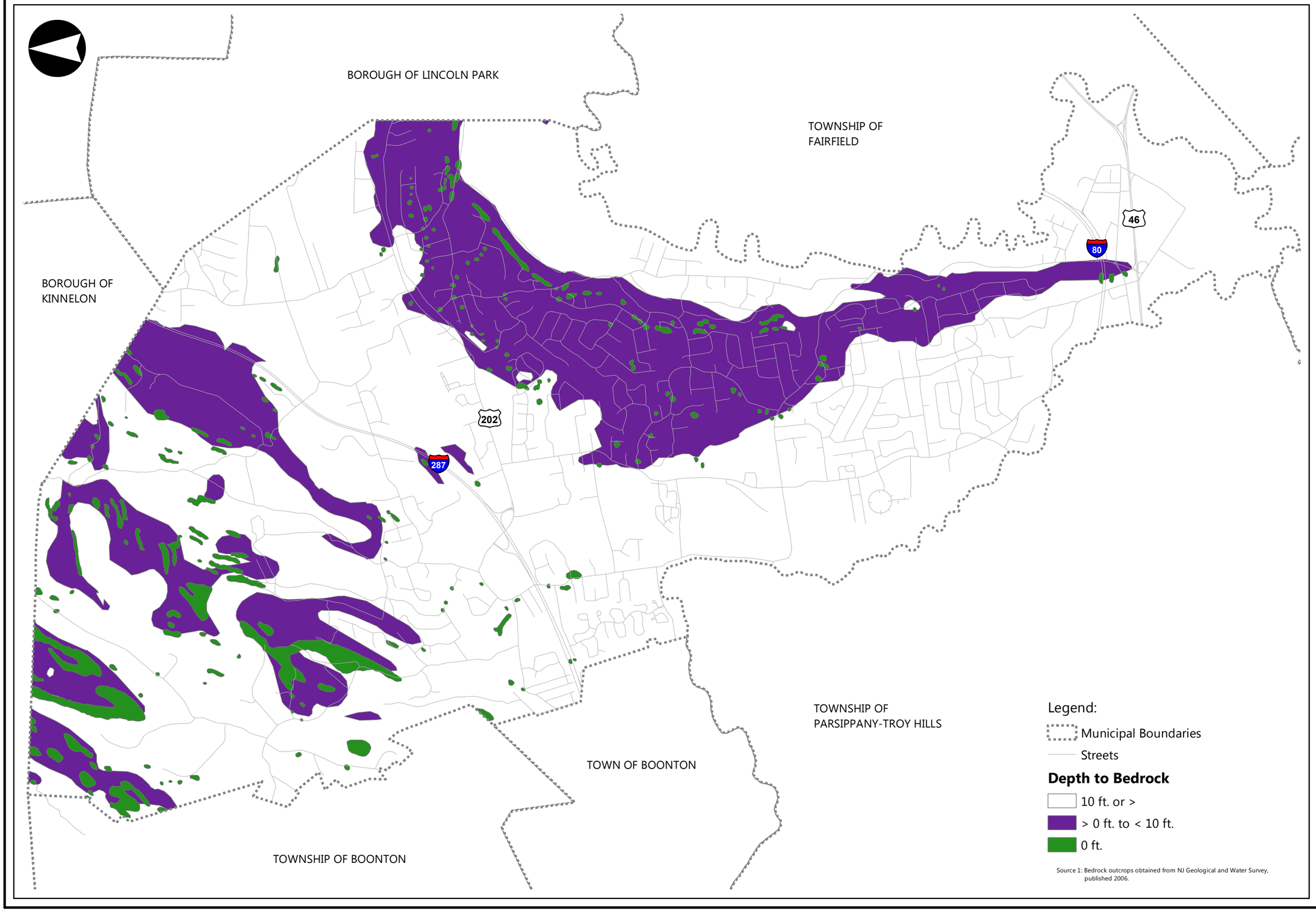
3.5 Depth to Bedrock

Depth to bedrock is the thickness of the unconsolidated sediments (surficial materials) overlying consolidated rock (bedrock). An understanding of depth to bedrock can help with mitigation of contamination from industrial spills, on-site sewage disposal, etc., in that excavation volumes of contaminated material can be quantified. Depth to bedrock can also be a critical factor in development decisions, as it may affect construction techniques, maintenance, and utility service, and therefore costs.

The New Jersey Geological Survey has mapped depth to bedrock for the entire State. The data for Montville Township are presented in Figure 10, Depths to Bedrock. The map depicts depth to in one of three categories: one showing where surficial materials are generally absent and bedrock outcrop is extensive (0 ft depth to bedrock); one showing where surficial materials are generally greater than zero but less than ten feet thick and bedrock outcrop is scattered (>0 ft to <10 ft depth to bedrock); and one showing where surficial materials are generally ten feet or greater in thickness (10 ft or > depth to bedrock). As shown, the distribution of shallow depth to bedrock in Montville Township is associated with those areas overlain by till (Netcong Till, Rahway Till). See Table 6 in the preceding subsection for more details regarding the characteristics of these surficial materials.



Source 1: Bedrock outcrops obtained from NJ Geological and Water Survey, published 2006.

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Figure 10

Depths to Bedrock

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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4. HYDROLOGY

This chapter focuses on hydrology, which consists of two subsets. Surface water hydrology considers the origin and processes of water in streams and lakes, whereas groundwater hydrology deals with the occurrence, movement, and quality of water beneath the Earth's surface. Both resources, as well as the interaction between the two, are explored below.

4.1 Watersheds and Subwatersheds

A watershed is defined as the area of land that drains into a body of water such as a river, lake, stream or bay. It is separated from other systems by high points in the area such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it. New Jersey is divided into 20 Watershed Management Areas (WMAs), two of which lie within Montville Township. Whereas the majority of the Township is in WMA 6 (which includes the Upper and Middle Passaic, Whippany and Rockaway River Watersheds), the northeast portion of the Township is in WMA 3 (which includes the Pompton, Ramapo, Pequannock and Wanaque River Watersheds). WMA 6 is characterized by extensive suburban development and reliance upon ground water sources for water supply. WMA 3 contains some of the State's major water supply reservoir systems including the Wanaque Reservoir, the largest surface water reservoir in New Jersey.

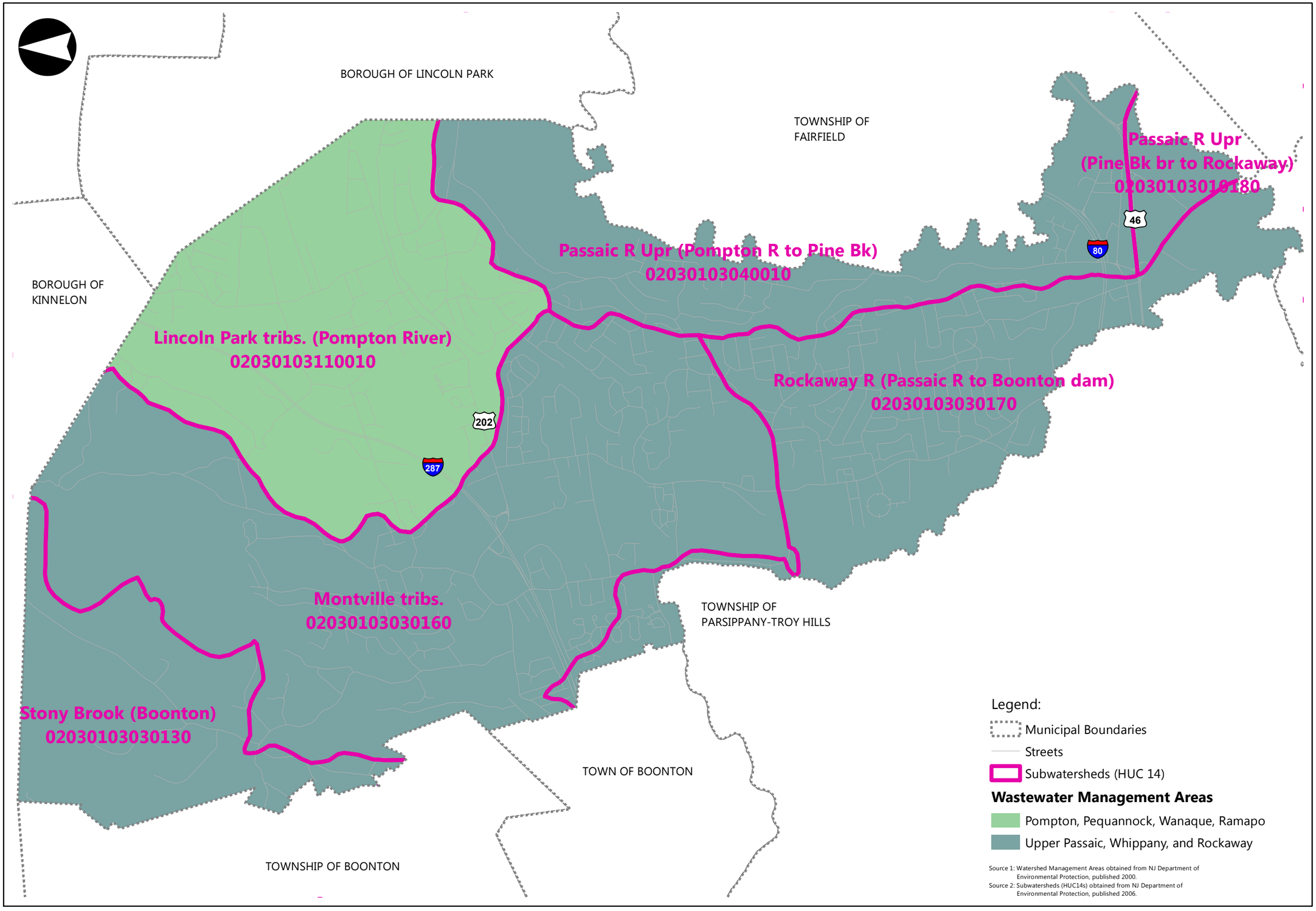
Each large watershed can be broken into smaller watersheds with their own topographic and hydrologic characteristics, which are called subwatersheds. In New Jersey, 14-digit Hydrologic Unit Codes (HUC-14s) are assigned to each subwatershed in the State. Montville Township contains portions of six HUC-14 subwatersheds, including five subwatersheds in WMA 6 and one subwatershed in WMA 3.

Figure 11, Watershed Management Areas/Subwatersheds, shows the boundaries of each of Montville's Watershed Management Areas and HUC-14 subwatersheds. Additional information pertaining to each WMA and subwatershed in the Township is provided in Table 7 below.

Table 7
Watershed Management Areas
Montville, New Jersey

WMA #	WMA Name	HUC-14 #	HUC-14 Name
3	Pompton, Pequannock, Wanaque, Ramapo	02030103110010	Lincoln Park tribs. (Pompton River)
6	Upper Passaic, Whippany, and Rockaway	02030103010180	Passaic R Upr (Pine Bk br to Rockaway)
		02030103030130	Stony Brook (Boonton)
		02030103030160	Montville tribs.
		02030103030170	Rockaway R (Passaic R to Boonton Dam)
		02030103040010	Passaic R Upr (Pompton R to Pine Bk)

Source: New Jersey Department of Environmental Protection: *NJDEP Watershed Management Areas in New Jersey, Edition 200901* and *14 Digit Hydrologic Unit Code Delineations for New Jersey, Edition 20110225.*



Source 1: Watershed Management Areas obtained from NJ Department of Environmental Protection, published 2000.
Source 2: Subwatersheds (HUC14s) obtained from NJ Department of Environmental Protection, published 2006.

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Figure 11
Watershed Management Areas and Subwatersheds

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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4.2 Surface Waters

Montville has a variety of surface waters consisting of lakes, ponds and streams. These surface waters are depicted on Figure 12, Water Bodies, Streams and Buffers. As shown, the southeastern border of the Township, adjacent to the Borough of Fairfield, lies along the Passaic River, which drains into the Passaic River Upper subwatersheds. The southwestern border of the Township, adjacent to the Township of Parsippany-Troy Hills, lies along the Rockaway River, which drains into the Rockaway River subwatershed. This drainage basin also contains Hatfield Brook and Lake Hiawatha.

The eastern portion of the Township, in the vicinity of Lincoln Park, has a number of streams, including Beaver Brook, Indian Brook, Little Beaver Brook, Sonville Brook, South Brook and portions of the Morris Canal. All of these surface waters are in Watershed Management Area 03 and drain to the Lincoln Park tributaries subwatershed.

In the western portion of the Township, near the Town of Boonton, surface waters include Crooked Brook, East Lake Montowac Brook, North Valhalla Brook, Passaic Valley Brook, Surprise Lake, and portions of the Morris Canal. In addition, this area contains Lake Montowac, Lake Valhalla, Surprise Lake and Patex Pond. Each of these surface waters drain into the Montville tributaries subwatershed.

Finally, the northwesternmost section of the Township, adjacent to the Township of Boonton and Borough of Kinnelon, contains the following surface waters: Stony Brook, Deer Pond and Taylortown Reservoir. All of these surface waters drain into the Stony Brook (Boonton) subwatershed.

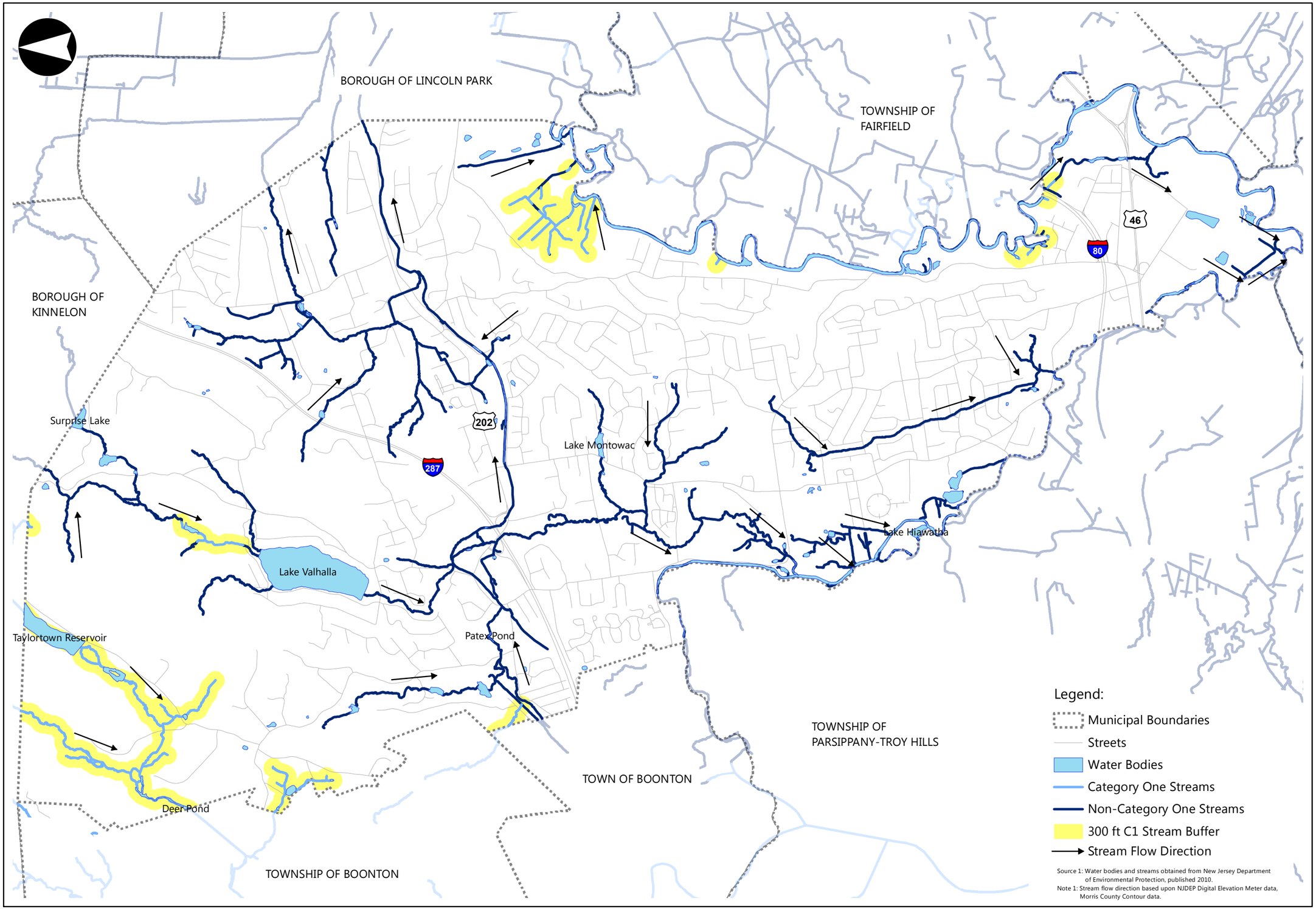
The State of New Jersey classifies surface waters in two distinct ways – according to their sensitivity and by the aquatic life they support. Each type of classification is discussed below.

1. Antidegradation Designations

   The Surface Water Quality Standards (SWQS) at N.J.A.C. 7:9B establish antidegradation policies for all surface waters in the State based on sensitivity levels. The three tiers of antidegradation designations area as follows:

   - *Outstanding National Resource Waters (ONRW).* The most protective tier of antidegradation designations, this category includes all surface waters classified as Freshwater 1 (FW1) and Pinelands (PL). These waters are set aside for posterity because of their unique significance. Any activity which might alter existing water quality in these waters is prohibited.

   - *Category One (C1).* The second tier of antidegradation designations, C1 waters are protected from any measurable changes in water quality because of their exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources.



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TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

Figure 12

Water Bodies, Streams and Buffers

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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- *Category Two (C2).* All waters not designated as ONRW or C1 are designated as C2. Similar to C1 waters, existing water quality is maintained in C2 waters. However, lowering of water quality is authorized to accommodate necessary and important social and economic development.

As shown on Figure 12, Montville Township does not contain any waterbodies classified as ONRW. However, it does contain a number of waters designated as C1. These C1 waterways include segments of the Passaic River in the eastern portion of the Township as well as portions of Stony Brook, Crooked Brook and the Taylortown Reservoir in the northwestern portion of the Township.

Also shown on Figure 12 is a buffer area surrounding all C1 waters in the Township. The Stormwater Management (N.J.A.C. 7:8) and Flood Hazard Area Control Act (N.J.A.C. 7:13) rules establish a 300-foot buffer for certain activities proposed adjacent to C1 designated waters or their upstream tributaries in the same subwatershed. Specifically, within these 300-foot buffers, or Special Water Resource Protection Areas (SWRPA), new construction or expansion to existing structures that will disturb one acre or more of the property or that would increase impervious surfaces on site by at least one-quarter of an acre is prohibited.

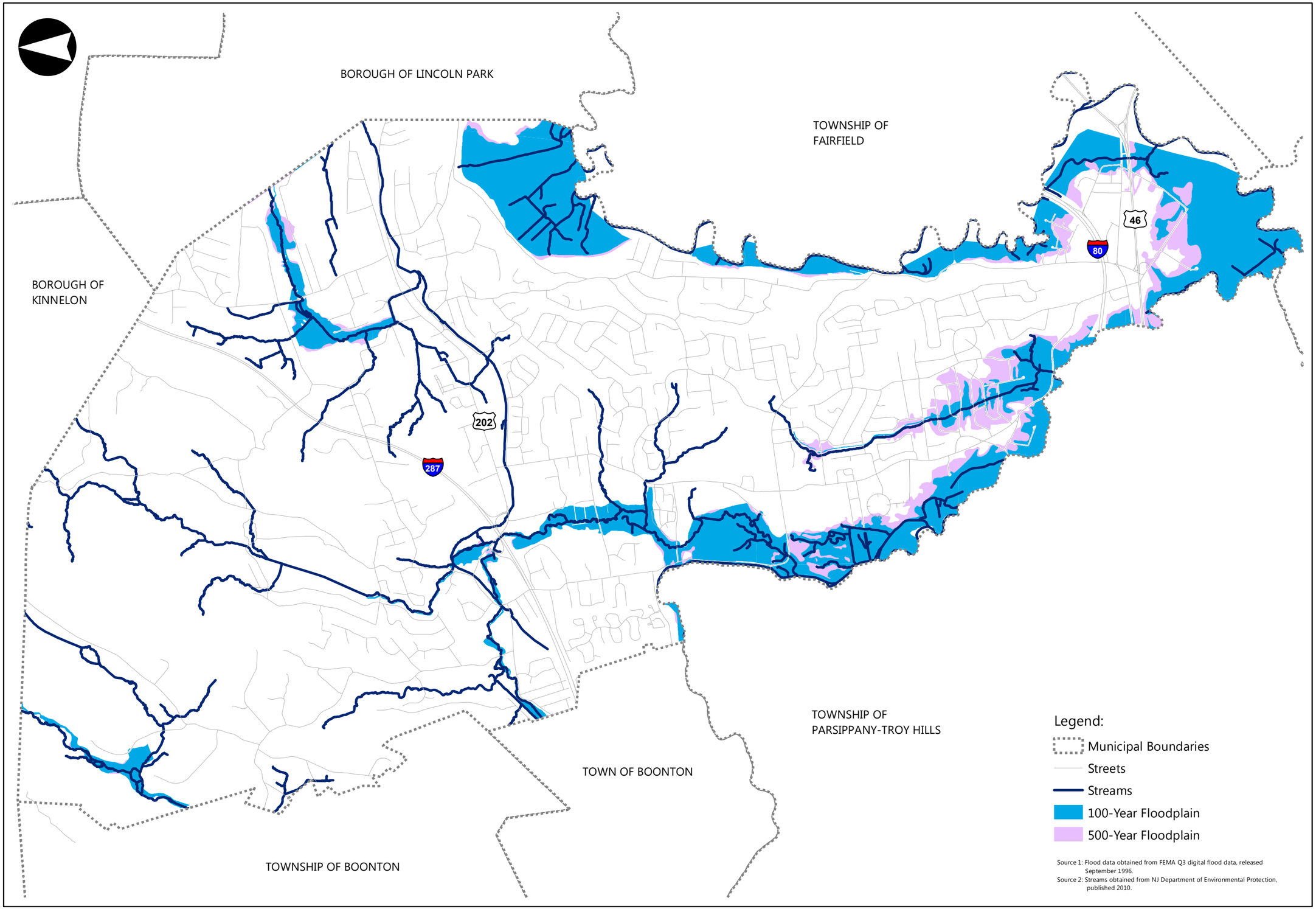
2. Aquatic Life Designations

The SWQS at N.J.A.C. 7:9B further classifies surface waters based on the aquatic life they support. Freshwaters are classified as FW1 (not subject to any man-made wastewater discharges) and FW2 waters (all other freshwaters except Pinelands waters). Freshwaters are further classified based on trout status, including trout production (FW2-TP), trout maintenance (FW2-TM), and nontrout (FW2-NT). All of Montville's surface waters are designated as FW2 and the vast majority are not suitable for trout (NT). However, the portion of Crooked Brook near Route 202 along the border with the Town of Boonton is classified as suitable for trout production (TP).

Designated uses within FW2 waters include maintenance, migration and propagation of the natural and established biota; primary contact recreation; industrial and agricultural water supply; public potable water supply after conventional filtration treatment and disinfection; and any other reasonable uses. Within FW2 waters, activities are regulated based on certain water quality criteria, as set forth at N.J.A.C. 7:9B-1.14.

4.3 Floodplains

Figure 13, FEMA Flood Hazard Areas, depicts flood hazard areas in Montville Township This information is derived from the Federal Emergency Management Agency (FEMA) Q3 Digital Flood Data, which were released in September of 1996 and are the most current data available. The data identify areas that lie within the 100-year and 500-year floodplains, which are descriptions based upon probability of flooding. As shown, the flood hazard areas in the Township correspond to the prominent water features in the municipality, including the Passaic River, the Rockaway River, Beaver Brook, Indian Brook, Crooked Brook and Hatfield Brook.



Source 1: Flood data obtained from FEMA Q3 digital flood data, released September 1996.
Source 2: Streams obtained from NJ Department of Environmental Protection, published 2010.

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Figure 13

FEMA
Flood Hazard Areas

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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NJDEP regulates activities within flood hazard areas in accordance with the Flood Hazard Area Control Act Rules at N.J.A.C. 7:13. As stated therein, a flood hazard area permit as required by N.J.A.C. 7:13, or a coastal permit as required by N.J.A.C. 7:7 and 7:7E, are required to engage in regulated activities in flood hazard areas. Regulated activities include the alteration of topography through excavation, grading and/or placement of fill; the clearing, cutting and/or removal of vegetation in a riparian zone; the creation of impervious surface; the storage of unsecured material; the construction, reconstruction and/or enlargement of a structure; and the conversion of a building into a private residence or a public building.

4.4 Groundwater

Aquifers are a body of geologic material that can store significant quantities of groundwater and supply such quantities to natural springs and water wells. Aquifers are therefore highly important because they provide Township residents with the majority of their potable water.

Figure 14, Aquifers of Montville, depicts the location of aquifers in Montville Township, consistent of bedrock (fractured-rock) and surficial (glacial sediment over 50-feet thick) aquifers. As shown, there are four types of bedrock aquifers in the Township. These are each described below.

- *Basalt aquifers* are composed of hard, dense and highly-fractured igneous rocks. Groundwater, which is stored and transmitted in fractures, is normally fresh, slightly to highly alkaline, moderately hard, and of the calcium-bicarbonate type.

- *Brunswick aquifers* and *Brunswick aquifer conglomerates* are composed of sandstone, siltstone and shale of the Passaic, Towaco, Feltville and Boonton Formations. Groundwater, which is stored and transmitted in fractures, is normally fresh, slightly alkaline, non-corrosive and hard. Calcium-bicarbonate type waters dominate. Subordinate calcium-sulfate waters are associated with high total dissolved solids (TDS).

- *Igneous and metamorphic rock aquifers* are composed of gneiss, granite, schist and marble. Groundwater is stored and transmitted in fractures, with fractures in marble locally enlarged by chemical weathering. Average groundwater from non-marble units is fresh, slightly acidic, corrosive and moderately hard. Water from marble has higher TDS, alkalinity, pH, hardness, and is less corrosive. Calcium-bicarbonate type waters dominate.

Each type of aquifer can be ranked on their ability to yield groundwater to high-capacity wells. These wells include water-supply, irrigation, and industrial-supply wells sited and tested for maximum yield. The five aquifer rank values (A,B,C,D,E) are based on a statistical analysis of median yields for over 8,000 high-capacity wells. Table 8 below describes the aquifer rankings and the median yield associated with each rank value.

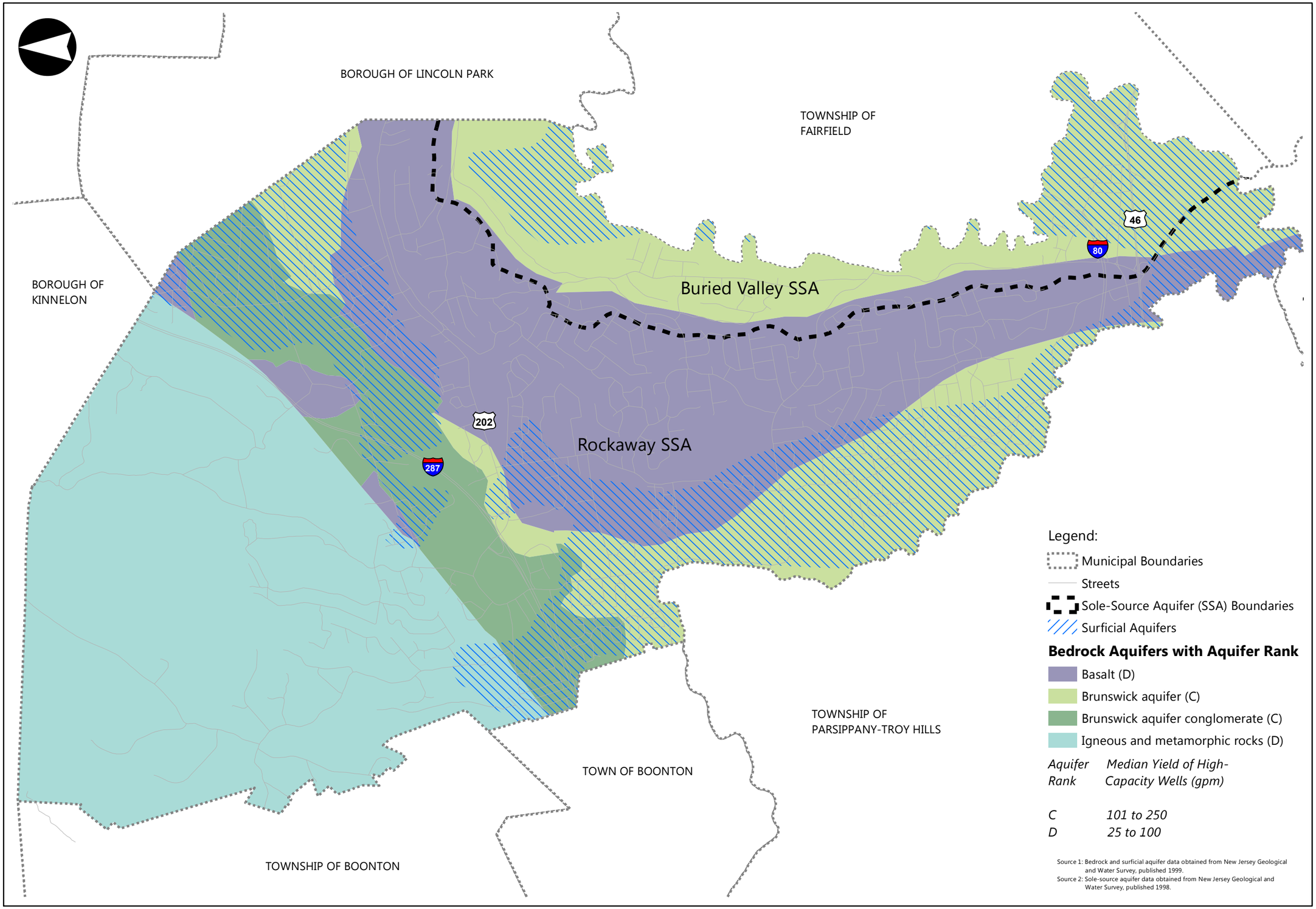

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Figure 14

Aquifers of Montville

Rev	Description	Date	Dwn	Ckd

Graphic Scale
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Table 8
Aquifer Rankings and Median Yield of High-Capacity Wells
Montville, New Jersey

Aquifer Rank	Median Yield of High-Capacity Wells (gpm)	Bedrock Aquifers in Montville Township
A	> 500	N/A
B	> 250 to 500	N/A
C	> 100 to 250	Brunswick; Brunswick conglomerate
D	25 to 100	Basalt; Igneous and metamorphic rock
E	< 25	N/A

Source: New Jersey Department of Environmental Protection: *Aquifers of New Jersey, Open File Map OFM 24, 1998.*

Figure 14 also shows the locations of sole-source aquifers in Montville Township. Sole-source aquifers (SSAs) are those aquifers that contribute more than 50 percent of the drinking water to a specific area and the water would be impossible to replace if the aquifer were contaminated. Sole-source aquifers are defined with guidelines set forth by the U.S. Environmental Protection Agency (EPA) as authorized in section 1424(e) of the Safe Drinking Water act of 1974. Any federally-funded project in an area that could affect ground-water in a sole-source aquifer must be reviewed by the USEPA. This 'project review area' includes the aquifer's 'recharge zone' and it's 'stream-flow source zone'. The recharge zone is the area through which water recharges the aquifer. The source zone is the upstream area that contributes recharge water to the aquifer. As shown on Figure 14, two SSAs cover Montville Township: the Rockaway SSA, which covers the majority of the municipality, and the Buried Valley SSA, which lies along the southeastern border of the Township.

4.5 Groundwater Recharge

Groundwater recharge is the process by which rainwater infiltrates the ground and reaches the water table regardless of the underlying geology. It supports aquifer recharge, stream baseflow and wetlands. Groundwater recharge is estimated in New Jersey using the methodology outlined in the NJ Geological Survey Report GSR-32 "A Method of Evaluating Ground-Water-Recharge Areas in New Jersey" (1993). The method uses rainfall data from climate-monitoring stations, land use and land cover data, soil descriptions, and the extent of wetlands and open waters. These data are combined using scientific methods to determine how much ground water is available in any particular area for recharge. Measurements of groundwater recharge are based on inches of infiltration per year.

Figure 15, Groundwater Recharge, shows the rate of groundwater recharge throughout Montville Township. As shown, groundwater recharge rates in Montville range from zero inches per year to 24 inches per year. Table 9 below provides information on the groundwater recharge ranking system and the amount of Township land area within each recharge rank.

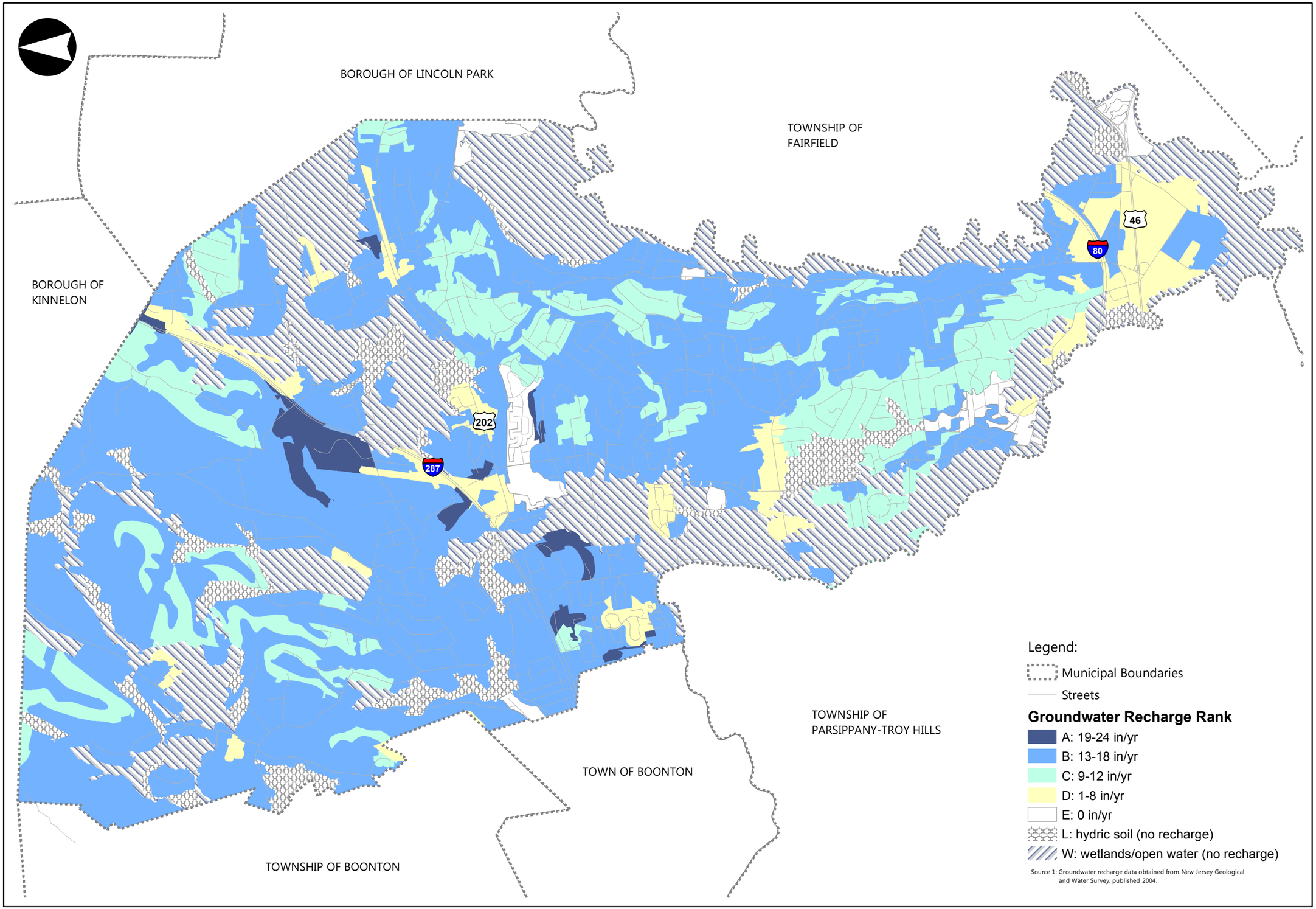

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Figure 15

Groundwater Recharge

Rev	Description	Date	Dwn	Ckd

Graphic Scale
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Table 9
Groundwater Recharge by Rank
Montville, New Jersey

Groundwater Recharge Rank	Groundwater Recharge Rate (in/yr)	Acreage in Township (ac)	Percent of Township (%)
A	19-24	209.90	1.72
B	13-18	6,071.67	49.64
C	9-12	1,586.79	12.97
D	1-8	702.09	5.74
E	0	270.46	2.21
L	Hydric soil (no recharge)	661.95	5.41
W	Wetlands & open water (no recharge)	2,698.19	22.06
X	No recharge calculated	31.94	0.26
TOTAL`		**12,233**	**100.0**

Source: New Jersey Geological and Water Survey: *Ground-Water Recharge for New Jersey Digital Geodata Series, DGS02-03*; calculations by calculations by Burgis Associates, Inc.

4.6 Wellhead Protection Areas

A Well Head Protection Area (WHPA) is an area calculated around a Public Community Water Supply (PCWS) well or Public Non-Community Water Supply (PNCWS) well. Public Community Water Supply (PCWS) wells are defined as public water supply wells serving at least 15-service connections used by year-round residents regularly serving at least 25-year round residents. Public Non-Community Water Supply (PNCWS) wells are defined as public water supply wells that are not public community wells and regularly service at least 25-individuals for at least 60-days in any given calendar year.

The WHPA delineates the horizontal extent of groundwater captured by a well pumping at a specific rate over a specific period of time. The WHPA is mapped based upon time of travel, which is the amount of time it will take for ground water to flow to the well. WHPA mapping consists of three tiers, as follows:

- *Tier 1* is a two-year time of travel (e.g., the groundwater within this tier flows to the well within a two-year time period).
- *Tier 2* is equivalent to a five-year time of travel.
- *Tier 3* is equivalent to a twelve-year time of travel.

WHPA delineations are conducted in response to the Safe Drinking Water Act Amendments of 1986 and 1996 as part of NJDEP's Source Water Area Protection Program (SWAP). The delineations are the first step in defining the sources of water to a public supply well. Within these areas, potential contamination will be assessed and appropriate monitoring will be undertaken as subsequent phases of the NJDEP SWAP.

Figure 16, Wellhead Protection Areas, shows the locations of WHPAs throughout Montville Township. As shown, the Township contains six PCWS wells and 11 PNCWS wells, for which Wellhead Protection Areas have been delineated.

4.7 Public Water Supply

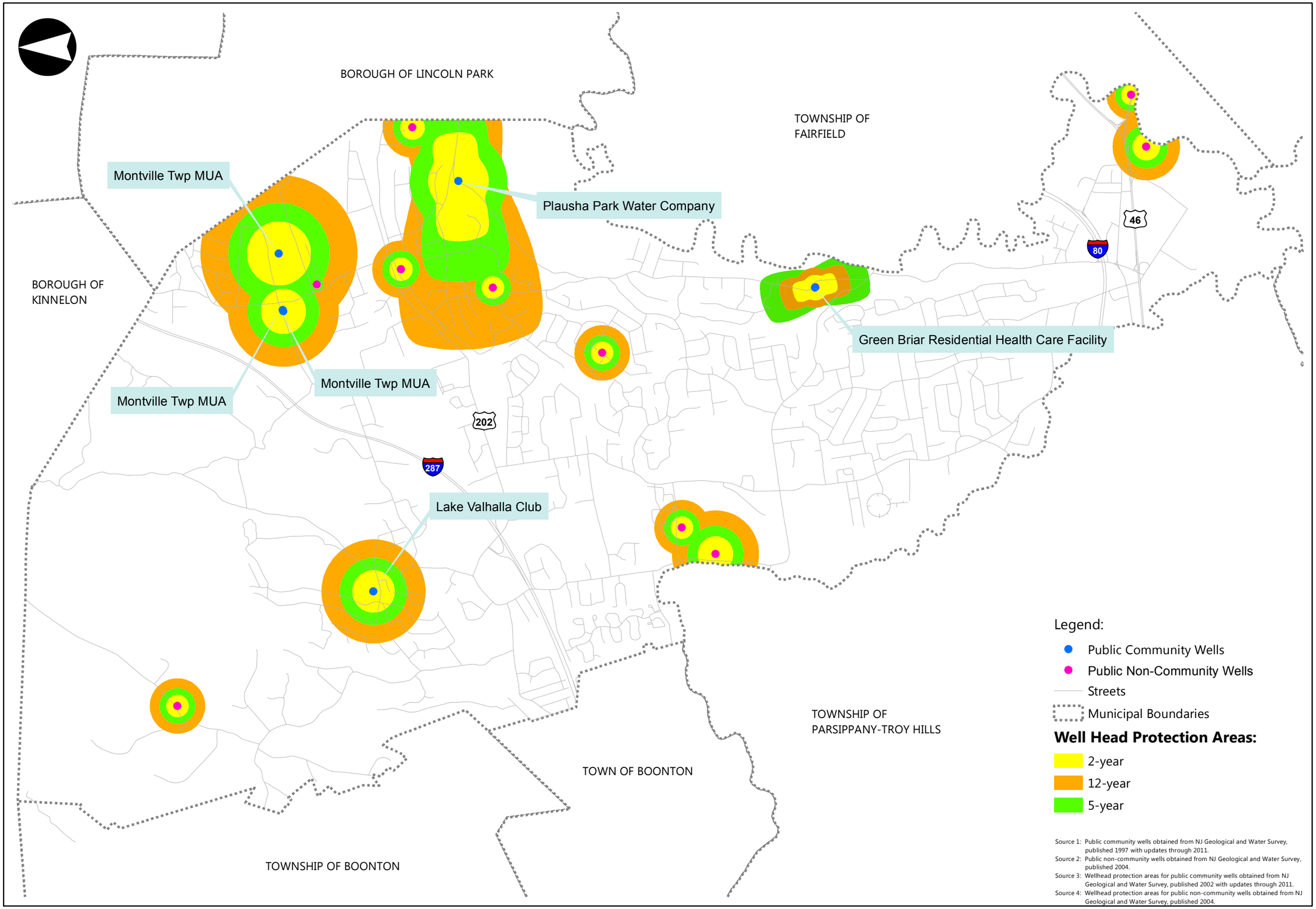
Montville's public water supply serves approximately 6,750 individual properties in the Township. Figure 17, Potable Water: Existing Areas Served, illustrates the locations of those parcels actively served by a potable water service provider, as per the Township Water and Sewer Department.

The Township's primary source of potable water is from three production wells, one of which is located on Indian Lane East and two of which are located on Indian Lane West. All of these wells are located within the Towaco Valley Aquifer, which, along with the aquifer's drainage basin, was the subject of a 1979 study prepared by the consulting firm Geonics. This study identified the aquifer as a major source of potable water supply and recommended zoning and development control measures in an effort to help protect that essential local resource. Subsequently, the Township adopted its Critical Water Resources (CWR) Overlay District to promote land use restrictions within the areas identified as Prime Aquifer and Restricted Area.

In 1998, the Township and Montville Township Municipal Utilities Authority (MUA) contracted with the consulting firm Vincent Uhl Associates to further evaluate and refine the Towaco Valley Aquifer. The findings from Vincent Uhl Associates have led to the adoption of redefined district boundaries in 2003 and 2012. Figure 18, Critical Water Resources, shows the most up-to-date boundaries of the Prime Aquifer and Restricted Area.

The combined pumping capacity of the Township's three production wells is 3.674 MGD (million gallons per day), however the Uhl study established the safe yield of the aquifer at 2.0 MGD on average. The Township also has a bulk water purchase agreement with the City of Jersey City (which has a reservoir in the Township of Parsippany-Troy Hills) for 128 MGY (million gallons per year) for normal supply and 1.0 MGD for emergency supply, and with the Borough of Lincoln Park for 55 MGY.

In addition to the 1.0 MGD emergency supply from Jersey City, there is also an emergency tie-in with the Town of Boonton water supply system at the intersection of Route 202 and Fulton Street. The Town of Boonton provides water to 29 properties on Oklahoma Avenue and Taylortown Road.



Source 1: Public community wells obtained from NJ Geological and Water Survey, published 1997 with updates through 2011.
Source 2: Public non-community wells obtained from NJ Geological and Water Survey, published 2004.
Source 3: Wellhead protection areas for public community wells obtained from NJ Geological and Water Survey, published 2002 with updates through 2011.
Source 4: Wellhead protection areas for public non-community wells obtained from NJ Geological and Water Survey, published 2004.

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Figure 16

Wellhead Protection Areas

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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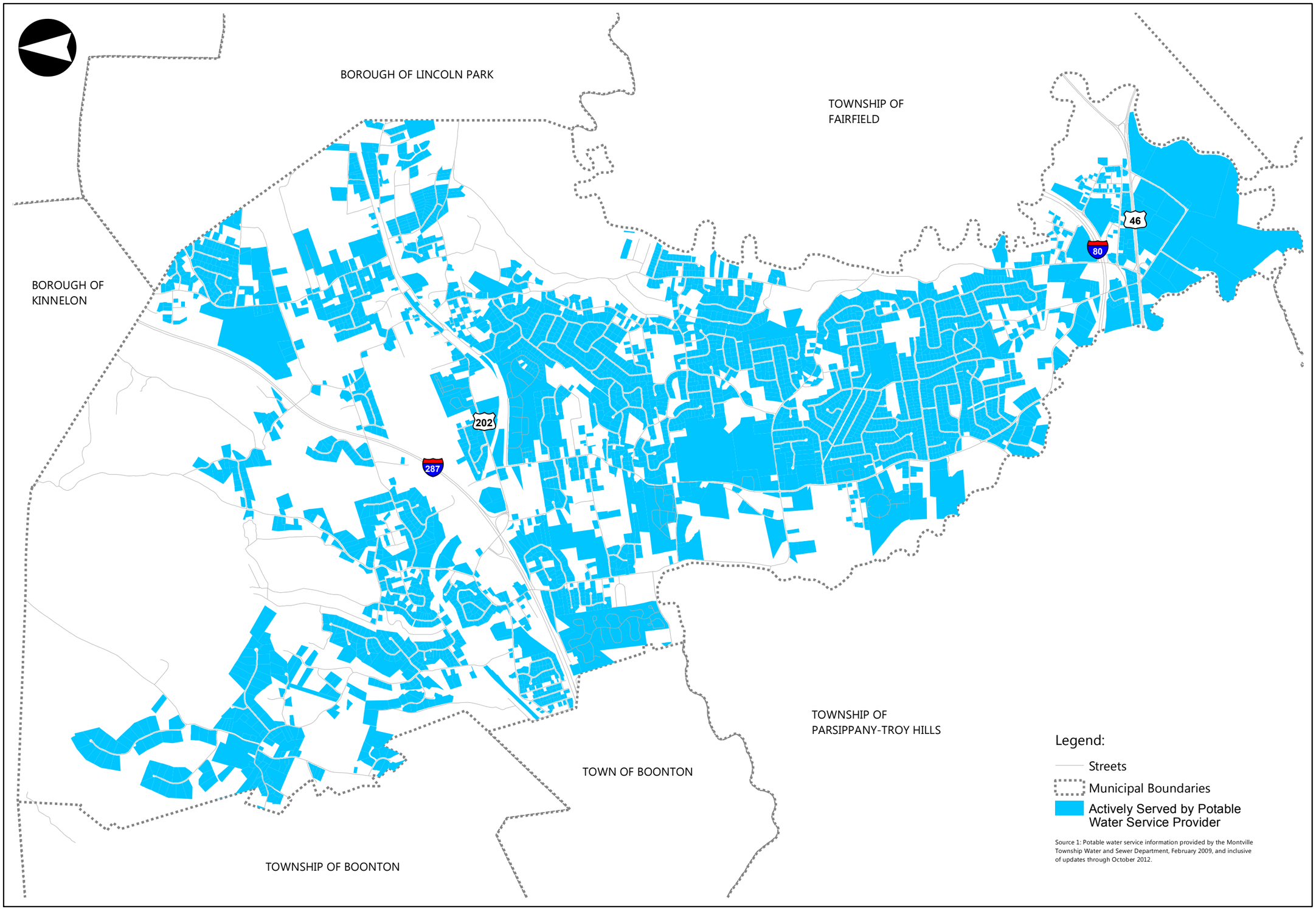

Source 1: Potable water service information provided by the Montville Township Water and Sewer Department, February 2009, and inclusive of updates through October 2012.

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Figure 17

Potable Water: Existing Areas Served

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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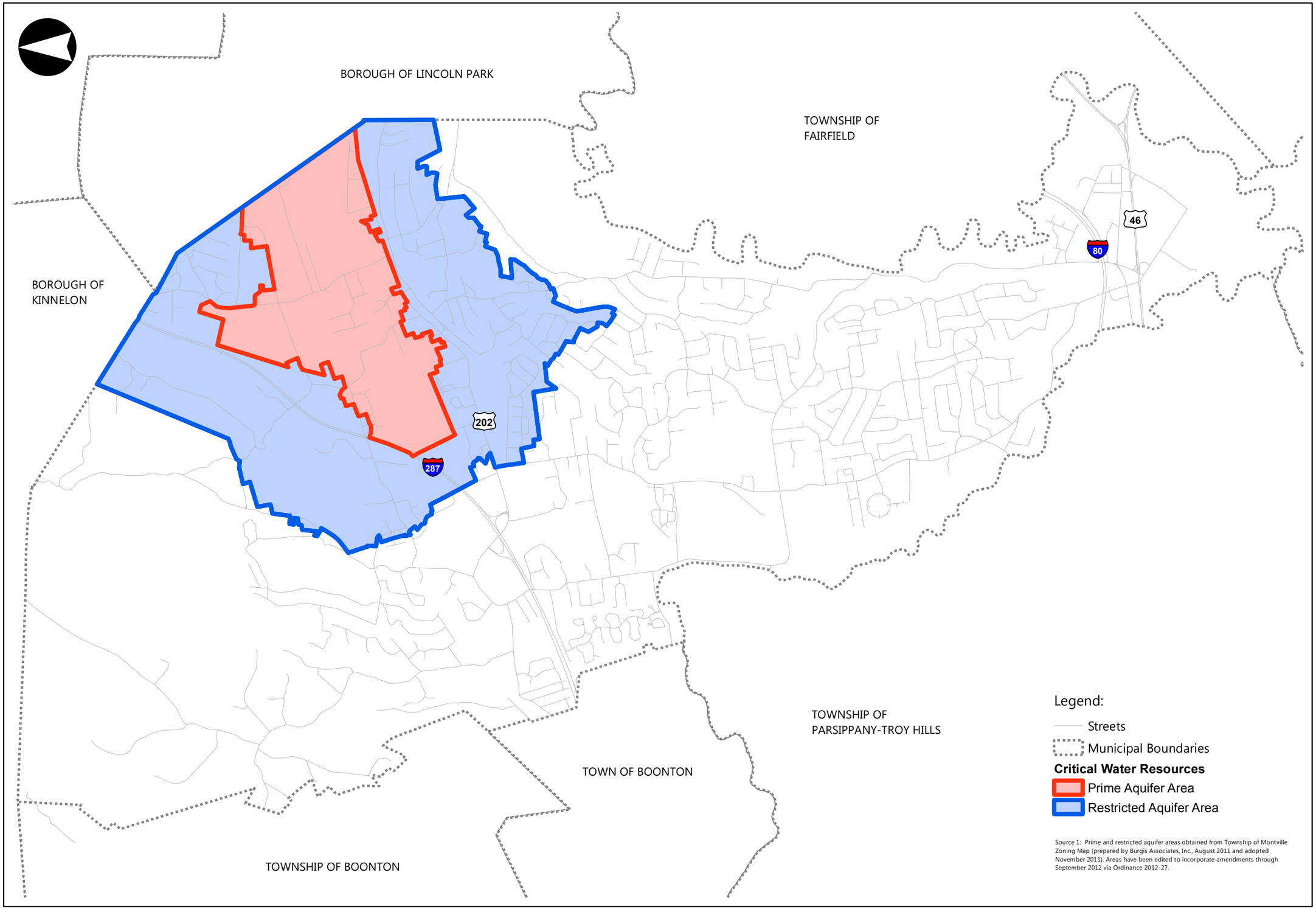

Source 1: Prime and restricted aquifer areas obtained from Township of Montville Zoning Map (prepared by Burgis Associates, Inc., August 2011 and adopted November 2011). Areas have been edited to incorporate amendments through September 2012 via Ordinance 2012-27.

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Figure 18

Critical Water Resources

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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5. SOILS

The soils in Montville Township are an important natural resource. Soils filter our water, provide essential nutrients to our forests and crops, and help regulate the Earth's temperature as well as many of the important greenhouse gases. Soils also help determine the feasibility of development, suitability for agriculture and preservation, and the type of plant and animal communities that can be supported.

5.1 Soil Types and Characteristics

The Soil Survey Geographic (SSURGO) database maintained by the Natural Resources Conservation Service (NRCS) provides detailed information on soil types and characteristics throughout the United States. The distribution of major soil types in Montville Township are shown on Figures 19, 20 and 21. For ease of viewing, the Township has been divided along the boundaries of the Township's three different communities – Montville, Towaco, and Pine Brook – as represented by their fire districts. Figure 19, Soils Area 1, shows the soil types within the Montville Fire District; Figure 20, Soils Area 2, shows the soil types within the Towaco Fire District; and Figure 21, Soils Area 3, shows the soil types within the Pine Brook Fire District.

Table 10 on the following pages details the important characteristics of each soil type located in the Township. It must be noted that the data provided for each soil type are based on spatial data for the entire State and are to be used for general planning purposes only. A site-specific analysis must be carried out to determine the limitations of each soil type.

The following descriptions are offered for each column heading in Table 10:

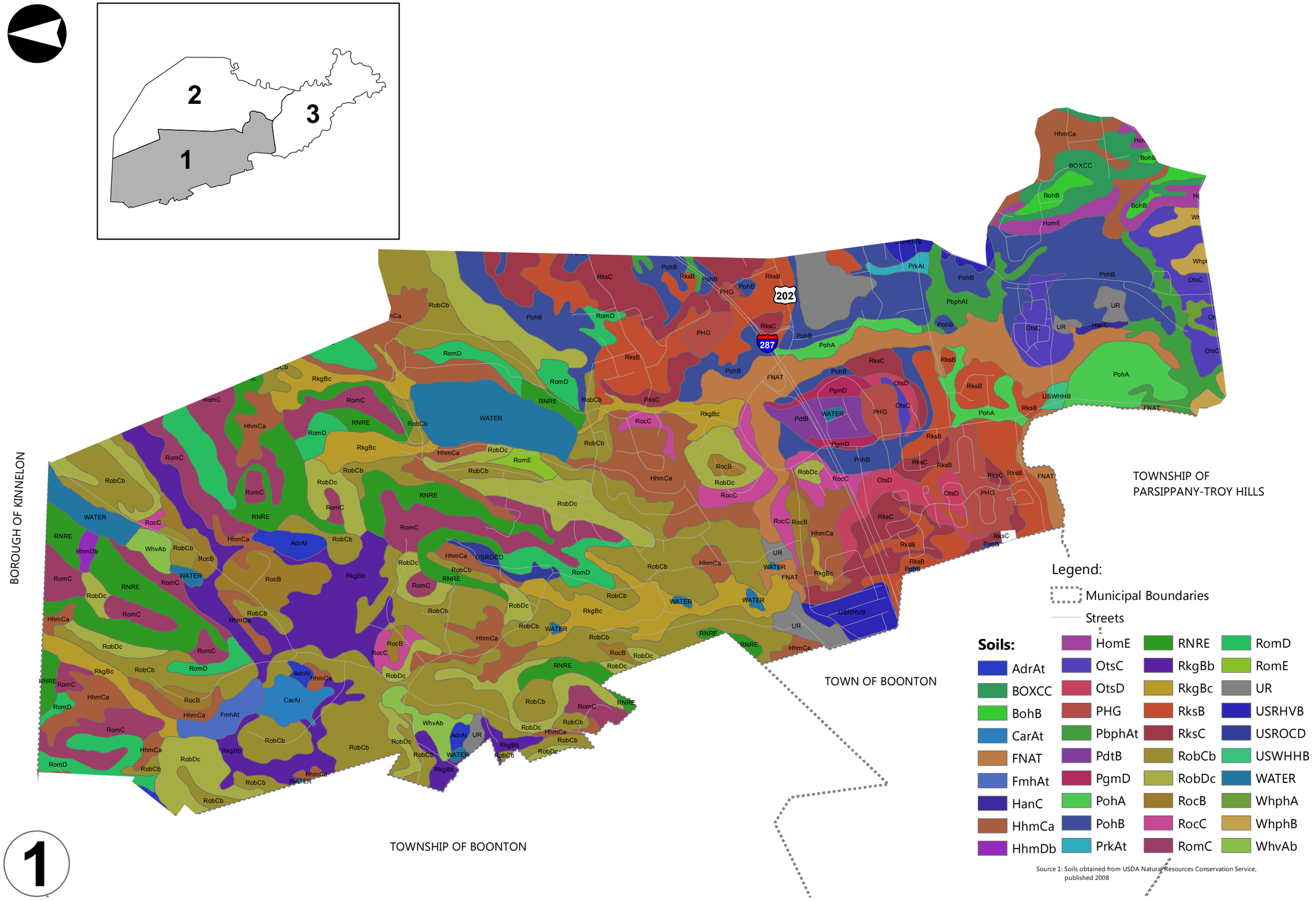
1. Symbol and Name

   An identifying symbol precedes the soil type name in the table. Together, the soil symbols and names represent the soils or miscellaneous areas (for example, rock outcrop) in the survey area. The symbol along with the name can be used to determine the composition and properties of a soil type. Some soil types are made up of two or more major soils or miscellaneous areas. These are complexes, associations, or undifferentiated groups.

   - *Complexes* consist of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps.

   - *Associations* are made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately.

   - *Undifferentiated groups* are made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management.



Source 1: Soils obtained from USDA Natural Resources Conservation Service, published 2008

1

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Figure 19

Soils Area 1:
Montville Fire District

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 412.5 825 1,650 2,475 Feet

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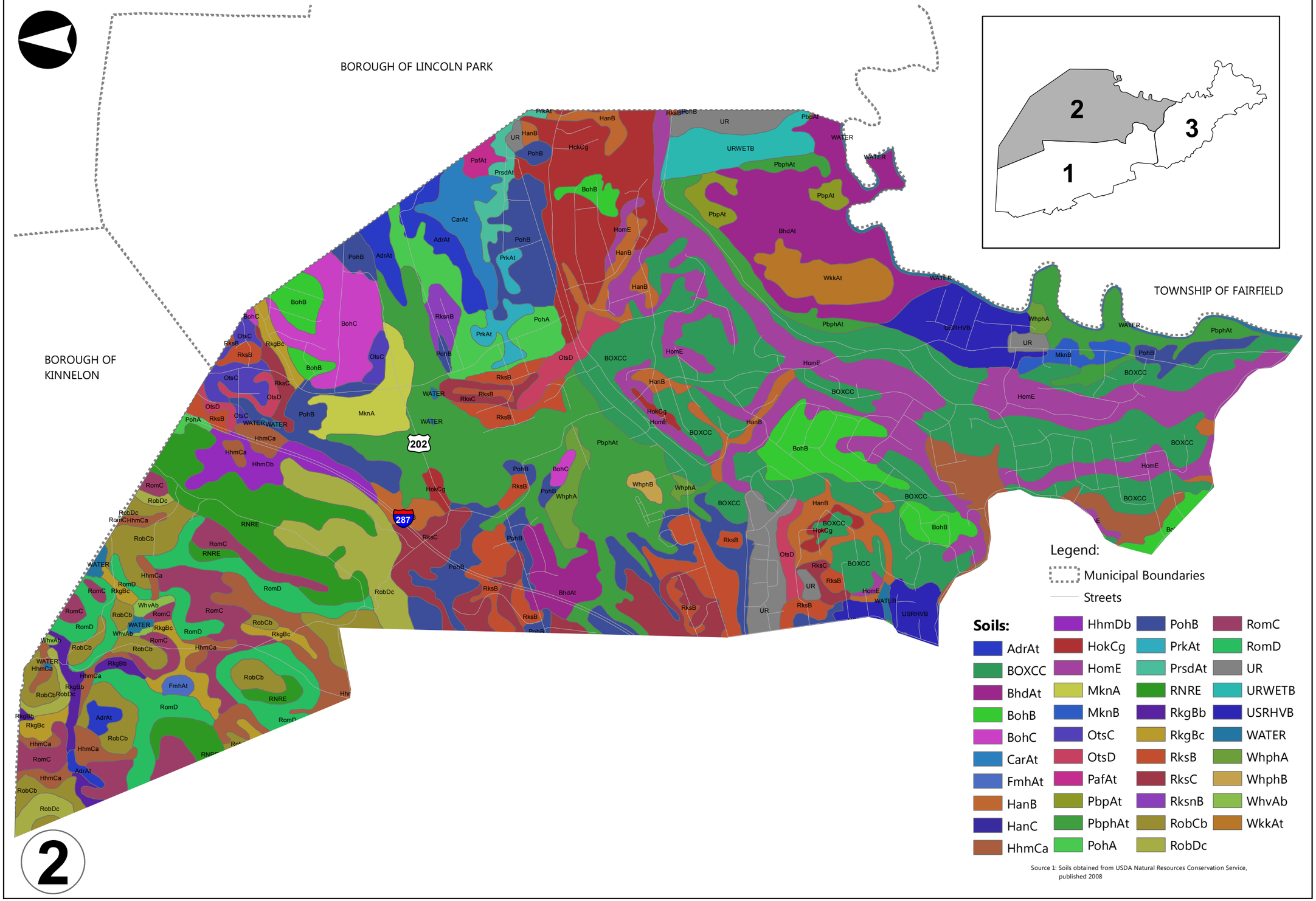

Source 1: Soils obtained from USDA Natural Resources Conservation Service, published 2008

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Figure 20

Soils Area 2:
Towaco Fire District

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 412.5 825 1,650 2,475 Feet

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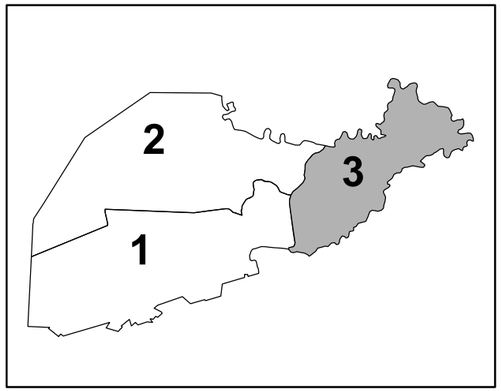

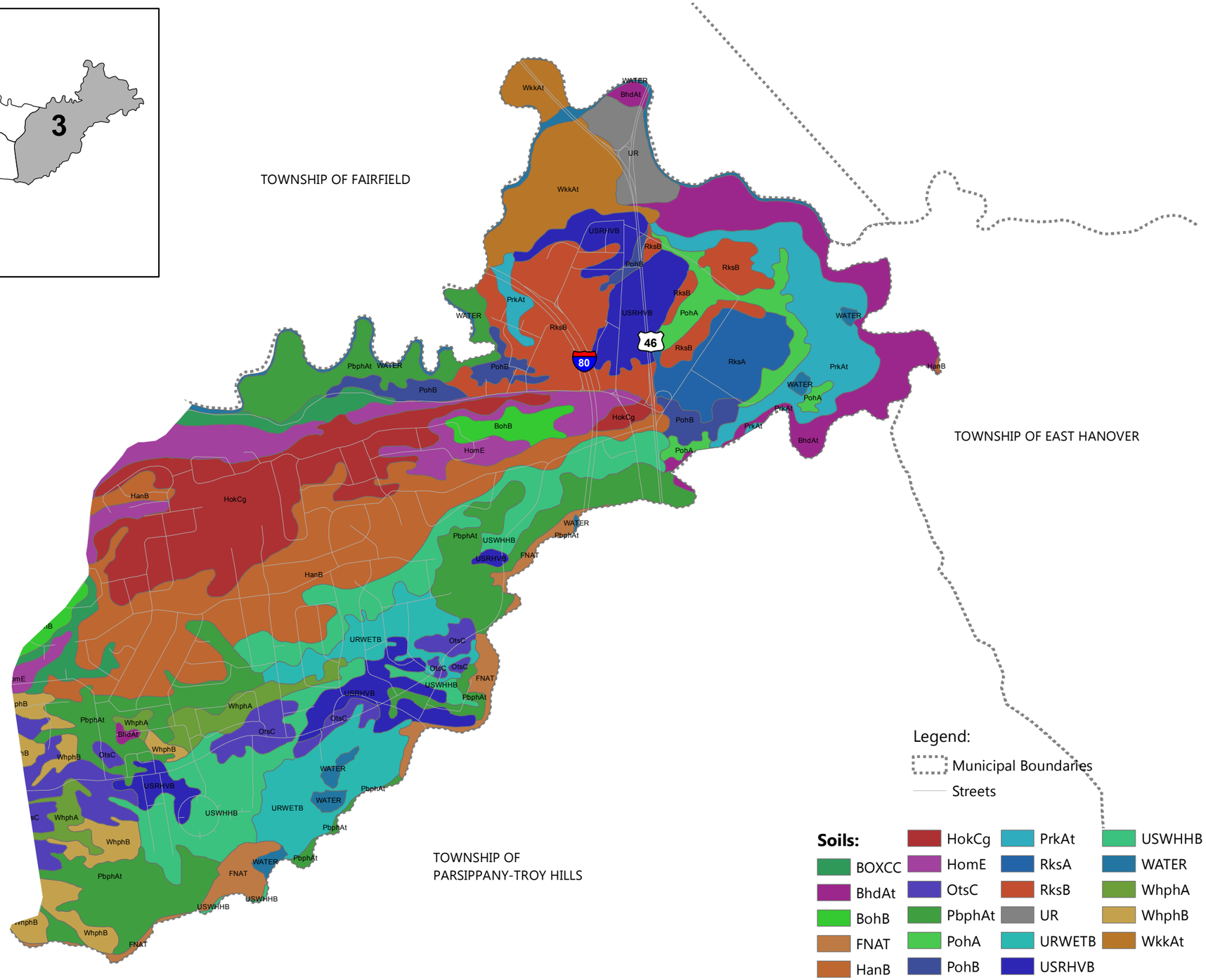

Source 1: Soils obtained from USDA Natural Resources Conservation Service, published 2008

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Project Title:

2013 Natural Resource Inventory

TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

Figure 21

Soils Area 3:
Pine Brook
Fire District

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 370 740 1,480 2,220 Feet

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Project No.	2465.26
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Date	03.07.13
Drawn	RW

Dwg. No.
SOILS-PB

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Table 10
Soil Types and Characteristics
Montville, New Jersey

Symbol	Name	Parent Material	Hydrologic Soil Group	Drainage Class	Depth to Water Table (in)	Surface Runoff	Restrictive Layer	Depth to Top of Restrictive Layer (in)	Potential for Frost Action	Wind Erodibility Group
AdrAt	Adrian muck, 0 to 3 percent slopes, frequently flooded	Herbaceous organic material over deposits of sandy outwash	A/D	Very poorly drained	0	Negligible	---	---	High	2
BhdAt	Biddeford silt loam, 0 to 2 percent slopes, frequently flooded	Silty and clayey glaciomarine deposits and/or glaciolacustrine deposits	D	Very poorly drained	0	Negligible	---	---	High	2
BohB	Boonton moderately well drained gravelly loam, 3 to 8 percent slopes	Coarse-loamy basal till derived from basalt	C	Moderately well drained	18-36	High	Fragipan	---	Moderate	5
BohC	Boonton moderately well drained gravelly loam, 8 to 15 percent slopes	Coarse-loamy basal till derived from basalt	C	Moderately well drained	18-36	High	Fragipan	---	Moderate	5
BOXCC	Boonton and Haledon soils, 8 to 15 percent slopes, extremely stony									
	Boonton, moderately well drained, extremely stony, and similar soils: 45 percent	Coarse-loamy till derived from basalt	C	Moderately well drained	18-36	High	Fragipan	---	Moderate	8
	Haledon, extremely stony, and similar soils: 40 percent	Coarse-loamy till derived from basalt	C	Somewhat poorly drained	6-18	Very high	Fragipan	16-30	High	8
CarAt	Carlisle muck, 0 to 2 percent slopes, frequently flooded	Herbaceous organic material and/or woody organic material	A/D	Very poorly drained	0	Negligible	---	---	High	2
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	Recent alluvium	B/D	Somewhat poorly drained	6-18	Negligible	---	---	High	5
FNAT	Fluvaquents and undifluvents, 0 to 3 percent slopes, frequently flooded									
	Fluvaquents, wet, frequently flooded, and similar soils: 55 percent	Sandy alluvium	B/D	Poorly drained	0-12	Very high	---	---	Low	8
	Udifluvents, loamy, frequently flooded, and similar soils: 45 percent	Sandy alluvium	C	Moderately well drained	12-36	Low	---	---	Low	5
HanB	Haledon silt loam, 3 to 8 percent slopes.	Coarse-loamy basal till derived from basalt	C	Somewhat poorly drained	7-18	Low	Fragipan	24-36	High	5
HanC	Haledon silt loam, 8 to 15 percent slopes	Coarse-loamy basal till derived from basalt	C	Somewhat poorly drained	6-18	Very high	Fragipan	16-30	High	5
HhmCa	Hibernia loam, 3 to 15 percent slopes, stony	Coarse-loamy colluvium and/or till	C	Somewhat poorly drained	6-18	Very high	Fragipan	---	High	5
HhmDb	Hibernia loam, 15 to 25 percent slopes, very stony	Coarse-loamy colluvium and/or till	C	Somewhat poorly drained	6-18	Very high	Fragipan	---	High	8
HokCg	Holyoke silt loam, 0 to 15 percent slopes, rocky	Loamy till derived from basalt	D	Well drained	---	Very high	Lithic bedrock	10-20	Moderate	5
HomE	Holyoke-Rock outcrop complex, 15 to 45 percent slope									
	Holyoke and similar soils: 60 percent	Loamy till derived from basalt	D	Well drained	---	High	Lithic bedrock	10-20	Moderate	5
	Rock outcrop: 40 percent	Rock outcrop	D	---	---	---	Lithic bedrock	0	---	---
MknA	Minoa silt loam, 0 to 3 percent slopes	Coarse-loamy lagoonal deposits	C	Somewhat poorly drained	6-18	Very high	---	---	High	5
MknB	Minoa silt loam, 3 to 8 percent slopes	Coarse-loamy lagoonal deposits	C	Somewhat poorly drained	6-18	Very high	---	---	High	5
OtsC	Otisville gravelly loamy sand, 3 to 15 percent slopes	Glaciofluvial deposits derived from sandstone and shale	A	Excessively drained	---	Low	---	---	Low	2

Table 10
Soil Types and Characteristics
Montville, New Jersey

Symbol	Name	Parent Material	Hydrologic Soil Group	Drainage Class	Depth to Water Table (in)	Surface Runoff	Restrictive Layer	Depth to Top of Restrictive Layer (in)	Potential for Frost Action	Wind Erodibility Group
OtsD	Otisville gravelly loamy sand, 15 to 25 percent slopes	Glaciofluvial deposits derived from sandstone and shale	A	Excessively drained	---	Medium	---	---	Low	2
PafAt	Palms muck, 0 to 2 percent slopes, frequently flooded	Woody organic material	A/D	Very poorly drained	0	Negligible	---	---	High	2
PbpAt	Parsippany silt loam, 0 to 3 percent slopes, frequently flooded	Fine glaciolacustrine deposits derived from basalt, shale and granitic gneiss material	D	Poorly drained	0-6	Negligible	---	---	High	8
PbphAt	Parsippany silt loam, sandy loam substratum, 0 to 3 percent slopes, frequently flooded	Fine glaciolacustrine deposits derived from basalt, shale and granitic gneiss material	D	Poorly drained	0-12	Negligible	---	---	High	8
PdtB	Patternburg gravelly loam, 3 to 8 percent slopes	Reddish quartoze coarse-loamy residuum weathered from conglomerate and/or fanglomerate	B	Well drained	---	Low	Lithic bedrock	54-66	Moderate	5
PgmD	Penn-Klinesville channery silt loams, 12 to 18 percent slopes									
	Penn and similar soils: 60 percent	Fine-loamy residuum weathered from acid reddish shale, siltstone, and fine-grain sandstone	C	Well drained	---	High	Paralithic bedrock	30-42	Moderate	5
	Klinesville and similar soils: 40 percent	Fine-loamy residuum weathered from acid reddish shale, siltstone, and fine-grain sandstone	D	Somewhat excessively drained	---	High	Paralithic bedrock	10-20	Moderate	5
PHG	Pits, sand and gravel	Sandy material disturbed by human activity	---	Well drained	---	---	---	---	---	8
PohA	Pompton sandy loam, 0 to 3 percent slopes	Coarse-loamy outwash derived from gneiss, sandsatone and basalt	B/D	Somewhat poorly drained	6-18	Low	---	---	High	3
PohB	Pompton sandy loam, 3 to 8 percent slopes	Coarse-loamy outwash derived from gneiss, sandsatone and basalt	B/D	Somewhat poorly drained	6-18	Very high	---	---	High	3
PrkAt	Preakness sandy loam, 0 to 3 percent slopes, frequently flooded	Coarse-loamy outwash derived from granite and some basalt	D	Poorly drained	0-6	Low	---	---	High	8
PrsdAt	Preakness dark surface variant sandy loam, 0 to 3 percent slopes, frequently flooded	Coarse-loamy outwash derived from granite and some basalt	D	Very poorly drained	0-6	Low	---	---	High	8
RkgBb	Ridgebury loam, 0 to 8 percent slopes, very stony	Loamy till derived from granite and/or gneiss and/or schist	C	Poorly drained	0-6	Very high	Fragipan	---	High	8
RkgBc	Ridgebury loam, 0 to 8 percent slopes, extremely stony	Loamy till derived from granite and/or gneiss and/or schist	C	Poorly drained	0-6	Very high	Fragipan, Lithic Bedrock	---, 72-99	High	8
RksA	Riverhead gravelly sandy loam, 0 to 3 percent slopes	Glaciofluvial deposits derived from granite and gneiss	B	Well drained	---	Very low	---	---	Moderate	3
RksB	Riverhead gravelly sandy loam, 3 to 8 percent slopes	Glaciofluvial deposits derived from granite and gneiss	B	Well drained	---	Low	---	---	Moderate	3
RksC	Riverhead gravelly sandy loam, 8 to 15 percent slopes	Glaciofluvial deposits derived from granite and gneiss	B	Well drained	---	Low	---	---	Moderate	3
RksnB	Riverhead variant gravelly sandy loam, 3 to 8 percent slopes	Glaciofluvial deposits derived from granite and gneiss	B	Well drained	---	Low	---	---	Moderate	3
RNRE	Rock-outcrop-Rockaway complex, 15 to 35 percent slopes									

Table 10
Soil Types and Characteristics
Montville, New Jersey

Symbol	Name	Parent Material	Hydrologic Soil Group	Drainage Class	Depth to Water Table (in)	Surface Runoff	Restrictive Layer	Depth to Top of Restrictive Layer (in)	Potential for Frost Action	Wind Erodibility Group
	Rock outcrop: 60 percent	Rock outcrop	D	---	---	---	Lithic bedrock	0	None	---
	Rockaway, moderately well drained, extremely stony, and similar soils: 40 percent	Coarse-loamy till derived from granite and gneiss	C	Moderately well drained	24-36	Very high	Fragipan, Lithic Bedrock	18-30, 72-99	Moderate	8
RobCb	Rockaway sandy loam, 8 to 15 percent slopes, very stony	Coarse-loamy till derived from granite and gneiss	C	Well drained	24-36	High	Fragipan	18-30	Moderate	8
RobDc	Rockaway sandy loam, 15 to 25 percent slopes, extremely stony	Coarse-loamy till derived from granite and gneiss	C	Well drained	24-36	Very high	Fragipan	18-30	Moderate	8
RocB	Rockaway gravelly sandy loam, 3 to 8 percent slopes	Coarse-loamy till derived from granite and gneiss	C	Well drained	24-36	High	Fragipan	18-30	Moderate	3
RocC	Rockaway gravelly sandy loam, 8 to 15 percent slopes	Coarse-loamy till derived from granite and gneiss	C	Well drained	24-36	High	Fragipan	18-30	Moderate	3
RomC	Rockaway - Rock outcrop complex, 8 to 15 percent slopes									
	Rockaway, moderately well drained, extremely stony, and similar soils: 70 percent	Coarse-loamy till derived from granite and gneiss	C	Moderately well drained	24-36	High	Fragipan, Lithic Bedrock	18-30, 72-99	Moderate	8
	Rock outcrop: 30 percent	Rock outcrop	D	---	---	---	Lithic bedrock	0	None	---
RomD	Rockaway - Rock outcrop complex, 15 to 25 percent slopes									
	Rockaway, extremely stony, and similar soils: 60 percent	Coarse-loamy till derived from granite and gneiss	C	Well drained	24-36	Very high	Fragipan	18-30	Moderate	8
	Rock outcrop: 25 percent	Rock outcrop	D	---	---	---	Lithic bedrock	0	---	---
RomE	Rockaway - Rock outcrop complex, 25 to 45 percent slopes									
	Rockaway, moderately well drained, very stony, and similar soils: 55 percent	Coarse-loamy till derived from granite and gneiss	C	Moderately well drained	24-36	Very high	Fragipan, Lithic Bedrock	16-39, 48-72	Moderate	8
	Rock outcrop: 30 percent	Rock outcrop	D	---	---	---	Lithic bedrock	0	None	---
UR	Urban land	Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material	---	---	---	---	---	---	---	8
URWETB	Urban land, wet substratum, 0 to 8 percent slopes	Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material	---	---	---	---	---	---	---	---
USRHVB	Urban land - Riverhead complex, 3 to 8 percent slopes									
	Urban land: 60 percent	Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material	---	---	---	---	---	---	---	---
	Riverhead and similar soils: 40 percent	Glaciofluvial deposits derived from granite and gneiss	B	Well drained	---	Low	---	---	Moderate	3
USROCD	Urban land - Rockaway complex, 15 to 25 percent slopes									
	Urban land: 45 percent	Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material	---	---	---	---	---	---	---	---

Table 10
Soil Types and Characteristics
Montville, New Jersey

Symbol	Name	Parent Material	Hydrologic Soil Group	Drainage Class	Depth to Water Table (in)	Surface Runoff	Restrictive Layer	Depth to Top of Restrictive Layer (in)	Potential for Frost Action	Wind Erodibility Group
	Rockaway, stony, and similar soils: 40 percent	Coarse-loamy till derived from granite and gneiss	C	Well drained	24-36	Very high	Fragipan	18-30	Moderate	3
USWHHB	Urban land - Whippany, occasionally flooded complex, 0 to 8 percent slopes									
	Urban land: 45 percent	Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material	---	---	6-18	---	---	---	---	---
	Whippany, occasionally flooded, and similar soils: 40 percent	Silty and clayey glaciolacustrine deposits derived from shale and/or granite and/or basalt	C	Somewhat poorly drained	6-18	Very high	---	---	High	6
WhphA	Whippany silt loam, sandy loam substratum, 0 to 3 percent slopes	Silty and clayey glaciolacustrine deposits derived from shale and/or granite and/or basalt	C	Somewhat poorly drained	6-18	Very high	---	---	High	6
WhphB	Whippany silt loam, sandy loam substratum, 3 to 8 percent slopes	Silty and clayey glaciolacustrine deposits derived from shale and/or granite and/or basalt	C	Somewhat poorly drained	6-18	Very high	---	---	High	6
WhvAb	Whitman loam, 0 to 3 percent slopes, very stony	Loamy till derived from granite and gneiss and/or schist	D	Very poorly drained	0	Negligible	Fragipan	---	High	8
WkkAt	Willette muck, 0 to 2 percent slopes, frequently flooded	Organic material over clayey lacustrine deposits	A/D	Very poorly drained	0	Negligible	---	---	High	2

Source: USDA Natural Resources Conservation Service, SSURGO Soil Data Mart, accessed August 2012.

2. Parent Material

Parent material is the term for the general physical, chemical and mineralogical composition of the unconsolidated material, mineral or organic, from which the soil develops. The character and composition of the parent material plays an important role in determining soil properties. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of fragments.

3. Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. The four hydrologic soil groups are:

- *Group A.* Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

- *Group B.* Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

- *Group C.* Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

- *Group D.* Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

4. Drainage Class

The term “drainage class” identifies the natural drainage condition of the soil. It refers to the frequency and duration of wet periods. Drainage classes are based on field observations of water tables, soil wetness, landscape position and soil morphology. They provide a guide to the limitations and potentials of the soil for field crops, forestry, range, wildlife, and recreational uses. Seven classes of natural soil drainage are recognized:

excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained.

5. Depth to Water Table (in)

The term “water table" refers to a zone in the soil that is saturated with groundwater. The depth to water table is the shallowest depth to the wet soil layer (water table) at any time during the year, expressed as inches from the soil surface.

6. Surface Runoff

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

7. Restrictive Layer and Depth to Top

A restrictive layer is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. "Depth to top" is the vertical distance from the soil surface to the upper boundary of the restrictive layer, expressed in inches.

8. Potential for Frost Action

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

9. Wind Erodibility Group

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

5.2 Urban Land Units

As shown, in the previous subsection, Montville Township contains a number of soil types labeled as "urban land units." Urban land units are those surfaces covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material. The limitations of urban land units must be determined on a site-by-site basis. Figure 22, Urban Land Units, highlights the geographic distribution of urban land units in Montville Township. Table 11 below provides details on the areas associated with the various types of urban land units in the Township.

Table 11
Urban Land Units
Montville, New Jersey

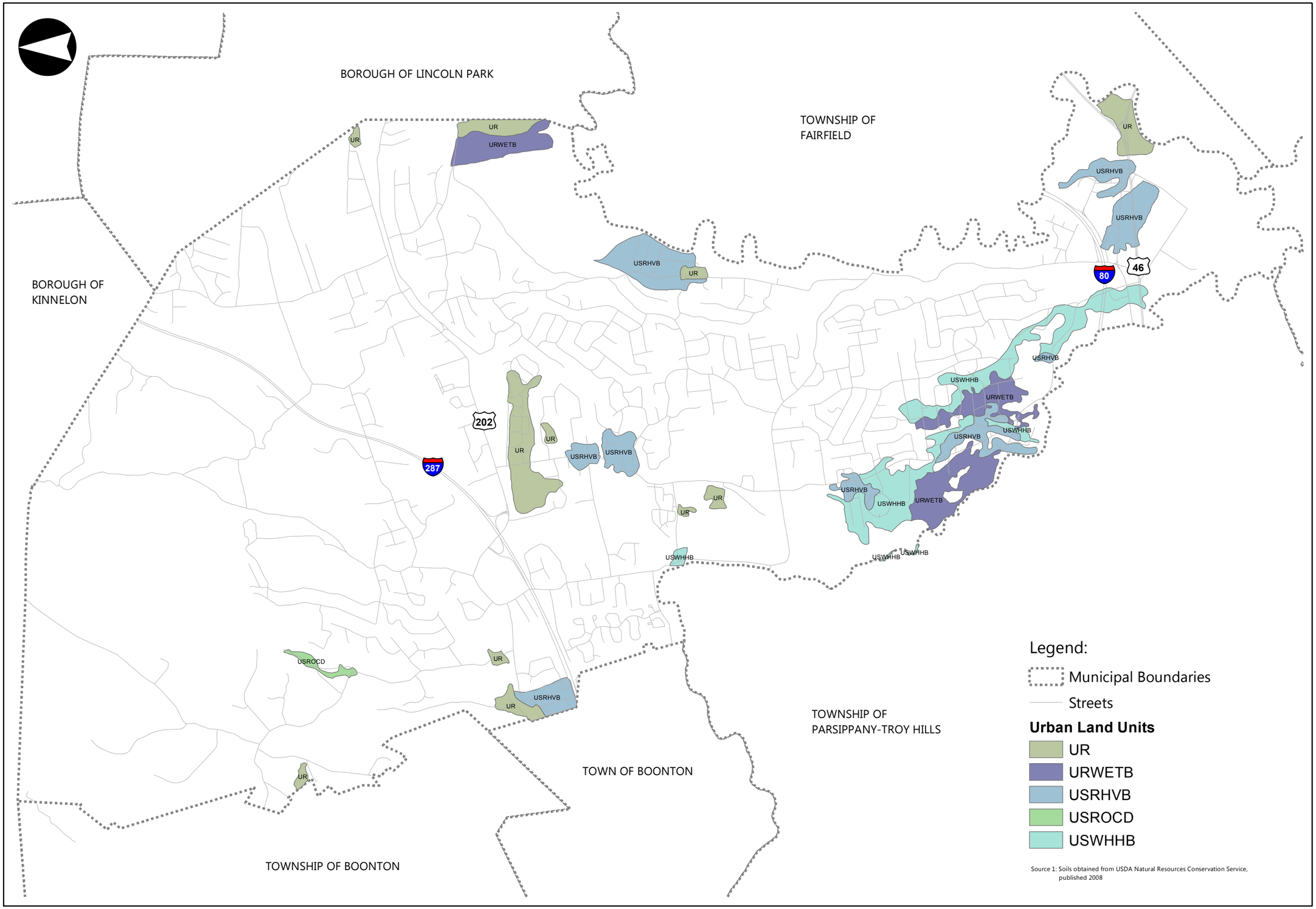
Soil Symbol	Soil Name	Acreage in Township (ac)	Percent of Township (%)
UR	Urban land	367.46	3.00
URWETB	Urban land, wet substratum, 0 to 8 percent slopes	197.60	1.62
USRHVB	Urban land, Riverhead complex, 3 to 8 percent slopes	454.05	3.71
USROCD	Urban land, Rockaway complex, 15 to 25 percent slopes	12.05	0.10
USWHHB	Urban land, Whippany, occasionally flooded complex, 0 to 8 percent slopes	457.06	3.74
Total Urban Land Units Within Montville Township		**1,488.22**	**12.17**

Source: USDA Natural Resources Conservation Service, SSURGO Soil Data Mart, accessed August 2012; calculations by Burgis Associates, Inc.

5.3 Development Limitations

Knowledge of the type and distribution of soils over an area can help to determine limitations to development, including limitations that affect the siting, design, construction and maintenance of dwellings and small commercial buildings, as well as those that affect the suitability of the soil for a septic system.

The SSURGO database provides a report entitled "Dwellings and Small Commercial Buildings," which shows the degree and kind of soil limitations affecting such development for each soil type in Montville Township. "Dwellings" include single-family units up to three stories high, either with or without basements. "Small Commercial Buildings" include structures less than three stories high and without basements. Ratings for both types of development are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs.



Source 1: Soils obtained from USDA Natural Resources Conservation Service, published 2008

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2013 Natural Resource Inventory

TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

Figure 22

Urban Land Units

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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The report places soil types within three categories: "Not Limited," "Somewhat Limited," and "Very Limited." "Not Limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat Limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very Limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Development limitations by geographic area in Montville are illustrated on Figure 23, Limitations to Development, and quantified in Table 12 below. It is noted that the map and table include categories labeled "Not to Somewhat Limited" and "Somewhat to Very Limited." These categories are used to describe soil types that have different limitations on development, depending on the development type (i.e., a soil that is not limited for dwellings, but somewhat limited for small commercial buildings is categorized as "Not to Somewhat Limited"). Please refer to the report included in the Appendix of this document for more information.

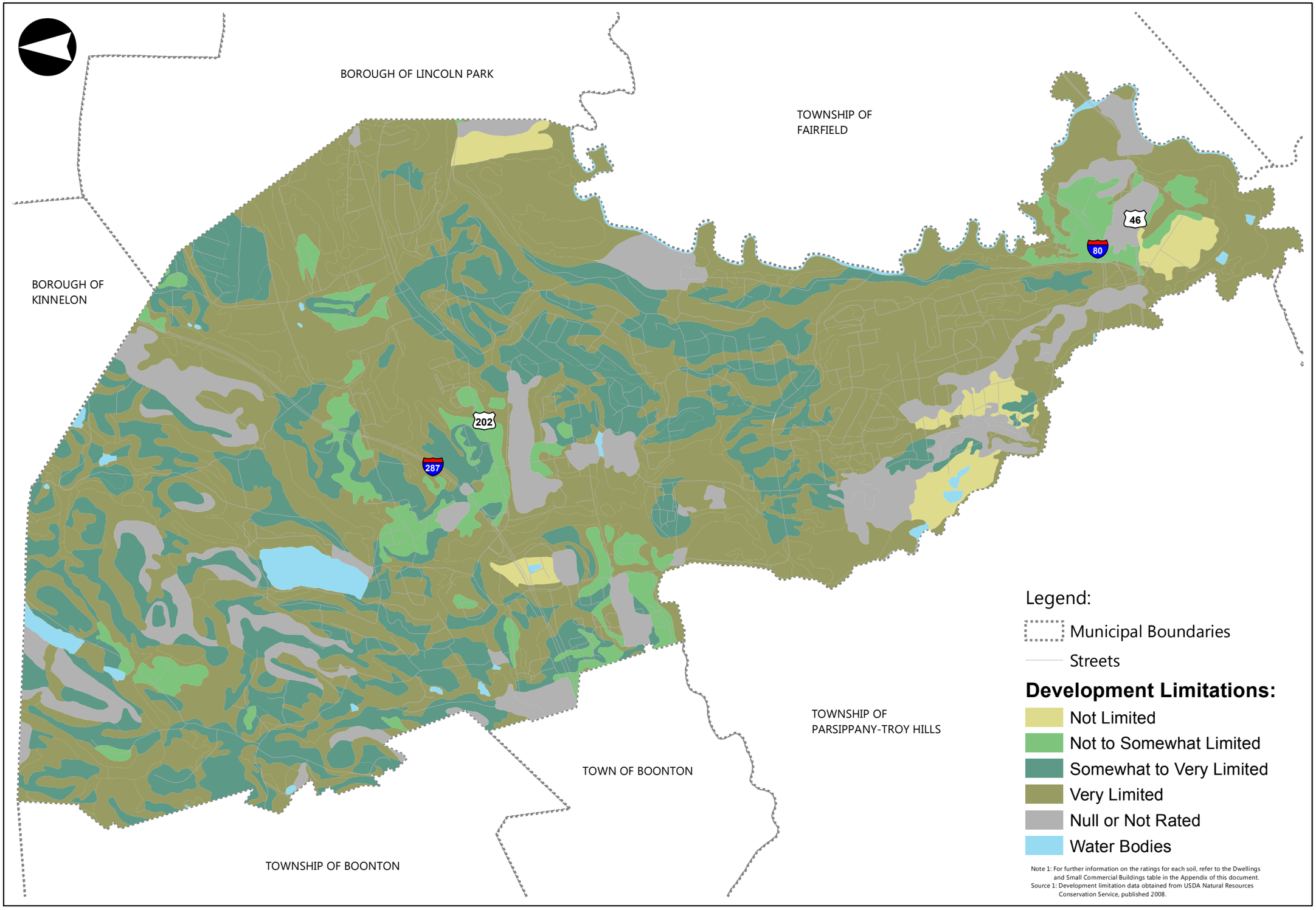
Table 12
Limitations to Development
Montville, New Jersey

Rating	Acreage in Township (ac)	Percent of Township (%)
Not Limited	295.17	2.4
Not to Somewhat Limited	671.74	5.5
Somewhat to Very Limited	2,990.20	24.4
Very Limited	6,754.80	55.2
Null or Not Rated	1,329.58	10.9
Water Bodies	191.51	1.6
Total	**12,233**	**100.0**

Source: USDA Natural Resources Conservation Service, SSURGO Soil Data Mart, *Dwellings and Commercial Buildings Report*, accessed August 2012; calculations by Burgis Associates, Inc.

Additionally, the Web Soil Survey, operated by the USDA's Natural Resources Conservation Service, provides a report entitled "Sewage Disposal (NJ)," which evaluates the septic suitability for each soil type in Montville Township. Ratings are based on each soil's properties that affect absorption of the effluent, construction, and pollution of ground and surface water. This report is included in the Appendix of this document.

The report places soil types within three categories: "Not Limited," "Somewhat Limited," and "Very Limited." "Not Limited" indicates that the soil has features that are very favorable for septic systems. "Somewhat Limited" indicates that the soil has features that are moderately favorable for septic systems. "Very Limited" indicates that the soil has one or more features that are unfavorable for septic systems.



Note 1: For further information on the ratings for each soil, refer to the Dwellings and Small Commercial Buildings table in the Appendix of this document.
Source 1: Development limitation data obtained from USDA Natural Resources Conservation Service, published 2008.

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TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

Figure 23

Limitations to Development

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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Septic limitations by geographic area in Montville are illustrated on Figure 24, Septic Suitability, and quantified in Table 13 below. Please refer to the report included in the Appendix of this document for more information.

Table 13
Septic Suitability
Montville, New Jersey

Rating	Acreage in Township (ac)	Percent of Township (%)
Not Limited	1,346.06	11.0
Somewhat Limited	30.70	0.3
Very Limited	9,141.49	74.7
Null or Not Rated	1,523.24	12.5
Water Bodies	191.51	1.6
Total	**12,233**	**100.0**

Source: USDA Natural Resources Conservation Service, Web Soil Survey, *Sewage Disposal (NJ) Report*, accessed March 2013; calculations by Burgis Associates, Inc.

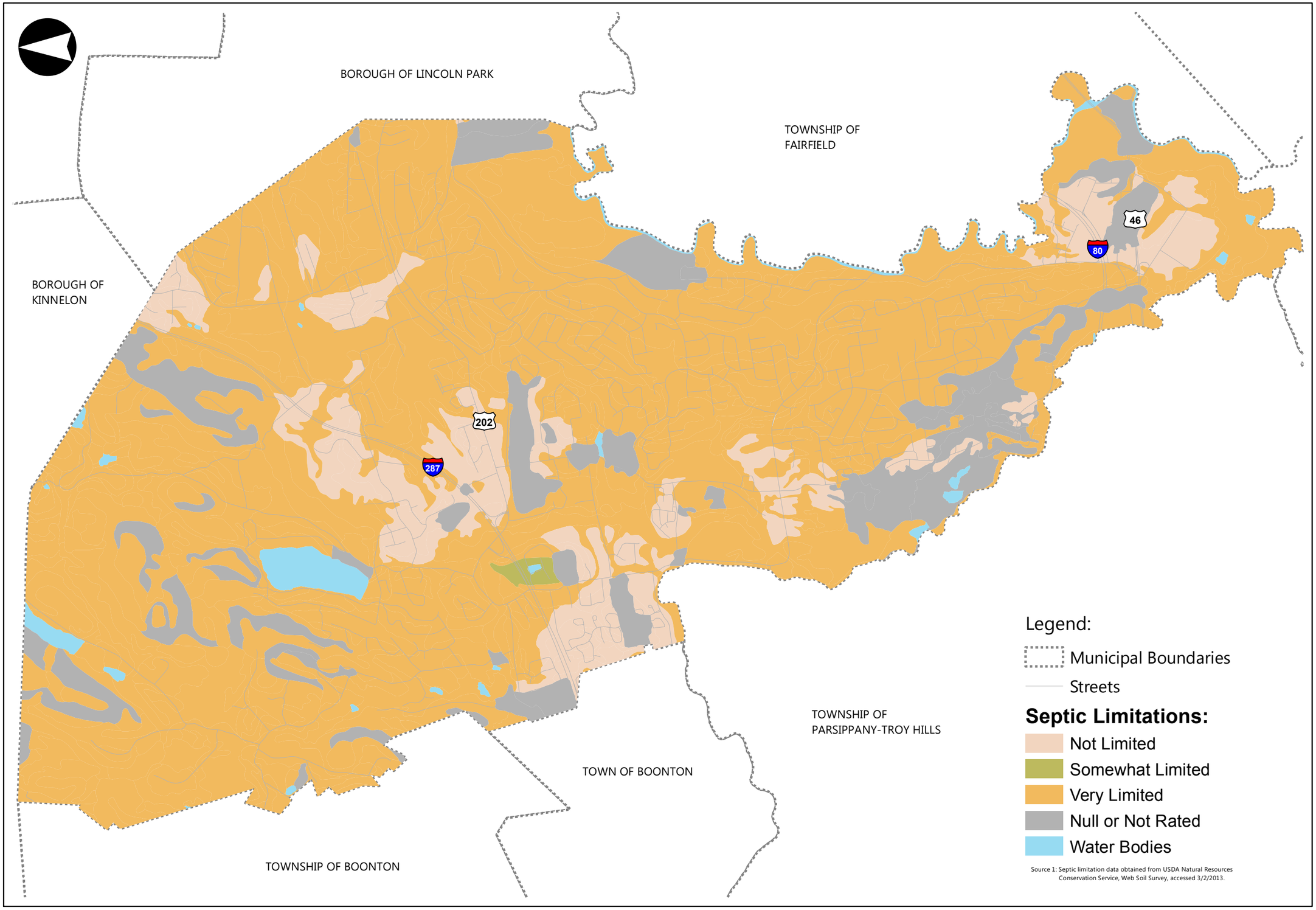
5.4 Prime and Other Important Farmlands

The SSURGO database also identifies soils that are considered important farmlands. Important farmlands consist of three classifications: prime farmland, farmland of statewide importance, and farmland of unique importance. Figure 25, Prime and Other Important Farmlands, illustrates the distribution of prime and other important farmlands throughout Montville Township.

The farmland classifications are described as follows:

1. Prime Farmland

   Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from zero to six percent.



Source 1: Septic limitation data obtained from USDA Natural Resources Conservation Service, Web Soil Survey, accessed 3/2/2013.

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Figure 24

Septic Suitability

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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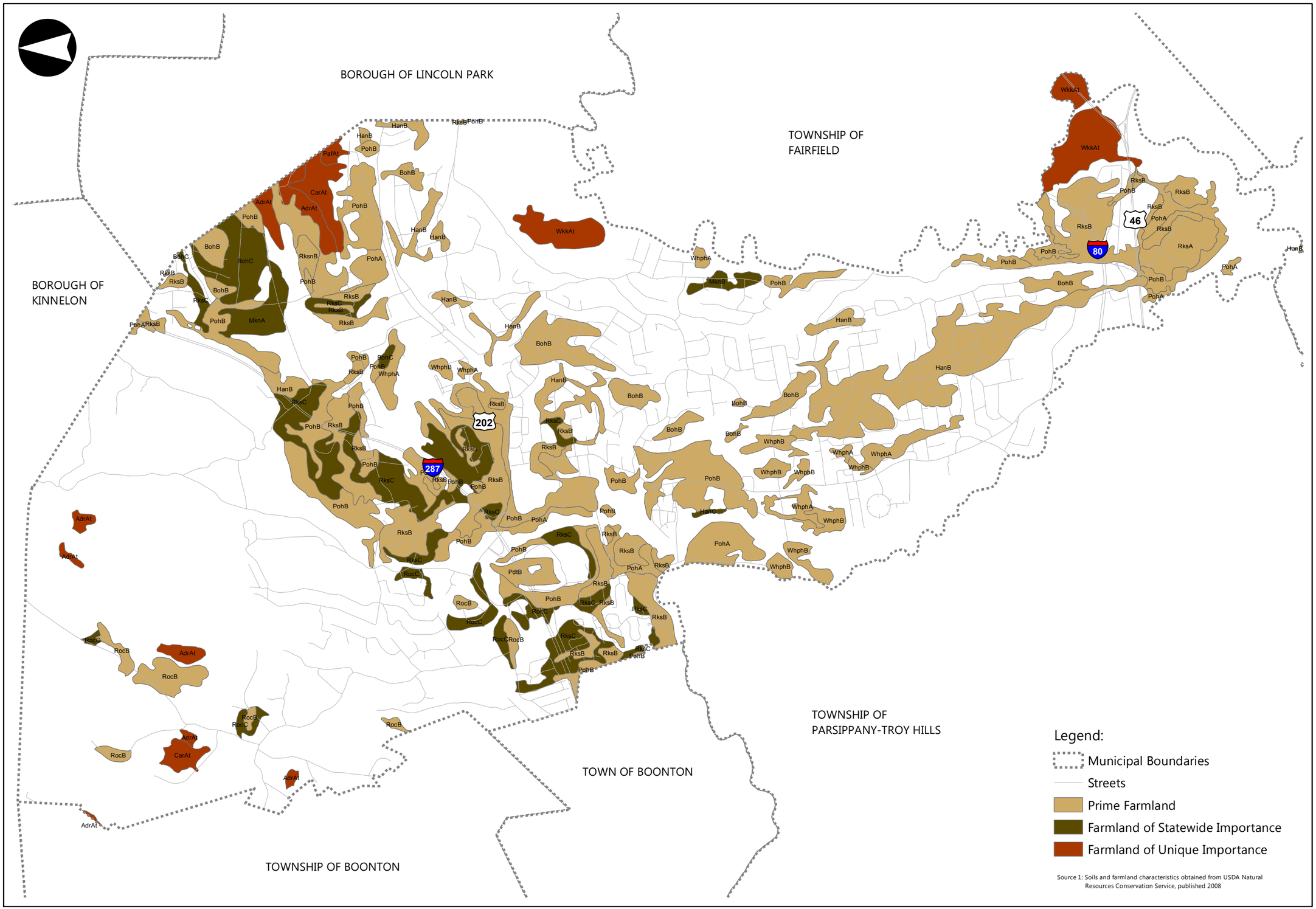

Source 1: Soils and farmland characteristics obtained from USDA Natural Resources Conservation Service, published 2008

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Figure 25

Prime and Other Important Farmlands

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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2. Farmland of Statewide Importance

   This is land that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Generally, farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmlands if conditions are favorable.

3. Farmland of Unique Importance

   Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration.

The types of soil that are classified as prime and other important farmlands within Montville Township, as well as the land areas within each category, are identified in Table 14 on the following page.

Table 14
Prime and Other Important Farmlands
Montville, New Jersey

Soil Symbol	Soil Name	Farmland Classification	Acreage in Township (ac)	Percent of Township (%)
BohB	Boonton moderately well drained gravelly loam, 3 to 8 percent slopes	Prime farmland	3,142.70	25.69
HanB	Haledon silt loam, 3 to 8 percent slopes	Prime farmland		
PdtB	Pattenburg gravelly loam, 3 to 8 percent slopes	Prime farmland		
PohA	Pompton sandy loam, 0 to 3 percent slopes	Prime farmland		
PohB	Pompton sandy loam, 3 to 8 percent slopes	Prime farmland		
RksA	Riverhead gravelly sandy loam, 0 to 3 percent slopes	Prime farmland		
RksB	Riverhead gravelly sandy loam, 3 to 8 percent slopes	Prime farmland		
RksnB	Riverhead variant gravelly sandy loam, 3 to 8 percent slopes	Prime farmland		
RocB	Rockaway gravelly sandy loam, 3 to 8 percent slopes	Prime farmland		
WhphA	Whippany silt loam, sandy loam substratum, 0 to 3 percent slopes	Prime farmland		
WhphB	Whippany silt loam, sandy loam substratum, 3 to 8 percent slopes	Prime farmland		
BohC	Boonton moderately well drained gravelly loam, 8 to 15 percent slopes	Statewide importance	724.99	5.93
HanC	Haledon silt loam, 8 to 15 percent slopes	Statewide importance		
MknA	Minoa silt loam, 0 to 3 percent slopes	Statewide importance		
MknB	Minoa silt loam, 3 to 8 percent slopes	Statewide importance		
RksC	Riverhead gravelly sandy loam, 8 to 15 percent slopes	Statewide importance		
RocC	Rockaway gravelly sandy loam, 8 to 15 percent slopes	Statewide importance		
AdrAt	Adrian muck, 0 to 3 percent slopes, frequently flooded	Unique importance	561.88	4.59
CarAt	Carlisle muck, 0 to 2 percent slopes, frequently flooded	Unique importance		
PafAt	Palms muck, 0 to 2 percent slopes, frequently flooded	Unique importance		
WkkAt	Willette muck, 0 to 2 percent slopes, frequently flooded	Unique importance		
Total Prime/Important Farmlands Within Montville Township			**4,429.57**	**36.21**

Source: USDA Natural Resources Conservation Service: SSURGO Soil Data Mart, accessed August 2012; calculations by Burgis Associates, Inc.

6. WETLANDS

According to the United States Environmental Protection Agency, wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Water saturation (hydrology) largely determines how the soil develops and the types of plant and animal communities living in and on the soil. Wetlands may support both aquatic and terrestrial species. The prolonged presence of water creates conditions that favor the growth of specially adapted plants (hydrophytes) and promote the development of characteristic wetland (hydric) soils.

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

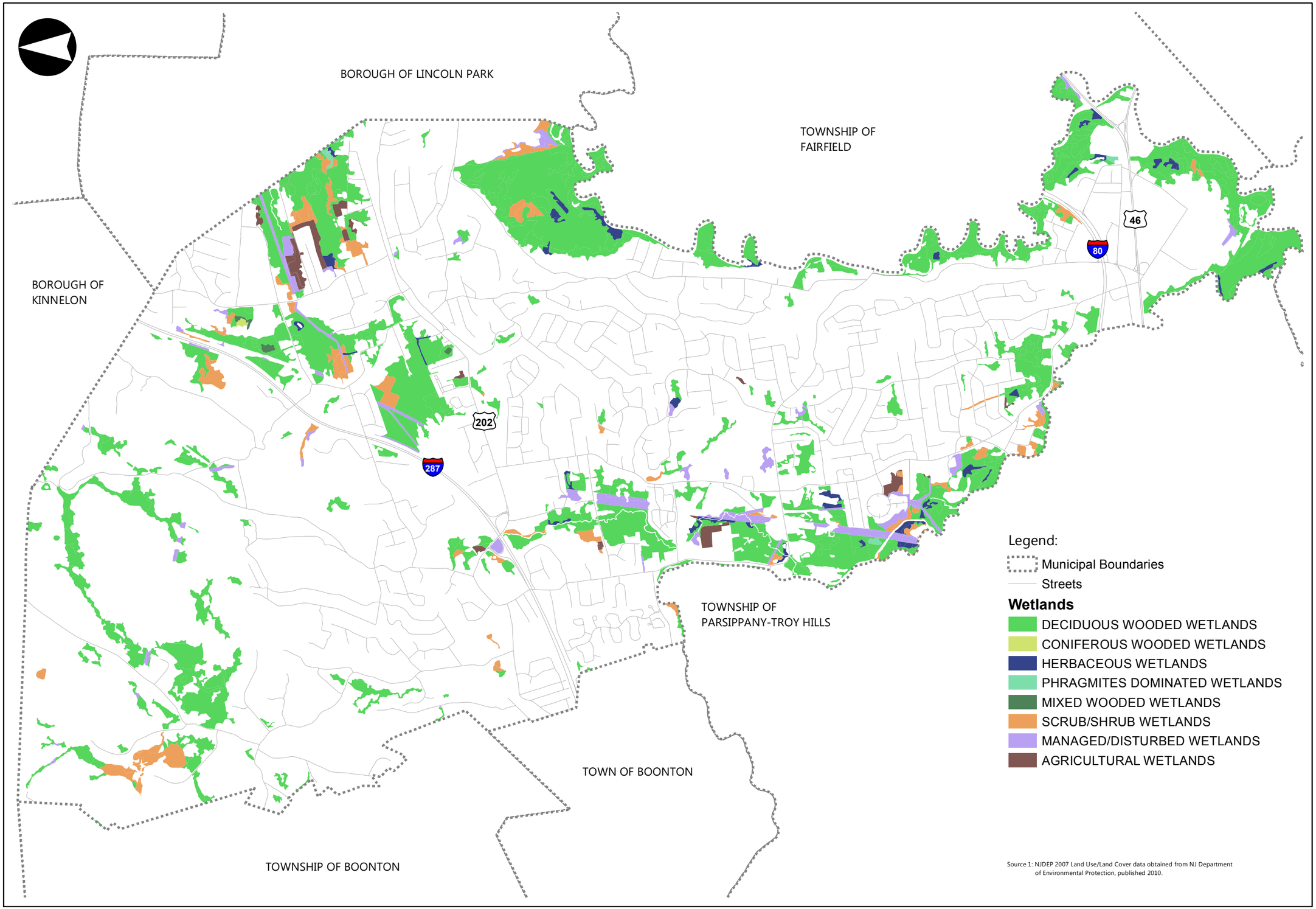
6.1 Location of Wetlands

Wetland areas have been mapped by NJDEP for the entire state as part of its 2007 Land Use/Land Cover Update. Freshwater wetlands were first mapped under the New Jersey Freshwater Wetlands Mapping Program and were incorporated into the 2007 land use/land cover datasets, which were produced by visually interpreting color infrared photography. Figure 26, Wetlands, shows the locations of wetlands within Montville Township.

As shown on Figure 26, there are a number of wetland areas throughout Montville. The most extensive wetland areas are those surrounding the Passaic River along the eastern border of the Township, those surrounding the Rockaway River along the southwestern border of the Township, and those surrounding the Beaver Brook and Indian Brook tributaries in the northeastern portion of the Township. Although this map provides a good indication of where wetlands are located, only an official determination from the NJDEP (called a “letter of interpretation” or “LOI”) can validate the presence of wetlands on a given property.

6.2 Wetland Types and Vegetation

Figure 26, Wetlands, illustrates the different types of wetlands and their locations within Montville Township. Table 15, which follows, provides details on the areas associated with these different wetland types.



Source 1: NJDEP 2007 Land Use/Land Cover data obtained from NJ Department of Environmental Protection, published 2010.

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Figure 26

Wetlands

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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Table 15
Wetlands by Type
Montville, New Jersey

Category Code	Wetland Type (Land Use/Land Cover Category Name)	Acreage in Township (ac)	Percent of Township (%)
Interior Wetlands			
6210	Deciduous Wooded Wetlands	1,767.85	14.45
6220	Coniferous Wooded Wetlands	1.63	0.01
6240	Herbaceous Wetlands	57.98	0.47
6241	Phragmites Dominate Wetlands	5.88	0.05
6251	Mixed Wooded Wetlands with Deciduous Prevalent	2.30	0.02
6252	Mixed Wooded Wetlands with Coniferous Prevalent	2.60	0.02
	Interior Wetlands Total	**1,838.24**	**15.03**
Interior Wetlands – Scrub/Shrub			
6231	Deciduous Brush and Bog Wetlands	157.52	1.29
6233	Mixed Brush and Bog Wetlands with Deciduous Dominant	8.46	0.07
6234	Mixed Brush and Bog Wetlands with Coniferous Dominant	5.96	0.05
	Scrub/Shrub Wetlands Total	**171.94**	**1.41**
Managed or Disturbed Wetlands			
7340	Disturbed Wetlands	19.82	0.16
1750	Managed Wetland in Maintained Lawn Greenspace	18.37	0.15
1850	Managed Wetland in Built-Up Maintained Recreation Area	13.74	0.11
1461	Wetland Rights-of-Way	81.05	0.66
	Managed or Disturbed Wetlands Total	**132.98**	**1.09**
Agricultural Wetlands			
2140	Agricultural Wetlands	40.73	0.33
2150	Former Agricultural Wetlands (Becoming Shrubby, Not Built-Up)	8.92	0.07
	Agricultural Wetlands Total	**49.65**	**0.41**
Total Wetlands Within Montville Township		**2,192.80**	**17.93**

Source: New Jersey Department of Environmental Protection: *NJDEP 2007 Land Use/Land Cover Update, Edition 20100712;* calculations by Burgis Associates, Inc.

Descriptions of the different types of wetlands within Montville Township are provided below. These descriptions are based on the NJDEP Modified Anderson Classification System (2007 Land Use/Land Cover Classification System).

1. Interior Wetlands

   These wetlands are generally found in non-tidal lowlands associated with primary, secondary and tertiary watercourses, and isolated wetlands. Included under this heading

are all forested wetland (regardless of tidal influences) dominated by deciduous and coniferous trees, and non-tidal herbaceous marshes and savannas.

a. *Deciduous Wooded Wetlands (6210).* These wetlands are closed canopy swamps dominated by deciduous trees normally associated with watercourses, edges of marshes, and isolated wetlands. The important canopy species includes Acer rubrum, Nyssa sylvatica, Fraxinus pennsylvanica, Salix nigra, Quercus bicolor, Q. phellos, Q. falcata, Liquidambar styraciflua, and Platanus occidentalis. These species combine to form a series of mixed hardwood lowland habitats throughout the entire state.

b. *Coniferous Wooded Wetlands (6220).* These wetlands are closed canopy, dominated by coniferous tree species associated with watercourses, seeps, and low topographic land. Important plant species include Tsuga canadensis, Larix laricina, and Picea mariana as monotypic stands or mixed communities.

c. *Herbaceous Wetlands (Non-Tidal Marshes) (6240).* These are wetlands dominated by various herbaceous species that are not connected or associated with tidal waters. Lake edges, open flood plains and abandoned wetland agricultural fields are locations for this cover type. Important plant species include Leersia oryzoides, Phalaris arundinacea, Nuphar lutea, Polygonum arifolium, P. sagittatum, Typha latifolia and Phragmites.

d. *Phragmites Dominate Interior Wetlands (6241).* This category contains fresh marsh areas where the common reed, Phragmites australis, dominates.

e. *Mixed Wooded Wetlands (includes 6251 – Mixed Wooded Wetlands with Deciduous Prevalent and 6252 – Mixed Wooded Wetlands with Coniferous Prevalent).* Included in this category are wetlands inhabited by mixtures of deciduous and coniferous tree species, with the dominant type of tree species greater than 50 percent but less than 75 percent. Species of each type will be similar to those identified under 6210 and 6220.

2. Interior Wetlands – Scrub/Shrub Wetlands

This brush category will include communities composed primarily of young saplings of deciduous and/or coniferous tree species.

a. *Deciduous Brush and Bog Wetlands (6231).* Important plant species include Acer rubrum, A. negundo, Liquidamber stryaciflua, Alnus serrulata, Cornus stolonifer, and C. amomum; and woody shrubs such as Vaccinium corymbosum, V. macrocarpon, Spirea alba, Viburnum dentatum, Rosa palustris, Myrica pennsylvania, M. gale, Clethra alnifolia, Cephalanthus occidentalis and Rhododendron viscosum, among others.

b. *Mixed Brush and Bog Wetlands (includes 6233 – Mixed Brush and Bog Wetlands with Deciduous Dominant and 6234- Mixed Brush and Bog Wetlands with Coniferous*

Dominant). Included in this category are brush and bog wetlands with a mixture of deciduous and coniferous species, with the dominate species greater than 50 percent but less than 75 percent. Species will be similar to those described under 6231 and 6232.

3. Managed or Disturbed Wetlands

Included in this category are former wetland areas that have been altered, but which still exhibit signs of soil saturation. These areas do not support typical wetland vegetation. They do, however, exist in areas shown on the US Soil Conservation Service soil surveys to have hydric soils.

a. *Disturbed Wetlands (7430).* Included in this category are those former natural wetlands that have been altered by some form of clearing, leveling, grading, filling and/or excavating. Because of the alterations, these areas may in fact be unvegetated. These areas may be in transition to a use or associated with a transitional development.

b. *Managed Wetland in Maintained Lawn Greenspace (1750).* Included in this category are those former natural wetland areas that now are part of an altered managed landscape. These areas are vegetated primarily by grasses and other planted vegetation that may be routinely mowed. Examples of this category would be maintained open lawns and storm water swales in residential, commercial or industrial areas. None of the wetlands included in this category are routinely inundated, although the swales may be on occasion.

c. *Managed Wetland in Built-Up Maintained Recreation Area (1850).* Included in this category are those former natural wetland areas that now are part of an altered managed recreational area. These areas are vegetated primarily by grasses and other planted vegetation that may be routinely mowed. Examples of this category would be saturated portions of golf courses, and fields used for baseball and other sports in designated recreation areas. None of the wetlands included in this category are routinely inundated, although portions may be on occasion.

d. *Wetland Rights-of-Way (1461).* Included in this category are rights-of-way that exist in former wetland areas. Although these areas may not support typical wetland vegetation because of alterations associated with creating the rights-of-way and the periodic clearing, they may support shrubby forms of the surrounding vegetation.

4. Agricultural Wetlands

Included under this heading are all agricultural and former agricultural wetlands.

a. *Agricultural Wetlands (2140).* Included in this category are lands under cultivation that are modified former wetland areas, and which still exhibit evidence of soil saturation on the photography. These agricultural wetlands exist in areas shown on soil surveys of the Natural Resources Conservation Service to have hydric soils.

b. *Former Agricultural Wetlands – Becoming Shrubby, Not Built-Up (2150).* This category includes areas previously identified as agricultural wetlands, but which do not appear to be under active cultivation. These areas have not undergone any other alterations, such as filling, grading or development. These wetlands may continue to develop into a scrub/shrub wetland area if active cultivation is not resumed.

6.3 New Jersey Freshwater Wetlands Protection Act Rules

The 1987 enactment of the New Jersey Freshwater Wetlands Protection Act, N.J.S.A. 13:9B, was followed in 1988 by the adoption of the Freshwater Wetlands Protection Act Rules, N.J.A.C. 7:7A. Subsequently, in 1994, NJDEP assumed responsibility in most of New Jersey for the Federal wetlands permitting program, also known as the "Federal 404 program" because it stems from section 404(g) of the Federal Clean Water Act, 33 U.S.C. §§ 1251 et seq. The Federal 404 program had previously been administered in New Jersey by the U.S. Army Corps of Engineers (ACOE).

The Freshwater Wetlands Protection Act Rules provide a host of regulations aimed towards the preservation of New Jersey's wetlands as well as transition areas, or "buffers." Specifically, virtually all activities proposed in wetlands are regulated, including cutting of vegetation, dredging, excavation or removal of soil, drainage or disturbance of the water level, filling or discharge of any materials, driving of pilings, and placing of obstructions. In addition, the DEP must determine the width of transition areas around wetlands, which is dependent on the sensitivity of the particular wetland. Under the Rules, wetlands are divided into three classifications based on resource value: Exceptional, Intermediate or Ordinary. Each is described below.

- *Exceptional Resource Value Wetlands*: An exceptional resource value wetland is a freshwater wetland which discharges into FW1 or FW2 trout production waters or their tributaries, is a present habitat for threatened or endangered species, or is a documented habitat for threatened or endangered species and is suitable for breeding, resting, or feeding by these species during the normal period these species would use the habitat.

- *Ordinary Resource Value Wetlands:* An ordinary resource value wetland is any freshwater wetland that is not an exceptional resource value wetland, and which is an isolated wetland, as defined at N.J.A.C. 7:7A-1.4 and 2.4.

- *Intermediate Resource Value Wetlands*: An intermediate resource value wetland is any freshwater wetland not defined as exceptional or ordinary.

A transition area is required adjacent to wetlands of exceptional or intermediate resource value, but are not required adjacent to wetlands of ordinary resource value. The standard width of a transition area required adjacent to an exceptional resource value wetland is 150 feet. The standard width of a transition area required adjacent to an intermediate resource value wetland is 50 feet. These standard widths can only be modified through the issuance of a transition area waiver. Proposed activities within all transition areas typically require permits from the DEP.

7. VEGETATION

The vegetation of an area develops in response to environmental conditions and human influences. Climate, soils, topography, hydrology and development all impact the types of plant life that can be supported in a particular area. Plant cover in Montville Township ranges from a minimum of natural vegetation in commercial areas to heavily wooded, natural reserves.

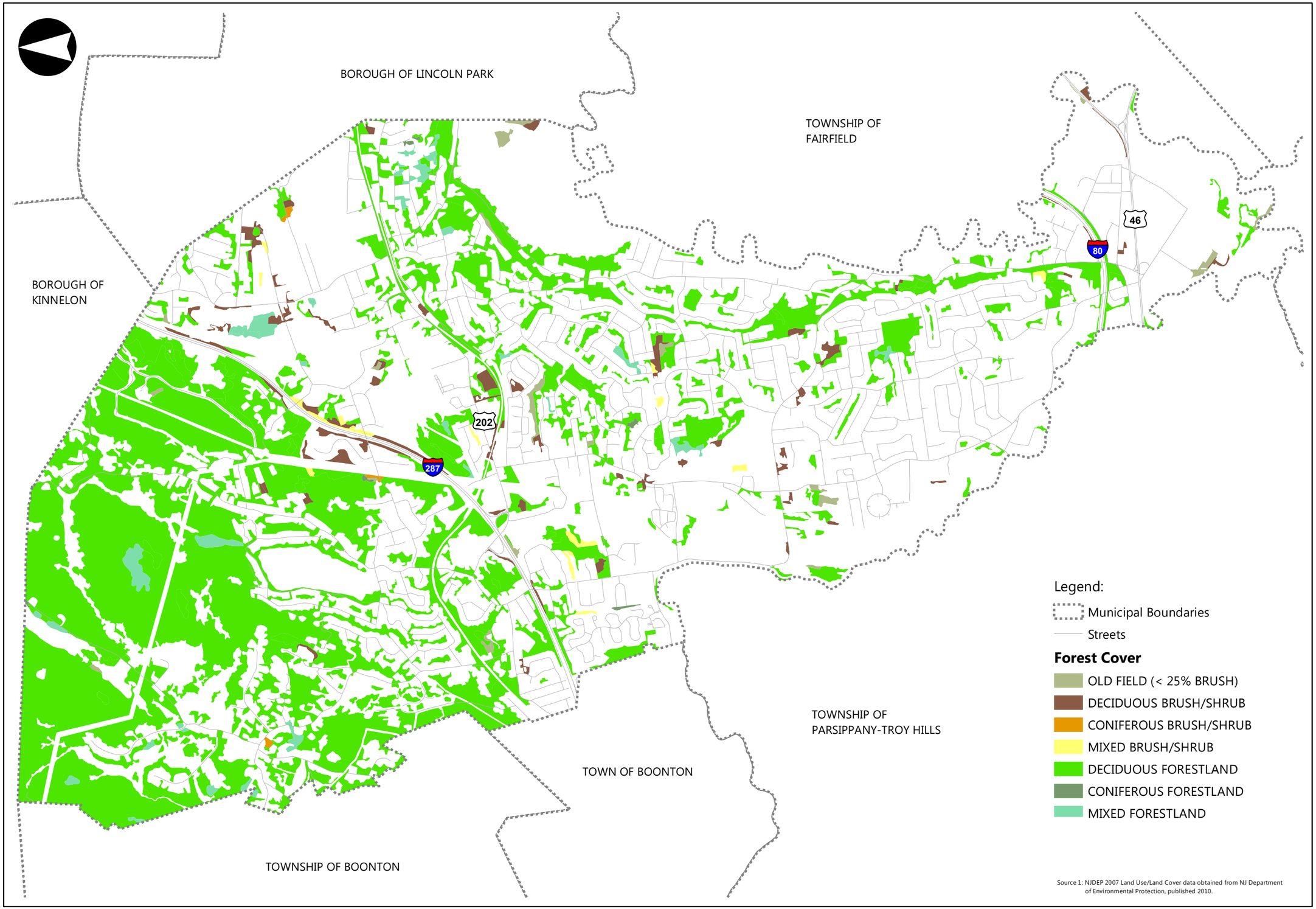
Healthy native trees and other types of vegetation can have positive effects on air quality, water quality, wildlife habitat, climate, and many other aspects of the ecology of an area. Invasive non-indigenous plants, however, can cause substantial ecological and economic problems. Some of these species cause harm by crowding out native species, contributing to species extinctions, altering the structure of natural plant communities, disrupting ecosystem functions, and degrading recreational opportunities.

7.1 Vegetative Cover

Land covers and vegetative types have been mapped by NJDEP for the entire state as part of its 2007 Land Use/Land Cover Update. Such data were produced by visually interpreting color infrared photography. Through this process, photo-interpreters examined each image and, based on their knowledge of photo signatures, classified the image into various land use/land cover categories. Figure 26, Wetlands, in the previous chapter of this document, shows the locations of wetlands within Montville Township. Figure 27, Forest Cover, shows forested areas within the municipality.

7.2 Types of Vegetation

Figure 27, Forest Cover, illustrates the different types of forestland and their locations within Montville Township. Table 16, which follows, provides details on the areas associated with these different forestland types.



Source 1: NJDEP 2007 Land Use/Land Cover data obtained from NJ Department of Environmental Protection, published 2010.

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Figure 27

Forest Cover

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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Table 16
Forestland by Type
Montville, New Jersey

Category Code	Forestland Type (Land Use/Land Cover Category Name)	Acreage in Township (ac)	Percent of Township (%)
Deciduous Forestland			
4110	Deciduous (10%-50% Crown Closure)	248.57	2.03
4120	Deciduous (>50% Crown Closure)	3,251.19	26.58
	Deciduous Forestland Total	**3,499.76**	**28.61**
Coniferous Forestland			
4220	Coniferous (>50% Crown Closure)	5.37	0.04
	Coniferous Forestland Total	**5.37**	**0.04**
Mixed Forestland			
4311	Mixed with Coniferous Prevalent (10%-50% Crown Closure)	8.88	0.07
4312	Mixed with Coniferous Prevalent (>50% Crown Closure)	32.53	0.27
4321	Mixed with Deciduous Prevalent (10%-50% Crown Closure)	5.68	0.05
4322	Mixed with Deciduous Prevalent (>50% Crown Closure)	52.76	0.43
	Mixed Forestland Total	**99.84**	**0.82**
Brushland/Shrubland			
4410	Old Field (<25% Brush Covered)	43.27	0.35
4420	Deciduous Brush/Shrubland	124.38	1.02
4430	Coniferous Brush/Shrubland	5.00	0.04
4440	Mixed Deciduous/Coniferous Brush/Shrubland	27.42	0.22
	Brushland/Shrubland Total	**200.07**	**1.64**
Total Forestland Within Montville Township		**3,805.04**	**31.11**

Source: New Jersey Department of Environmental Protection: *NJDEP 2007 Land Use/Land Cover Update, Edition 20100712;* calculations by Burgis Associates, Inc.

Descriptions of the different types of forestland within Montville Township are provided below. These descriptions are based on the NJDEP Modified Anderson Classification System (2007 Land Use/Land Cover Classification System). Forestland consists of four distinct categories: Deciduous; Coniferous; Mixed Deciduous-Coniferous; and Brushland.

1. Deciduous Forestland

   This category includes forested lands that contain deciduous tree species. Deciduous trees are those species which lose their leaves at the end of the growing season. These trees remain leafless throughout the winter and sprout new leaves the following spring. The average height of the stand is at least 20 feet. A forest stand must have at least 75 percent canopy coverage from deciduous tree species to be placed in this category.

a. *Deciduous (10%-50% Crown Closure) (4110).* This category contains deciduous forest stands that have crown closure greater than 10 percent, but less than 50 percent. Crown closure is the percentage of a forest area occupied by the vertical projections of tree crowns. Crown closure percentages provide a reasonable estimate of stand density.

b. *Deciduous (>50% Crown Closure) (4120).* This category contains deciduous stands with crown closures greater than 50 percent.

2. Coniferous Forestland

This category includes forested lands which contain coniferous tree species. Coniferous species are those trees commonly known as evergreens. They do not lose their leaves (needles) at the end of the growing season but retain them through the year. The stand must be 20 feet high and must be stocked by at least 75 percent conifers to be labeled as a coniferous stand.

a. *Coniferous (>50% Crown Closure) (4220).* This category contains natural coniferous stands with crown closures greater than 50 percent.

3. Mixed Forestland

This category consists of forested areas where there is a mixture of coniferous and deciduous trees. If less than 75 percent of the forest is dominated by either type then the stand is placed in the mixed forestland category. This category only includes forest stands greater than 20 feet in height.

a. *Mixed with Coniferous Prevalent (includes 4311 – Mixed with Coniferous Prevalent (10%-50% Crown Closure) and 4312 – Mixed with Coniferous Prevalent (> 50% Crown Closure).* This category contains stands of mixed coniferous and deciduous trees with the coniferous species greater than 50 percent. Included in this category are stands with crown closures between 10 percent and 50 percent, as well as stands with crown closures greater than 50 percent.

b. *Mixed with Deciduous Prevalent (includes 4321 – Mixed with Deciduous Prevalent (10%-50% Crown Closure) and 4322 – Mixed with Deciduous Prevalent (> 50% Crown Closure).* This category contains stands of mixed deciduous and coniferous trees with the deciduous species greater than 50 percent. Included in this category are stands with crown closures between 10 percent and 50 percent, as well as stands with crown closures greater than 50 percent.

4. Brushland/Shrubland

This category contains forestlands which are predominately 20 feet or less in height. Vegetative communities in these areas may range from early successional species which are only a few years old, to climax or sub-climax communities which are many years

old. Also included in this category are old fields that are covered primarily by grasses and some shrubs. Brushland areas represent critical habitat for many species of wildlife in New Jersey.

a. *Old Field (< 25% Brush Covered) (4410).* This category includes open areas that have less than 25 percent brush cover. The predominant cover types are grasses, herbaceous species, tree seedlings and/or saplings. An area is placed in the Old Field category if the amount of brush cover requires extensive brush removal before plowing.

b. *Deciduous Brush/Shrubland (>25% Brush Covered with Deciduous Species Predominant > 75%) (4420).* This category contains natural forested areas with deciduous species less than 20 feet in height. An area must have greater than 25 percent brush cover to be placed in this category. This category also contains inactive agricultural areas that have been grown over with brush.

c. *Coniferous Brush/Shrubland (>25% Brush Covered with Coniferous Species Predominant > 75%) (4430).* This category contains natural forested areas with coniferous species less than 20 feet in height. An area must have greater than 25 percent brush cover to be placed in this category.

d. *Mixed Deciduous/Coniferous Brush/Shrubland (>25% Brush Covered with a Mixture of Deciduous Coniferous Species; <75% of One Type) (4440).* This category contains natural forested areas less than 20 feet in height with a mixture of coniferous and deciduous trees.

For descriptions and locations of the different types of wetlands within Montville Township, see the previous chapter of this document.

7.3 Endangered Plant Species of New Jersey and Plant Species of Concern

In 1989 the New Jersey Legislature declared that "plant species have medicinal, genetic, ecological, educational, and aesthetic value to the citizens of New Jersey" and enacted the Endangered Plant Species List Act (N.J.S.A. 13:1B-15.151 et seq.). The Act directed the Division of Parks and Forestry in the Department of Environmental Protection to create the State's first official list of plant species endangered in New Jersey. Endangered plant species were defined in the Act as native species whose survival in the State or nation is in jeopardy, including plant species listed, proposed or under review by the federal government as endangered or threatened in the United States, any additional species known or believed to be rare throughout its worldwide range, and any species having five or fewer extant populations within the State.

The Endangered Plant Species List (N.J.A.C. 7:5C-1.1 et seq.) was first adopted on June 4, 1990 and most recently revised May 12, 2005. Although the list itself and the rule of which it is part do not provide any protection for officially listed species, several regulatory agencies in NJDEP

responsible for protecting plant habitat have incorporated the Endangered Plant Species List into their criteria for review of permits.

It is also noted that NJDEP, through its Natural Heritage Database, is responsible for monitoring the status of many additional plant species that are not included on the official Endangered Plant Species List. As codified in the Endangered Plant Species rules (N.J.A.C. 7:5C-3.1), this list of Plant Species of Concern includes those species not listed as endangered but whose status are monitored by the Natural Heritage Database. By combining the lists of Endangered Plant Species and Plant Species of Concern, the list of Special Plants of New Jersey includes all plant species that are considered to be of conservation concern in the State.

This list, which was most recently revised January 2010, can be found in the Appendix of this document. It is noted that this list covers all of New Jersey, and is therefore not limited to species located in Montville Township. The Township is currently in the process of updating this information as it pertains to Montville; once complete, it will be incorporated into this document by addendum.

7.4 Natural Heritage Priority Sites

Using the Natural Heritage Database, the Office of Natural Lands Management (ONLM) has identified Natural Heritage Priority Sites throughout the state. Such sites represent critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities. These areas should be considered to be top priorities for the preservation of biological diversity in New Jersey.

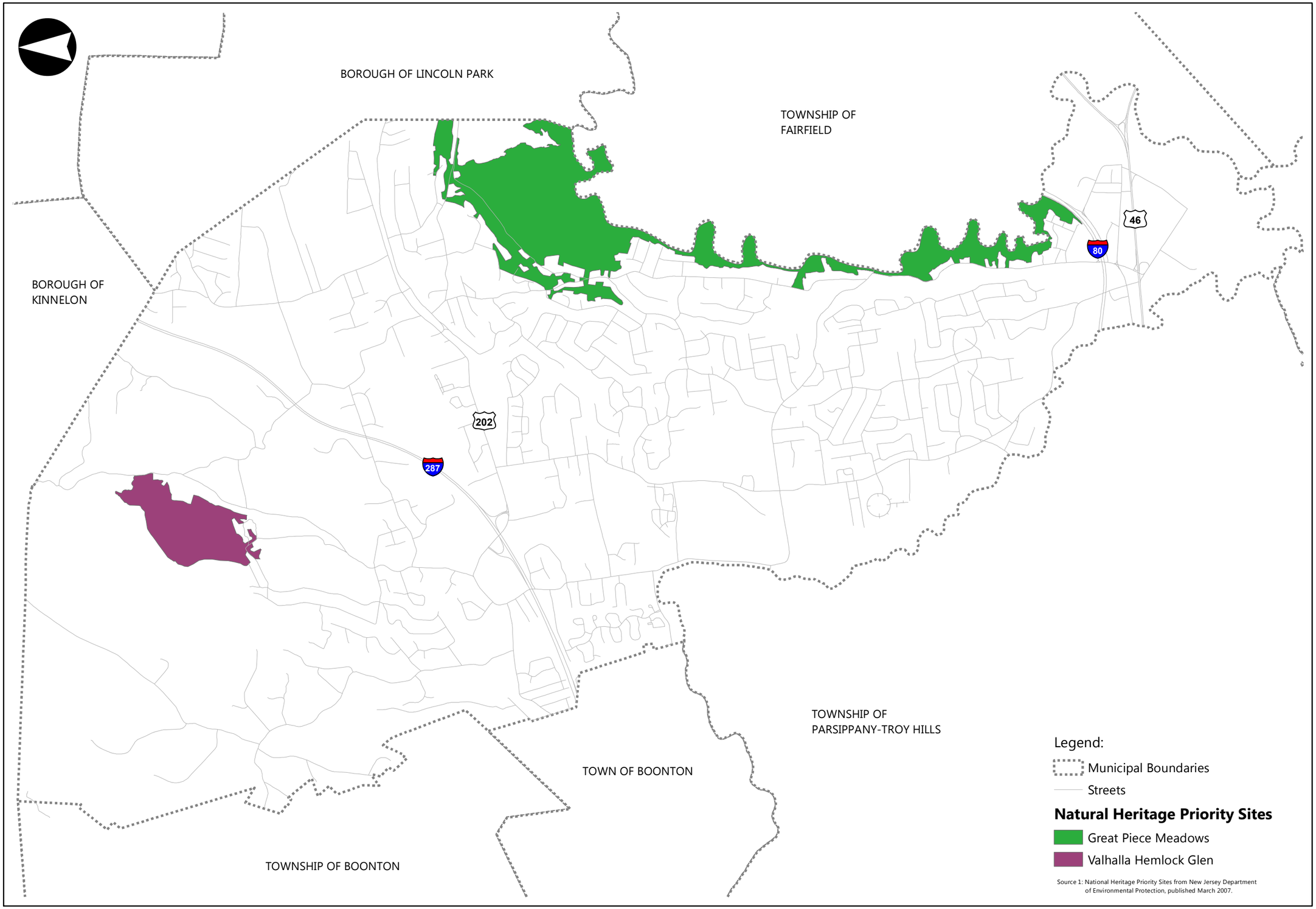
Each site is ranked according to its significance for biological diversity and can be used to distinguish between sites that are of global significance for conservation of biological diversity versus those that are of state significance. The global biodiversity significance ranks range from B1 to B5. The state biodiversity significance ranks range from V1 to V5. Descriptions for these rankings are described in the Appendix of this document.

Figure 28, Natural Heritage Priority Sites, identifies the two sites that are located wholly or partially in Montville Township. Table 17 below provides for each site a description of its physical characteristics, the type of habitat it contains, and its biological diversity ranking.

Table 17
Natural Heritage Priority Sites
Montville, New Jersey

Site Name	Physical Description	Habitat	Bio Rank
Green Piece Meadows	Mostly forested wetland complex with some scrub-shrub and emergent areas. Also includes adjacent upland forest areas.	Contains two state critically imperiled plant species and two state rare plant species.	B4V1
Valhalla Hemlock Glen	Rocky slopes in hemlock ravine with associated wetlands along small stream.	Contains good occurrence of state imperiled plant species.	B5V4

Source: New Jersey Department of Environmental Protection: *NJDEP Natural Heritage Priority Sites, Edition 200703.*



Source 1: National Heritage Priority Sites from New Jersey Department of Environmental Protection, published March 2007.

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Figure 28

Natural Heritage Priority Sites

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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7.5 New Jersey Landscape Project

The primary source of information with regard to critical habitats for animal species in Montville Township is the New Jersey Landscape Project. The Landscape Project began in 1994 by the N.J. Division of Fish and Wildlife's Endangered and Nongame Species Program (ENSP). Its goal is to protect New Jersey's biological diversity by maintaining and enhancing imperiled wildlife populations within healthy, functioning ecosystems.

The Landscape Project combines documented wildlife location information with 2007 Land Use/Land Cover data to delineate imperiled and special concern species habitat throughout the state. The most recent version of the Project (Version 3.1) identifies habitat patches that animals use and that are required to support local populations, rather than pinpointing exact locations of the most sensitive wildlife sites or simply protecting points where species happened to be observed at one point in time. These patches are then classified, or ranked, based on the status of the species present.

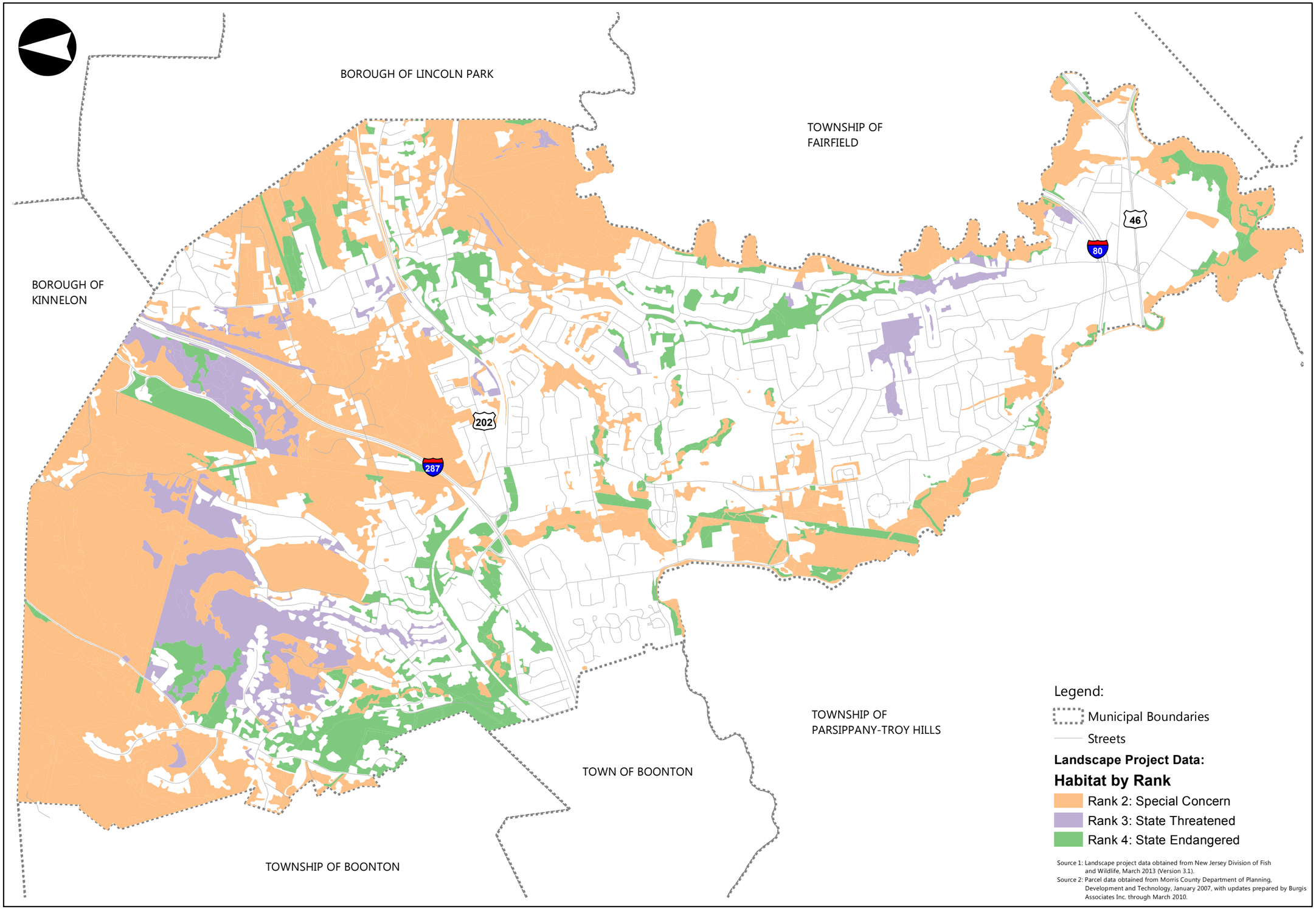
Rank 1 is assigned to habitat patches that meet habitat-specific suitability requirements for endangered, threatened or special concern wildlife species, but that do not intersect with any confirmed occurrences of such species. Rank 2 is assigned to patches containing one or more occurrences of species considered to be species of special concern. Rank 3 is assigned to patches containing one or more occurrences of State threatened species. Rank 4 is assigned to patches with one or more occurrences of State endangered species. Rank 5 is assigned to patches containing one or more occurrences of wildlife listed as endangered and threatened pursuant to the Federal Endangered Species Act of 1973.

Figure 29, New Jersey Landscape Project, illustrates the locations of critical habitat areas within Montville Township. Table 18 details the specific species within these habitats and their rank.

Table 18
Endangered, Threatened and Special Concern Species
Montville, New Jersey

Rank	Common Name	Scientific Name	Taxonomy
2	Black-billed Cuckoo	*Coccyzus erythropthalmus*	Aves
2	Brown Thrasher	*Toxostoma rufum*	Aves
2	Cooper's Hawk	*Accipiter cooperii*	Aves
2	Great Blue Heron	*Ardea herodias*	Aves
2	Northern Copperhead	*Agkistrodon contortrix mokasen*	Reptilia
2	Red-shouldered Hawk	*Buteo lineatus*	Aves
2	Tiger Spiketail	*Cordulegaster erronea*	Insecta
2	Veery	*Catharus fuscescens*	Aves
2	Wood Thrush	*Hylocichla mustelina*	Aves
3	Barred Owl	*Strix varia*	Aves
3	Wood Turtle	*Glyptemys insculpta*	Reptilia
4	Bald Eagle	*Haliaeetus leucocephalus*	Aves
4	Blue-spotted Salamander	*Ambystoma laterale*	Amphibia
4	Bobcat	*Lynx rufus*	Mammalia
4	Northern Goshawk	*Accipiter gentilis*	Aves
4	Red-shouldered Hawk	*Buteo lineatus*	Aves

Source: New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program: *NJDEP Species Based Habitat, Skylands Region, Version 3.1, Edition 20120221.*



Source 1: Landscape project data obtained from New Jersey Division of Fish and Wildlife, March 2013 (Version 3.1).
Source 2: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.

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Figure 29

New Jersey Landscape Project

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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8. CONTAMINATED SITES

Approximately 6,650 individual properties in Montville Township are served by the public water supply, the majority of which is provided by groundwater from the Township. As development in Montville has increased over time, so has the threat to the quality of our groundwater, as certain land use activities have contributed contaminants to the subsurface. In an effort to increase awareness regarding groundwater quality in the state, the NJDEP has compiled various information regarding contaminated sites. This information is explored below.

8.1 Known Contaminated Sites (Non-Homeowner)

The Known Contaminated Sites in New Jersey (KCSNJ) list is an inventory that includes all non-homeowner sites and properties within the state where contamination of soil or groundwater has been confirmed at levels equal to or greater than applicable standards. This list identifies sites in NJDEP's Site Remediation Program where remediation is currently active or pending. Active Sites are those sites having one or more active case with any number of pending and closed cases, whereas Pending Sites are those sites having one or more pending cases, no active cases, and any number of closed cases. It is important to note that some of the cases listed may have been fully remediated and should no longer be considered contaminated sites. In addition, new contaminated sites may have been identified since the creation of this list and are not included here. For further information, contact the NJDEP Site Remediation Program; for information on a particular site, see http://www.nj.gov/dep/srp/kcsnj/dmguide.htm.

According to the KCSNJ list, which is current as of February 2012, there are 31 known contaminated non-homeowner sites in Montville Township, including 28 Active Sites and 3 Pending Sites. These sites are described in more detail in Table 19 below and their locations are depicted on Figure 30, Known Contaminated Sites (Non-Homeowner).

Table 19
Known Contaminated Sites (Non-Homeowner)
Montville, New Jersey

Map ID #	PI* #	Site Name	Site Address	Remediation Status	Date Remedial Status Assigned	Remedial Level Code**
1	003879	MAROTTA SCIENTIFIC CONTROLS INC***	78 BOONTON AVE	ACTIVE	7/25/1994	D
2	005284	KEVAH KONNER INC	65 RT 46	ACTIVE	1/5/1998	C3
3	006511	TOWACO SERVICE CENTER	686 RT 202	ACTIVE	3/17/2012	C2
4	007094	EXXON R/S #35169	391 RT 202	ACTIVE	8/13/2011	C2
5	009021	PENSKE TRUCK LEASING CO LP	57 RT 46	ACTIVE	10/27/2011	C2
6	011068	SHELL SERVICE STATION 100136	287 CHANGE BRIDGE RD	ACTIVE	3/1/1994	C2
7	012582	PINE BROOK AMOCO	27 RT 46	ACTIVE	7/27/2000	C2
8	016459	TOWACO SUNOCO S/S	858 RT 202	ACTIVE	7/9/1992	C2
9	018181	ESTES EXPRESS LINES	34 CHAPIN RD	ACTIVE	2/3/2010	C2

Map ID #	PI* #	Site Name	Site Address	Remediation Status	Date Remedial Status Assigned	Remedial Level Code**
10	020165	GI AUTO SALVAGE CO INC	85 OLD BLOOMFIELD AVE	ACTIVE	7/30/1998	C2
11	027256	URMSTON REALTY CORP	3 MARS CT	ACTIVE	5/12/1997	C2
12	031069	FURON CO	337 CHANGE BRIDGE RD	ACTIVE	12/1/1987	D
13	032430	A RENT ALL CENTER/KEKON REALTY	67 RT 46	ACTIVE	1/7/1999	C2
14	033344	MONTVILLE UNITED METHODIST CHURCH	29 WHITEHALL RD	ACTIVE	3/2/2005	C2
15	160943	3 HAROLD TERRACE	3 HAROLD TER	ACTIVE	7/22/2002	NO INFO
16	208584	WOODMONT COURT AT MONTVILLE	BONNIEVIEW LN	ACTIVE	9/23/2003	B
17	420872	9 FOX ROAD	9 FOX RD	PENDING	2/7/2007	B
18	424254	57 OLD LANE	57 OLD LN	ACTIVE	7/18/2007	B
19	545737	PSE&G ELECTRIC TRANSMISSION	29 MILLERS LN	ACTIVE	11/16/2010	C1
20	550156	PSE&G ELECTRIC TRANSMISSION	BOONTON AVE	ACTIVE	1/6/2011	C1
21	550160	PSE&G ELECTRIC TRANSMISSION	77 STONY BROOK RD	ACTIVE	1/6/2011	C1
22	98850	NA-FACILITY IS VACANT	640 MAIN RD	ACTIVE	10/6/2005	C1
23	G000000 644	PENICK CORPORATION	12 TAYLORTOWN RD	ACTIVE	9/9/1979	D
24	G000003 442	MORAN PAINT COMPANY	87 RT 46	ACTIVE	8/11/1998	C2
25	G000004 148	FANTASTIC DRY CLEANING***	111 HOOK MOUNTAIN RD	ACTIVE	1/1/2011 9/30/2005	C2 C3
26	G000004 903	DESIGN RESOURCE GROUP INTERNATIONAL INC	1 CHAPIN RD	PENDING	8/4/1994	C2
27	G000008 802	FAIRCLOUGH & SONS INCORPORATED***	811 RT 202	ACTIVE	2/18/1998	D
28	G000009 943	21 DOUGLAS DRIVE	21 DOUGLAS DR	ACTIVE	10/14/1992	C2
29	G000009 944	47 MAIN ROAD	47 RT 202	ACTIVE	10/21/1992	C3
30	G000027 169	ALLBRANDS TIRE	63 RT 46	PENDING	6/7/2000	C2
31	G000060 824	PROSPECT STREET GW CONTAMINATION***	PROSPECT ST & MONTVILLE & HIGHLAND AVES	ACTIVE	1/8/2001 1/5/2001 1/8/2001	C1 C2 C3

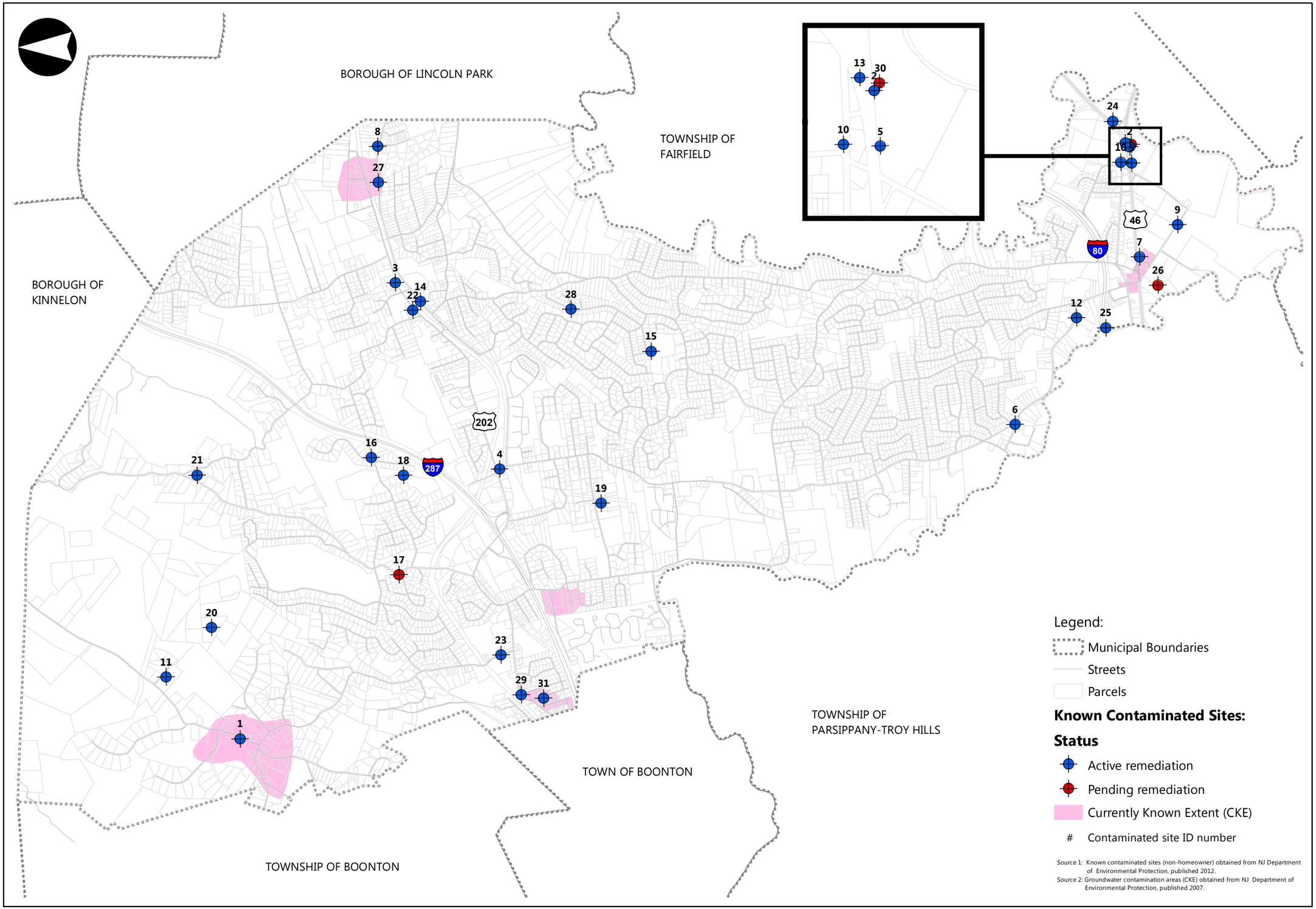
Source: NJDEP Site Remediation Program, *Known Contaminated Sites of New Jersey (KCSNJ) List, Prepared April 12, 2012;* and NJDEP Record Access Program, *Data Miner Reporting Tool for Selected Sites, Last Updated June 15, 2012.*

* Site Remediation Program Interest (PI) Number is identification number used by NJDEP to track site.
** Remedial Level Code Key:

B = Single phase RA – single contamination affecting only soils
C1 = No formal design – source known or identified – potential groundwater contamination
C2 = Formal design – known source or release with groundwater contamination
C3 = Multi –phased RA – unknown or uncontrolled discharge to soil or groundwater
D = Same as remedial level C3 plus typically deisngated as Federal Superfund Site
U = Not yet determined

*** Groundwater contamination areas (Currently Known Extent (CKE))

Note 1: Additional groundwater contamination area (CKE) at Viewmont Terrace (no associated non-homeowner site).
Note 2: See http://www.nj.gov/dep/srp/kcsnj/dmguide.htm for detailed information on a particular site.



Source 1: Known contaminated sites (non-homeowner) obtained from NJ Department of Environmental Protection, published 2012.
Source 2: Groundwater contamination areas (CKE) obtained from NJ Department of Environmental Protection, published 2007.

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Figure 30

Known Contaminated Sites (Non-Homeowner)

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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8.2 Known Contaminated Sites (Homeowner)

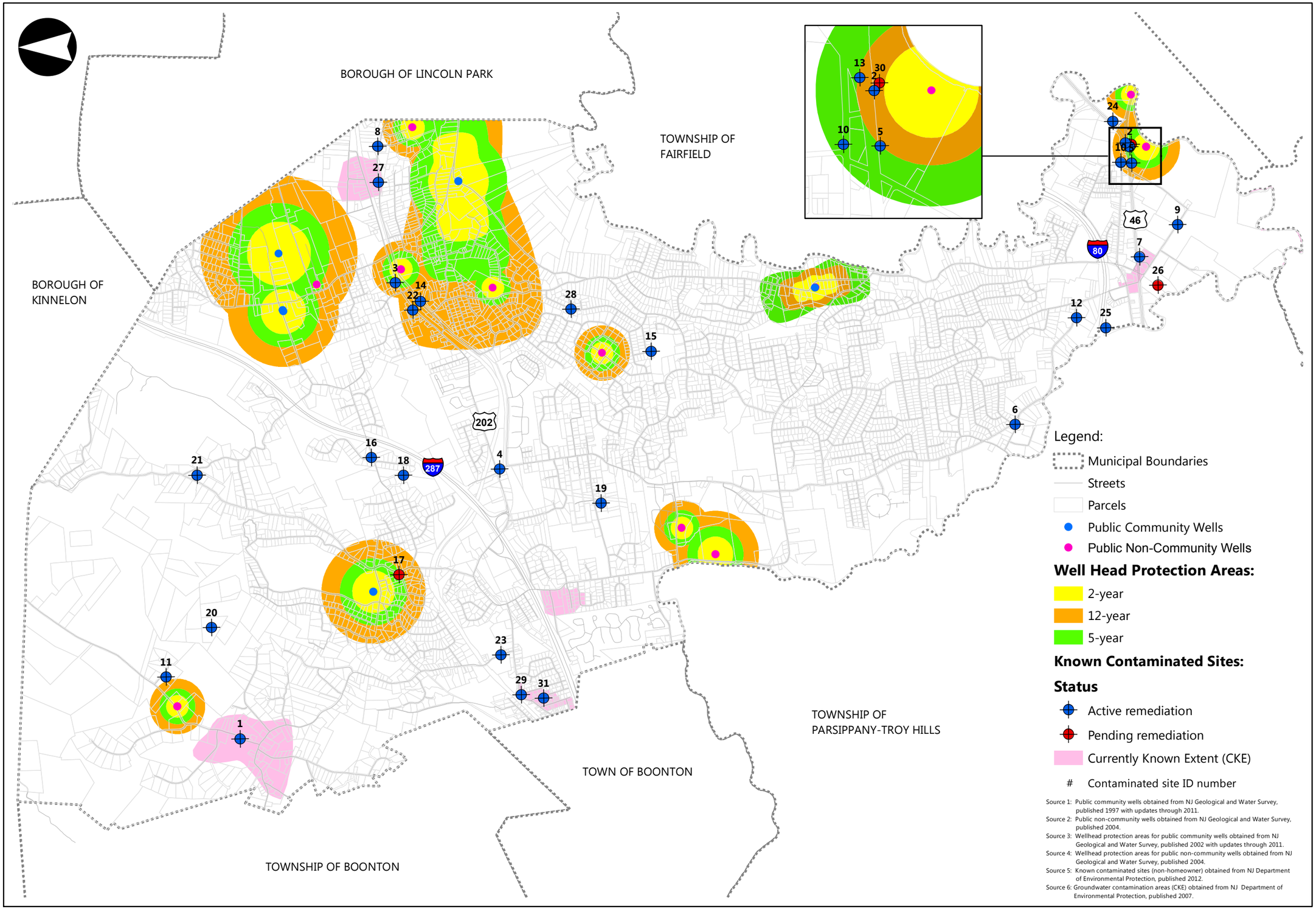
Homeowner sites and properties with known contamination of soil or groundwater are also tracked by NJDEP as part of its Site Remediation Program; however, their locations are not identified in this document. Homeowner sites generally involve small heating oil discharges that are resolved within months, making their inclusion herein likely to be inaccurate and unduly alarming. For a current list of known contaminated homeowner sites, see NJDEP's tabular report at:<http://www.state.nj.us/dep/srp/kcsnj/kcsnj_active.pdf>or<http://www.nj.gov/dep/srp/kcsnj/kcsnj_active.xls>.

8.3 Currently Known Extent (CKE) of Groundwater Contamination

NJDEP also provides information about areas in the state which are specified as the Currently Known Extent (CKE) of groundwater pollution. CKE areas are geographically defined areas within which the local groundwater resources are known to be compromised because the water quality exceeds drinking water and groundwater quality standards for specific contaminants. CKEs are used by NJDEP staff, water purveyors, and local officials to make decisions concerning appropriate treatment and/or replacement of contaminated drinking water supplies.

The CKE areas within Montville Township are identified on Figure 30, Known Contaminated Sites (Non-Homeowner), as well as in Table 19 on the preceding pages. CKE areas and known contaminated non-homeowner sites are also depicted in relation to the Township's Wellhead Protection Areas on Figure 31, Wellhead Protection Areas and Known Contaminated Sites (Non-Homeowner).

As shown, there are five CKE areas within Montville Township. It is important to note that CKEs are approximations of the actual aerial extent of groundwater contamination and the boundaries presented herein may change over time as NJDEP develops new information.



Source 1: Public community wells obtained from NJ Geological and Water Survey, published 1997 with updates through 2011.
Source 2: Public non-community wells obtained from NJ Geological and Water Survey, published 2004.
Source 3: Wellhead protection areas for public community wells obtained from NJ Geological and Water Survey, published 2002 with updates through 2011.
Source 4: Wellhead protection areas for public non-community wells obtained from NJ Geological and Water Survey, published 2004.
Source 5: Known contaminated sites (non-homeowner) obtained from NJ Department of Environmental Protection, published 2012.
Source 6: Groundwater contamination areas (CKE) obtained from NJ Department of Environmental Protection, published 2007.

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Figure 31

Wellhead Protection Areas and Known Contaminated Sites (Non-Homeowner)

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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9. HISTORIC AND CULTURAL FEATURES

Historic sites are defined by the Municipal Land Use Law (MLUL), N.J.S.A. 40:55D-1 et seq., as "any real property, man-made structure, natural object or configuration or any portion or group of the foregoing of historical, archaeological, cultural, scenic or architectural significance." Historic sites include buildings, structures and archaeological sites. Historic districts are defined by the MLUL as "one or more historic sites and intervening or surrounding property significantly affecting or affected by the quality and character of the historic site or sites." Districts include rural, residential and industrial areas, as well as historic transportation corridors, including roads, railroad routes and canals.

Montville Township contains a number of historic sites and districts – several of which are identified as such by the State and National Registers of Historic Places, while many others are designated at the local level. Each level of historic resource designation is discussed in turn below.

9.1 National and New Jersey Registers of Historic Places

The National Register of Historic Places is the official list of the nation's historic resources that are worthy of preservation. The 1966 National Historic Preservation Act established a National Register of Historic Places to include significant districts, sites, structures, buildings, and objects of local, state and national interest. This act also authorized states to create similar registers and preservation programs, which led to the creation of the New Jersey Register of Historic Places. The New Jersey Register is the official list of New Jersey's historic resources and is closely modeled after the National Register Program. Both Registers have the same criteria for eligibility, nomination form and review process.

To qualify, a property must meet one of the following criteria for evaluating significance:

a. Association with events that have made significant contribution to the broad patterns of our history; or
b. Association with the lives of significant persons in our past; or
c. Embodiment of the distinctive characteristics of a type, period or method of construction, or representative of the work of a master, or in possession of high artistic values, or representative of a significant and distinguishable entity whose components may lack individual distinction; or
d. Having yielded or may be likely to yield information important to history or prehistory.

Ordinarily, cemeteries, birthplaces, graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National or State Registers. However, such properties may qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

a. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
b. A building or structure removed from its original location, but which is primarily significant for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
c. A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building associated with his or her productive life; or
d. A cemetery that derives its primary importance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
e. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
f. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
g. A property achieving significance within the past 50 years, if it is of exceptional importance.

In addition to significance, listed properties must also possess the physical "integrity" to convey its historic, architectural, or cultural significance. Preservationists evaluate "integrity" of original location, physical design, setting, materials, workmanship, feeling or character, and the property's appearance relative to the historic period, people and events for which it is associated and significant.

The State Historic Preservation Office (SHPO) currently identifies 33 properties, sites or districts in the Township that are listed or identified as eligible for listing on the National and New Jersey Registers. These are identified in Tables 20, 21 and 22, and graphically depicted on Figure 32 (Individual Historic Sites), Figure 33 (Historic Districts), Figure 34 (Jacobus Rural Historic District), and Figure 35 (Morris Canal Historic District – NR/SR Designation). These figures are located at the end of this chapter.

Table 20
New Jersey and National Registers of Historic Places
Montville, New Jersey

Map ID #	Name*	Address	Block	Lot	State/National Register Status**
1	Beach House (Henry Beach Farm & House)	129 Old Changebridge Rd	123	16	SHPO Opinion: 11/18/10
2	Cook/Stephens House Site	***	***	***	DOE: 8/20/81; SHPO Opinion: 7/29/81
3	Davenport-Demarest House (Demarest Farm)	140 Old Changebridge Rd	124.9	10.3	NR: 1/17/92; SR: 11/25/91 (Dutch Stone Houses in Montville MPS)
4	Henry Doremus House	490 Main Rd (Rt 202)	39.10	66.1	NR: 1/17/92; SR: 11/25/91 (Dutch Stone Houses in Montville MPS) NR: 10/31/72; SR: 3/17/72 (individual nomination)
5	Doremus House Windmill	94 Waughaw Rd	21.2	47	SHPO Opinion: 5/18/81
6	Dutch Stone Houses in Montville MPDF	(See individual MPS listings)	--	--	NR: 1/17/92; SR: 11/25/91
7	Effingham Low House	102 Hook Mountain Rd	164	5	NR: 1/17/92; SR: 11/25/91 (Dutch Stone Houses in Montville MPS)
8	Former Canal House	Nowak Ln	57	5	DOE: 8/20/81; SHPO Opinion: 7/29/81
9	Iron Mines	***	***	***	SHPO Opinion: 7/29/81 (DOE: 9/3/81 found site Not Eligible)
10	Jacobus Rural Historic District	(See Table 21)	--	--	DOE: 9/28/81; SHPO Opinion: 7/29/81
11	Abraham A. Jacobus House	82 Waughaw Rd	21.2	46.1	SHPO Opinion: 5/18/81
12	Daniel Jacobus House & Farmstead	88 Old Ln	21.2	45	DOE: 9/3/81; SHPO Opinion: 7/29/81
13	H. Jacobus House (Cornelius Jacobus House)	2 Indian Ln	24.2	31.4	SHPO Opinion: 5/18/81
14	John I. Jacobus House Site	***	***	***	SHPO Opinion: 7/29/81
15	Jersey City Water Works Historic District	Boonton to Jersey City – reservoirs and pipelines	--	--	SHPO Opinion: 2/20/03
16	Montville Schoolhouse	6 Taylortown Rd	56	7	NR: 12/11/09; SR: 9/11/09; COE 3/22/05
17	Morris Canal Historic District	(See Table 22)	--	--	NR: 10/1/74; SR: 11/26/73; SHPO Opinion 4/27/04
18	PNJ Interconnection Bushkill to Roseland Transmission Line	Middle Smithfield, PA to Roseland, NJ – transmission line ROW	--	--	SHPO Opinion: 9/9/11
19	Johannes Parlaman House	16 Vreeland Ave	54	18	NR: 1/17/92; SR: 11/25/91 (Dutch Stone Houses in Montville MPS)

Map ID #	Name*	Address	Block	Lot	State/National Register Status**
20	Parsonage of the Montville Reformed Dutch Church (Cornelius T. Doremus House)	107 Changebridge Rd	123	2	NR: 1/17/92; SR: 11/25/91 (Dutch Stone Houses in Montville MPS)
21	Prehistoric site: 28-MR-195	***	***	***	DOE: 9/28/81; SHPO Opinion: 5/18/81
22	Prehistoric site: 28-MR-197	***	***	***	DOE: 9/28/81; SHPO Opinion: 7/29/81
23	Schneider Prehistoric Archaeological Site	***	***	***	SHPO Opinion: 6/25/80
24	Martin Van Duyne House	292 Main Rd (Rt 202)	57	8	NR: 1/17/92; SR: 11/25/91; DOE: 9/3/81; SHPO Opinion: 5/18/81 (Dutch Stone Houses in Montville MPS)
25	Van Duyne Cider Mill	160 Pine Brook Rd	122	23	COE: 3/22/05
26	Van Duyne-Jacobus House	29 Changebridge Rd	59.2 63	3-12 11-16	NR: 1/17/92; SR: 11/25/91 (Dutch Stone Houses in Montville MPS)
27	James Van Duyne Farmhouse	32 Waughaw Rd	39	17	NR: 4/15/82; SR: 1/14/82
28	Simon Van Duyne House	58 Maple Ave	165	5	NR: 1/17/92; SR: 11/25/91 (Dutch Stone Houses in Montville MPS)
29	Van Duyne-Como Pre-historic Archaeological Site	***	***	***	SHPO Opinion: 6/25/80
30	Van Ness Prehistoric Archaeological Site	***	***	***	SHPO Opinion: 6/25/80
31	Nicholas Vreeland Outkitchen (T. Vreeland Outkitchen)	52 Jacksonville Rd	40	7.1	NR: 12/11/09; SR: 9/10/09; DOE: 9/3/81; SHPO Opinion: 9/21/78; COE: 5/3/04
32	Vreeland House (Jacob Taylor House)	164 Boonton Ave	1	6	SHPO Opinion: 11/18/10
33	Vreeland-Van Duyne House (Henry Vreeland Farm)	50 Jacksonville Rd	40	10	DOE: 9/3/81; SHPO Opinion: 9/21/78

Sources: New Jersey's State Historic Preservation Office (SHPO) historic properties listings, last updated 6/4/2012; SHPO Opinions; and discussions with SHPO Historic Preservation Specialists.

* Where appropriate, SHPO names are followed in parentheses by names used in Montville Township's list of Locally Designated Historic Sites and Districts.

** Glossary of abbreviations:

COE: A Certification of Eligibility is issued by the New Jersey State Historic Preservation Officer. For properties not already listed on the New Jersey Register of Historic Places, a COE satisfies a prerequisite to apply for funds from the New Jersey Historic Trust, as well as several county preservation funding programs.

DOE: A Determination of Eligibility is issued by the Keeper of the National Register, National Park Service, Department of Interior. It is a formal certification that a property is eligible for registration.

MPDF: A Multiple Property Documentation Form is the core of a Multiple Property Submission, the format currently used to register groups of properties that are related by historical association or theme, but are not contiguous and need not be nominated all at the same time. A Multiple Property Documentation Form contains the historic contexts, and the background historical, geographical, and architectural information about the group of properties being nominated, and is accompanied by one or more Registration Forms that describe specific properties. Together, the MPDF and its associated Registration Forms comprise a Multiple Property Submission.

MPS: A Multiple Property Submission is the name given to the current format for nominating groups of properties related by historical association or theme, but which are not contiguous and need not be nominated all at the same time. In 1986, this format replaced the previously used Thematic and Multiple Resource Area (TRA/MRA) formats. A MPS consists of a Multiple Property Documentation Form and its associated Registration Forms. In the following lists, properties registered as part of a Multiple Property Submission indicate the name of the MPS of which it was a part.

NR: This abbreviation indicates that a property is listed on the National Register of Historic Places.

SHPO Opinion: This is an opinion of eligibility issued by the State Historic Preservation Officer. It is in response to a federally funded activity that will have an effect on historic properties not listed on the National Register.

SR: This abbreviation indicates that a property is listed on the New Jersey Register of Historic Places (State Register).

*** Archaeological sites: locations kept confidential to prevent looting. Map includes 1 square mile grids indicating the presence of archaeological sites.

Table 21
Jacobus Rural Historic District - Individual Sites
Montville, New Jersey

Map ID #	Name*	Block	Lot	Comments
		21.2	42 (partial)	
12	Daniel Jacobus House & Farmstead	21.2	45	Eligible (Indv.) for NR/SR, Locally Designated
		21.2	45.2 (partial)	
		21.2	45.8	
		21.2	45.9	
		21.2	45.10	
10a	Vreeland House	21.2	46	Eligible (HD) for NR/SR
11	Abraham A. Jacobus House	21.2	46.1	Eligible (Indv.) for NR/SR, Locally Designated
5	Doremus House Windmill	21.2	47	Eligible (Indv.) for NR/SR
13	H. Jacobus House (Cornelius Jacobus House)	24.2	31.4	Eligible (Indv.) for NR/SR, Locally Designated
		24.2	31.5	
		24.2	31.6 (partial)	
		39	7.1	
		39	7.2	
38	Brandt A. Jacobus House	39	7.3	Eligible (HD) for NR/SR, Locally Designated
10b	Garret B. Jacobus House	40	67	Eligible (HD) for NR/SR
		40	68	
		40	68.1	
43	David Jacobus House	40	69	Eligible (HD) for NR/SR, Locally Designated
		40	69.1	
		40	69.3 (partial)	
10c	Bonnie View Farm Ruins	***	***	Eligible (HD) for NR/SR

Source: NJDEP Geo-Web Mapping Tool, last updated 6/1/2011.

* Where appropriate, SHPO names are followed in parentheses by names used in Montville Township's list of Locally Designated Historic Sites and Districts.

*** Archaeological sites: locations kept confidential to prevent looting. Map includes 1 square mile grids indicating the presence of archaeological sites.

Table 22
Morris Canal Historic District – Individual Sites*
Montville, New Jersey

Block	Lot	Name
52.2	29	
51	19.5	
51	19.6	Morris Canal Plane 8E (Listed (HD) on NR/SR)
51	28	Morris Canal Plane 8E (Listed (HD) on NR/SR)
51	29	Morris Canal Plane 8E (Listed (HD) on NR/SR)
51	30.1, 30.2	
51	31	Morris Canal Plane 8E (Listed (HD) on NR/SR)
51	32	Plane Tender's House (Listed (HD) on NR/SR)
51	33, 34, 35	
51	36	Morris Canal Plane 9E (Listed (HD) on NR/SR)
51	37, 38, 39, 40	
56	6.1	Deck's Grist Mill (Listed (HD) on NR/SR)
56	13	Morris Canal Plane 9E (Listed (HD) on NR/SR)
56	14	Morris Canal Plane 9E (Listed (HD) on NR/SR); Deck's Grist Mill (Listed (HD) on NR/SR); Canal House a.k.a. Canal Store (Locally Designated)
56	15.1	Deck's Grist Mill (Listed (HD) on NR/SR)
59	1, 2, 3, 4, 5, 6, 7, 7.1, 7.2, 8, 9, 10, 11, 29, 30	
57	1.2, 2, 3, 5, 6, 6.1, 7, 10	
55	1, 2	
61.1	1	
61	1	
59.2	21, 21.1, 22, 23, 24, 25, 26	
44	1, 5	
82.9	12, 12.1, 12.2, 12.3, 13.2	
82.16	11, 12.4, 17.1, 19, 19.1, 20, 20.2	
95	1, 2, 10, 12, 13, 14, 15	
98	1, 2, 3, 4, 5, 20, 21, 23	
100	1, 2, 4.16, 5, 5.1, 5.2	
101	1, 2, 3, 4	
104	1	Morris Canal Bridge 98-A (Listed (HD) on NR/SR)
104	2, 3, 4, 5, 6	
109	1	Morris Canal Bridge 98-A (Listed (HD) on NR/SR)
109	2	Morris Canal Bridge 98-A (Listed (HD) on NR/SR)
109	3, 3.3, 4.1, 4.2, 5.1, 5.2, 6, 7, 8, 11, 12, 13, 17, 18, 19, 20, 21, 25, 26, 27, 30.20	
110	13, 14, 15, 16.1, 17.1, 18, 18.1	
110	19	Morris Canal Plane 10E (Listed (HD) on NR/SR)
110	20	Morris Canal Plane 10E (Listed (HD) on NR/SR)
110	21.3, 21.4	
110	22	Morris Canal Plane 10E (Listed (HD) on NR/SR)

Source: NJDEP Geo-Web Mapping Tool, last updated 6/1/2011.
* Parcels on this list are either entirely or partially located within the boundaries of the Morris Canal Historic District.

9.2 Locally Designated Historic Resources

As set forth in Chapter 230, Article XXV, of the Township Code, Montville's Historic Preservation Review Commission (HPRC) has the power to identify historic landmarks, sites and districts within the Township that are worthy of preservation at the local level. In order to be designated on the local register, a property or district must be worthy of preservation because of its historical, cultural, social or architectural significance in that it possesses integrity of location, design, setting, material workmanship. In addition, the property or district must meet one of the following criteria:

A. Be associated with events that have made a significant contribution to the history of the Township, state or nation;

B. Be associated with the lives of significant persons in our past;

C. Embody the distinctive characteristics of a type, period or method of construction, represent the work of a master or possess high artistic values; or

D. Have yielded or may be likely to yield information important in prehistory or history.

Once a potential historic site or district has been identified, the Planning Board, either directly or by delegating the responsibility to the HPRC, notifies the owner that their property will be considered for designation as a historic landmark, advise them of the significance and consequence of same, and advise them of their right to be heard concerning such designation. The Planning Board then holds a public hearing, at which all interested persons shall be entitled to present their opinions, suggestions and objections. After full consideration of the evidence brought out at the public hearing, and upon considering any recommendations of the HPRC, the Planning Board makes its decision and issues a final report to the public stating reasons in support of its action with respect to the historical designation.

Any proposed designation by the Planning Board is then forwarded to the Township Committee for a final determination of designation and, if designated, included in the Master Plan. Following adoption of a designation ordinance, certificates of designation are then served upon the owner of the site so designated, and copies are filed with the Tax Collector and the Tax Assessor, who maintain a record of all historic designations in the tax rolls. Notice of the designation is also made to the office of the Construction Official.

Since the establishment of the HPRC in 1998, a total of 53 historic sites and two historic districts have been locally designated for preservation. These are identified in Tables 23, 24 and 25, and graphically depicted on Figure 32 (Individual Historic Sites), Figure 33 (Historic Districts), Figure 36 (Capstick Historic District), and Figure 37 (Morris Canal in Montville Historic District – Local Designation). These figures are located at the end of this chapter.

Table 23
Locally Designated Historic Sites and Districts
Montville, New Jersey

Map ID #	Name*	Address	Block	Lot	Comments
32	Jacob Taylor House (Vreeland House)	164 Boonton Ave	1	6	Eligible (Indv.) for NR/SR
12	Daniel Jacobus House & Farmstead	88 Old Ln	21.2	45	Eligible (Indv.) for NR/SR; Jacobus Rural Historic Dist
11	Abraham A. Jacobus House	82 Waughaw Rd	21.2	46.1	Eligible (Indv.) for NR/SR; Jacobus Rural Historic Dist
13	Cornelius Jacobus House (H. Jacobus House)	2 Indian Ln	24.2	31.4	Eligible (Indv.) for NR/SR; Jacobus Rural Historic Dist
34	J.J. Vreeland House	80 Jacksonville Rd	24.2	51	
35	A.H. Van Ness Farm & Sawmill	21 Brook Valley Rd	29	1, 1.2	
36	J.H. Vreeland House	85 Jacksonville Rd	32	1	
37	S. Van Ness Farm	73 Jacksonville Rd	32	15, 15.1, 15.2	
38	Brandt A. Jacobus House	64 Waughaw Rd	39	7.3	Eligible (HD) for NR/SR; Jacobus Rural Historic Dist
27	James Van Duyne Farmhouse	32 Waughaw Rd	39	17	Listed (Indv.) on NR/SR
39	Van Duyne Family Graveyard	19 Duynecrest Rd	39	18.2	
40	Martin A. Van Duyne House	22 Waughaw Rd	39	21	
4	Henry Doremus House	490 Main Rd (Rt 202)	39.10	66.1	Listed (Indv.) on NR/SR
41	Vreeland House	444 Main Rd (Rt 202)	39.11	79	
31	T. Vreeland Outkitchen (Nicholas Vreeland Outkitchen)	52 Jacksonville Rd	40	7.1	Listed (Indv.) on NR/SR
33	Henry Vreeland Farm (Vreeland-Van Duyne House)	50 Jacksonville Rd	40	10	Eligible (Indv.) for NR/SR
42	Whitehall School a.k.a. Lyceum Theater	7 Waughaw Rd	40	56	
43	David Jacobus House	69 Waughaw Rd	40	69	Eligible (HD) for NR/SR; Jacobus Rural Historic Dist
44	A. Hyler House a.k.a. Dr. Longstreet House	84 Main Rd (Rt 202)	46	4.1, 4.2	
45	Banta House	2 Viewmont Terrace	52	56	
46	William Hamma House	77 River Rd	54	4	
47	Zabriskie Mill Foundation	87 River Rd	54	6	
19	Johannes Parlaman House	16 Vreeland Ave	54	18	Listed (Indv.) on NR/SR
48	Canal House a.k.a. Canal Store	160 Main Rd (Rt 202)	56	14	
49	Christopher Barmore House	228 Main Rd (Rt 202)	56	21	
50	Elijah A. Baldwin House	14 Valhalla Rd	56	26	
51	Baldwin-Van Duyne Tannery	11 Valhalla Rd	57	2	
52	John Van Duyne Farmstead	240 Main Rd (Rt 202)	57	4	
24	Martin Van Duyne House	292 Main Rd (Rt 202)	57	8	Listed (Indv.) on NR/SR

Map ID #	Name*	Address	Block	Lot	Comments
53	Andrew Decker House	199 Main Rd (Rt 202)	59	1	
54	Lawrence Tavern a.k.a. Husk	245 Main Rd (Rt 202)	59	13	
55	Demouth Ice House	261 Main Rd (Rt 202)	59	14	
56	Miller Homestead	56 Millers Ln	59.1	5.1, 5.2	
57	C.H. Renshaw House	40 River Rd	59.1	6.9	
58	J. Blowers House	34 River Rd	59.1 59.4	8.1-8.8 28-32	
59	Philip Hyler House a.k.a. H. Collard House	319 Main Rd (Rt 202)	59.1	19	
26	Van Duyne-Jacobus House	29 Changebridge Rd	59.2 63	3-12 11-16	Listed (Indv.) on NR/SR
60	E. Jacobus House a.k.a. H. Miller House	56 River Rd	76	15	
61	A.H. Zabriskie House	36 & 38 Church Ln	76.1	8.2, 8.3	
62	E.E. Hitchell House	21 Whitehall Rd	98	4	
63	Kelly Store a.k.a. Canal House	855 Main Rd (Rt 202)	109	22	
64	W.H. Van Duyne House	2 Weldon Pl	121	2	
65	Van Duyne Farm	3 Clay Dr	122	21.1-21.5	
25	Van Duyne Cider Mill	160 Pine Brook Rd	122	23	Eligible (Indv.) for NR/SR
20	Cornelius T. Doremus House (Parsonage of the Montville Reformed Dutch Church)	107 Changebridge Rd	123	2	Listed (Indv.) on NR/SR
1	Henry Beach Farm & House (Beach House)	129 Old ChangebridgeRd	123	16	Eligible (Indv.) for NR/SR
3	Demarest Farm (Davenport-Demarest House)	140 Old ChangebridgeRd	124.9	10.3	Listed (Indv.) on NR/SR
66	Samuel Stiles House	157 Changebridge Rd	131	16	
67	H. Collard House	192 Changebridge Rd	139.11	39	
68	True Dutch Reform Cemetery	200 Changebridge Rd	141.5	13	
7	Effingham Low House	102 Hook Mountain Rd	164	5	Listed (Indv.) on NR/SR
28	Simon Van Duyne House	58 Maple Ave	165	5	Listed (Indv.) on NR/SR
69	Dayton Farm	43 Chapin Rd	184	6.1	
70	Capstick Historic District	(See Table 24)	--	--	
17	Morris Canal in Montville Historic District	(See Table 25)	--	--	Also See Listing on NR/SR

Source: Montville Township Historic Preservation Review Commission (HPRC).
* Where appropriate, locally used names are followed in parentheses by names used by SHPO on the New Jersey and National Registers of Historic Places.

Table 24
Capstick Historic District – Individual Sites
Montville, New Jersey

Map ID #	Name	Address	Block	Lot
70a	Capstick Factory/Globe & Columbia Print Works and Montville Finishing Company	3 & 12 Taylortown Rd	46 56	1 6
70b	John Capstick House	28 Taylortown Rd	18	31
70c	John Capstick Jr. House	28A Taylortown Rd	18	28
70d	Thomas Capstick House	28B Taylortown Rd	18	27
70e	Capstick Superintendant W.J. Coles/ J.H. Van Ness House	25 & 25A Taylortown Rd	34	11, 11.1
70f	Capstick Estate Barn & Icehouse	23 Taylortown Rd	34	12
70g	Mill Foremen's Row	18, 20, 22 & 24 Taylortown Rd	56	2-5
70h	Excelsior Fire House	12 Taylortown Rd	56	6
70i	Montville Schoolhouse*	6 Taylortown Rd	56	7
70j	Montville Methodist Episcopal Church	4 Taylortown Rd	56	8
70k	Capstick Print Works Store	109 Main Rd (Rt 202)	51	26

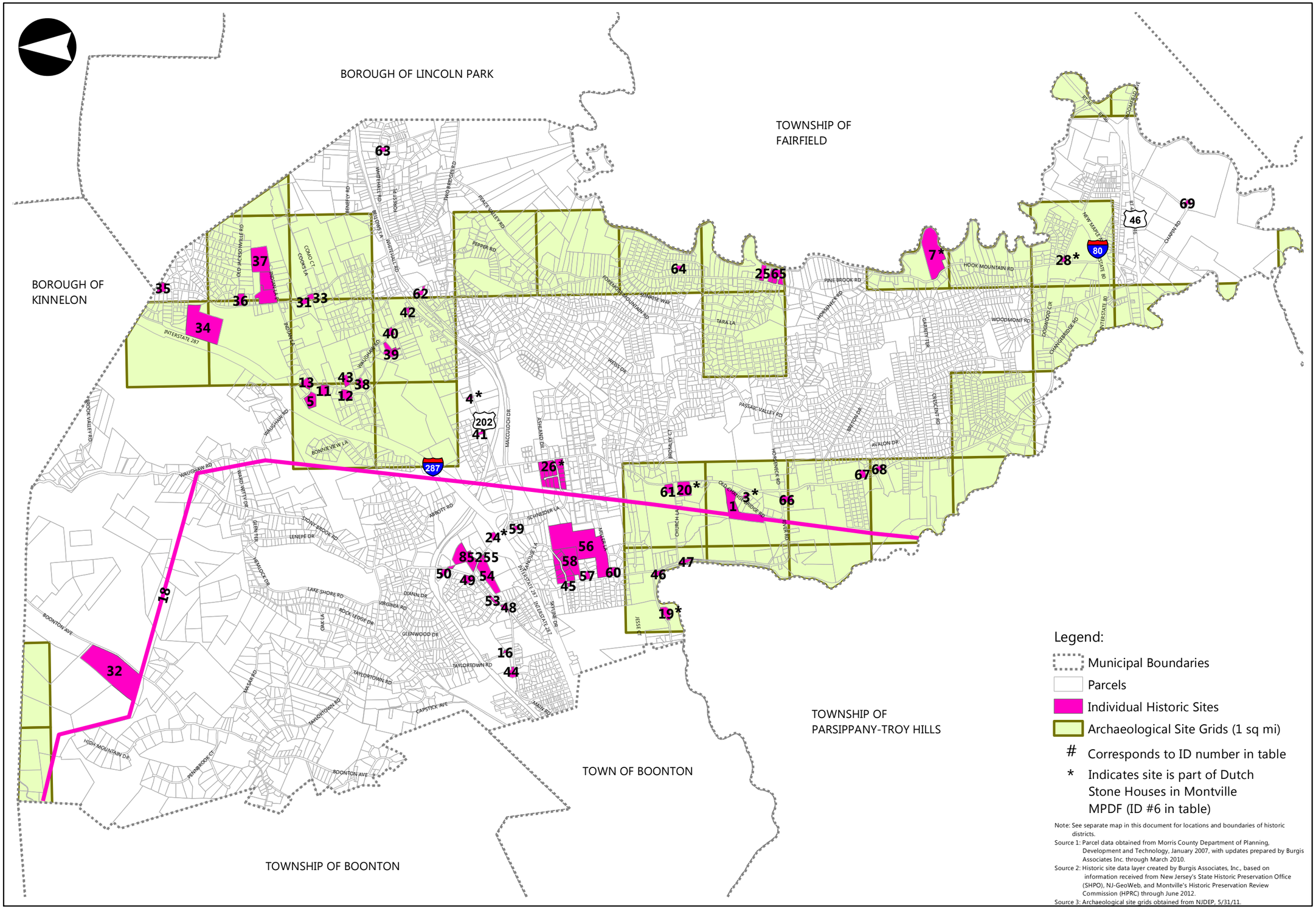
Source: Township of Montville Historic Preservation Review Commission (HPRC).
* Listed (Indv.) on NR/SR.

Table 25
Morris Canal in Montville Historic District – Individual Sites
Montville, New Jersey

Name	Block	Lot
Plane 8E Powerhouse Top of Plane 8E	51	29
Pool between 8E & 9E, Weir, Stone Bank	51	31
9E Plane Tender's House	51	32
Top Plane 9E, Bridge # 88	51	36
Plane 9E, Bridge # 88	56	13
Bottom 9E, Bridge # 89, Canal House*	56	14
Bridge # 90	59	7
	59	7.1
Bridge # 89	59	7.2
Waste Weir, Basins	57	1.1, 1.2
Bridge # 91	57	2
Bridge # 90, 91	57	3
	57	5
Bridge # 92	57	6.1
Bridge # 92	57	7
Bridge # 93	57	10
Bridge # 94	55	1
Bridge # 94	55	2
Bridge # 94, to centerline Bridge # 93, Route 287	59.2	21
to centerline	59.2	21.1
to centerline	59.2	22

Name	Block	Lot
to centerline	59.2	23
to centerline	59.2	24
to centerline	59.2	25
Bridge # 94, Changebridge # 95	59.2	26
Basin, Bridge # 96	82.9	12, 12.1-12.3
	82.16	20
	82.16	20.2
Bridge # 97	95	13
Basin, Bridge # 97	98	5
Basin	100	1
Bridge # 98, Graveyard	100	2
See Lot 5.2	100	5
	100	5.1
	100	5.2
Bridge # 98A, Dorsey Pond	109	2
Prism Filled	109	3
Prism Filled	109	3.3
Prism Filled	109	4.1
Prism Filled	109	4.2
Prism Filled	109	5.1
Prism Filled	109	5.2
	109	6
	109	7
	109	11
	109	13
	109	17
Basin, Bridge # 99	109	21
Bridge # 99	110	14
Plane # 10E top.	110	16.1
Plane # 10E top.	110	17.1
Plane # 10E, Tender's House	110	18
Plane # 10E, Powerhouse	110	18.1
Plane # 10E, Powerhouse	110	19
Plane # 10E	110	20
Plane # 10E	110	22

Source: Township of Montville Historic Preservation Review Commission (HPRC).
* Locally designated as Individual Landmark Site.



Note: See separate map in this document for locations and boundaries of historic districts.

Source 1: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.

Source 2: Historic site data layer created by Burgis Associates, Inc., based on information received from New Jersey's State Historic Preservation Office (SHPO), NJ-GeoWeb, and Montville's Historic Preservation Review Commission (HPRC) through June 2012.

Source 3: Archaeological site grids obtained from NJDEP, 5/31/11.

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TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

Figure 32

Individual Historic Sites

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 550 1,100 2,200 3,300 Feet

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Date	03.04.13
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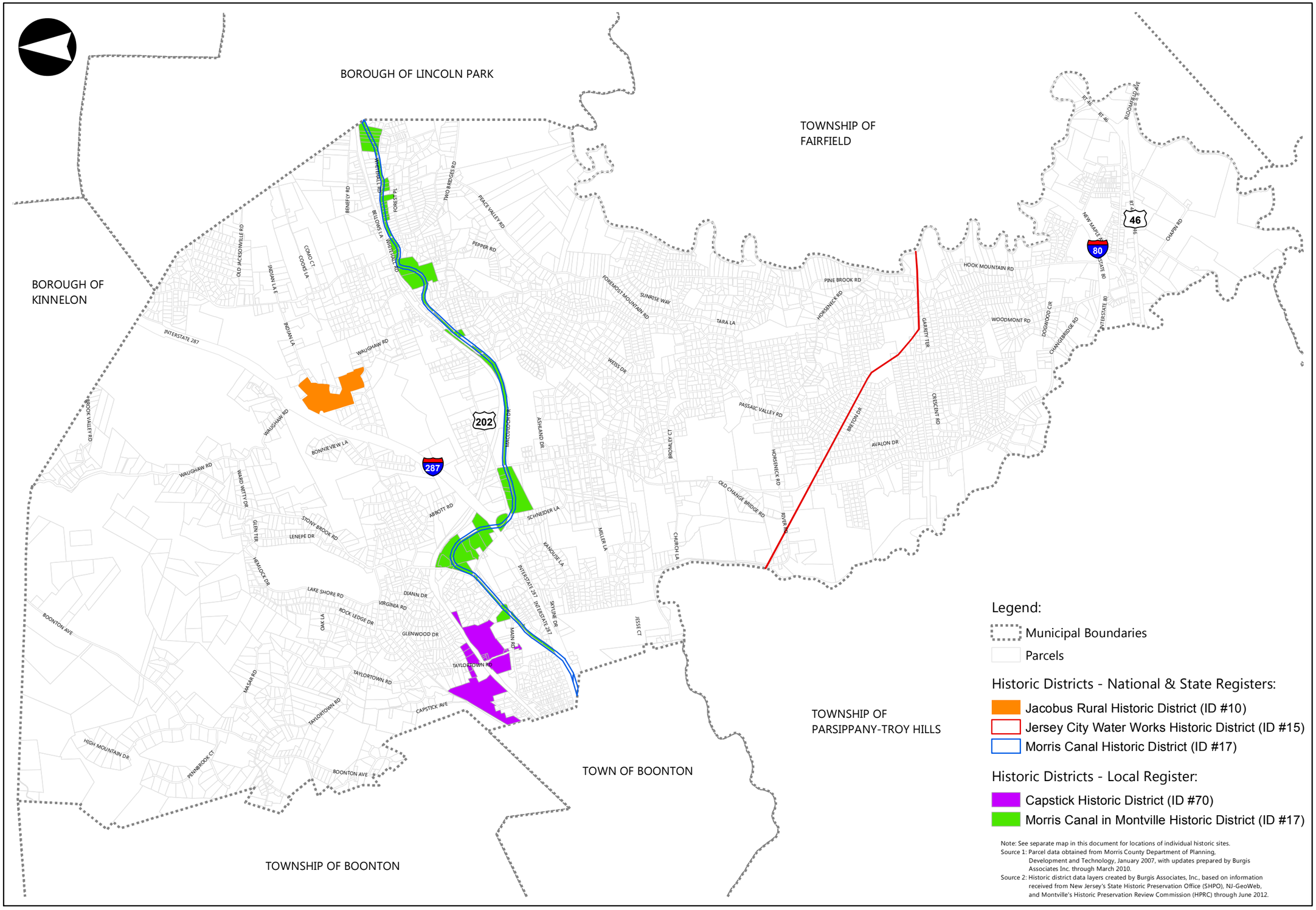

Note: See separate map in this document for locations of individual historic sites.
Source 1: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.
Source 2: Historic district data layers created by Burgis Associates, Inc., based on information received from New Jersey's State Historic Preservation Office (SHPO), NJ-GeoWeb, and Montville's Historic Preservation Review Commission (HPRC) through June 2012.

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Figure 33

Historic Districts

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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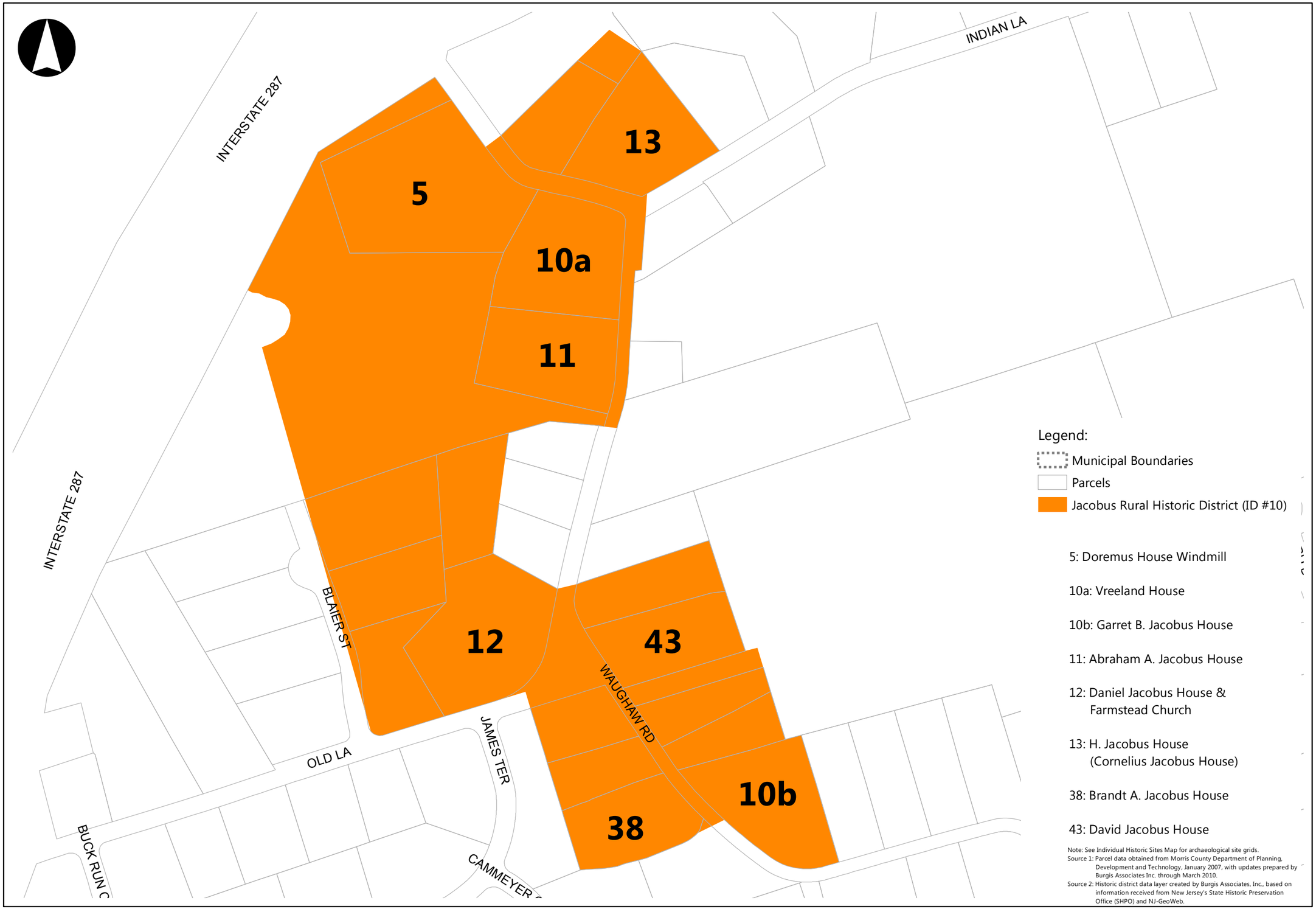

Note: See Individual Historic Sites Map for archaeological site grids.
Source 1: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.
Source 2: Historic district data layer created by Burgis Associates, Inc., based on information received from New Jersey's State Historic Preservation Office (SHPO) and NJ-GeoWeb.

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TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

Figure 34

Jacobus Rural Historic District

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 40 80 160 240 Feet

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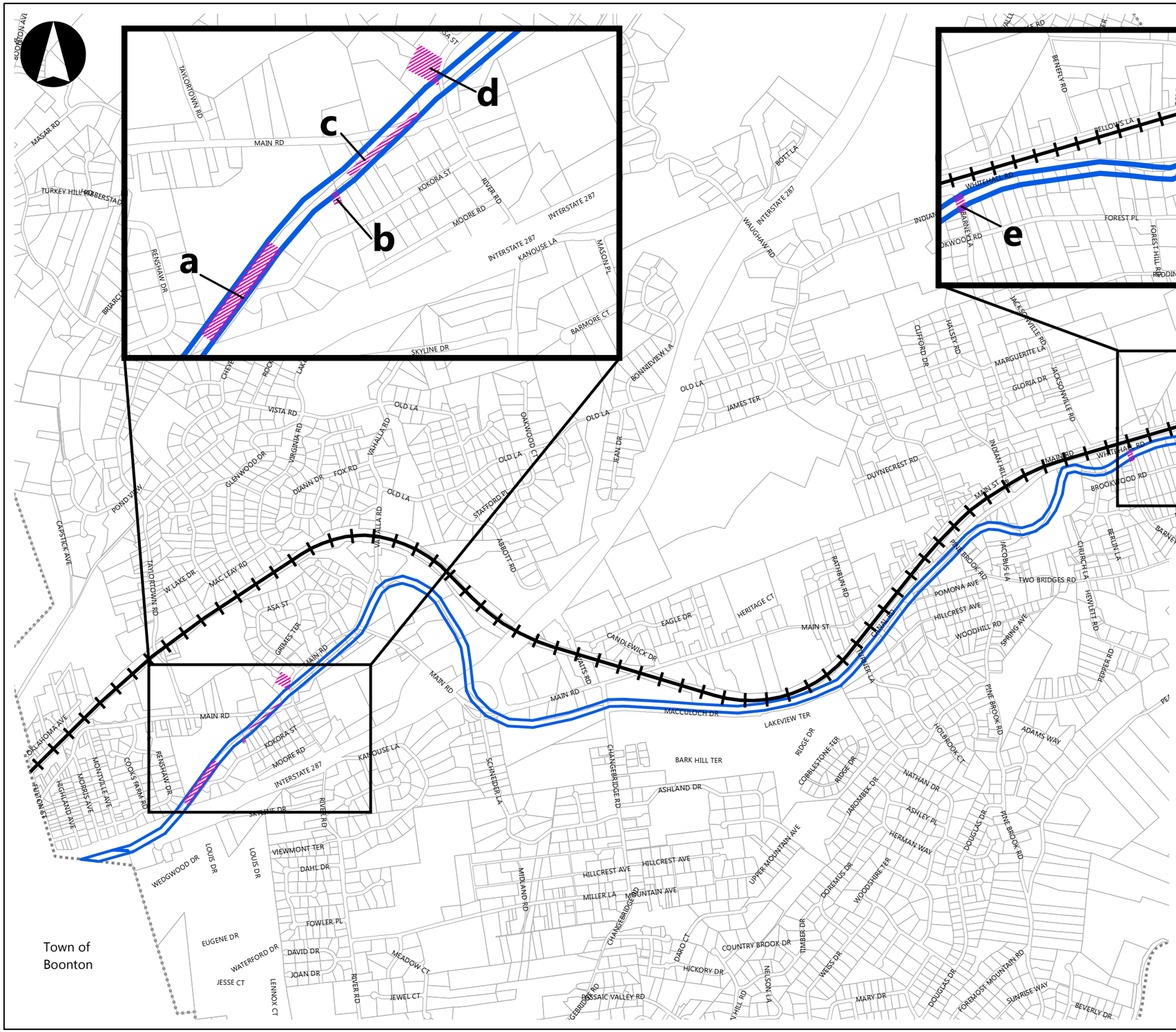

Source 1: Parcel data obtained from Morris County Department of Planning, Development and Technology, January 2007, with updates prepared by Burgis Associates Inc. through March 2010.
Source 2: Historic district data layer created by Burgis Associates, Inc., based on information received from New Jersey's State Historic Preservation Office (SHPO) and NJ-GeoWeb.
Source 3: Rail line data obtained from NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS) , April 2012.

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MORRIS COUNTY, NEW JERSEY

Figure 35

Morris Canal Historic District (NR/SR Designation)

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 262.5 525 1,050 1,575 Feet

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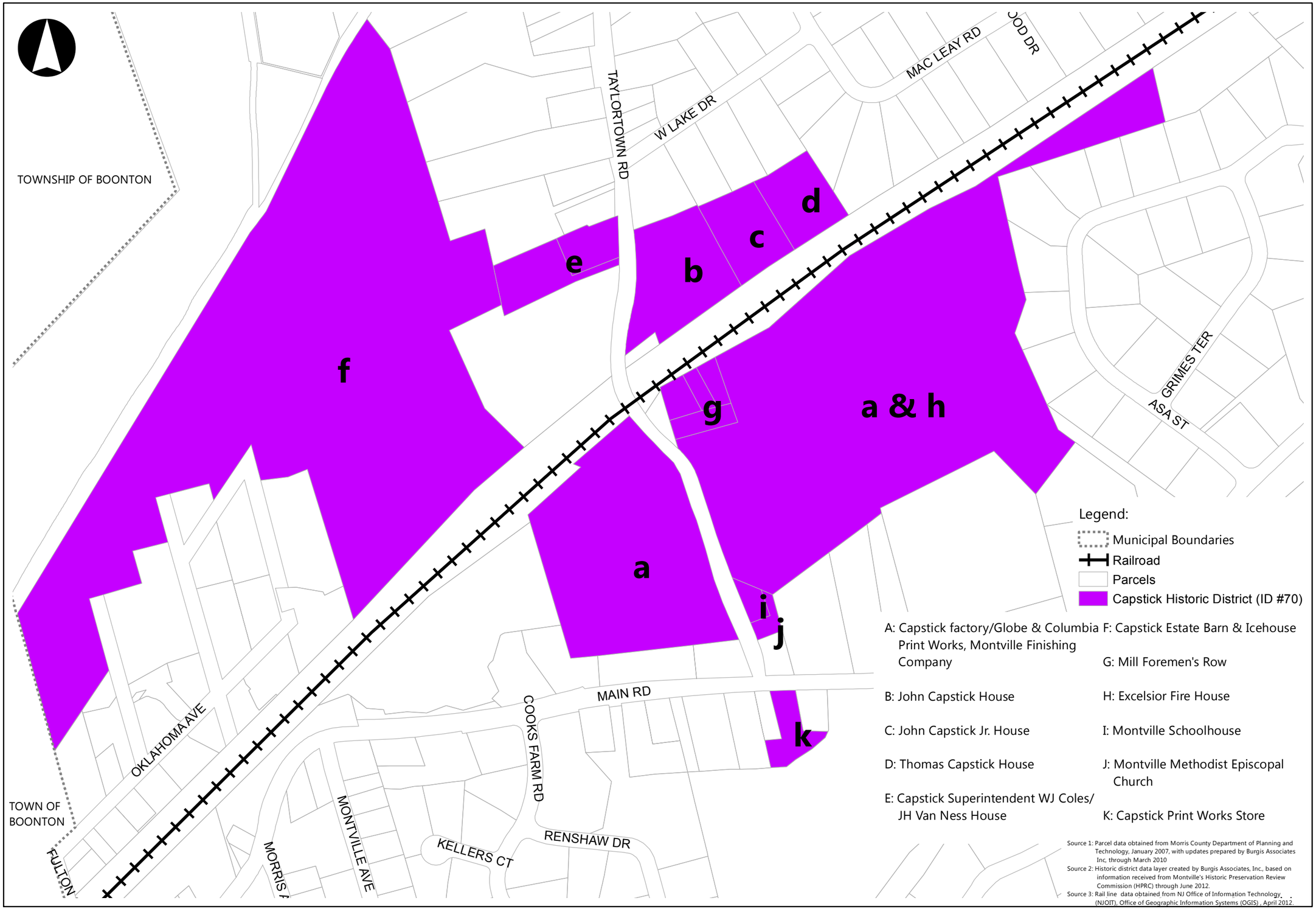

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MORRIS COUNTY, NEW JERSEY

Figure 36

Capstick Historic District

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 50 100 200 300 Feet

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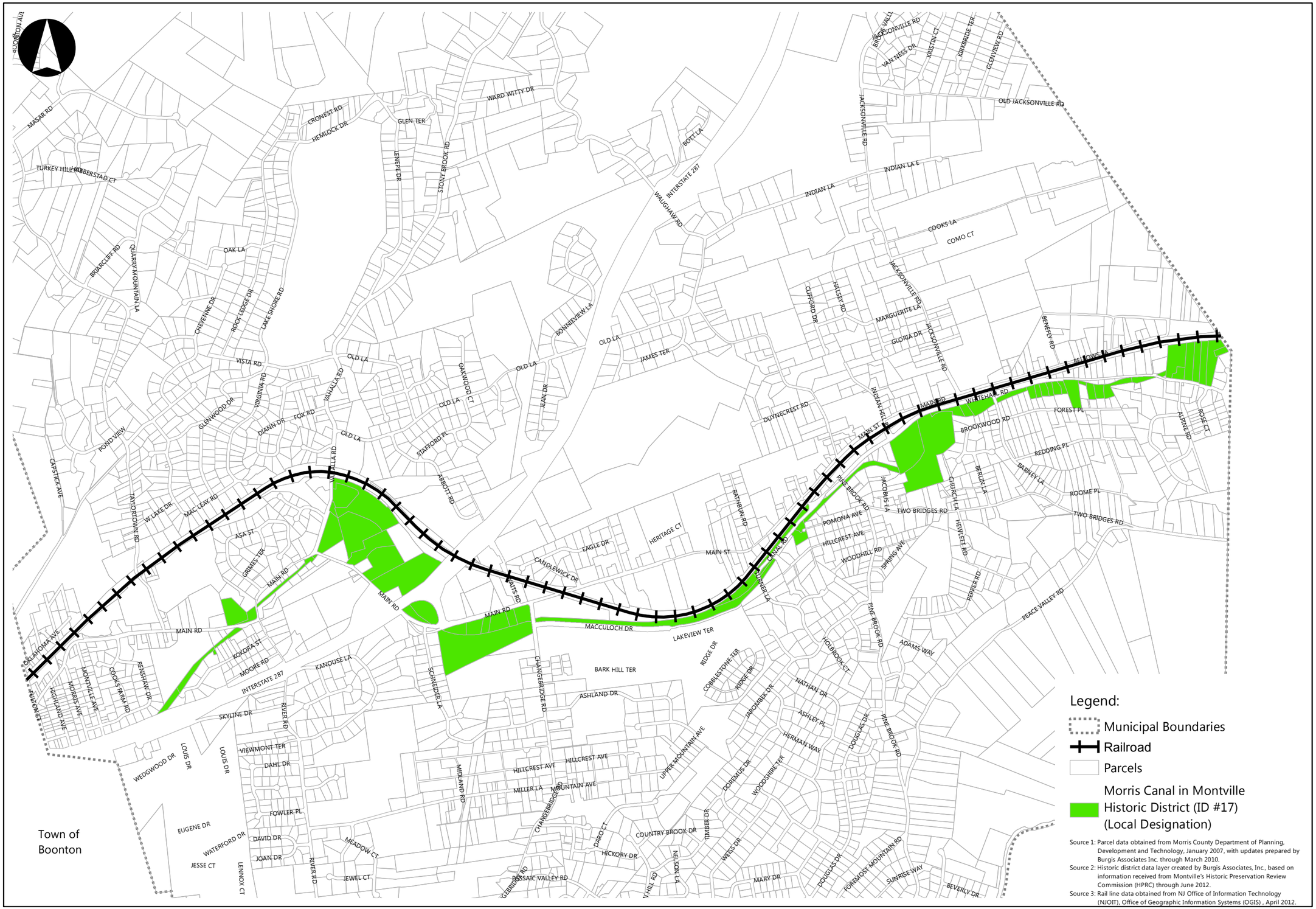

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TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

Figure 37

Morris Canal Historic District (Historic Designation)

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 275 550 1,100 1,650 Feet

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Project No.	2465.26
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10. REGIONAL RELATIONSHIPS

The Township of Montville cannot plan for the protection and preservation of its natural resources without taking into consideration the planning initiatives of the state and region to which it belongs. Not only is the Township subject to the State Development and Redevelopment Plan and Morris County Master Plan Elements, but it is also located within the New Jersey Highlands Region and therefore subject to that agency's Regional Master Plan. Each of these relationships is explored in turn below.

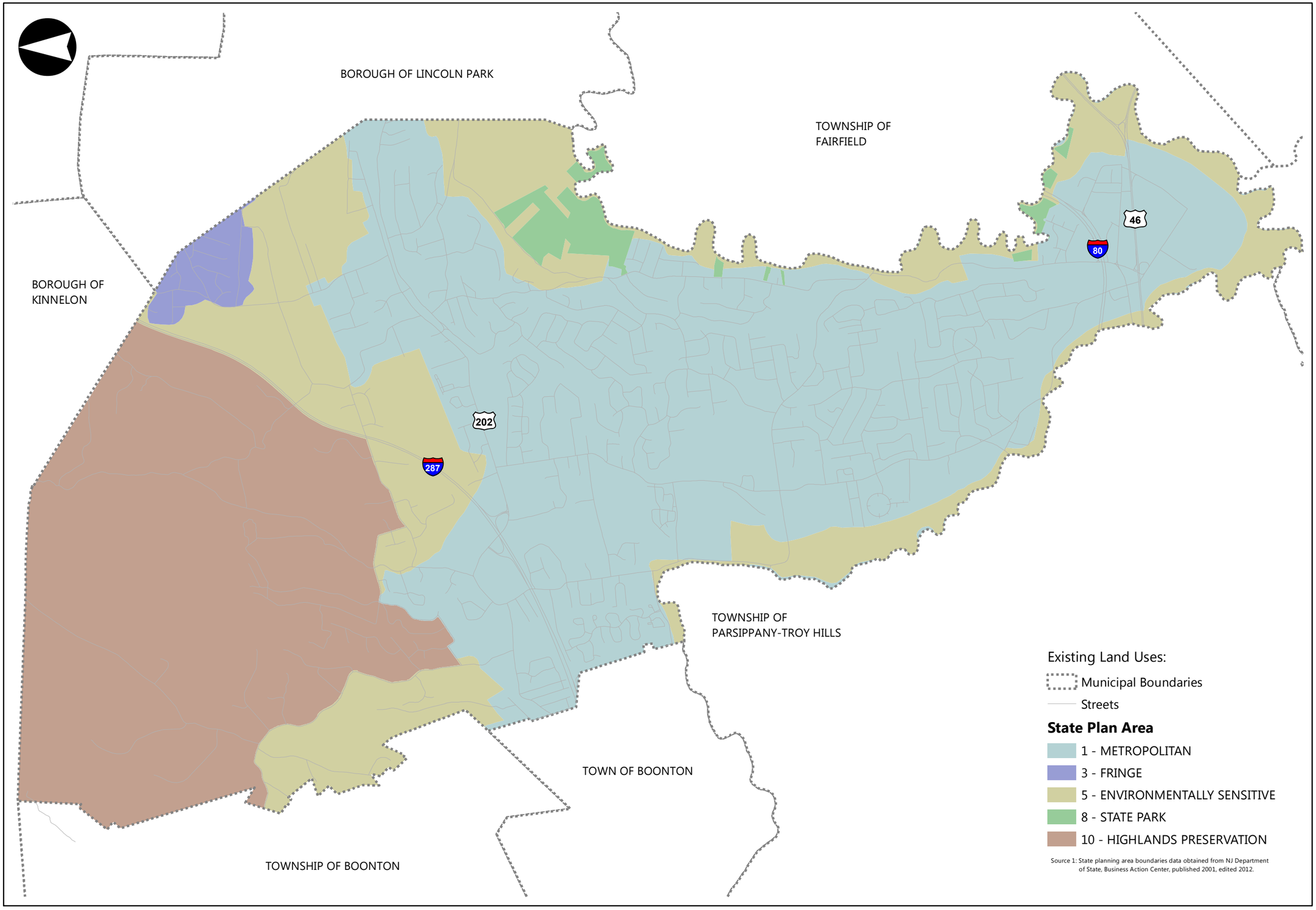
10.1 State Development and Redevelopment Plan (SDRP)

On April 28, 2004, the New Jersey State Planning Commission (SPC) approved the release of a preliminary State Development and Redevelopment Plan (SDRP), which serves as a blueprint for future development and redevelopment on a statewide basis. The Plan's main objective is to guide future development and redevelopment to ensure the most efficient use of existing infrastructure systems, and to maintain the capacities of infrastructure, environment, natural resources, fiscal, economic and other systems. Generally, the Plan attempts to curb development in rural areas and in those parts of the state where development has only recently begun, encourage new development along transportation corridors, in older cities and in suburbs that have the necessary infrastructure to accommodate it, and concentrate development in rural areas around selected centers. While the Plan does not take power away from planning and zoning at the municipal level, the State will use the plan as a guide for decisions regarding funding for infrastructure improvements.

In order to implement its general statewide policies and objectives, the SDRP divides the state into a number of land use "Planning Areas." The SDRP has established a set of policy objectives to guide local planning in each planning area. These policy objectives are designed to implement the statewide goals and objectives of the SDRP in the context of the unique qualities and conditions in each of the planning areas. The goal of this project is to implement land use policies on the local level that will be consistent with the State Plan policies. The State Plan Policy Map indicates that there are five Planning Areas located in Montville Township, including the Metropolitan Planning Area, Fringe Planning Area, Environmentally Sensitive Planning Area, Parks and Natural Areas, and Highlands Preservation Area. Figure 38, State Development and Redevelopment Plan Areas, illustrates the locations of each of these areas within the Township.

The SDRP Planning Areas relevant to Montville are described as follows:

1. Metropolitan Planning Area. The Metropolitan Planning Area (PA-1) encompasses large urban centers and developed suburban areas. These areas are fully developed with significant investment in existing, but aging, infrastructure systems. There is little vacant land available for development and, as such, much of the development activity is infill development or redevelopment. The SDRP states that public and private investment in PA-1 should be the "principle priority" of state, regional and local planning agencies, with the intent being to direct development and redevelopment into these portions of the State. Within this framework, the recommended policy objectives for PA-1 are summarized to include the following:



Source 1: State planning area boundaries data obtained from NJ Department of State, Business Action Center, published 2001, edited 2012.

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Project Title:

2013 Natural Resource Inventory

TOWNSHIP OF MONTVILLE
MORRIS COUNTY, NEW JERSEY

Figure 38

State Development & Redevelopment Plan Areas

Rev	Description	Date	Dwn	Ckd

Graphic Scale
0 500 1,000 2,000 3,000 Feet

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Project No.	2465.26
Sheet No.	1 of 1
Date	03.04.13
Drawn	RW

Dwg. No.
SDRP

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a. Land Use: Guide new development and redevelopment in PA-1 in a manner which ensures an efficient use of remaining vacant parcels and existing infrastructure.

b. Housing: Preserve the existing housing stock through a program of maintenance and rehabilitation. Provide a variety of housing choices through new development and redevelopment.

c. Economic Development: Promote economic development by encouraging redevelopment, infill development, public-private partnerships, and infrastructure improvements.

d. Transportation: Encourage the use of public transit and alternative modes of transportation.

e. Natural Resource Conservation: Reclaim environmentally damaged sites and mitigate impacts on remaining environmental and natural resources, including wildlife habitats. Special emphasis should be on air quality, preservation of historic sites, the provision of open space and recreation.

f. Recreation: Maintain existing parks and open space and expand system through redevelopment and additional land dedications.

g. Historic Preservation: Integrate and reconcile historic preservation with new development and redevelopment efforts.

h. Public Facilities and Open Space**:** Complete, repair or replace existing infrastructure systems to enable future development and redevelopment.

i. Intergovernmental Coordination**:** Provide for regionalization and intergovernmental coordination of land use and development policies.

2. Fringe Planning Area**.** The Fringe Planning Area (PA-3) is a predominantly rural landscape that is not prime agricultural or environmentally sensitive land, with scattered small communities and free-standing residential, commercial, and industrial development. In most cases, Fringe Planning Areas serve as a transition between suburban and rural landscapes. This category does not have and is not planned to have urban level infrastructure.

3. Environmentally Sensitive Planning Area**.** The Environmentally Sensitive Planning Area (PA-5) has large contiguous areas of land that contain valuable ecosystems, natural resources and wildlife habitats. These areas are either undeveloped or have limited development that is rural in character. The primary policy objective for PA-5 is the protection of environmentally sensitive areas through the promotion of center development with clear boundaries and buffer areas separating the center from the surrounding "environs." Natural resources should be protected and preserved in large contiguous tracts of open space. The SDRP suggests that these areas may be appropriate

for recreational facilities, and infrastructure should only be provided to support linkages between centers or to promote recreational and other activities.

4. Parks and Natural Areas. Parks and Natural Areas include an array of publicly dedicated lands which contribute to the Plan's goal of preserving and enhancing areas with historic, cultural, scenic, open space and recreational value. It includes state and federally owned or managed tracts of land, as well as county and local parks that have been dedicated for public benefit. The SDRP's intention is to provide the public with recreational and educational opportunities while ensuring the protection of critical natural resources. The Plan recommends the maintenance of facilities and ensures the connection of these areas systems of open lands.

5. Highlands Preservation Area. The Highlands Preservation Area category is a more recent addition to the State Plan Policy Map and is reflective of the Highlands area boundaries established by the Highlands Water Protection and Planning Act. This Act and the resultant Highlands Regional Master Plan are discussed in more detail in the following subsection of this chapter.

10.2 Highlands Regional Master Plan

The Highlands Water Protection and Planning Act, passed by the New Jersey State legislature on June 10, 2004, significantly impacts land use planning and environmental protection throughout the 800,000 acre region that is encompassed by the Act. The New Jersey Highlands Region includes 88 municipalities in seven counties. The legislation authorized and directed the newly established Highlands Water Protection and Planning Council to effectuate the Act's goals through a comprehensive set of powers. The Act empowered the Highlands Water Protection and Planning Council, a 15 member political subdivision of the State created under this Act, with a number of duties, including the adoption of a regional master plan within 18 months of the Council's first meeting.

The Act divides the Highlands region into two areas: a Preservation Area and a Planning Area. While the Act severely restricts and controls development in the Preservation Area, its treatment of development in the Planning Area is more permissive. The Highlands Regional Master Plan (RMP) was prepared and adopted by the Council on July 17, 2008 to effectuate appropriate and coordinated land use decisions within the region. Within 15 months of the Plan's adoption, each municipality and county wholly or partially in the Preservation Area was required to revise its master plan and development regulations to conform to the goals, requirements and provisions of the RMP. Revisions were to be submitted to the Council for its approval, rejection or conditional approval. If a municipality or county failed to adopt or enforce these revisions, the Act authorized the Council to adopt and enforce rules and requirements necessary to implement the RMP on its behalf. The Act offered incentives to municipalities and counties located within the Planning Area to do the same.

Montville Township, being located entirely within the Highlands Region, has participated in the Highlands Plan Conformance since 2009. This process has involved the completion of several "modules", including preparation of a two-step build-out analysis, draft Highlands environmental

resource inventory, draft Highlands master plan element, draft Highlands development regulations, draft housing element and fair share plan, and municipal self-assessment and implementation schedule. Each of these efforts is intended to bring the Township into conformity with the goals, requirements and provisions of the RMP.

Montville Township's Petition for Plan Conformance was submitted to the Highlands Council on December 8, 2009. In January 2012, the Highlands Council approved Montville's Petition for Plan Conformance, conditioned upon the Township's adoption of the above noted documents. The Township is currently in this implementation phase of Plan Conformance, with the required documents expected to be adopted in 2013 and beyond.

It is noted that although Montville has land area within both the Highlands Preservation and Planning Areas, the Township ultimately elected to petition for Highlands Plan Conformance only for the Preservation Area portion of the municipality (see Figure 38, State Development and Redevelopment Plan Areas, for the Preservation Area boundary). As such, only lands within the Township's Preservation Area will be subject to documents adopted as part of the Highlands Plan Conformance process. And while Montville elected not to petition for the Planning Area portion of the municipality, the Act allows the Township to enter into compliance at any time.

10.3 Morris County Planning

The Morris County Planning Board is the body responsible for planning initiatives at the County level. Although the County Planning Board is limited by the Municipal Land Use Law to an advisory role on most land use issues, the County does influence local land use decisions in a variety of ways. For example, the County Planning Board has responsibility for the review of projects impacting county roads and drainage facilities, and in doing so, provides partial regulation of local development activity. The Morris County Division of Planning, Development and Technology also assists municipalities through the State Development and Redevelopment Plan Cross-Acceptance process, provides guidance for stormwater management planning and provides technical and other assistance to municipalities in many areas. Finally, the County Planning Board also has the responsibility of adopting a master plan showing the Board's recommendations for the development of the county.

To this end, the County has produced a number of Master Plan Elements over the past 40 years, including a Future Land Use Plan (1975), Historic Preservation Plan (1976), Open Space Plan (1988), Circulation Plan (1992), Water Supply Plan (1994), Bicycle and Pedestrian Plan (1998), and a Farmland Preservation Plan (2003). Acknowledging that many of these documents are outdated, the County Planning Board prepared in 2007 a State of the County Report, the primary purposes of which were to identify changes in major conditions in Morris County and to identify major planning-related trends and issues for future consideration by the Morris County Planning Board.

The State of the County Report details the major objectives set forth in the 1975 Future Land Use Plan, and describes the progress in meeting each of these recommendations. The objectives related to conservation policies and the County's natural and cultural resources are as follows:

- Acquire adequate open space for future populations, focusing on acquisition before developing existing sites for recreation. Integrate recreation opportunities throughout urban, suburban and rural areas.

    - Progress Report: *Substantial gains have been made in the area of open space acquisition, with approximately 44,000 additional acres preserved by federal, state, county and municipal governments over the last 30+ years. Although not considered "open space," over 6,000 acres of preserved farmland have also been added. Additional lands have been preserved by private non-profit groups.*

- Preserve water supply sources from urban encroachment and pollution. Preserve major watersheds, prime aquifer recharge areas, reservoirs or well-field areas, headwaters of major streams, steep slopes, wetlands and wildlife habitats by direct public acquisition, regulatory legislation, or finally, through zoning for "least intensity uses."

    - Progress Report: *The county is addressing this goal by participating in programs at the State and regional level aimed at the protection of water resources. Such efforts include the county's initiation of a water balance study to determine the amount of water available for consumption. Most recently, this issue has been highlighted by passage of the Highlands Water Protection and Planning Act, which designates 32 municipalities within the county as critical for water resource protection.*

- Assume responsibility as a custodian of Morris County's historic heritage and make efforts to preserve that heritage in accordance with the County Historic Preservation Plan Element of the Master Plan.

    - Progress Report: *Twenty-two of the county's 39 municipalities have established official Historic Commissions or Landmark Advisory Committees with many more private associations, foundations and societies devoted to local historic preservation. The Morris County Heritage Commission completed a historic sites survey for the entire county in 1987, and the creation of the Morris County Historic Preservation Trust in 2002 provides ongoing funding for historic preservation project throughout the county.*

As noted above, the State of the County Report also sets forth a number of planning-related trends and issues related to environmental and conservation strategies. The major trends/issues relevant to open space preservation, farmland preservation, and historic preservation, are as follows:

Open Space Preservation –

- With rising land values, the ability to acquire new open space lands is increasingly limited, particularly the acquisition of lands suitable for active recreation purposes.

- As open space purchase slows, maintenance of existing open space and the need for improved recreational facilities will grow in importance. More emphasis may be placed on the restoration of open space resources.

- Historically, the Morris County Open Space Trust Fund has focused on the acquisition of new properties. The potential to diversify the use of the fund to address facility and maintenance requirements may need to be explored.

- New NJDEP regulations continue to restrict the use of land, including open space lands set aside by counties and municipalities for active and passive recreation purposes. Increased buffers along waterways and development limitations associated with the Highlands Act will hinder potential recreational development of open space lands in the Highlands Preservation Area. These restrictions will require consideration in the assessment of existing and future recreational development plans.

Farmland Preservation –

- The Highlands Act may result in an increase in the number of preserved farms and farmland in the Highlands Preservation Area due to limitations on non-agricultural development and the rising emphasis being place on preservation in this area by state policymakers.

- Agri-tourism and direct farm marketing have become increasingly important aspects of agriculture and its success as a thriving industry. Promoting agri-tourism throughout the county will continue to be a high priority.

- As suburban residential development continues to encroach into agricultural areas, increased sensitivity to right-to-farm issues may be required to protect agricultural activities and the rights of farmers.

Historic Preservation –

- As redevelopment within the county occurs, greater public awareness and education of historic resources and the benefits of preservation will be required to ensure protection of these resources. Greater public awareness is also needed to promote the creation of compatible redevelopment plans in areas with historic and/or architecturally significant structures.

- Continued funding support for historic site acquisition, rehabilitation and maintenance will be needed. Although county support through the Preservation Trust is anticipated to continue, increased local and nonprofit support will be needed to accomplish long term preservation goals. The continued amendment of additional local open space trust funds to allow the use of funding for historic preservation purposes will help to address this issue.

- With growing demands on local discretionary funding, the identification of economically viable uses for historic structures will become more important. The fostering of historic tourism and the sensitive adaptive reuse of historic structures will become increasingly necessary to support and maintain these resources. County and local historic preservation funding efforts can help support this adaptive reuse and redevelopment, promoting future economic growth while respecting the past.

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12. METADATA

Burgis Associates, Inc.					
Areas Actively Served by Potable Water Service Provider					
Publication Date:	March 2013	Scale:		Format:	Vector digital data
Used for Figure(s):	PWEAS	Online Link:			
Short Description:	Potable water service data layer created by Burgis Associates, Inc., based on information provided by the Montville Township Water and Sewer Department, February 2009, and inclusive of updates through October 2012.				
Capstick Historic District					
Publication Date:	June 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	CAPHD, DIST	Online Link:			
Short Description:	Historic district data layer created by Burgis Associates, Inc., based on information received from Montville's Historic Preservation Review Commission (HPRC) through June 2012.				
Existing Land Uses					
Publication date:	August 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	ELU	Online Link:			
Short Description:	Existing land use data layer created by Burgis Associates, Inc., based on land use information obtained in 2009 from the Township of Montville Tax Assessor, with field verification by Burgis Associates, Inc. Preserved open space data was obtained from the Township of Montville Management Specialist and updated through August 2012.				
Individual Historic Sites					
Publication Date:	June 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	HIST	Online Link:			
Short Description:	Historic site data layer created by Burgis Associates, Inc., based on information received from New Jersey's State Historic Preservation Office (SHPO), NJ-GeoWeb, and Montville's Historic Preservation Review Commission (HPRC) through June 2012.				
Jacobus Rural Historic District					
Publication Date:	June 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	DIST, JRHD	Online Link:			
Short Description:	Historic district data layer created by Burgis Associates, Inc., based on information received from New Jersey's State Historic Preservation Office (SHPO) and NJ-GeoWeb, through June 2012.				
Morris Canal Historic District					
Publication Date:	June 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	DIST, MCHD	Online Link:			
Short Description:	Historic district data layer created by Burgis Associates, Inc., based on information received from New Jersey's State Historic Preservation Office (SHPO) and NJ-GeoWeb, through June 2012.				
Morris Canal in Montville Historic District					
Publication Date:	June 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	DIST, MCMHD	Online Link:			
Short Description:	Historic district data layer created by Burgis Associates, Inc., based on information received from Montville's Historic Preservation Review Commission (HPRC) through June 2012.				
Prime and Restricted Aquifer Areas					
Publication Date:	November 2011	Scale:		Format:	Vector digital data
Used for Figure(s):	CWR	Online Link:			
Short Description:	Aquifer area data layers created by Burgis Associates, Inc., based on Township of Montville Zoning Map (adopted November 2011). Areas have been edited to incorporate amendments through September 2012 via Ordinance 2012-27.				
Steep Slopes					
Publication Date:	March 2013	Scale:		Format:	Vector digital data
Used for Figure(s):	SLOPE2	Online Link:			
Short Description:	Steep slope data layers created by Burgis Associates, Inc., based on 2002 NJDEP 10-meter Digital Elevation Grid information clipped to watershed boundaries.				
Essex County					
Municipal Boundaries					
Publication date:	2010	Scale:		Format:	Vector digital data
Used for Figure(s):	All	Online Link:			
Short Description:	This data set is a spatial representation of updated municipalities in Essex County.				

Federal Emergency Management Agency					
100 Year Flood Plain					
Publication Date:	September 1996	Scale:		Format:	Vector digital data
Used for Figure(s):	FLOOD	Online Link:	https://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=productQ3Overview&title=Q3%2520Overview&parent=productInfo&parentTitle=Product%2520Information		
Short Description:	Digital Q3 Flood Data are developed by scanning the existing FIRM hardcopy, vectorizing a thematic overlay of flood risks. Vector Q3 Flood Data files contain only certain features from the existing FIRM hardcopy. Q3 vector data are contained in one single countywide file, including all incorporated and unincorporated areas of a county.				
500 Year Flood Plain					
Publication Date:	September 1996	Scale:		Format:	Vector digital data
Used for Figure(s):	FLOOD	Online Link:	https://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=productQ3Overview&title=Q3%2520Overview&parent=productInfo&parentTitle=Product%2520Information		
Short Description:	Digital Q3 Flood Data are developed by scanning the existing FIRM hardcopy, vectorizing a thematic overlay of flood risks. Vector Q3 Flood Data files contain only certain features from the existing FIRM hardcopy. Q3 vector data are contained in one single countywide file, including all incorporated and unincorporated areas of a county.				
Morris County Department of Planning, Development, & Technology					
Lakes					
Publication Date:	August 24, 2010	Scale:		Format:	Vector digital data
Used for Figure(s):	ELU	Online Link:			
Short Description:	This data set is a spatial representation of lakes in Morris County.				
Municipal Boundaries					
Publication Date:	August 24, 2010	Scale:		Format:	Vector digital data
Used for Figure(s):	All	Online Link:	http://www.morrisplanning.org/divisions/GIS/		
Short Description:	This data set is a spatial representation of updated municipalities in Morris County.				
Parcels					
Publication Date:	January 2007, updates through March 2010	Scale:		Format:	Vector digital data
Used for Figure(s):	CAPHD, DIST, ELU, HIST, JRHD, KCSL, MCHD, MCMHD, PRES, RLOC	Online Link:			
Short Description:	This dataset is an ESRI geodatabase feature class which currently contains polygonal parcel-based features derived from the conversion of municipal tax maps into a contiguous municipal parcel map. It was developed to provide the Morris County Planning Board with the local and regional information necessary for the writing of county master plans.				
Streets					
Publication Date:	August 24, 2010	Scale:		Format:	Vector digital data
Used for Figure(s):	All	Online Link:	http://www.morrisplanning.org/divisions/GIS/		
Short Description:	Provides a comprehensive road network of Morris County.				
New Jersey Department of Environmental Protection					
Archaeological Site Grid of New Jersey					
Publication Date:	May 31, 2011	Scale:		Format:	Vector digital data
Used for Figure(s):	HIST	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/statewide/historic_sitegrid.htm		
Short Description:	This dataset includes a vector grid of approximately 1/2 mile cells indicating the presence of Archaeological Sites that: 1. Are included in the New Jersey or National Registers of Historic Places, 2. Have been determined Eligible for inclusion through federal or state processes as administered by the HPO, or 3. Have been identified through cultural resource survey or other documentation on file at the HPO. The majority of features in the dataset represent categories 1 and 2 above.				
Category One Streams					
Publication Date:	June 2007	Scale:		Format:	Vector digital data
Used for Figure(s):	H20	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/statewide/swqs.htm		
Short Description:	This data is a digital representation of New Jersey's Surface Water Quality Standards in accordance with "Surface Water Quality Standards for New Jersey Waters" as designated in N.J.A.C. 7:9 B. The hydrography stream network was created to support water management and monitoring activities within NJDEP, and to be a valuable layer for computerized cartographic products.				

Contours					
Publication Date:	1987	Scale:		Format:	Vector digital data
Used for Figures(s):	TOPO	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/statewide/stcon.htm		
Short Description:	This dataset is a graphical representation of New Jersey's statewide elevation contours with twenty foot intervals. It was created from the USGS DEM 100 meter lattice.				
Currently Known Extent (CKE) of Groundwater Contamination					
Publication Date:	March 2007	Scale:		Format:	Vector digital data
Used for Figure(s)	KCSL, WHPA and KCSL	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/statewide/cke.htm		
Short Description:	This data layer contains information about areas in the state which are specified as the Currently Known Extent (CKE) of ground water pollution. CKE areas are geographically defined areas within which the local ground water resources are known to be compromised because the water quality exceeds drinking water and ground water quality standards for specific contaminants.				
Faults					
Publication Date:	June 30, 1999	Scale:	1:100,000	Format:	Vector digital data
Used for Figure(s):	BEDROCK	Online Link:	http://www.state.nj.us/dep/njgs/geodata/faults.htm		
Short Description:	The Bedrock Geology of New Jersey consists of statewide and countywide data layers (contacts, faults, folds, dikes). The series is intended to provide the public with basic geoscience information for use in geoscience, natural resource and environmental analyses.				
Forest Cover	July 12, 2010	Scale:		Format:	Vector digital data
Used for Figure(s):	FRST	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/lulc07/w03lu07.htm and http://www.nj.gov/dep/gis/digidownload/metadata/lulc07/w06lu07.htm		
Short Description:	This layer was derived from the NJDEP's 2007 Land Use/Land Cover dataset. The 2007 LU/LC data set is the fourth in a series of land use mapping efforts that was begun in 1986. Revisions and additions to the initial baseline layer were done in subsequent years from imagery captured in 1995/97, 2002 and 2007.				
Bedrock Geology					
Publication Date:	May 10, 2007	Scale:	1:100,000	Format:	Vector digital data
Used for Figure(s):	BEDROCK	Online Link:	http://www.state.nj.us/dep/njgs/geodata/geology.htm		
Short Description:	The Bedrock Geology of New Jersey consists of statewide and countywide data layers (contacts, faults, folds, dikes). The series is intended to provide the public with basic geoscience information for use in geoscience, natural resource and environmental analyses.				
Known Contaminated Site List (KCSL)					
Publication Date:	February 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	KCSL, WHPA and KCSL	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/statewide/kcsl.htm		
Short Description:	The Known Contaminated Sites List (KCSNJ) for New Jersey (Non-Homeowner) are those non-homeowner sites and properties within the state where contamination of soil or ground water has been confirmed at levels equal to or greater than applicable standards. This list of Known Contaminated Sites may include sites where remediation is either currently under way, required but not yet initiated or has been completed.				
Groundwater Recharge Rank					
Publication Date:	December 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	KCSL	Online Link:	http://www.state.nj.us/dep/njgs/geodata/dgs02-3/metadata/w03cmb.htm http://www.state.nj.us/dep/njgs/geodata/dgs02-3/metadata/w06cmb.htm		
Short Description:	An estimation of ground-water recharge for Watershed Management Area 6, (Upper Passaic, Whippany and Rockaway Rivers) and Watershed Management Area 3 (Pompton, Pequannock, Wanaque, Ramapo). Ground-water recharge is estimated using the NJGS methodology from NJ Geological Survey Report GSR-32 "A Method for Evaluation of Ground-Water-Recharge Areas in New Jersey. Land-use/land-cover, soil and municipality-based climatic data were combined and used to produce an estimate of ground-water recharge in inches/year. Recharge was then ranked by volume (billions of gallons/year) using natural breaks in the percentage of total volume.				
Landscape Project Data					
Publication Date:	February 21, 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	LSC	Online Link:	http://www.state.nj.us/dep/gis/digidownload/metadata/landscape/skylands_v3_1.htm		
Short Description:	The Landscape Project combines documented wildlife locations with NJDEP aerial photo-based 2007 Land Use/Land Cover (LULC) to delineate imperiled and special concern species habitat within New Jersey.				
Natural Heritage Priority Sites					
Publication date:	March 1, 2007	Scale:		Format:	Vector digital data
Used for Figure(s):	NHP	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/statewide/prisites.htm		
Short Description:	The Natural Heritage Priority Sites Coverage was created to identify critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities. Natural Heritage Priority Sites are based on analysis of information in the New Jersey Natural Heritage Database.				

Non-Category One Streams					
Publication Date:	June 2007	Scale:		Format:	Vector digital data
Used for Figure(s)	H20	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/statewide/swqs.htm		
Short Description:	This data is a digital representation of New Jersey's Surface Water Quality Standards in accordance with "Surface Water Quality Standards for New Jersey Waters" as designated in N.J.A.C. 7:9 B. The hydrography stream network was created to support water management and monitoring activities within NJDEP, and to be a valuable layer for computerized cartographic products.				
Streams					
Publication Date:	November 1, 2010		1:250,000	Format:	Vector digital data
Used for Figure(s):	FLOOD, H2O	Online Link:	http://www.nj.gov/dep/gis/nhd2002.html		
Short Description:	This data is a digital representation of New Jersey's Surface Water Quality Standards in accordance with "Surface Water Quality Standards for New Jersey Waters" as designated in N.J.A.C. 7:9 B. The hydrography stream network was created to support water management and monitoring activities within NJDEP, and to be a valuable layer for computerized cartographic products.				
Surficial Geology					
Publication Date:	January 1, 2006	Scale:		Format:	Vector digital data
Used for Figure(s):	SURF	Online Link:	http://www.state.nj.us/dep/njgs/geodata/njsrfgeo.htm		
Short Description:	This geographic information system (GIS) data set shows the extent of surficial geologic materials in New Jersey. Surficial materials are the unconsolidated glacial, river, wetland, windblown, marine, estuarine, and hillslope sediments and weathered rock materials that overlie bedrock and Coastal Plain formations and that are the parent material for agronomic soils.				
Water Bodies:					
Publication Date:	November 1, 2010	Scale:		Format:	Vector digital data
Used for Figure(s):	H2O	Online Link:	http://www.nj.gov/dep/gis/nhd2002.html		
Short Description:	The data set will provide Waterbody information for regulators, planners, and others interested in hydrography data. The use of the NHD data layers in hydrologic analyses will provide a means of monitoring "the health of the citizens and ecosystems of New Jersey" through the use of diverse applications. This data set is intended to serve as a resource for analysis rather than regulatory delineations.				
Watershed Management Areas					
Publication Date:	April 5, 2005	Scale:		Format:	Vector digital data
Used for Figure(s):	WSHD	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/statewide/depwmas.htm		
Short Description:	The depwmas data is a simplified version of dephuc14 data. The dephuc14 is NJDEP's version of the U.S. Geological Survey (USGS) hydrologic-unit-code basins that delineates the extent of the DEP watershed management regions and areas to be used for the statewide watershed initiative. Both the depwmas and dephuc14 data comprise the Watershed Base Maps for New Jersey. Also, both were created from the USGS HUC14 by replacing the state boundary included with the USGS version with the DEP state and county border data(stco). The data was produced to address data-processing problems arising from combining the USGS huc14 with NJDEP GIS data due to the use of conflicting state boundaries.				
Wetlands					
Publication Date:	July 12, 2010	Scale:		Format:	Vector digital data
Used for Figure(s)	WETL	Online Link:	http://www.nj.gov/dep/gis/digidownload/metadata/lulc07/w03lu07.htm and http://www.nj.gov/dep/gis/digidownload/metadata/lulc07/w06lu07.htm		
Short Description:	The 2007 LU/LC data set is the fourth in a series of land use mapping efforts that was begun in 1986. Revisions and additions to the initial baseline layer were done in subsequent years from imagery captured in 1995/97, 2002 and 2007. This present 2007 update was created by comparing the 2002 LU/LC layer from NJ DEP's Geographical Information Systems (GIS) database to 2007 color infrared (CIR) imagery and delineating and coding areas of change.				
New Jersey Department of State					
State Plan Areas					
Publication Date:	March 1, 2001 Edited 2013	Scale:		Format:	Vector digital data
Used for Figure(s):	SDRP	Online Link:	http://www.nj.gov/state/planning/splan2.html		
Short Description:	This dataset contains the boundaries of the Planning Areas of the NJ State Development and Redevelopment Plan (NJSDRP). The Planning Areas file was created to help implement the goals of the New Jersey State Plan. It is used for making maps illustrating the NJSDRP, for analyzing the NJSDRP and for comparison to other GIS files and mapping.				
New Jersey Highlands Council					
Major Roadways					
Publication Date:	April 2009	Scale:		Format:	Vector digital data
Used for Figure(s):	RLOC	Online Link:	http://www.highlands.state.nj.us/njhighlands/actmaps/maps/gis_data.html		
Short Description:	All NJ roads above the municipal level.				
Park and Rides					
Publication Date:	2006	Scale:		Format:	Vector digital data
Used for Figure(s):	RLOC	Online Link:	http://www.highlands.state.nj.us/njhighlands/actmaps/maps/gis_data.html		
Short Description:	Existing park and ride locations.				

New Jersey Land Conservancy					
Preserved Lands					
Publication date:	2011	Scale:		Format:	Vector digital data
Used for Figure(s):	PRES	Online Link:	http://www.montvillenj.org/docs/land/MontvilleOS%20Update-TrailsPlan_WEB_7.28.2011.pdf		
Short Description:	Preserved land data from 2011 Montville Open Space Plan Update – Trails Plan, prepared by NJ Land Conservancy, with updates from Township through September 2012.				
New Jersey Office of Information Technology, Office of Geographic Information Systems					
Rail Network					
Publication Date:	April 2012	Scale:		Format:	Vector digital data
Used for Figure(s):	RLOC, CAPHD, MCHD, MCMHD	Online Link:	https://njgin.state.nj.us/NJ_NJGINExplorer/ShowMetadata.jsp?docId={A1707722-A426-4405-97A1-56386A5994C2}		
Short Description:	Line data delineating right-of-way centerlines for rail, light rail, and subway service lines operated by New Jersey Transit and connecting commuter lines.				
Rail Station					
Publication Date:	January 2011	Scale:		Format:	Vector digital data
Used for Figure(s):	RLOC	Online Link:	https://njgin.state.nj.us/NJ_NJGINExplorer/ShowMetadata.jsp?docId={A1707722-A426-4405-97A1-56386A5994C2}		
Short Description:	Provides location and attribute information for currently operated regional rail service. Data set is intended only for general planning and mapping use. Single lines represent approximate right-of-way centerlines, not track centerlines.				
United States Geological and Water Survey					
Aquifers (Bedrock and Surficial)					
Publication Date:	April 22, 1999	Scale:	1:250,000	Format:	Vector digital data
Used for Figure(s):	AQUF	Online Link:	http://www.state.nj.us/dep/njgs/geodata/dgs98-5.htm		
Short Description:	The Aquifers of New Jersey consists of two ARC/INFO Geographic Information Systems (GIS) coverages of the bedrock and surficial aquifers and confining units in New Jersey. The bedrock-aquifer coverage includes fractured-rock aquifers of the Valley and Ridge, Highlands, and Piedmont physiographic provinces, and aquifers and confining units of the Coastal Plain physiographic province.				
Depth to Bedrock					
Publication Date:	2006	Scale:		Format:	Vector digital data
Used for Figure(s):	DEPTH	Online Link:	http://www.state.nj.us/dep/njgs/geodata/njoutcrp.htm		
Short Description:	This dataset shows the extent of outcropping bedrock materials in northern and central New Jersey exclusive of the Coastal Plain. Two units are used: one showing where surficial materials are generally absent and bedrock outcrop is extensive and one showing where surficial materials are generally less than ten feet thick and bedrock outcrop is scattered. It was prepared in cooperation with the U. S. Geological Survey (USGS) National Geologic Mapping Program.				
Public Community Wells					
Publication Date:	February 1997 Updates through 2011	Scale:		Format:	Vector digital data
Used for Figure(s):	WHPA and KCSL, WHPA	Online Link:	http://www.state.nj.us/dep/njgs/geodata/dgs97-1md.htm		
Short Description:	The Public-Community Water-Supply (PCWS) Wells contains information for the wells in New Jersey that supply potable water to public communities. The NJDEP has cataloged and field located using the Global Positioning System (GPS) the PCWS wells as part of the Source Water Area delineation process. The data contained within is from the NJGS Wells Database.				
Public Non-Community Wells					
Publication Date:	April 5, 2004	Scale:		Format:	Vector digital data
Used for Figure(s):	WHPA and KCSL, WHPA	Online Link:	http://www.highlands.state.nj.us/njhighlands/actmaps/maps/gis_data/HL_Public_Non_Community_Water_Suppy_Wells.html		
Short Description:	This is a derivative dataset that represents a simple extraction of the wells mapped by NJGS that are within the New Jersey Highlands Region. A Public Non-Community Water Supply well is a public water supply well used by individuals other than year-round residents for at least sixty days of the year. A Public Non-Community Water Supply well can be either transient or nontransient.				
Sole Source Aquifer Boundaries					
Publication Date:	1998	Scale:		Format:	Vector digital data
Used for Figure(s):	AQUF	Online Link:	http://www.state.nj.us/dep/njgs/geodata/dgs98-6.htm		
Short Description:	DGS98-6 contains an ARC/INFO Geographic Information System (GIS) polygon coverage of the sole-source aquifers for New Jersey that are approved as of June 1998. The coverage was built by the N.J. Geological Survey from standard GIS files of U.S. Geological Survey (USGS) hydrologic units, New Jersey state and municipal boundaries, and aquifers.				

Well Head Protection Areas – Public Community Wells					
Publication Date:	October 2002 Updates through 2011	Scale:		Format:	Vector digital data
Used for Figure(s):	WHPA and KCSL, WHPA	Online Link:	http://www.state.nj.us/dep/njgs/geodata/dgs02-2md.htm		
Short Description:	A Well Head Protection Area (WHPA) is an area calculated around a Public Community Water Supply (PCWS) well in New Jersey that delineates the horizontal extent of groundwater captured by a well pumping at a specific rate over two-, five-, and twelve-year periods of time for unconfined wells. The confined wells have a fifty foot radius delineated around each well serving as the well head protection area to be controlled by the water purveyor in accordance with Safe Drinking Water Regulations (see NJAC 7:10-11.7(b)1).				
Well Head Protection Areas – Non-Public Community Wells					
Publication Date:	April 5, 2004	Scale:		Format:	Vector digital data
Used for Figure(s):	WHPA and KCSL, WHPA	Online Link:	http://www.state.nj.us/dep/njgs/geodata/dgs04-5md.htm		
Short Description:	A Well Head Protection Area for a Public Non-Community Water Supply Well (PNCWS) in New Jersey is a map area calculated around a Public Non-Community Water Supply well that delineates the horizontal extent of ground water captured by a well pumping at a specific rate over a two-, five-, and twelve-year period.				
United States Department of Agriculture, National Resource Conservation Service					
Development Limitations					
Publication Date:	2008	Scale:		Format:	Soil Report
Used for Figure(s):	DEVP	Online Link:	http://soildatamart.nrcs.usda.gov/Report.aspx?Survey=NJ027&UseState=NJ		
Short Description:	SSURGO depicts information about the kinds and distribution of soils on the landscape. The soil map and data used in the SSURGO product were prepared by soil scientists as part of the National Cooperative Soil Survey. Development limitation data is available via the Dwellings and Small Commercial Buildings report. Rating class terms indicate the extent to which the soils are limited by soil properties that affect building site development.				
Septic Limitations					
Publication Date:	2013	Scale:		Format:	Soil Report
Used for Figure(s):	SEPT	Online Link:	http://websoilsurvey.nrcs.usda.gov/		
Short Description:	Web Soil Survey (WSS) provides soil data produced by the National Cooperative Soil Survey. Septic suitability data is available via the Sewage Disposal (NJ) report. Rating class terms indicate the extent to which the soils are limited by soil properties that affect absorption of the effluent, construction, and pollution of ground and surface water.				
Prime and Other Important Farmland					
Publication Date:	2008	Scale:		Format:	Soil Report
Used for Figure(s):	PFARM	Online Link:	http://soildatamart.nrcs.usda.gov/Report.aspx?Survey=NJ027&UseState=NJ		
Short Description:	SSURGO depicts information about the kinds and distribution of soils on the landscape. The soil map and data used in the SSURGO product were prepared by soil scientists as part of the National Cooperative Soil Survey. Farmland data is available via the Prime and Other Important Farmlands report. Rating class terms indicate the soils that are considered important farmlands.				
Soils					
Publication Date:	2008	Scale:		Format:	Vector digital data
Used for Figure(s):	DEVP, PFARM, SEPT, SOILS, URBN	Online Link:	http://soildatamart.nrcs.usda.gov/Report.aspx?Survey=NJ027&UseState=NJ		
Short Description:	SSURGO depicts information about the kinds and distribution of soils on the landscape. The soil map and data used in the SSURGO product were prepared by soil scientists as part of the National Cooperative Soil Survey.				

APPENDICES

A-1 List of Preserved Lands by Block and Lot
A-2 List of Endangered Plant Species and Plant Species of Concern
A-3 Dwellings and Small Commercial Buildings Report
A-4 Sewage Disposal (NJ) Report
A-5 Natural Heritage Priority Sites – Rank Descriptions

APPENDIX A-1

List of Preserved Lands by Block and Lot

Appendix A-1
Preserved Lands: Federal Land - USACE
Montville, New Jersey

Block	Lot	Property Location	Acres	Owner
41	7	70 Cooks Lane	12.93	US Army Corp Engrs Real Estate Div

Source: Township of Montville, updated through September 2012.

Appendix A-1
Preserved Lands: State Land - NJDEP
Montville, New Jersey

Block	Lot	Property Location	Acres	Owner
41	14	56 Bellows Ln	0.44	NJ Dept Environmental Protection
120	3	65 Peace Valley Rd	18.77	State of NJ/Dept of Environmental Protection
120	6	17 Peace Valley Rd	8.46	State of NJ/Dept of Environmental Protection
120	7	45 Peace Valley Rd	19.98	State of NJ/Dept of Environmental Protection
120	8	49 Peace Valley Rd	15.22	NJ Dept Environmental Protection
120	8.2	29 Peace Valley Rd	7.54	NJ Dept Environmental Protection
120	9	27 Peace Valley Rd	22.85	NJ Dept Environmental Protection
120	11	Peace Valley Rd	5.98	NJ Dept Environmental Protection
120	13	Peace Valley Rd	4.38	NJ Dept Environmental Protection
120	14	Peace Valley Rd	11.31	NJ Dept Environmental Protection
120	15	Peace Valley Rd	15.31	NJ Dept Environmental Protection
120	16	Peace Valley Rd	11.11	NJ Dept Environmental Protection
120	17	23 Peace Valley Rd	7.95	NJ Dept Environmental Protection
120	18.1	19 Peace Valley Rd	15.11	NJ Dept Environmental Protection
120	28.1	94R Pine Brook Rd	0.36	NJ Dept Consv & Economic Develop
120	29	Pine Brook Rd	4.52	NJ Dept Environmental Protection
120	30	Pine Brook Rd	26.49	NJ Dept Environmental Protection
122	22.1	162R Pine Brook Rd	0.36	NJ Dept Consv & Economic Develop
122	28.1	146R Pine Brook Rd	0.04	NJ Dept Consv & Economic Develop
122	29.1	144R Pine Brook Rd	0.09	NJ Dept Consv & Economic Develop
122	31	140 Pine Brook Rd	16.69	State of NJ/Dept of Environmental Protection
164	2	130 Hook Mt Rd	0.01	NJ Dept of Conservation
164	4	104 Hook Mt Rd	13.18	NJ Dept of Conservation
164	19	Hook Mt Rd (Rear)	7.13	NJ Dept of Conservation
164	20.8	Effingham-Low Ct (Rear)	3.47	State of NJ/Dept of Environmental Protection
164	34	Marts Ln R	12.68	NJ Dept of Conservation
167	14	Int State Hwy 80	4.87	NJ Dept of Conservation
167	27	Passaic River Bank	5.39	NJ Dept of Conservation

Source: Township of Montville, updated through September 2012.

Appendix A-1
Preserved Lands: County Park Land
Montville, New Jersey

Block	Lot	Property Location	Acres	Owner
1	2	Kincaid Rd	10.72	County of Morris%Morris Co Park Com
1	7	168 Boonton Ave	71.11	County of Morris
1	8	180R Boonton Ave	38.27	County of Morris
1	9	Kincaid Rd	14.29	County of Morris
1	10	Kincaid Rd	28.76	County of Morris
1	11.44	Boonton Ave (Rear)	76.66	Morris County Park Commission
1	11.49	Boonton Ave (Rear)	42.43	County of Morris
1	11.5	Boonton Ave (Rear)	54.5	County of Morris
1	11.51	Boonton Ave (Rear)	51.98	State of NJ DEP & County of Morris
1	11.55	High Mountain Dr	24.91	County of Morris
1	32	124 Boonton Ave	2.8	County of Morris
1	33	126 Boonton Ave	9	County of Morris
1.1	1	Kincaid Rd	1.5	County of Morris%Morris Co Park Com
1.1	2	Kincaid Rd	2.71	County of Morris
3	1	Stony Brook Rd Rear	7.09	Morris County Park Commission
3	2	201 Boonton Ave	53.64	Morris County Park Commission
3	3	Boonton Ave	23.15	Morris County Park Commission
3	4	187R Boonton Ave	11.63	County of Morris
3	5	Boonton Ave	7.77	Morris County Park Commission
3	7	Boonton Ave (Rear)	9.53	Morris County Park Commission
3	9	Stony Brook Rd	22.75	Morris County Park Commission
3	12	Stony Brook Rd R W/S	6.77	Morris County Park Commission
3	13	92 Stony Brook Rd	103.08	Morris County Park Commission
3	15	Hemlock Dr	28.73	County of Morris
3	21	Boonton Ave&Tylrtwn	4.01	Morris County Park Commission
3	22	Boonton Ave&Tylrtwn	6.69	Morris County Park Commission
3	23	Stony Brook Rd	5.77	County of Morris%Morris Co Park Com
3	24	Bet Stony Brk&Boonton Ave	5.7	County of Morris
3	25	Boonton Ave	17.06	Morris County Park Commission
3	26	Boonton Ave	20.92	County of Morris
3	28	Boonton Ave (Rear)	20.75	Morris County Park Commission
3	29	Bet Stony Brk&Boonton Ave	20.65	Morris County Park Commission

Appendix A-1
Preserved Lands: County Park Land
Montville, New Jersey

Block	Lot	Property Location	Acres	Owner
3	30	Boonton Ave	8.7	Morris County Park Commission
3	31	Boonton Ave	1.96	Morris County Park Commission
3	32	Bet Boonton & Stoney Brk	9.45	Morris County Park Commission
3	33	Boonton Ave	21.59	Morris County Park Commission
3	34	Boonton Ave	11.11	Morris County Park Commission
3	35	Boonton Ave	6.83	Morris County Park Commission
3	36	n/a	8.42	n/a
3	39	119-123 Boonton Ave	68.67	Morris County Park Commission
3	40.2	Boonton Ave	13.49	County of Morris%Morris Co Park Com
3	62	Boonton Ave	25.66	Morris County Park Commission
3	63	Boonton Ave	6.22	Morris County Park Commission
3	64	Bet Boonton & Stoney Brk	10.46	Morris County Park Commission
3	66	Boonton Ave	7.24	County of Morris
24	17	107 Stony Brook Rd	16.69	Morris County Park Commission

Source: Township of Montville, updated through September 2012.

Appendix A-1
Preserved Lands: Municipal Recreation & Open Space Inventory (ROSI)
Montville, New Jersey

Block	Lot	Property Location	Acres	Owner
2	12	40 Boonton Ave	16.64	Montville Township
3	6.1	Boonton Ave Rear	22.96	Montville Township
3	8	139 Boonton Ave	263.7	Montville Township
3	8.1	Boonton Ave Rear	7.73	Montville Township
3	19	Bet Stoney Brk & Glen	7.14	Montville Township
3	38.6	5A Mars Ct	11.65	Montville Township
7	3	Cronest Rd	1.01	Montville Township
7	4	Cronest Rd	0.58	Montville Township
7	5	Cronest Rd	0.67	Montville Township
21.1	18.5	Waughaw Rd	44.97	Montville Township
21.1	40.2	Old Ln	23.26	Montville Township
21.1	42	100 Waughaw Rd	88.17	Montville Township
21.2	42	80A Waughaw Rd	12.06	Montville Township
24.2	34	Jacksonville Rd	90.71	Montville Township
24.2	51	80 Jacksonville Rd	23.81	Montville Township
32	14	35 Old Jacksonville Rd	42.26	Montville Township
32	27	61 Cooks Ln	3.33	Montville Township
33	23	19 Boonton Ave	44.97	Montville Township
39	9.2	Waughaw Rd	68.2	Montville Township
39	34.2	586 Rt 202	17.39	Montville Township
39	42	568 Rt 202	3.99	Montville Township
39	58	520 Rt 202	0.51	Montville Township
39	67	16 Twaits Rd	60.91	Montville Township
39	75	Peach Hill Rd	12.62	Montville Township
39	83	11 South Abbott Rd	7.39	Montville Township
39	83.2	15 Abbott Rd	4.75	Montville Township
40	3.4	Indian Ln	14.66	Montville Township
40	69.3	67 Waughaw Rd	19.74	Montville Township
41	3.2	Cooks Ln	11.14	Montville Township
54	2	26 Vreeland Ave	10.5	Montville Township
54	8	River Rd W/S	0.85	Montville Township
59.1	5.02	58 Millers Ln	32.86	Montville Township

Appendix A-1
Preserved Lands: Municipal Recreation & Open Space Inventory (ROSI)
Montville, New Jersey

Block	Lot	Property Location	Acres	Owner
76	15.2	43 Millers Ln	14.3	Montville Township
79	26	Country Brook Dr	7.29	Montville Township
79	43	8 Daro Ct	8.6	Montville Township
82.1	10	27 Mary Dr	3.12	Montville Township
82.9	1	38 Jarombek Dr	10.4	Montville Township
105	6	14 Barney Rd	0.27	Montville Township
113	4.2	Hewlett Rd	6.41	Montville Township
113	5.1	43 Two Bridges Rd	5.14	Montville Township
113	11	4 Hewlett Rd	6.58	Montville Township
113	29	30 Peace Valley Rd	8.75	Montville Township
116	4	15 Cedar Rd (T)	14.21	Montville Township
116	16	9 Hewlett Rd	1.11	Montville Township
120	28.6	Midvale Ave Rear	2.31	Montville Township
123	13	86 River Rd	11.47	Montville Township
123	19	112 River Rd	31.18	Montville Township
123	20	118 River Rd	5.25	Montville Township
124	6	91 Passaic Valley Rd	13.02	Montville Township
124	12	130 Change Bridge Rd	81.35	Montville Township
124	13	132 Change Bridge Rd	0.46	Montville Township
124.6	9.1	37 Passaic Valley Rd	7.53	Montville Township
131	2	177 Change Bridge Rd	0.49	Montville Township
131	15	179-181 Change Bridge Rd	63.79	Montville Township
138	10.2	229 Change Bridge Rd	5.96	Montville Township
138	12	249 Change Bridge Rd	38.46	Montville Township
138	13	33 Stiles Ln	0.82	Montville Township
139.6	19.8	178 Konner Ave North	2.66	Montville Township
141.1	14	12 Tristam - 131 Konner	8.45	Montville Township
144	18	Hilldale Rd	20.35	Montville Township
147	1	12 Walnut Dr	2.54	Montville Township
149.1	2	33A Buckingham Cir	7.64	Montville Township
156	30.2	Change Bridge Rd	2.11	Montville Township
156	34	308 Change Bridge Rd	34.77	Montville Township

Appendix A-1
Preserved Lands: Municipal Recreation & Open Space Inventory (ROSI)
Montville, New Jersey

Block	Lot	Property Location	Acres	Owner
164	38	Maple Ave (Rear)	4.97	Montville Township
167	15	32 Maple Ave	15.17	Montville Township
167	26	10 Maple Ave	14.99	Montville Township

Source: Township of Montville, updated through September 2012.

Appendix A-1
Preserved Lands: Town of Boonton-Owned Preserved Land
Montville, New Jersey

Block	Lot	Property Location	Acres	Owner
52.3	27	Rexland Dr	10.08	Town of Boonton

Source: Township of Montville, updated through September 2012.

Appendix A-1
Preserved Lands: Preserved Farmland
Montville, New Jersey

Block	Lot	Property Location	Acres	Owner
32	28	53 Jacksonville Rd	28.76	Lotta Lettuce Jts Farms LLC

Source: Township of Montville, updated through September 2012.

APPENDIX A-2

List of Endangered Plant Species and Plant Species of Concern

(Listed Alphabetically by Latin Name and Common Name)

List of Endangered Plant Species and Plant Species of Concern
January 2010

Scientific Name	Common Name	G Rank	S Rank	Federal Status	State Status	Other Status
Acorus americanus	American Sweetflag	G5	S1?			HL
Actaea rubra var. rubra	Red Baneberry	G5T5	S2			HL
Adlumia fungosa	Climbing Fumitory	G4	S2			HL
Aeschynomene virginica	Sensitive Joint-vetch	G2	S1	LT	E	LP, HL
Agalinis auriculata	Ear-leaf False Foxglove	G3	SX			HL
Agalinis fasciculata	Pine Barren Foxglove	G5	S3			HL
Agalinis paupercula var. paupercula	Small-flower False Foxglove	G5T5	S2			HL
Agastache nepetoides	Yellow Giant-hyssop	G5	S2			HL
Agastache scrophulariifolia	Purple Giant-hyssop	G4	S2			HL
Agrimonia microcarpa	Small-fruit Grooveburr	G5	S2			HL
Agrostis geminata	Ticklegrass	G5	S1?			HL
Alisma triviale	Large Water-plantain	G5	S1		E	LP, HL
Alopecurus aequalis var. aequalis	Short-awn Meadow-foxtail	G5T5?	S2			HL
Alopecurus carolinianus	Tufted Meadow-foxtail	G5	S2			HL
Amaranthus pumilus	Seabeach Amaranth	G2	S1	LT	E	LP, HL
Amelanchier humilis	Low Service-berry	G5	S1S2			HL
Amelanchier sanguinea	Round-leaf Service-berry	G5T5	S1.1		E	LP, HL
Amelanchier stolonifera	Running Service-berry	G5	S3			HL
Amianthium muscitoxicum	Fly Poison	G4G5	S2			HL
Ammannia latifolia	Koehn's Toothcup	G5	S1		E	LP, HL
Andromeda glaucophylla	Bog Rosemary	G5T5	S1		E	LP, HL
Andropogon glomeratus var. hirsutior	Hairy Beardgrass	G5T5	SH.1			HL
Andropogon gyrans	Elliott's Beardgrass	G5	S2			HL
Andropogon ternarius var. ternarius	Silvery Beardgrass	G5T5?	S2			HL
Anemone canadensis	Canada Anemone	G5	SX			HL
Anemone cylindrica	Long-head Anemone	G5	S1		E	LP, HL
Anemone virginiana var. alba	Riverbank Anemone	G5T4T5	S2			HL
Angelica venenosa	Hairy Angelica	G5	S1S2			HL
Antennaria neglecta var. canadensis	Canada Pussytoes	G5T5?	S1		E	LP, HL
Aplectrum hyemale	Puttyroot	G5	S1		E	LP, HL
Arabis drummondii	Drummond's Rockcress	G5	S1.1		E	LP, HL
Arabis hirsuta var. pycnocarpa	Western Hairy Rockcress	G5T5	S1			HL
Arabis missouriensis	Missouri Rockcress	G5?Q	S1.1			HL
Aralia hispida	Bristly Sarsaparilla	G5	S3			HL
Arceuthobium pusillum	Dwarf Mistletoe	G5	S1		E	LP, HL
Arenaria stricta	Rock Sandwort	G5T5	SH		E	LP, HL
Arethusa bulbosa	Dragon Mouth	G4	S2			HL
Arisaema triphyllum ssp. stewardsonii	Northern Jack-in-the-pulpit	G5T4	S2			HL
Aristida dichotoma var. curtissii	Curtiss' Three-awn Grass	G5T5	S2			HL
Aristida lanosa	Woolly Three-awn Grass	G5	S1		E	LP, HL
Aristida virgata	Wand-like Three-awn Grass	G5T4T5	S2			HL
Aristolochia serpentaria	Virginia Snakeroot	G4	S3			HL
Armoracia lacustris	Lake Water-cress	G4?	SH		E	LP, HL
Arnica acaulis	Leopardbane	G4	SX.1			HL
Arnoglossum muehlenbergii	Great Indian Plantain	G4	SX.1			HL
Artemisia campestris ssp. caudata	Beach Wormwood	G5T5	S2			HL
Asclepias lanceolata	Smooth Orange Milkweed	G5	S2			HL
Asclepias quadrifolia	Four-leaf Milkweed	G5	S3			HL
Asclepias rubra	Red Milkweed	G4G5	S2			LP, HL
Asclepias variegata	White Milkweed	G5	S2			HL
Asclepias verticillata	Whorled Milkweed	G5	S2			HL
Asimina triloba	Pawpaw	G5	S1		E	LP, HL
Asplenium bradleyi	Bradley's Spleenwort	G4	S1		E	LP, HL
Asplenium montanum	Mountain Spleenwort	G5	S2			HL
Asplenium pinnatifidum	Lobed Spleenwort	G4	S1		E	LP, HL
Asplenium ruta-muraria var. cryptolepis	Wall-rue	G5T5	S2			HL
Aster borealis	Rush Aster	G5	S1		E	LP, HL
Aster concolor	Eastern Silvery Aster	G5	S2			LP, HL
Aster ericoides var. ericoides	White Heath Aster	G5T5	S1S2			HL
Aster ericoides var. prostratus	Prostrate White Heath Aster	G5T4T5Q	S3			HL

List of Endangered Plant Species and Plant Species of Concern
January 2010

Scientific Name	Common Name	G Rank	S Rank	Federal Status	State Status	Other Status
Aster firmus	Shining Aster	G5T5	SX.1		E	LP, HL
Aster novi-belgii var. elodes	Marsh New York Aster	G5TNR	S3			HL
Aster praealtus	Willow-leaf Aster	G5T5?	S1		E	LP, HL
Aster prenanthoides	Crooked-stem Aster	G4G5	S2			HL
Aster radula	Low Rough Aster	G5	S1		E	LP, HL
Aster tradescantii	Tradescant's Aster	G4Q	S2			HL
Aster urophyllus	Arrow-leaf Aster	G4G5	S2			HL
Astragalus canadensis var. canadensis	Canadian Milk-vetch	G5T5	SX.1			HL
Athyrium pycnocarpon	Glade Fern	G5	S1		E	LP, HL
Atriplex subspicata	Saline Orache	G5	S1		E	LP, HL
Azolla caroliniana	Eastern Mosquito-fern	G5	S2			HL
Betula papyrifera var. papyrifera	Paper Birch	G5T5	S2			HL
Betula pumila var. pumila	Swamp Birch	G5T5?	S2			HL
Bidens beckii	Water-marigold	G4G5	S1		E	LP, HL
Bidens bidentoides	Estuary Burr-marigold	G3G4	S2			HL
Bidens eatonii	Eaton's Beggar-ticks	G2G3	S1.1		E	LP, HL
Bidens mitis	Small-fruit Beggar-ticks	G4?	S1			HL
Blephilia ciliata	Downy Woodmint	G5	SH.1			HL
Boltonia asteroides var. glastifolia	Southern Boltonia	G5TNR	S1		E	LP, HL
Boltonia montana	Appalachian Mountain Boltonia	G1G2	S1S2			HL
Botrychium lanceolatum var. angustisegmentum	Lance-leaf Moonwort	G5T4	S2			HL
Botrychium multifidum	Leathery Grape Fern	G5	S1		E	LP, HL
Botrychium oneidense	Blunt-lobe Grape Fern	G4Q	S2			HL
Botrychium simplex var. laxifolium	Upland Least Moonwort	G5TNR	SH			HL
Botrychium simplex var. simplex	Least Moonwort	G5T5	SH.1			HL
Botrychium simplex var. tenebrosum	Slender Least Moonwort	G5T4?Q	S2			HL
Bouteloua curtipendula	Side-oats Grama Grass	G5T5	S1		E	LP, HL
Bromus ciliatus var. ciliatus	Fringed Brome	G5T5	S2S3			HL
Bromus kalmii	Kalm's Brome	G5	S2			HL
Bromus latiglumis	Early Brome	G5	S2S3			HL
Buchnera americana	Bluehearts	G5?	SX			HL
Cacalia atriplicifolia	Pale Indian Plantain	G4G5	S1		E	LP, HL
Calamagrostis pickeringii	Pickering's Reed Grass	G4	S1		E	LP, HL
Calla palustris	Wild Calla	G5	S3			HL
Callitriche palustris	Marsh Water-starwort	G5	S2			HL
Callitriche terrestris	Austin's Terrestrial Water-starwort	G5	S3			HL
Calystegia sepium ssp. appalachiana	Appalachian Bindweed	G5T4?	SU			HL
Calystegia sepium ssp. erratica	Occluded Bindweed	G5TNR	SH.1		E	LP, HL
Calystegia spithamaea	Erect Bindweed	G4G5T4T5	S1		E	LP, HL
Cardamine angustata	Slender Toothwort	G5	S3			HL
Cardamine diphylla	Two-leaf Toothwort	G5	S3			HL
Cardamine douglassii	Purple Bittercress	G5	S2			HL
Cardamine longii	Long's Bittercress	G3	SH		E	LP, HL
Cardamine maxima	Large Toothwort	G5Q	S1.1		E	LP, HL
Cardamine pratensis var. palustris	Meadow Cuckoo-flower	G5T5	S3			HL
Cardamine rotundifolia	Round-leaf Bittercress	G4	S1		E	LP, HL
Carex aggregata	Glomerate Sedge	G5	S1S2			HL
Carex albursina	White Bear Lake Sedge	G5	S2		E	LP, HL
Carex alopecoidea	Foxtail Sedge	G5	S1		E	LP, HL
Carex amphibola var. amphibola	Narrow-leaf Sedge	G4Q	S1		E	LP, HL
Carex aquatilis	Water Sedge	G5	S1		E	LP, HL
Carex arctata	Drooping Wood Sedge	G5?	S1		E	LP, HL
Carex backii	Back's Sedge	G4	SH.1		E	LP, HL
Carex bebbii	Bebb's Sedge	G5	S2			HL
Carex bicknellii var. bicknellii	Bicknell's Sedge	G5T5	S2			HL
Carex brunnescens	Round-spike Brownish Sedge	G5T5	S1		E	LP, HL
Carex bushii	Bush's Sedge	G4	S1		E	LP, HL
Carex buxbaumii	Brown Sedge	G5	S3			HL
Carex canescens var. canescens	Silvery Sedge	G5T5	SU			HL

List of Endangered Plant Species and Plant Species of Concern
January 2010

Scientific Name	Common Name	G Rank	S Rank	Federal Status	State Status	Other Status
Carex caroliniana	Carolina Sedge	G5	S3			HL
Carex cephaloidea	Thin-leaf Sedge	G5	S2			HL
Carex conjuncta	Soft Fox Sedge	G4G5	S3			HL
Carex conoidea	Field Sedge	G5	S2			HL
Carex crawei	Crawe's Sedge	G5	S1		E	LP, HL
Carex crawfordii	Crawford's Sedge	G5	S2			HL
Carex cryptolepis	Small Yellow Sedge	G4	S2			HL
Carex cumulata	Clustered Sedge	G4?	SH		E	LP, HL
Carex deweyana	Dewey's Sedge	G5T5	S1		E	LP, HL
Carex diandra	Lesser Panicled Sedge	G5	S1			HL
Carex disperma	Soft-leaf Sedge	G5	S1S2			HL
Carex eburnea	Ebony Sedge	G5	S2			HL
Carex formosa	Handsome Sedge	G4	S1.1		E	LP, HL
Carex frankii	Frank's Sedge	G5	S3			HL
Carex haydenii	Cloud Sedge	G5	S1		E	LP, HL
Carex hitchcockiana	Hitchcock's Sedge	G5	S2			HL
Carex hyalinolepis	Shore-line Sedge	G4G5	SX.1			HL
Carex jamesii	James' Sedge	G5	S1		E	LP, HL
Carex joorii	Cypress-swamp Sedge	G4G5	S1.1		E	LP, HL
Carex lasiocarpa var. americana	American Slender Sedge	G5T5	S2			HL
Carex laxiculmis var. copulata	Coupled Sedge	G5T3T5	S1			HL
Carex leavenworthii	Leavenworth's Sedge	G5	SU			HL
Carex leptalea var. harperi	Harper's Sedge	G5T4T5	S2S3			HL
Carex leptonervia	Fine-nerve Sedge	G4	S1		E	LP, HL
Carex limosa	Mud Sedge	G5	S1		E	LP, HL
Carex lonchocarpa	Southern Long Sedge	G5	SX.1			HL
Carex louisianica	Louisiana Sedge	G5	S1		E	LP, HL
Carex lupuliformis	Hop-like Sedge	G4	S1		E	LP, HL
Carex meadii	Mead's Sedge	G4G5	S1			HL
Carex mesochorea	Midland Sedge	G4G5	S2			HL
Carex mitchelliana	Mitchell's Sedge	G4	S2			HL
Carex oligocarpa	Few-fruit Sedge	G4	S1		E	LP, HL
Carex pallescens	Pale Sedge	G5	S2			HL
Carex peckii	Peck's White-tinged Sedge	G4G5	S1		E	LP, HL
Carex plantaginea	Plantain-leaf Sedge	G5	S1.1		E	LP, HL
Carex polymorpha	Variable Sedge	G3	S1		E	LP, HL
Carex prairea	Prairie Sedge	G5?	S2			HL
Carex pseudocyperus	Cyperus-like Sedge	G5	S1		E	LP, HL
Carex retrorsa	Retrorse Sedge	G5	S2			HL
Carex siccata	Hillside Sedge	G5	S1		E	LP, HL
Carex silicea	Seabeach Sedge	G5	S2			HL
Carex sterilis	Dioecious Sedge	G4	S2			HL
Carex stipata var. maxima	Large Awl-fruit Sedge	G5T5?	SH			HL
Carex tenera	Quill Sedge	G5	S2			HL
Carex tuckermanii	Tuckerman's Sedge	G4	S1		E	LP, HL
Carex typhina	Cat-tail Sedge	G5	S3			HL
Carex utriculata	Bottle-shaped Sedge	G5	S2			HL
Carex viridula ssp. viridula	Green Sedge	G5T5	S2			HL
Carex willdenowii var. willdenowii	Willdenow's Sedge	G5T5	S2			HL
Carex woodii	Wood's Sedge	G4	S1.1			HL
Castanea pumila	Chinquapin	G5	S1		E	LP, HL
Castilleja coccinea	Scarlet Indian-paintbrush	G5	S2			HL
Celtis tenuifolia	Dwarf Hackberry	G5	S2			HL
Centella erecta	Erect Coinleaf	G5	SX.1			HL
Centrosema virginianum	Spurred Butterfly-pea	G5	SH		E	LP, HL
Ceratophyllum echinatum	Spiny Coontail	G4?	S1		E	LP, HL
Cercis canadensis	Redbud	G5T5	S1		E	LP, HL
Chaerophyllum procumbens var. procumbens	Spreading Chervil	G5T5	S3			HL
Chamaelirium luteum	Devil's-bit	G5	S3			HL

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Chasmanthium latifolium	Indian Wood-oats	G5	SX.1			HL
Cheilanthes lanosa	Hairy Lipfern	G5	S2			HL
Chenopodium berlandieri var. macrocalycium	Large-calyx Goosefoot	G5T4	S2			HL
Chenopodium pratericola	Narrow-leaf Goosefoot	G5	S2			HL
Chenopodium rubrum	Red Goosefoot	G5	S1		E	LP, HL
Chenopodium simplex	Maple-leaf Goosefoot	G5	S2			HL
Chenopodium standleyanum	Stanley's Goosefoot	G5	S2			HL
Chionanthus virginicus	Fringetree	G5	S3			HL
Cinna latifolia	Slender Wood-reed	G5	S1		E	LP, HL
Cirsium altissimum	Tall Thistle	G5	SX.1			HL
Cirsium virginianum	Virginia Thistle	G3	S1		E	LP, HL
Claytonia virginica var. hammondiae	Hammond's Yellow Spring Beauty	G5T1	S1.1		E	LP, HL
Cleistes divaricata	Spreading Pogonia	G4	S1		E	LP, HL
Clematis occidentalis var. occidentalis	Purple Clematis	G5T5	S2			HL
Clintonia borealis	Yellow Clintonia	G5	S3			HL
Clitoria mariana	Butterfly-pea	G5	S1		E	LP, HL
Coeloglossum viride var. virescens	Long-bract Green Orchid	G5T5	S2			HL
Coelorachis rugosa	Wrinkled Jointgrass	G5	S1		E	LP, HL
Commelina erecta	Slender Dayflower	G5T5	SH.1		E	LP, HL
Conioselinum chinense	Hemlock-parsley	G5	S1		E	LP, HL
Corallorhiza trifida	Early Coralroot	G5	S2			HL
Corallorhiza wisteriana	Spring Coralroot	G5	SX			HL
Corema conradii	Broom Crowberry	G4	S1		E	LP, HL
Coreopsis rosea	Rose-color Coreopsis	G3	S2			LP, HL
Cornus amomum var. schuetzeana	Pale Dogwood	G5T5	S1		E	LP, HL
Cornus canadensis	Bunchberry	G5	S1S2			HL
Cornus foemina	Stiff Dogwood	G5	S2			HL
Crataegus calpodendron	Pear Hawthorn	G5	S1		E	LP, HL
Crataegus chrysocarpa var. chrysocarpa	Fireberry Hawthorn	G5TNR	S2			HL
Crataegus dodgei	Dodge's Hawthorn	G4	S2			HL
Crataegus holmesiana	Holmes' Hawthorn	G5	S1			HL
Crataegus pedicellata	Scarlet Hawthorn	G5	S1S2			HL
Crataegus pennsylvanica	Pennsylvania Hawthorn	G3Q	S1.1			HL
Crataegus punctata	Dotted Hawthorn	G5	S2			HL
Crataegus succulenta	Fleshy Hawthorn	G5	S1		E	LP, HL
Croton willdenowii	Elliptical Rushfoil	G5	S2			LP, HL
Cryptogramma stelleri	Slender Rockbrake	G5	SH.1		E	LP, HL
Cuphea viscosissima	Blue Waxweed	G5?	S3			HL
Cuscuta cephalanthi	Buttonbush Dodder	G5	S1		E	LP, HL
Cuscuta coryli	Hazel Dodder	G5?	S2			HL
Cuscuta indecora	Collared Dodder	G5T2T4	S1.1		E	LP, HL
Cuscuta polygonorum	Smartweed Dodder	G5	S2			HL
Cynoglossum virginianum var. boreale	Northern Wild Comfrey	G5T4T5	SH.1		E	LP, HL
Cynoglossum virginianum var. virginianum	Wild Comfrey	G5T5	S2			HL
Cyperus engelmannii	Engelmann's Flat Sedge	G4Q	S2			HL
Cyperus hystricinus	Bristly Flat Sedge	G4	SH		E	LP, HL
Cyperus lancastriensis	Lancaster Flat Sedge	G5	S1		E	LP, HL
Cyperus plukenetii	Plukenet's Flat Sedge	G5	SH		E	LP, HL
Cyperus polystachyos	Coast Flat Sedge	G5T5	S1		E	LP, HL
Cyperus pseudovegetus	Marsh Flat Sedge	G5	S1		E	LP, HL
Cyperus refractus	Reflexed Flat Sedge	G5	SH		E	LP, HL
Cyperus retrofractus	Rough Flatsedge	G5	SH		E	LP, HL
Cyperus schweinitzii	Schweinitz's Flat Sedge	G5	S1		E	LP, HL
Cyperus tenuifolius	Low Spike Sedge	G5	SH		E	LP, HL
Cypripedium candidum	Small White Lady's-slipper	G4	S1		E	LP, HL
Cypripedium parviflorum var. makasin	Fen Small Yellow Lady's-slipper	G5T4Q	S2			HL
Cypripedium reginae	Showy Lady's-slipper	G4	S1		E	LP, HL
Cystopteris protrusa	Lowland Fragile Fern	G5	S2			HL

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Dalibarda repens	Robin-run-away	G5	SH.1		E	LP, HL
Deschampsia caespitosa	Tufted Hair Grass	G5	S3			HL
Desmodium cuspidatum var. cuspidatum	Toothed Tick-trefoil	G5T5?	S2			HL
Desmodium humifusum	Trailing Tick-trefoil	G1G2Q	S1		E	LP, HL
Desmodium laevigatum	Smooth Tick-trefoil	G5	S3			HL
Desmodium nuttallii	Nuttall's Tick Trefoil	G5	S3			HL
Desmodium ochroleucum	Cream-flower Tick-trefoil	G1G2	SX.1			HL
Desmodium pauciflorum	Few-flower Tick-trefoil	G5	SH		E	LP, HL
Desmodium sessilifolium	Sessile-leaf Tick-trefoil	G5	S1		E	LP, HL
Desmodium strictum	Pineland Tick-trefoil	G4	S2			LP, HL
Desmodium viridiflorum	Velvety Tick-treefoil	G5?	S2			HL
Dicentra canadensis	Squirrel-corn	G5	S1		E	LP, HL
Dicentra eximia	Wild Bleeding-heart	G4	SH.1		E	LP, HL
Diodia virginiana	Larger Buttonweed	G5T5	S1		E	LP, HL
Dirca palustris	Leatherwood	G4	S2			HL
Doellingeria infirma	Cornel-leaf Aster	G5	S2			HL
Draba reptans	Carolina Whitlow-grass	G5	SH		E	LP, HL
Dryopteris celsa	Log Fern	G4	S1			HL
Dryopteris clintoniana	Clinton's Woodfern	G5	S3			HL
Dryopteris goldiana	Goldie's Wood Fern	G4	S3			HL
Echinochloa muricata var. microstachya	Small-spike Rough Barnyard Grass	G5T5	S1S2			HL
Echinodorus parvulus	Dwarf Burrhead	G3Q	SH.1			HL
Elatine americana	American Waterwort	G4	S2			HL
Elatine minima	Small Waterwort	G5	S3			HL
Eleocharis brittonii	Britton's Spike-rush	G4G5	S1		E	LP, HL
Eleocharis compressa	Flat-stem Spike-rush	G4	S1		E	LP, HL
Eleocharis elliptica	Elliptic Spike-rush	G5	S2			HL
Eleocharis equisetoides	Knotted Spike-rush	G4	S1		E	LP, HL
Eleocharis erythropoda	Bald Spike-rush	G5	S3			HL
Eleocharis halophila	Salt-marsh Spike-rush	G4	S2			HL
Eleocharis intermedia	Matted Spike-rush	G5	S2			HL
Eleocharis melanocarpa	Black-fruit Spike-rush	G4	S1		E	LP, HL
Eleocharis minima	Small Spike-rush	G4G5	SX.1		E	LP, HL
Eleocharis olivacea var. reductiseta	Pine Barren Spike-rush	G5T1T2	S1S2			HL
Eleocharis pauciflora	Few-flower Spike-rush	G5	S1		E	LP, HL
Eleocharis quadrangulata	Angled Spike-rush	G4	S2			HL
Eleocharis tenuis var. verrucosa	Warty Spike-rush	G5T3T5	S1.1		E	LP, HL
Eleocharis tortilis	Twisted Spike-rush	G5	S1		E	LP, HL
Elephantopus carolinianus	Carolina Elephant-foot	G5	SH		E	LP, HL
Ellisia nyctelea	Aunt Lucy	G5	S1		E	LP, HL
Elymus trachycaulus	Slender Wheatgrass	G5	S1		E	LP, HL
Elymus trachycaulus ssp. subsecundus	One-sided Wheatgrass	G5T5	S1			HL
Elymus trachycaulus ssp. trachycaulus	Slender Wheatgrass	G5T5	S1			HL
Epilobium angustifolium ssp. circumvagum	Narrow-leaf Fireweed	G5T5	SH			HL
Epilobium leptophyllum	Bog Willowherb	G5	S2			HL
Epilobium strictum	Downy Willowherb	G5?	S2			HL
Equisetum pratense	Meadow Horsetail	G5	S1		E	LP, HL
Equisetum sylvaticum	Woodland Horsetail	G5	S3			HL
Equisetum variegatum	Variegated Horsetail	G5T5	S1		E	LP, HL
Eragrostis frankii	Frank's Love Grass	G5	S2			HL
Eragrostis hirsuta	Stout Love Grass	G5	S1.1			HL
Erechtites hieraciifolia var. megalocarpa	Large-fruit Fireweed	G5T3	S1S2			HL
Eriocaulon parkeri	Parker's Pipewort	G3	S2			HL
Eriophorum gracile	Slender Cotton-grass	G5T4T5	SH		E	LP, HL
Eriophorum tenellum	Rough Cotton-grass	G5	S1		E	LP, HL
Eriophorum vaginatum var. spissum	Sheathed Cotton-grass	G5T5	SH		E	LP, HL
Eriophorum viridicarinatum	Thin-leaf Cotton-grass	G5	S3			HL
Eryngium aquaticum var. aquaticum	Marsh Rattlesnake-master	G4T4	S3			HL
Eryngium yuccifolium var. yuccifolium	Tall Rattlesnake-master	G5T5	SX			HL

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Euonymus atropurpurea var. atropurpurea	Wahoo	G5T5	S1?			HL
Eupatorium album var. vaseyi	Vasey's Boneset	G5T3T5	S2			HL
Eupatorium altissimum	Tall Boneset	G5	S2			HL
Eupatorium aromaticum var. aromaticum	Smaller White Snakeroot	G5T5	S1			HL
Eupatorium capillifolium	Dog-fennel Thoroughwort	G5	S1		E	LP, HL
Eupatorium coelestinum	Mist-flower	G5	S3			HL
Eupatorium resinosum	Pine Barren Boneset	G3	S2		E	LP, HL
Eupatorium sessilifolium var. brittonianum	Britton's Upland Boneset	G5T3T5	S2			HL
Euphorbia corollata	Flowering Spurge	G5	S2			HL
Euphorbia marilandica	Maryland Spurge	GNR	SNA		E	LP, HL
Euphorbia purpurea	Darlington's Glade Spurge	G3	S1		E	LP, HL
Filipendula rubra	Queen-of-the-prairie	G4G5	SX		E	LP, HL
Fimbristylis caroliniana	Carolina Fimbry	G4	S2			HL
Fimbristylis castanea	Marsh Fimbry	G5	S3			HL
Fimbristylis puberula var. puberula	Hairy Fimbry	G5T5?	S2			HL
Fraxinus profunda	Pumpkin Ash	G4	S1		E	LP, HL
Fuirena squarrosa	Hairy Umbrella-sedge	G4G5	S3			HL
Galactia volubilis	Downy Milk-pea	G5	SH		E	LP, HL
Galium boreale	Northern Bedstraw	G5	S3			HL
Galium concinnum	Shining Bedstraw	G5	SX.1			HL
Galium hispidulum	Coast Bedstraw	G5	S1		E	LP, HL
Galium labradoricum	Labrador Marsh Bedstraw	G5	S1		E	LP, HL
Galium palustre	Marsh Bedstraw	G5	S3			HL
Galium trifidum	Small Bedstraw	G5T5	S2		E	LP, HL
Gaultheria hispidula	Creeping-snowberry	G5	S1		E	LP, HL
Gaura biennis	Biennial Beeblosom	G5	S3			HL
Gentiana andrewsii var. andrewsii	Fringed Bottle Gentian	G5?T5?	S2			HL
Gentiana autumnalis	Pine Barren Gentian	G3	S3			LP, HL
Gentiana catesbaei	Catesby's Gentian	G5	SX.1			HL
Gentiana linearis	Narrow-leaf Gentian	G4G5	SH		E	LP, HL
Gentiana saponaria var. saponaria	Soapwort Gentian	G5T5	S3			HL
Gentiana villosa	Striped Gentian	G4	SX.1			HL
Gentianella quinquefolia var. quinquefolia	Stiff Gentian	G5T4T5	S2			HL
Geum rivale	Chocolate-root	G5	S3			HL
Geum vernum	Spring Avens	G5	S2			HL
Glaux maritima	Sea-milkwort	G5	SX.1		E	LP, HL
Glyceria borealis	Small Floating Manna Grass	G5	SH.1		E	LP, HL
Glyceria grandis	American Manna Grass	G5T5	S2		E	LP, HL
Glyceria laxa	Northern Manna Grass	G5	S1			HL
Glyceria melicaria	Long Manna Grass	G5	S3			HL
Gnaphalium helleri	Small Everlasting	G4G5T3?	SH		E	LP, HL
Gnaphalium macounii	Winged Cudweed	G5	SH		E	LP, HL
Goodyera tesselata	Checkered Rattlesnake-plantain	G5	SX.1		E	LP, HL
Gratiola pilosa	Hairy Hedge Hyssop	G5?	S2			HL
Gratiola virginiana	Round-fruit Hedge-hyssop	G5	S2			HL
Gymnocarpium dryopteris	Oak Fern	G5	S1S2			HL
Gymnopogon ambiguus	Bearded Skeleton Grass	G4	S3			HL
Gymnopogon brevifolius	Short-leaf Skeleton Grass	G5	SH		E	LP, HL
Hasteola suaveolens	Sweet-scent Indian-plantain	G3	SX.1			HL
Helianthemum bicknellii	Hoary Frostweed	G5	S3			HL
Heliopsis helianthoides var. scabra	Rough Ox-eye	G5T5	SU			HL
Helonias bullata	Swamp-pink	G3	S3	LT	E	LP, HL
Hemicarpha micrantha	Small-flower Halfchaff Sedge	G5	S1		E	LP, HL
Heteranthera multiflora	Bouquet Mud-plantain	G4	S3			HL
Hieracium kalmii	Canada Hawkweed	G5T3T5	S1		E	LP, HL
Hieracium marianum	Maryland Hawkweed	G5?	SU			HL
Honckenya peploides var. robusta	Seabeach Sandwort	G5T4	S1			HL
Hottonia inflata	Featherfoil	G4	S1		E	LP, HL
Houstonia longifolia	Long-leaf Summer Bluet	G4G5	SX			HL
Hybanthus concolor	Green Violet	G5	S1		E	LP, HL

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Hydrastis canadensis	Golden Seal	G4	S1		E	LP, HL
Hydrocotyle prolifera	Canby's Marsh-pennywort	G5T5?	S1S2			HL
Hydrocotyle ranunculoides	Floating Marsh-pennywort	G5	S1		E	LP, HL
Hydrocotyle verticillata var. verticillata	Whorled Marsh-pennywort	G5T5	S3			HL
Hydrophyllum canadense	Broad-leaf Waterleaf	G5	S1		E	LP, HL
Hypericum adpressum	Barton's St. John's-wort	G3	S2		E	LP, HL
Hypericum ellipticum	Pale St. John's-wort	G5	S2			HL
Hypericum gymnanthum	Clasping-leaf St. John's-wort	G4	S1			HL
Hypericum majus	Larger Canadian St. John's Wort	G5	S1		E	LP, HL
Hypericum prolificum	Shrubby St. John's-wort	G5	S1		E	LP, HL
Hypericum pyramidatum	Great St. John's-wort	G4	S3			HL
Ilex montana	Large-leaf Holly	G5	S1		E	LP, HL
Isanthus brachiatus	False Pennyroyal	G5	S1		E	LP, HL
Isoetes lacustris	Lake Quillwort	G5	S1.1		E	LP, HL
Isoetes melanopoda	Black-base Quillwort	G5	SH		E	LP, HL
Isoetes riparia var. riparia	Shore Quillwort	G5?T5?Q	S3			HL
Isoetes tuckermanii	Tuckerman's Quillwort	G4?	SH.1		E	LP, HL
Isotria medeoloides	Small Whorled Pogonia	G2	S1	LT	E	LP, HL
Jeffersonia diphylla	Twinleaf	G5	S1		E	LP, HL
Juglans cinerea	Butternut	G4	S3			HL
Juncus articulatus	Jointed Rush	G5	S2			HL
Juncus brachycarpus	Short-fruit Rush	G4G5	S1		E	LP, HL
Juncus brachycephalus	Fen Rush	G5	S3			HL
Juncus brevicaudatus	Narrow-panicle Rush	G5	S2			HL
Juncus caesariensis	New Jersey Rush	G2	S2		E	LP, HL
Juncus coriaceus	Awl-leaf Rush	G5	S1		E	LP, HL
Juncus dudleyi	Dudley's Rush	G5	S3			HL
Juncus elliottii	Elliott's Rush	G4G5	SX.1		E	LP, HL
Juncus greenei	Greene's Rush	G5	S2			HL
Juncus nodosus var. nodosus	Knotted Rush	G5T5?	S3			HL
Juncus torreyi	Torrey's Rush	G5	S1		E	LP, HL
Juniperus communis var. depressa	Dwarf Juniper	G5T5	S3			HL
Kalmia polifolia	Pale-laurel	G5	S1		E	LP, HL
Krigia dandelion	Potato Dwarf-dandelion	G5	SH.1		E	LP, HL
Kuhnia eupatorioides	False Boneset	G5T5	S1		E	LP, HL
Lactuca graminifolia var. graminifolia	Grass-leaf Lettuce	G5?T3T5	S1			HL
Lactuca hirsuta var. sanguinea	Red-stem Hairy Lettuce	G5?T5?	S2			HL
Lathyrus japonicus var. maritimus	Smooth Beach-pea	G5T4T5	SU			HL
Lathyrus ochroleucus	Cream Vetchling	G4G5	SH		E	LP, HL
Lathyrus venosus	Veiny Vetchling	G5	SX		E	LP, HL
Lechea intermedia var. intermedia	Large-pod Pinweed	G5T4T5	S2			HL
Lechea tenuifolia	Narrow-leaf Pinweed	G5	S1		E	LP, HL
Ledum groenlandicum	Labrador Tea	G5	S1			HL
Lemna perpusilla	Minute Duckweed	G5	S1		E	LP, HL
Lemna trisulca	Star Duckweed	G5	S2			HL
Lemna valdiviana	Pale Duckweed	G5	S1		E	LP, HL
Leptochloa fascicularis var. maritima	Long-awn Sprangletop	G5T3T4Q	S2			HL
Lespedeza stuevei	Stueve's Downy Bush-clover	G4?	S2			HL
Liatris scariosa var. novae-angliae	Northern Blazing-star	G5?T3	SH		E	LP, HL
Liatris spicata var. spicata	Blazing-star	G5T5?	S3			HL
Lilium philadelphicum var. philadelphicum	Wood Lily	G5T4T5	S2			HL
Limosella subulata	Awl-leaf Mudwort	G4G5	S1		E	LP, HL
Linnaea borealis	Twinflower	G5T5	SH		E	LP, HL
Linum intercursum	Sandplain Flax	G4	S1		E	LP, HL
Linum sulcatum	Grooved Yellow Flax	G5T5	S1		E	LP, HL
Linum virginianum	Woodland Flax	G4G5	S3			HL
Listera australis	Southern Twayblade	G4	S2			LP, HL
Listera cordata	Heartleaf Twayblade	G5T5	S1		E	LP, HL
Listera smallii	Appalachian Twayblade	G4	S1.1		E	LP, HL
Lithospermum canescens	Hoary Puccoon	G5	SX			HL

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Lobelia boykinii	Boykin's Lobelia	G2G3	S1		E	LP, HL
Lobelia canbyi	Canby's Lobelia	G4	S3			LP, HL
Lobelia dortmanna	Water Lobelia	G4G5	SH		E	LP, HL
Lonicera canadensis	American Fly-honeysuckle	G5	S1		E	LP, HL
Ludwigia brevipes	Tucker's Island Primrose-willow	G2G3	SX.1			HL
Ludwigia hirtella	Hairy Primrose-willow	G5	S1			LP, HL
Ludwigia linearis	Narrow-leaf Primrose-willow	G5	S1			LP, HL
Lupinus perennis	Wild Lupine	G5	S3			HL
Lupinus perennis var. occidentalis	Hairy Sundial Lupine	G5T3T5	S2			HL
Lupinus perennis var. perennis	Sundial Lupine	G5T5?	S3			HL
Luzula acuminata	Hairy Wood-rush	G5T4T5	S2		E	LP, HL
Lycopodiella caroliniana var. caroliniana	Carolina Club-moss	G5T4	S3			HL
Lycopodiella inundata	Northern Bog Club-moss	G5	S1			HL
Lycopodium annotinum	Stiff Club-moss	G5	S1		E	LP, HL
Lycopodium hickeyi	Hickey's Ground-pine	G5	S2S3			HL
Lycopus americanus var. longii	Long's Bugleweed	G5TNRQ	S2S3			HL
Lycopus rubellus	Stalked Water-hoarhound	G5	S2			HL
Lygodium palmatum	Climbing Fern	G4	S2			LP, HL
Lysimachia hybrida	Lowland Loosestrife	G5	S3			HL
Lysimachia lanceolata	Lance-leaf Loosestrife	G5	S1			HL
Lysimachia thyrsiflora	Tufted Loosestrife	G5	S3			HL
Lythrum alatum var. alatum	Winged Loosestrife	G5T5	S2			HL
Lythrum lineare	Narrow-leaf Loosestrife	G5	S3			HL
Maianthemum canadense var. interius	Western False Lily-of-the-valley	G5T4	S1.1		E	LP, HL
Malaxis bayardii	Bayard Long's Adder's-mouth	G1G2	SH		E	LP, HL
Malaxis monophyllos	White Adder's-mouth	G4Q	SH		E	LP, HL
Malaxis unifolia	Green Adder's-mouth	G5	SH			HL
Malus angustifolia var. puberula	Spiny Wild Crabapple	G5?T2T4	S2			HL
Melanthium virginicum	Virginia Bunchflower	G5	S1		E	LP, HL
Menyanthes trifoliata	Buck-bean	G5	S2			HL
Mertensia virginica	Virginia Bluebells	G5	S3			HL
Micranthemum micranthemoides	Nuttall's Mudwort	GH	SH		E	LP, HL
Milium effusum	Tall Millet Grass	G5	SH.1		E	LP, HL
Mimulus alatus	Winged Monkey-flower	G5	S3			HL
Mimulus moschatus var. moschatus	Muskflower	G5T5	S2			HL
Monarda clinopodia	Basil Beebalm	G5	SH		E	LP, HL
Monarda didyma	Oswego-tea	G5	S2			HL
Monarda media	Purple Bergamot	G4?	SH			HL
Muhlenbergia capillaris	Long-awn Smoke Grass	G5T5?	S1		E	LP, HL
Muhlenbergia glomerata	Eastern Smoke Grass	G5	S2			HL
Muhlenbergia sylvatica var. robusta	Large Woodland Dropseed	G5TNR	S2			HL
Muhlenbergia sylvatica var. sylvatica	Woodland Dropseed	G5T3T5	S3			HL
Muhlenbergia torreyana	Pine Barren Smoke Grass	G3	S3			LP, HL
Myrica gale	Sweetgale	G5	S3			HL
Myriophyllum heterophyllum	Variable-leaf Water-milfoil	G5	S2			HL
Myriophyllum pinnatum	Cutleaf Water-milfoil	G5	S1		E	LP, HL
Myriophyllum sibiricum	Common Water-milfoil	G5	S1		E	LP, HL
Myriophyllum tenellum	Slender Water-milfoil	G5	S1		E	LP, HL
Myriophyllum verticillatum	Whorled Water-milfoil	G5	SH		E	LP, HL
Najas guadalupensis var. guadalupensis	Southern Water-nymph	G5T5	S3			HL
Narthecium americanum	Bog Asphodel	G2	S2	C	E	LP, HL
Nelumbo lutea	American Lotus	G4	S1		E	LP, HL
Nuphar microphyllum	Small Yellow Pond-lily	G5T4T5	SH		E	LP, HL
Nymphaea odorata ssp. tuberosa	Tuberous White Water-lily	G5T5	S2			HL
Nymphoides cordata	Floatingheart	G5	S3			LP, HL
Obolaria virginica	Virginia Pennywort	G5	S2			HL
Oenothera humifusa	Sea-beach Evening-primrose	G5	S2		E	LP, HL
Oenothera oakesiana	Oakes' Evening-primrose	G4G5Q	S2			HL
Oenothera villosa ssp. villosa	Hairy Evening-primrose	G5T5?	SU			HL
Oldenlandia uniflora	Clustered-bluets	G5	S3			HL

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Onosmodium virginianum	Virginia False-gromwell	G4	S1		E	LP, HL
Ophioglossum pusillum	Northern Adder's-tongue	G5	S3			HL
Ophioglossum vulgatum var. pycnostichum	Southern Adder's-tongue	G5	S1		E	LP, HL
Orthilia secunda	Sidebells	G5	S2			HL
Oryzopsis asperifolia	White-grained Mountain-rice Grass	G5	S1		E	LP, HL
Oryzopsis pungens	Slender Mountain-rice Grass	G5	SH.1		E	LP, HL
Osmunda cinnamomea var. glandulosa	Glandular Cinnamon Fern	G5TNR	S2			HL
Panax quinquefolius	American Ginseng	G3G4	S2			HL
Panicum aciculare	Bristling Panic Grass	G5	SH		E	LP, HL
Panicum acuminatum var. acuminatum	Walter Benner's Panic Grass	G5T5	SX			HL
Panicum amarum var. amarulum	Southern Seabeach Grass	G5T3T5	S3			HL
Panicum boreale	Northern Panic Grass	G5	S1		E	LP, HL
Panicum dichotomum var. roanokense	Bluish Panic Grass	G5T4?	SH			HL
Panicum dichotomum var. yadkinense	Spotted-sheath Panic Grass	G5T3T4Q	SH			HL
Panicum flexile	Wiry Panic Grass	G5	S1		E	LP, HL
Panicum gattingeri	Gattinger's Witch Grass	G4	S1S2			HL
Panicum hemitomon	Maiden-cane	G5?	S2			LP, HL
Panicum hirstii	Hirst Brothers' Panic Grass	G1	S1	C	E	LP, HL
Panicum leucothrix	Rough Panic Grass	G4?Q	S2			HL
Panicum longiligulatum	Coastal-plain Panic Grass	G4G5Q	SH.1			HL
Panicum oligosanthes var. oligosanthes	Few-flower Panic Grass	G5T5?	S1S2			HL
Panicum oligosanthes var. scribnerianum	Scribner's Panic Grass	G5T5	S2			HL
Panicum rigidulum var. condensum	Dense Panic Grass	G5T5?	S2			HL
Panicum scabriusculum	Sheathed Panic Grass	G4	S2			HL
Panicum tenue	White-edge Panic Grass	G5T4T5	SH			HL
Panicum wrightianum	Wright's Panic Grass	G4	S2			HL
Panicum xanthophysum	Slender Panic Grass	G5	SH.1		E	LP, HL
Paronychia montana	Mountain Nailwort	G4	SH			HL
Paspalum dissectum	Mudbank Crown Grass	G4?	S2			HL
Paspalum floridanum	Florida Crown Grass	G5	S3			HL
Paspalum setaceum var. ciliatifolium	Ciliate-leaf Crown Grass	G5T5Q	S2			HL
Paspalum setaceum var. psammophilum	Prostrate Crown Grass	G5T4?	S2S3			HL
Pedicularis lanceolata	Swamp Lousewort	G5	S3			HL
Pellaea glabella var. glabella	Smooth Cliffbrake	G5T5	S2			HL
Penstemon laevigatus	Smooth Beardtongue	G5	S1		E	LP, HL
Phacelia bipinnatifida	Fern-leaf Phacelia	G5	S1.1			HL
Phaseolus polystachios var. polystachios	Wild Kidney Bean	G5T5?	S2			HL
Phegopteris connectilis	Northern Beech Fern	G5	S2			HL
Phlox divaricata	Wild Blue Phlox	G5T3T5	S1		E	LP, HL
Phlox maculata var. maculata	Spotted Phlox	G5T4T5	S2			HL
Phlox pilosa	Downy Phlox	G5T5	SH		E	LP, HL
Phoradendron leucarpum	American Mistletoe	G5	S2			LP, HL
Phyla lanceolata	Fogfruit	G5	SH		E	LP, HL
Physalis grisea	Strawberry-tomato	G5?	SH			HL
Physalis pubescens var. integrifolia	Husk-tomato	G5T5?Q	SH			HL
Picea rubens	Red Spruce	G5	S1		E	LP, HL
Pinus pungens	Table Mountain Pine	G4	S1.1		E	LP, HL
Pinus resinosa	Red Pine	G5	S1.1		E	LP, HL
Pinus serotina	Pond Pine	G5	S2			HL
Pinus taeda	Loblolly Pine	G5	S2			HL
Pityopsis falcata	Sickle-leaf Golden-aster	G3G4	S3			LP, HL
Plantago maritima var. juncoides	Seaside Plantain	G5T5	S2			HL
Plantago pusilla	Dwarf Plantain	G5	SH		E	LP, HL
Platanthera ciliaris	Yellow Fringed Orchid	G5	S2			LP, HL
Platanthera cristata	Crested Yellow Orchid	G5	S3			LP, HL
Platanthera flava var. flava	Southern Rein Orchid	G4T4?Q	S1		E	LP, HL
Platanthera flava var. herbiola	Tubercled Rein Orchid	G4T4Q	S2			HL
Platanthera grandiflora	Large Purple Fringed Orchid	G5	S2			HL
Platanthera hookeri	Hooker's Orchid	G4	SH		E	LP, HL

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Platanthera hyperborea var. hyperborea	Leafy Northern Green Orchid	G5T5	SX			HL
Platanthera integra	Yellow Fringeless Orchid	G3G4	S1		E	LP, HL
Platanthera nivea	Snowy Orchid	G5	S1		E	LP, HL
Platanthera orbiculata	Round-leaf Orchid	G5	S1		E	LP, HL
Platanthera peramoena	Purple Fringeless Orchid	G5	S1		E	LP, HL
Platanthera psycodes	Purple Fringed Orchid	G5	S2			HL
Pluchea camphorata	Camphorweed	G5	SX.1			HL
Pluchea foetida	Stinking Fleabane	G5T5	SH		E	LP, HL
Poa autumnalis	Flexuous Spear Grass	G5	SH.1		E	LP, HL
Poa languida	Drooping Spear Grass	G3G4Q	S2			HL
Poa saltuensis	Old-pasture Spear Grass	G5	SH		E	LP, HL
Poa sylvestris	Woodland Spear Grass	G5	SH			HL
Podostemum ceratophyllum	Threadfoot	G5	S2			HL
Polanisia dodecandra ssp. dodecandra	Clammy-weed	G5T5?	S1			HL
Polemonium reptans	Greek-valerian	G5	S1		E	LP, HL
Polemonium vanbruntiae	Jacob's Ladder	G3G4	SX.1			HL
Polygala ambigua	Loose-spike Milkwort	G5?	S2			HL
Polygala curtissii	Curtiss's milkwort	G5	S1.1			HL
Polygala incarnata	Pink Milkwort	G5	SH		E	LP, HL
Polygala mariana	Maryland Milkwort	G5	S2			LP, HL
Polygala polygama	Racemed Milkwort	G5	S2			HL
Polygala ramosa	Low Pine Barren Milkwort	G5	SX.1			HL
Polygala senega	Seneca Snakeroot	G4G5	S1.1		E	LP, HL
Polygonum buxiforme	Small's Knotweed	G5	S2			HL
Polygonum cilinode	Fringed Black-bindweed	G5	S2			HL
Polygonum densiflorum	Dense-flower Knotweed	G5	S1		E	LP, HL
Polygonum erectum	Erect Knotweed	G5	S2			HL
Polygonum glaucum	Sea-beach Knotweed	G3	S1		E	LP, HL
Polygonum hydropiperoides var. opelousanum	Opelousas Water-pepper	G5TNRQ	S2			HL
Polygonum setaceum var. setaceum	Bristly Smartweed	G5T3T5	S2			HL
Polymnia uvedalia	Bear's-foot	G4G5	S1		E	LP, HL
Populus heterophylla	Swamp Cottonwood	G5	S2			HL
Porteranthus trifoliatus	Indian Physic	G4G5	S2			HL
Potamogeton alpinus	Northern Pondweed	G5	S1		E	LP, HL
Potamogeton confervoides	Algae-like Pondweed	G4	S2			HL
Potamogeton illinoensis	Illinois Pondweed	G5	S1		E	LP, HL
Potamogeton oakesianus	Oakes' Pondweed	G4	S2			HL
Potamogeton obtusifolius	Blunt-leaf Pondweed	G5	S1		E	LP, HL
Potamogeton praelongus	White-stem Pondweed	G5	S1		E	LP, HL
Potamogeton robbinsii	Robbin's Pondweed	G5	S2		E	LP, HL
Potamogeton vaginatus	Sheathed Pondweed	G5	SU			HL
Potamogeton zosteriformis	Eel-grass Pondweed	G5	S1		E	LP, HL
Potentilla arguta var. arguta	Tall Cinquefoil	G5T5?	S2			HL
Potentilla palustris	Marsh Cinquefoil	G5	SH		E	LP, HL
Potentilla tridentata	Three-toothed Cinquefoil	G5	S1.1		E	LP, HL
Prenanthes autumnalis	Pine Barren Rattlesnake-root	G4G5	S2			LP, HL
Prenanthes racemosa	Smooth Rattlesnake-root	G5TNR	SH		E	LP, HL
Proserpinaca intermedia	Mackenzie's Mermaidweed	G3G4Q	S3			HL
Prunus alleghaniensis	Allegheny Plum	G4T4	SX		E	LP, HL
Prunus angustifolia	Chickasaw Plum	G5T4T5	S2		E	LP, HL
Prunus pumila var. depressa	Low Sand Cherry	G5T5	S1			HL
Prunus pumila var. susquehanae	Appalachian Cherry	G5T4	S3			HL
Ptelea trifoliata	Wafer-ash	G5T5	S1		E	LP, HL
Puccinellia fasciculata	Saltmarsh Alkali Grass	G3G5	S1			HL
Pycnanthemum clinopodioides	Basil Mountain-mint	G2	S1		E	LP, HL
Pycnanthemum setosum	Awned Mountain-mint	G4	S3			HL
Pycnanthemum torrei	Torrey's Mountain-mint	G2	S1		E	LP, HL
Pyrola chlorantha	Greenish-flower Wintergreen	G5	S1		E	LP, HL
Pyrrhopappus carolinianus	Carolina desert-chicory	G5	S1			HL

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Quercus imbricaria	Shingle Oak	G5	S1.1		E	LP, HL
Quercus lyrata	Overcup Oak	G5	S1		E	LP, HL
Quercus michauxii	Basket Oak	G5	S3			HL
Quercus muehlenbergii	Yellow Oak	G5	S3			HL
Quercus nigra	Water Oak	G5	S1		E	LP, HL
Ranunculus allegheniensis	Allegheny Mountain Buttercup	G4G5	S1.1		E	LP, HL
Ranunculus ambigens	Water-plantain Spearwort	G4	S2			HL
Ranunculus cymbalaria	Seaside Buttercup	G5	SH		E	LP, HL
Ranunculus fascicularis	Early Buttercup	G5	S1		E	LP, HL
Ranunculus flabellaris	Yellow Water Buttercup	G5	S3			HL
Ranunculus longirostris	Long-beak Water Buttercup	G5	S2			HL
Ranunculus micranthus	Rock Buttercup	G5	S2			HL
Ranunculus pensylvanicus	Bristly Buttercup	G5	S2			HL
Ranunculus pusillus var. pusillus	Low Spearwort	G5T4?	S2			HL
Ranunculus reptans	Creeping Spearwort	G5T5	SH		E	LP, HL
Ranunculus trichophyllus var. trichophyllus	Thread-leaf Water Buttercup	G5T5	S2			HL
Rhexia aristosa	Awned Meadow-beauty	G3	S1		E	LP, HL
Rhexia interior	Showy Meadow-beauty	G5T4T5	S1		E	LP, HL
Rhododendron atlanticum	Dwarf Azalea	G4G5	S2		E	LP, HL
Rhododendron canadense	Rhodora	G5	S1		E	LP, HL
Rhododendron prinophyllum	Mountain Azalea	G5	S3			HL
Rhynchospora capillacea	Capillary Beaked-rush	G4	S1		E	LP, HL
Rhynchospora cephalantha	Large-head Beaked-rush	G5	S3			LP, HL
Rhynchospora filifolia	Thread-leaf Beaked-rush	G5	S1		E	LP, HL
Rhynchospora globularis	Coarse Grass-like Beaked-rush	G5?	S1		E	LP, HL
Rhynchospora glomerata	Clustered Beaked-rush	G5T5?	SH		E	LP, HL
Rhynchospora inundata	Slender Horned-rush	G4?	S2			LP, HL
Rhynchospora knieskernii	Knieskern's Beaked-rush	G2	S2	LT	E	LP, HL
Rhynchospora microcephala	Small-head Beaked-rush	G5T5	S1		E	LP, HL
Rhynchospora nitens	Short-beaked Bald-rush	G4?	S2			HL
Rhynchospora oligantha	Few-flower Beaked-rush	G4	S2			HL
Rhynchospora pallida	Pale Beaked-rush	G3	S3			HL
Rhynchospora rariflora	Rare-flower Beaked-rush	G5	S1		E	LP, HL
Rhynchospora scirpoides	Long-beak Bald-rush	G4	S2			HL
Ribes cynosbati	Prickly Gooseberry	G5	SU			HL
Ribes glandulosum	Skunk Currant	G5	S1.1		E	LP, HL
Ribes missouriense	Missouri Gooseberry	G5	S1		E	LP, HL
Ribes triste	Swamp Red Currant	G5	SU			HL
Rosa blanda var. blanda	Smooth Rose	G5T5	SU			HL
Rotala ramosior	Toothcup	G5	S3			HL
Rubus ascendens	Clausen's Dewberry	GNR	S1			HL
Rubus canadensis	Smooth Blackberry	G5	S1		E	LP, HL
Rubus gnarus	Pollock's Mill Blackberry	G3?	SH.1			HL
Rubus longii	Long's Blackberry	G4?Q	S1			HL
Rubus novocaesarius	New Jersey Dewberry	G1	S1.1			HL
Rubus originalis	Cold Spring Blackberry	G3?	S2			HL
Rubus ostryifolius	Highbush Blackberry	G3?Q	SH.1			HL
Rubus pervarius	Davis' Dewberry	G4?	SH.1			HL
Rubus recurvicaulis	Blanchard's Dewberry	G4?	S1.1			HL
Rubus setosus	Bristly Blackberry	G5	SH.1			HL
Rudbeckia fulgida	Orange Coneflower	G5T4?	S1		E	LP, HL
Rudbeckia fulgida var. speciosa	Showy Coneflower	G5T4?	SH.1?			HL
Ruellia caroliniensis	Carolina Petunia	G5	SH		E	LP, HL
Ruellia strepens	Limestone Petunia	G4G5	SX.1			HL
Rumex hastatulus	Engelmann's Sorrel	G5	SH			HL
Sabatia campanulata	Slender Marsh-pink	G5	S3			HL
Sabatia dodecandra var. dodecandra	Large Marsh-pink	G5?T4T5	S2			HL
Saccharum alopecuroidum	Silver Plume Grass	G5	SH			HL
Sacciolepis striata	American Cupscale	G5	SH		E	LP, HL

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Sagittaria australis	Southern Arrowhead	G5	S1		E	LP, HL
Sagittaria calycina var. calycina	Mississippi Arrowhead	G5T5?	S2			HL
Sagittaria calycina var. spongiosa	Tidal Arrowhead	G5T4	S3			HL
Sagittaria cuneata	Arum-leaf Arrowhead	G5	S1		E	LP, HL
Sagittaria filiformis	Narrow-leaf Arrowhead	G4G5	SH			HL
Sagittaria subulata	Awl-leaf Arrowhead	G4	S2			HL
Sagittaria teres	Slender Arrowhead	G3	S1		E	LP, HL
Salix candida	Hoary Willow	G5	S2			HL
Salix lucida ssp. lucida	Shining Willow	G5T5	S1?			HL
Salix pedicellaris	Bog Willow	G5	S1		E	LP, HL
Salix serissima	Autumn Willow	G4	S2			HL
Sanicula trifoliata	Large-fruit Black-snakeroot	G4	S1		E	LP, HL
Scheuchzeria palustris	Arrow-grass	G5T5	SH		E	LP, HL
Schizachne purpurascens	Purple Oat	G5	S1.1		E	LP, HL
Schizaea pusilla	Curly Grass Fern	G3G4	S3			LP, HL
Schoenoplectus acutus var. acutus	Hard-stem Bulrush	G5	S3			HL
Schoenoplectus novae-angliae	New England Bulrush	G5	S2			HL
Schoenoplectus smithii	Smith's Club-rush	G5?	S2			HL
Schoenoplectus torreyi	Torrey's Bulrush	G5?	S1		E	LP, HL
Schwalbea americana	Chaffseed	G2G3	S1	LE	E	LP, HL
Scirpus atrocinctus	Black-girdle Woolgrass	G5	S1			HL
Scirpus longii	Long's Woolgrass	G2G3	S2		E	LP, HL
Scirpus maritimus	Saltmarsh Bulrush	G5	SH		E	LP, HL
Scirpus microcarpus	Barberpole Bulrush	G5	S1		E	LP, HL
Scirpus pedicellatus	Stalked Woolgrass	G4	SH		E	LP, HL
Scirpus pendulus	Reddish Bulrush	G5	S3			HL
Scleria pauciflora var. caroliniana	Carolina Nut-rush	G5T4T5	S2			HL
Scleria pauciflora var. pauciflora	Papillose Nut-rush	G5T5?	S1?			HL
Scleria verticillata	Whorled Nut-rush	G5	S1		E	LP, HL
Sclerolepis uniflora	Bog Buttons	G4	S2			LP, HL
Scutellaria leonardii	Small Skullcap	G4T4	S1		E	LP, HL
Scutellaria nervosa	Veined Skullcap	G5	S2			HL
Sedum telephioides	Allegheny Stonecrop	G4	SX.1			HL
Selaginella rupestris	Rock Spike-moss	G5	S2			HL
Senecio anonymus	Small's Groundsel	G5	SU			HL
Senecio pauperculus	Balsam Ragwort	G5	S3			HL
Senecio tomentosus	Woolly Ragwort	G4G5	S2			HL
Sesuvium maritimum	Seabeach Purslane	G5	S2			HL
Setaria magna	Giant Fox-tail	G4G5	S2			HL
Silene caroliniana var. pensylvanica	Wild-pink	G5T4T5	S3			HL
Silene nivea	Snowy Catchfly	G4?	S1		E	LP, HL
Sisyrinchium fuscatum	Sand-plain Blue-eyed Grass	G5?	S2			HL
Sisyrinchium montanum	Strict Blue-eyed Grass	G5T4T5	S2		E	LP, HL
Smilacina trifolia	Three-leaf False Solomon's-seal	G5	S1		E	LP, HL
Smilax laurifolia	Laurel-leaf Greenbrier	G5	S3			HL
Smilax pseudochina	Bamboo Vine	G4G5	S3			HL
Smilax pulverulenta	Downy Carrion-flower	G4G5	S3			HL
Smilax tamnoides	Bristly Greenbrier	G5	S3			HL
Solidago elliottii	Elliott's Goldenrod	G5	S3			HL
Solidago hispida var. hispida	Hairy Goldenrod	G5T5	SU			HL
Solidago rigida	Prairie Goldenrod	G5T5	S1		E	LP, HL
Solidago rugosa ssp. rugosa var. sphagnophila	Summer Goldenrod	G5T3T5	S3			HL
Solidago speciosa var. speciosa	Showy Goldenrod	G5T5?	S2			HL
Solidago squarrosa	Stout Ragged Goldenrod	G4?	S2			HL
Solidago stricta	Wand-like Goldenrod	G5	S3			LP, HL
Solidago tarda	Late Goldenrod	G4?Q	S3			HL
Solidago uliginosa var. linoides	Flax-leaf Bog Goldenrod	G4G5T4T5	S3			HL
Solidago uliginosa var. uliginosa	Bog Goldenrod	G4G5T4T5	S3			HL
Sorbus americana	American Mountain-ash	G5	S2			HL

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Sparganium angustifolium	Narrow-leaf Burr-reed	G5	SH		E	LP, HL
Sparganium chlorocarpum	Green-fruited Bur-reed	G5	S3			HL
Sparganium minimum	Small Burr-reed	G5	S1		E	LP, HL
Sphagnum angustifolium	Sphagnum	G5	S1		E	LP, HL
Sphagnum austinii	Sphagnum	G4	SX		E	LP, HL
Sphagnum capillifolium	Sphagnum	G5	S2			HL
Sphagnum carolinianum	Sphagnum	G3	S2			HL
Sphagnum centrale	Sphagnum	G5	S1		E	LP, HL
Sphagnum contortum	Sphagnum	G5	S1		E	LP, HL
Sphagnum cyclophyllum	Sphagnum	G3	S2			HL
Sphagnum fuscum	Sphagnum	G5	S2			HL
Sphagnum macrophyllum	Sphagnum	G3G5	S2			HL
Sphagnum macrophyllum var. floridanum	Sphagnum	G3G5	S1		E	LP, HL
Sphagnum majus ssp. norvegicum	Sphagnum	G5?TNR	S1.1		E	LP, HL
Sphagnum perichaetiale	Sphagnum	G5	S2			HL
Sphagnum platyphyllum	Sphagnum	G5	SX.1		E	LP, HL
Sphagnum portoricense	Sphagnum	G5	S2			HL
Sphagnum quinquefarium	Sphagnum	G5	S1.1		E	LP, HL
Sphagnum riparium	Sphagnum	G5	S1		E	LP, HL
Sphagnum squarrosum	Sphagnum	G5	S2			HL
Sphagnum strictum	Sphagnum	G5	S1		E	LP, HL
Sphagnum subfulvum	Sphagnum	GNR	S1.1		E	LP, HL
Sphagnum subsecundum	Sphagnum	G5	S1		E	LP, HL
Sphagnum subtile	Sphagnum	G5?Q	S2			HL
Sphagnum tenellum	Sphagnum	G5	S2			HL
Sphagnum teres	Sphagnum	G5	S2			HL
Sphagnum warnstorfii	Sphagnum	G5	S2			HL
Sphenopholis pensylvanica	Swamp Oats	G4	S2			HL
Spiraea alba var. alba	Narrow-leaf Meadow-sweet	G5T5	S1			HL
Spiranthes laciniata	Lace-lip Ladies'-tresses	G4G5	S1		E	LP, HL
Spiranthes lucida	Shining Ladies'-tresses	G5	S2			HL
Spiranthes ochroleuca	Yellowish Nodding Ladies'-tresses	G4	S3			HL
Spiranthes odorata	Fragrant Ladies'-tresses	G5	S2			HL
Spiranthes tuberosa	Little Ladies'-tresses	G5	S3			LP, HL
Sporobolus clandestinus	Rough Rush-grass	G5	S3			HL
Sporobolus compositus var. compositus	Long-leaf Rush-grass	G5T5	S2			HL
Sporobolus neglectus	Small Rush-grass	G5	S1		E	LP, HL
Stachys hyssopifolia	Hyssop Hedge-nettle	G5	S2			HL
Stachys palustris var. homotricha	Hairy Hedge-nettle	G5T5?	SH		E	LP, HL
Stachys tenuifolia	Smooth Hedge-nettle	G5	S3			HL
Stellaria borealis	Boreal Starwort	G5T5	S1		E	LP, HL
Stellaria pubera	Star Chickweed	G5	SH		E	LP, HL
Streptopus amplexifolius	White Twisted-stalk	G5T5	S1		E	LP, HL
Streptopus roseus	Rosy Twisted-stalk	G5T5?	S1		E	LP, HL
Stylisma pickeringii var. pickeringii	Pickering's Morning-glory	G4T3	S1		E	LP, HL
Stylosanthes biflora	Pencil-flower	G5	S3			HL
Suaeda calceoliformis	American Seablite	G5	S2			HL
Suaeda rolandii	Roland's Seablite	G1G2Q	SH.1		E	LP, HL
Taenidia integerrima	Yellow-pimpernel	G5	S3			HL
Taxus canadensis	American Yew	G5	S2			HL
Teucrium canadense var. occidentale	Hairy Germander	G5T5?	SU			HL
Thaspium barbinode	Hairy-joint Meadow-parsnip	G5	SX			HL
Thaspium trifoliatum var. trifoliatum	Purple Meadow-parsnip	G5T5	S3			HL
Thuja occidentalis	Arborvitae	G5	S1		E	LP, HL
Tiarella cordifolia	Foamflower	G5T5	S1		E	LP, HL
Tipularia discolor	Cranefly Orchid	G4G5	S3			HL
Tofieldia racemosa	False Asphodel	G5	S1		E	LP, HL
Torreyochloa pallida var. fernaldii	Fernald's False Manna Grass	G5?T4Q	S1?			HL
Toxicodendron pubescens	Poison-oak	G5	S3			HL

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Scientific Name	Common Name	G Rank	S Rank	Federal Status	State Status	Other Status
Tradescantia ohiensis	Ohio Spiderwort	G5	S2			HL
Triadenum fraseri	Fraser's St. John's-wort	G5	S3			HL
Triadenum walteri	Walter's St. John's-wort	G5	S1		E	LP, HL
Trichomanes intricatum	Weft Fern	G4G5	S1.1		E	LP, HL
Trichostema setaceum	Narrow-leaf Bluecurls	G5	S2			HL
Tridens flavus var. chapmanii	Chapman's Redtop	G5T3T5	SH		E	LP, HL
Trifolium reflexum	Buffalo Clover	G3G4	SX			HL
Triglochin maritima	Seaside Arrow-grass	G5	S1		E	LP, HL
Trillium undulatum	Painted Trillium	G5	S2			HL
Triosteum angustifolium	Narrow-leaf Horse-gentian	G5	SH		E	LP, HL
Triphora trianthophora	Three Birds Orchid	G3G4	S1		E	LP, HL
Trollius laxus ssp. laxus	Spreading Globe Flower	G4T3	S1		E	LP, HL
Ulmus thomasii	Rock Elm	G5	SX.1			HL
Utricularia biflora	Two-flower Bladderwort	G5	S1		E	LP, HL
Utricularia gibba	Humped Bladderwort	G5	S3			LP, HL
Utricularia inflata	Large Swollen Bladderwort	G5	S3			HL
Utricularia intermedia	Flat-leaf Bladderwort	G5	S3			HL
Utricularia minor	Lesser Bladderwort	G5	S1		E	LP, HL
Utricularia olivacea	Dwarf White Bladderwort	G4	S1.1		E	LP, HL
Utricularia purpurea	Purple Bladderwort	G5	S3			LP, HL
Utricularia radiata	Small Swollen Bladderwort	G4	S3			HL
Utricularia resupinata	Reversed Bladderwort	G4	S1		E	LP, HL
Uvularia puberula var. nitida	Pine Barren Bellwort	G5T3?	S2		E	LP, HL
Vaccinium oxycoccos	Small Cranberry	G5	S2			HL
Valerianella chenopodiifolia	Goose-foot Cornsalad	G5	SH.1			HL
Valerianella radiata	Beaked Cornsalad	G5	S1		E	LP, HL
Valerianella umbilicata	Navel Cornsalad	G3G5	SH		E	LP, HL
Verbena simplex	Narrow-leaf Vervain	G5	S1		E	LP, HL
Vernonia glauca	Broad-leaf Ironweed	G5	S1		E	LP, HL
Veronica catenata	Sessile Water-speedwell	G5	S1		E	LP, HL
Viburnum alnifolium	Witch-hobble	G5	S1		E	LP, HL
Viburnum dentatum var. venosum	Veiny-leaf Arrow-wood	G5T4T5	S2			HL
Viburnum opulus var. americanum	Highbush-cranberry	G5T5	S3			HL
Vicia americana var. americana	American Purple Vetch	G5T5	S1			HL
Vicia caroliniana	Carolina Wood Vetch	G5	S1		E	LP, HL
Viola blanda var. palustriformis	Large-leaf White Violet	G4G5T4T5	S3			HL
Viola brittoniana var. brittoniana	Britton's Coast Violet	G4G5T4T5	S3			HL
Viola brittoniana var. pectinata	Cut-leaf Coast Violet	G4G5T3?Q	SH			HL
Viola canadensis	Canadian Violet	G5T5	S1		E	LP, HL
Viola hirsutula	Southern Wood Violet	G4	S2			HL
Viola rostrata	Long-spur Violet	G5	S3			HL
Viola septentrionalis	Northern Blue Violet	G5	S1		E	LP, HL
Vitis novae-angliae	New England Grape	G4G5Q	S1		E	LP, HL
Vulpia elliotea	Squirrel-tail Six-weeks Grass	G5	S1		E	LP, HL
Vulpia octoflora var. glauca	Slender Six-weeks Grass	G5T5	SU			HL
Waldsteinia fragarioides var. fragarioides	Barren-strawberry	G5T5	S2			HL
Wolffiella floridana	Sword Bogmat	G5	S1		E	LP, HL
Xyris caroliniana	Sand Yellow-eyed-grass	G4G5	S1		E	LP, HL
Xyris fimbriata	Fringed Yellow-eyed-grass	G5	S1		E	LP, HL
Xyris jupicai	Richard's Yellow-eyed-grass	G5	S2			HL
Xyris montana	Northern Yellow-eyed-grass	G4	S1.1		E	LP, HL
Zigadenus leimanthoides	Death-camus	G4Q	S1		E	LP, HL

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Common Name	Scientific Name	G Rank	S Rank	Federal Status	State Status	Otber Status
Algae-like Pondweed	*Potamogeton confervoides*	G4	S2			HL
Allegheny Mountain Buttercup	*Ranunculus allegheniensis*	G4G5	S1.1		E	LP, HL
Allegheny Plum	*Prunus alleghaniensis*	G4T4	SX		E	LP, HL
Allegheny Stonecrop	*Sedum telephioides*	G4	SX.1			HL
American Cupscale	*Sacciolepis striata*	G5	SH		E	LP, HL
American Fly-honeysuckle	*Lonicera canadensis*	G5	SI		E	LP, HL
American Ginseng	*Panax quinquefolius*	G3G4	S2			HL
American Lotus	*Nelumbo lutea*	G4	S1		E	LP, HL
American Manna Grass	*Glyceria grandis*	G5T5	S2		E	LP, HL
American Mistletoe	*Phoradendron leucarpum*	G5	S2			LP, HL
American Mountain-ash	*Sorbus americana*	G5	S2			HL
American Purple Vetch	*Vicia americana var. americana*	G5T5	S1			HL
American Seablite	*Suaeda calceoliformis*	G5	S2			HL
American Slender Sedge	*Carex lasiocarpa var. americana*	G5T5	S2			HL
American Sweetflag	*Acorus americanus*	G5	S1?			HL
American Waterwort	*Elatine americana*	G4	S2			HL
American Yew	*Taxus canadensis*	G5	S2			HL
Angled Spike-rush	*Eleocharis quadrangulata*	G4	S2			HL
Appalachian Bindweed	*Calystegia sepium ssp. appalachiana*	G5T4?	SU			HL
Appalachian Cherry	*Prunus pumila var. susquehanae*	G5T4	S3			HL
Appalachian Mountain Boltonia	*Boltonia montana*	G1G2	S1S2			HL
Appalachian Twayblade	*Listera smallii*	G4	S1.1		E	LP, HL
Arborvitae	*Thuja occidentalis*	G5	S1		E	LP, HL
Arrow-grass	*Scheuchzeria palustris*	G5T5	SH		E	LP, HL
Arrow-leaf-Aster	*Aster urophyllus*	G4G5	S2			HL
Arum-leaf Arrowhead	*Sagittaria cuneata*	G5	S1		E	LP, HL
Aunt Lucy	*Ellisia nyctelea*	G5	S1		E	LP. HL
Austin's Terrestrial Water-starwort	*Callitriche terrestris*	G5	S3			HL
Autumn Willow	*Salix serissima*	G4	S2			HL
Awl-leaf Arrowhead	*Sagittaria subulata*	G4	S2			HL
Awl-leaf Mudwort	*Limosella subulata*	G4G5	S1		E	LP, HL
Awl-leaf Rush	*Juncus coriaceus*	G5	S1		E	LP.HL
Awned Meadow-beauty	*Rhexia aristosa*	G3	Sl		E	LP, HL
Awned Mountain-mint	*Pycnanthemum setosum*	G4	S3			HL
Back's Sedge	*Carex backii*	G4	SH.l		E	LP, HL
Bald Spike-rush	*Eleocharis erythropoda*	G5	S3			HL
Balsam Ragwort	*Senecio pauperculus*	G5	S3			HL
Bamboo Vine	*Smilax pseudochina*	G4G5	S3			HL
Barberpole Bulrush	*Scirpus microcarpus*	G5	S1		E	LP, HL
Barren-strawberry	*Waldesteinia fragarioides var. fragarioides*	G5T5	S2			HL
Barton's St. John's-wort	*Hypericum adpressum*	G3	S2		E	LP, HL
Basil Beebalm	*Monarda clinopodia*	G5	SH		E	LP, HL
Basil Mountain-mint	*Pycnanthemum clinopodioides*	G2	S1		E	LP, HL
Basket Oak	*Quercus michauxii*	G5	S3			HL
Bayard Long's Adder's-mouth	*Malaxis bayardii*	G1G2	SH		E	LP, Hl
Beach Wormwood	*Artemisia campestris ssp. caudata*	G5T5	S2			HL
Beaked Cornsalad	*Valerianella radiata*	G5	S1		E	LP, HL
Bearded Skeleton Grass	*Gymnopogon ambiguus*	G4	S3			HL
Bear's-foot	*Polymnia uvedalia*	G4G5	S1		E	LP, HL
Bebb's Sedge	*Carex bebbii*	G5	S2			HL
Bicknell's Sedge	*Carex bicknellii va. Bicknelli*	G5T5	S2			HL
Biennial Beeblosom	*Gaura biennis*	G5	S3			HL
Black-base Quillwort	*Isoetes melanopoda*	G5	SH		E	LP, HL
Black-fruit Spike-rush	*Eleocharis melanocarpa*	G4	S1		E	LP, HL
Black-girdle Woolgrass	*Scirpus atrocinctus*	G5	S1			HL
Blanchard's Dewberry	*Rubus recurvicaulis*	G4?	S1.1			HL
Blazing-star	*Liatris spicata var. spicata*	G5T5?	S3			HL
Blue Waxweed	*Cuphett vb;cosissima*	G5°	S3			HL
Bluehearts	*Buchnera americana*	G5?	SX			HL
Bluish Panic Grass	*Panicum dichotomum var. roanokense*	G5T4?	SH			HL
Blunt-leaf Pondweed	*Potamogeton obtusifolius*	G5	S1		E	LP, HL
Blunt-lobe Grape Fern	*Botrychium oneidense*	G4Q	S2			HL
Bog Asphodel	*Narthecium americanum*	G2	S2	C	E	LP, HL
Bog Buttons	*Sclerolepis uniflora*	G4	S2			LP, HL
Bog Goldenrod	*Solidago uliginosa var. uliginosa*	G4G5T4T5	S3			HL

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Bog Rosemary	*Andromeda glaucophylla*	G5T5	Sl		E	LP, HL
Bog Willow	*Salix pedicellaris*	G5	S1		E	LP, HL
Bog Willowherb	*Epilobium leptophyllum*	G5	S2			HL
Boreal Starwort	*Stellaria borealis*	G5T5	S1		E	LP, HL
Bottle-shaped Sedge	*Carex utriculata*	G5	S2			HL
Bouquet Mud-plantain	*Heteranthera multiflora*	G4	S3			HL
Boy kin's Lobelia	*Lobelia boykinii*	G2G3	S1		E	LP, HL
Bradley's Spleenwort	*Asplenium bradleyi*	G4	Sl		E	LP, H.L
Bristling Panic Grass	*Panicum aciculare*	G5	SH		E	LP, HL
Bristly Blackberry	*Rubus setosus*	G5	SH.1?			HL
Bristly Buttercup	*Ranunculus pensylvanicus*	G5	S2			HL
Bristly Flat Sedge	*Cyperus hystricinus*	G4	SH		E	LP, HL
Bristly Greenbrier	*Smilax tamnoides*	G5	S3			HL
Bristly Sarsaparilla	*Aralia hispida*	G5	S3			HL
Bristly Smartweed	*Polygonum setaceum var. setaceum*	G5T3T5	S2			HL
Britton's Coast Violet	*Viola brittoniana var. brittoniana*	G4G5T4T5	S3			HL
Britton's Spike-rush	*Eleocharis brittonii*	G4GS	S1		E	LP, HL
Britton's Upland Boneset	*Eupatorium sessilifolium var. brittonianum*	G5T3T5	S2			HL
Broad-leaf Ironweed	*Vernonia glauca*	G5	S1		E	LP, HL
Broad-leaf Waterleaf	*Hydrophyllum canadense*	G5	S1		E	LP.HL
Broom Crowbeny	*Corema conradii*	G4	S1		E	LP.HL
Brown Sedge	*Carex buxbaumii*	G5	S3			HL
Buck-bean	*Menyanthes trifoliata*	G5	S2			HL
Buffalo Clover	*Trifolium reflexum*	G3G4	SX			HL
Bunchberry	*Cornus canadensis*	G5	S1S2			HL
Bush's Sedge	*Carex bushii*	G4	Sl		E	LP. HL
Butterfly-pea	*Clitoria mariana*	G5	S1		E	LP, HL
Butternut	*Juglans cinerea*	G4	S3			HL
Buttonbush Dodder	*Cuscuta cephalanthi*	G5	S1		E	LP, HL
Camphorweed	*Pluchea camphorata*	G5	SX.1			HL
Canada Anemone	*Anemone canadensis*	G5	SX			HL
Canada Hawkweed	*Hieracium kalmii*	G5T3T5	SL		E	LP, HL
Canada Pussytoes	*Antennaria neglecta var. canadensis*	G5T5?	S1		E	LP, HL
Canadian Milk-vetch	*Astragalus canadensis var. canadensis*	G5T5	SX.l			HL
Canadian Violet	*Viola canadensis*	G5T5	S1		E	LP, HL
Canby's Lobelia	*Lobelia canbyi*	G4	S3			LP, HL
Canby's Marsh-pennywort	*Hydrocotyle prolifera*	G5T5?	S1S2			HL
Capillary Beaked-rush	*Rhynchospora capillacea*	G4	S1		E	LP, HL
Carolina Club-moss	*Lycopodiella caroliniana var. caroliniana*	G5T4	S3			HL
Carolina desert-chicory	*Pyrrhopappus carolinianus*	G5	S1			HL
Carolina Elephant-foot	*Elephantopus carolinianus*	G5	SH		E	LP, HL
Carolina Fimbry	*Fimbristylis caroliniana*	G4	S2			HL
Carolina Nut-rush	*Scleria pauciflora var. caroliniana*	G5T4T5	S2			HL
Carolina Petunia	*Ruellia caroliniensis*	G5	SH		E	LP, HL
Carolina Sedge	*Carex caroliniana*	G5	S3			HL
Carolina Whitlow-grass	*Draba reptans*	G5	SH		E	LP, HL
Carolina Wood Vetch	*Vicia caroliniana*	G5	Sl		E	LP, HL
Catesby's Gentian	*Gentiana catesbaei*	G5	SX.l			HL
Cat-tail Sedge	*Carex typhina*	G5	S3			HL
Chaffseed	*Schwalbea americana*	G2G3	S1	LE	E	LP, HL
Chapman's Redtop	*Tridens flavus var. chapmanii*	G5T3T5	SH		E	LP, HL
Checkered Rattlesnake-plantain	*Goodyera tesselata*	G5	SX.1		E	LP, HL
Chickasaw Plum	*Prunus angustifolia*	G5T4T5	S2		E	LP, HL
Chinquapin	*Castanea pumila*	G5	S1		E	LP, HL
Chocolate-root	*Geum rivale*	G5	S3			HL
Ciliate-leaf Crown Grass	*Paspalum setaceum var. ciliatifolium*	G5T5Q	S2			HL
Clammy-weed	*Polanisia dodecandra ssp. Dodecandra*	G5T5?	S1			HL
Clasping-leaf St.John's-wort	*Hypericum gymnanthum*	G4	S1			HL
Clausen's Dewberry	*Rubus ascendens*	GNR	S1			HL
Climbing Fem	*Lygodium palmatum*	G4	S2			LP, HL
Climbing Fumitory	*Adlumia fungosa*	G4	S2			HL
Clinton's Woodfern	*Dryopteris clintoniana*	G5	S3			HL
Cloud Sedge	*Carex haydenii*	G5	Sl		E	LP, HL
Clustered Beaked-rush	*Rhynchospora glomerata*	G5T5?	SH		E	LP, HL
Clustered Sedge	*Carex cumulata*	G4?	SH		E	LP, HL

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Clustered-bluets	*Oldenlandia uniflora*	G5	S3			HL
Coarse Grass-like Beaked-rush	*Rhynchospora globularis*	G5?	S1		E	LP, HL
Coast Bedstraw	*Galium hispidulum*	G5	S1		E	LP, HL
Coast Flat Sedge	*Cyperus polystachyos*	G5T5	S1		E	LP, HL
Coastal-plain Panic Grass	*Panicum longiligulatum*	G4G5Q	SH.1			HL
Cold Spring Blackberry	*Rubus originalis*	G3?	S2			HL
Collared Dodder	*Cuscuta indecora*	G5T2T4	S1.1		E	LP, HL
Common Water-milfoil	*Myriophyllum sibiricum*	G5	S1		E	LP, HL
Cornel-leaf Aster	*Doellingeria infirma*	G5	S2			HL
Coupled Sedge	*Carex laxiculmis var. copulata*	G5T3T5	S1			HL
Cranefly Orchid	*Tipularia discolor*	G4G5	S3			HL
Crawe's Sedge	*Carex crawei*	G5	S1		E	LP.HL
Crawford's Sedge	*Carex crawfordii*	G5	S2			HL
Cream Vetchling	*Lathyrus ochroleucus*	G4G5	SH		E	LP, HL
Cream-flower Tick-trefoil	*Desmodium ochroleucum*	G1G2	SX.l			HL
Creeping Spearwort	*Ranunculus reptans*	G5T5	SH		E	LP, HL
Creeping-snowberry	*Gaultheria hispidula*	G5	S1		E	LP, HL
Crested Yellow Orchid	*Platanthera cristata*	G5	S3			LP, HL
Crooked-stem Aster	*Aster prenanthoides*	G4G5	S2			HL
Curly Grass Fern	*Schizae pusilla*	G3G4	S3			LP, HL
Curtiss' milkwort	*Polygala curtissii*	G5	S1.1			HL
Curtiss' Three-awn Grass	*Aristida dichotoma var. curtissii*	G5T5	S2			HL
Cut-leaf Coast Violet	*Viola brittoniana var. pectinata*	G4G5T3?Q	SH			HL
Cutleaf Water-milfoil	*Myriophyllum pinnatum*	G5	S1		E	LP, HL
Cyperus-like Sedge	*Carex pseudocyperus*	G5	S1		E	LP, HL
Cypress-swamp Sedge	*Carex joorii*	G4G5	S1.1		E	LP, HL
Darlington's Glade Spurge	*Euphorbia purpurea*	G3	S1		E	LP, HL
Davis' Dewberry	*Rubus pervarius*	G4?	SH.1			HL
Death-camus	*Zigadenus leimanthoides*	G4Q	S1		E	LP, HL
Dense Panic Grass	*Panicum rigidulum var. condensum*	G5T5?	S2			HL
Dense-flower Knotweed	*Polygonum densiflorum*	G5	S1		E	LP, HL
Devil's-bit	*Chamaelirium luteum*	G5	S3			HL
Dewey's Sedge	*Carex deweyana*	G5T5	S1		E	LP, HL
Dioecious Sedge	*Carex sterilis*	G4	S2			HL
Dodge's Hawthorn	*Crataegus dodgei*	G4	S2			HL
Dog-fennel Thoroughwort	*Eupatorium capillifolium*	G5	S1		E	LP.HL
Dotted Hawthorn	*Crataegus punctata*	G5	S2			HL
Downy Carrion-flower	*Smilax pulverulenta*	G4G5	S3			HL
Downy Milk-pea	*Galactia volubilis*	G5	SH		E	LP, HL
Downy Phlox	*Phlox pilosa*	G5T5	SH		E	LP, HL
Downy Willowherb	*Epilobium strictum*	G5?	S2			HL
Downy Woodmint	*Blephilia ciliata*	G5	SH.1			HL
Dragon Mouth	*Arethusa bulbosa*	G4	S2			HL
Drooping Spear Grass	*Poa languida*	G3G4Q	S2			HL
Drooping Wood Sedge	*Carex arctata*	G5?	S1		E	LP, HL
Drummond's Rockcress	*Arabis drummondii*	G5	S1.1		E	LP, HL
Dudley's Rush	*Juncus dudleyi*	G5	S3			HL
Dwarf Azalea	*Rhododendron atlanticum*	G4G5	S2		E	LP, HL
Dwarf Burrhead	*Echinodorus parvulus*	G3Q	SH.l			HL
Dwarf Hackberry	*Celtis tenuifolia*	G5	S2			HL
Dwarf Juniper	*Juniperus communis var. depressa*	G5T5	S3			HL
Dwarf Mistletoe	*Arceuthobium pusillum*	G5	Sl		E	LP, HL
Dwarf Plantain	*Plantago pusilla*	G5	SH		E	LP, HL
Dwarf White Bladderwort	*Utricularia olivacea*	G4	S1.1		E	LP, HL
Ear-leaf False Foxglove	*Agalinis auriculata*	G3	SX			HL
Early Brome	*Bromus latiglumis*	G5	S2S3			HL
Early Buttercup	*Ranunculus fascicilaris*	G5	S1		E	LP, HL
Early Coralroot	*Corallorhiza trifada*	G5	S2			HL
Eastern Mosquito-fern	*Azolla caroliniana*	G5	S2			HL
Eastern Silvery Aster	*Aster concolor*	GS	S2			LP, HL
Eastern Smoke Grass	*Muhlenbergia glomerata*	G5	S2			HL
Eaton's Beggar-ticks	*Bidens eatonii*	G2G3	Sl.l		E	LP, HL
Ebony Sedge	*Carex eburnea*	G5	S2			HL
Eel-grass Pondweed	*Potamogeton zosteriformis*	G5	S1		E	LP, HL

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Common Name	Scientific Name	G Rank	S Rank	Federal Status	State Status	Otber Status
Elliot's Goldenrod	*Solidago elliottii*	G5	S3			HL
Elliott's Beardgrass	*Andropogon gyrans*	G5	S2			HL
Elliott's Rush	*Juncus elliottii*	G4G5	SX.1		E	LP, HL
Elliptic Spike-rush	*Eleocharis elliptica*	G5	S2			HL
Elliptical Rushfoil	*Croton wildenowii*	G5	S2			LP, HL
Engelmann's Flat Sedge	*Cyperus engelmannii*	G4Q	S2			HL
Englemann's Sorrel	*Rumex hastatulus*	G5	SH			HL
Erect Bindweed	*Calystegia spithamaea*	G4G5T4T5	S1		E	LP.HL
Erect Coinleaf	*Centella erecta*	G5	SX.1			HL
Erect Knotweed	*Polygonum erectum*	G5	S2			HL
Estuary Burr-marigold	*Bidens bidentoides*	G3G4	S2			HL
False Asphodel	*Tofieldia racemosa*	G5	S1		E	LP, HL
False Boneset	*Kuhnia eupatorioides*	G5T5	S1		E	LP, HL
False Pennyroyal	*Isanthus brachiatus*	G5	S1		E	LP.HL
Featherfoil	*Hottonia inflata*	G4	S1		E	LP, HL
Fen Rush	*Juncus brachycephalus*	G5	S3			HL
Fen Small Yellow Lady's-slipper	*Cypripedium parviflorum var. makasin*	G5T4Q	S2			HL
Fernald's False Manna Grass	*Torreyochloa pallida var. fernaldii*	G5?T4Q	S1?			HL
Fern-leaf Phacelia	*Phacelia bipinnatifida*	G5	S1.1			HL
Few-flower Beaked-rush	*Rhynchospora oligantha*	G4	S2			HL
Few-flower Panic Grass	*Panicum oligosanthes var. oligosanthes*	G5T5?	S1S2			HL
Few-flower Spike-rush	*Eleocharis pauciflora*	G5	S1		E	LP, HL
Few-flower Tick-trefoil	*Desmodium pauciflorum*	G5	SH		E	LP, HL
Few-fruit Sedge	*Carex oligocarpa*	G4	S1		E	LP, HL
Field Sedge	*Carex conoidea*	G5	S2			HL
Fine-nerve Sedge	*Carex leptnonervia*	G4	S1		E	LP, HL
Fireberry Hawthorn	*Crataegus chrysocarpa var. chrysocarpa*	G5TNR	S2			HL
Flat-leaf Bladderwort	*Utricularia intermedia*	G5	S3			HL
Flat-stem Spike-rush	*Eleocharis compressa*	G4	Sl		E	LP, HL
Flax-leaf Bog Goldenrod	*Solidago uliginosa var. linoides*	G4G5T4T5	S3			HL
Fleshy Hawthorn	*Crataegus succulenta*	G5	S1		E	LP, HL
Flexuous Spear Grass	*Poa autumnalis*	G5	SH.1		E	LP, HL
Floating Marsh-pennywort	*Hydrocotyle ranunculoides*	GS	Sl		E	LP, HL
Floatingheart	*Nymphoideas cordata*	G5	S3			LP, HL
Florida Crown Grass	*Paspalum floridanum*	G5	S3			HL
Flowering Spurge	*Euphorbia corollata*	G5	S2			HL
Fly Poison	*Amianthium muscitoxicum*	G4G5	S2			HL
Foamflower	*Tiarella cordifolia*	G5T5	S1		E	LP, HL
Fogfruit	*Phyla lanceolata*	G5	SH		E	LP, HL
Four-leaf Milkweed	*Asclepias quadrifolia*	G5	S3			HL
Foxtail Sedge	*Carex alopecoidea*	G5	S1		E	LP, HL
Fragrant Ladies'-tresses	*Spiranthes odorata*	G5	S2			HL
Frank's Love Grass	*Eragrostis frankii*	G5	S2			HL
Frank's Sedge	*Carex frankii*	G5	S3			HL
Fraser's St. John's-wort	*Triadenum fraseri*	G5	S3			HL
Fringed Black-bindweed	*Polygonum cilinode*	G5	S2			HL
Fringed Bottle Gentian	*Gentiana andrewsii var. andrewsii*	G5?T5?	S2			HL
Fringed Brome	*Bromus ciliatus var. ciliatus*	G5T5	S2S3			HL
Fringed Yellow-eyed-grass	*Xyris fimbriata*	G5	S1		E	LP, HL
Fringetree	*Chionanthus virginicus*	G5	S3			HL
Gattinger's Witch Grass	*Panicum gattingeri*	G4	S1S2			HL
Giant Fox-tail	*Setaria magna*	G4G5	S2			HL
Glade Fern	*Athryrium pycnocarpon*	GS	Sl		E	LP, HL
Glandular Cinnamon Fern	*Osmunda cinnamonea var. glandulosa*	G5TNR	S2			HL
Glomerate Sedge	*Carex aggregata*	G5	S1S2			HL
Golden Seal	*Hydrastis canadensis*	G4	S1		E	LP, HL
Goldie's Wood Fern	*Dryopteris goldiana*	G4	S3			HL
Goose-foot Cornsalad	*Valerianella chenopodiifolia*	G5	SH.1			HL
Grass-leaf Lettuce	*Lactuca graminifolia var. graminifolia*	G5?T3T5	S1			HL
Great Indian Plantain	*Arnoglossum muehlenbergii*	G4	SX.l			HL
Great St. John's-wort	*Hypericum pyramidatum*	G4	S3			HL
Greek-valerian	*Polemonium reptans*	G5	S1		E	LP, HL
Green Adder's-mouth	*Malaxis unifolia*	G5	SH			HL
Green Sedge	*Carex viridula ssp. viridula*	G5T5	S2			HL
Green Violet	*Hybanthus concolor*	G5	Sl			LP, HL

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Greene's Rush	*Juncus greenei*	G5	S2			HL
Green-fruited Bur-reed	*Sparganium chlorocarpum*	G5	S3			HL
Greenish-flower Wintergreen	*Pyrola chlorantha*	G5	S1		E	LP, HL
Grooved Yellow Flax	*Linum sulcatum*	G5T5	S1		E	LP, HL
Hairy Hedge Hyssop	*Gratiola pilosa*	G5?	S2			HL
Hairy Angelica	*Angelica venenosa*	G5	S1S2			HL
Hairy Beardgrass	*Andropogon glomeratus var. hirsutior*	G5T5	SH.1			HL
Hairy Evening-primrose	*Oenothera villosa ssp. villosa*	G5T5?	SU			HL
Hairy Fimbry	*Fimbristylis puberula var. puberula*	G5T5?	S2			HL
Hairy Germander	*Teucrium canadense var. occidentale*	G5T5?	SU			HL
Hairy Goldenrod	*Solidago hispida var. hispida*	G5T5	SU			HL
Hairy Hedge-nettle	*Stachys palustris var. homotricha*	G5T5?	SH		E	LP, HL
Hairy Lipfern	*Cheilanthes lanosa*	G5	S2			HL
Hairy Primrose-willow	*Ludwigia hirtella*	G5	S1			LP, HL
Hairy Sundial Lupine	*Lupinus perennis var.occidentalis*	G5T2T5	S2			HL
Hairy Umbrella-sedge	*Fuirena squarrosa*	G4G5	S3			HL
Hairy Wood-rush	*Luzula acuminata*	G5T4T5	S2		E	LP, HL
Hairy-joint Meadow-parsnip	*Thaspium barbinode*	G5	SX			HL
Hammond's Yellow Spring Beauty	*Claytollia virginica var. hammondiae*	G5T1	S1.1		E	LP, HL
Handsome Sedge	*Carex formosa*	G4	S1.1		E	LP, HL
Hard-stem Bulrush	*Schoenoplectus acutus var. acutus*	G5	S3			HL
Harper's Sedge	*Carex leptalea var. harperi*	G5T4T5	S2S3			HL
Hazel Dodder	*Cuscuta coryli*	G5?	S2			HL
Heartleaf Twayblade	*Listera cordata*	G5T5	Sl		E	LP, HL
Hemlock-parsley	*Conioselinum chinense*	G5	S1		E	LP, HL
Hickey's Ground-pine	*Lycopodium hickeyi*	G5	S2S3			HL
Highbush Blackberry	*Rubus ostryifolius*	G3?Q	SH.1			HL
Highbush-cranberry	*Viburnum opulus var. americanum*	G5T5	S3			HL
Hillside Sedge	*Carex siccata*	G5	S1		E	LP, HL
Hirst Brothers' Panic Grass	*Panicum hirstii*	G1	S1	C	E	LP, HL
Hitchcock's Sedge	*Carex hitchcockniana*	G5	S2			HL
Hoary Frostweed	*Helianthemum bicknellii*	G5	S3			HL
Hoary Puccoon	*Lithospermum canescens*	G5	SX			HL
Hoary Willow	*Salix candida*	G5	S2			HL
Holmes' Hawthorn	*Crataegus holmesiana*	G5	S1			HL
Hooker's Orchid	*Platanthera hookeri*	G4	SH		E	LP, HL
Hop-like Sedge	*Carex lupuliformis*	G4	S1		E	LP, HL
Humped Bladderwort	*Utricularia gibba*	G5	S3			LP, HL
Husk-tomato	*Physalis pubescens var. integrifolia*	G5T5?Q	SH			HL
Hyssop Hedge-nettle	*Stachys hyssopifolia*	G5	S2			HL
Illinois Pondweed	*Potamogeton illinoensis*	G5	S1		E	LP, HL
Indian Physic	*Porteranthus trifoliatus*	G4G5	S2			HL
Indian Wood-oats	*Chasmanthium latifolium*	G5	SX.l			HL
Jacob's Ladder	*Polemonium vanbruntiae*	G3G4	SX.1			HL
James' Sedge	*Carex jamesii*	G5	S1		E	LP, HL
Jointed Rush	*Juncus articulatus*	G5	S2			HL
Kalm's Brome	*Bromus kalmii*	G5	S2			HL
Knieskern's Beaked-rush	*Rhynchospora knieskernii*	G2	S2	LT	E	LP, HL
Knotted Rush	*Juncus nodosus var. nodosus*	G5T5?	S3			HL
Knotted Spike-rush	*Eleocharis equisetoides*	G4	Sl		E	LP, HL
Koehn's Toothcup	*Ammannia latifolia*	G5	Sl		E	LP, HL
Labrador Marsh Bedstraw	*Galium labradoricum*	G5	Sl		E	LP, HL
Labrador Tea	*Ledum groenlandicum*	G5	S1			HL
Lace-lip Ladies'-tresses	*Spiranthes laciniata*	G4G5	S1		E	LP, HL
Lake Quillwort	*Isoetes lacustris*	G5	S1.1		E	LP, HL
Lake Water-cress	*Armoracia lacustris*	G4?	SH		E	LP, HL
Lancaster Flat Sedge	*Cyperus lancastriensis*	GS	S1		E	LP, HL
Lance-leaf Loosestrife	*Lysimachia lanceolata*	G5	S1			HL
Lance-leaf Moonwort	*Botrychium lanceolatum var. angustisegmentum*	G5T4	S2			HL
Large Awl-fruit Sedge	*Carex stipata var. maxima*	G5T5?	SH			HL
Large Marsh-pink	*Sabatia dodecandra var. dodecandra*	G5?T4T5	S2			HL
Large Purple Fringed Orchid	*Platanthera grandiflora*	G5	S2			HL
Large Swollen Bladderwort	*Utricularia inflata*	G5	S3			HL
Large Toothwort	*Cardamine maxima*	G5Q	S1.1		E	LP, HL

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Large Water-plantain	*Alisma trviala*	G5	Sl		E	LP, HL
Large Woodland Dropseed	*Muhlenbergia sylvatica var. robusta*	G5TNR	S2			HL
Large-calyx Goosefoot	*Chenopodium berlandieri var. macrocalycium*	G5T4	S2			HL
Large-fruit Black-snakeroot	*Sanicula trifoliata*	G4	S1		E	LP, HL
Large-fruit Fireweed	*Erechtites hieraciifolia var. megalocarpa*	G5T3	S1S2			HL
Large-head Beaked-rush	*Rhynchospora cephalantha*	G5	S3			LP, HL
Large-leaf Holly	*Ilex montana*	G5	Sl		E	LP, HL
Large-leaf White Violet	*Viola blanda var. palustriformis*	G4G5T4T5	S3			HL
Large-pod Pinweed	*Lechea intermedia var. intermedia*	G5T4T5	S2			HL
Larger Buttonweed	*Diodia virginiana*	G5T5	S1		E	LP. HL
Larger Canadian St. John's Wort	*Hypericum majus*	G5	Sl		E	LP, HL
Late Goldenrod	*Solidago tarda*	G4?Q	S3			HL
Laurel-leaf Greenbrier	*Smilax laurifolia*	G5	S3			HL
Leafy Northern Green Orchid	*Platanthera hyperborea var. hyperborea*	G5T5	SW			HL
Least Grape Fern	*Botrychium simplex var. simplex*	G5T5	SH. l			HL
Leatherwood	*Dirca palustris*	G4	S2			HL
Leathery Grape Fern	*Botrychium multifidum*	G5	S1		E	LP, HL
Leavenworth's Sedge	*Carex leavenworthii*	G5	SU			HL
Leopardbane	*Arnica acaulis*	G4	SX.1			HL
Lesser Bladderwort	*Utricularia minor*	G5	S1		E	LP, HL
Lesser Panicled Sedge	*Carex diandra*	G5	S1			HL
Limestone Petunia	*Ruellia strepens*	G4G5	SX.1			HL
Little Ladies'-tresses	*Spiranthes tuberosa*	G5	S3			LP, HL
Lobed Spleenwort	*Asplenium pinnatifidum*	G4	Sl		E	LP, HL
Loblolly Pine	*Pinus taeda*	G5	S2			HL
Log Fern	*Dryopteris celsa*	G4	S1			HL
Long Manna Grass	*Glyceria melicaria*	G5	S3			HL
Long-awn Smoke Grass	*Muhlenbergia capillaris*	G5T5?	S1		E	LP, HL
Long-awn Sprangletop	*Leptochloa fascicularius var. maritima*	G5T3T4Q	S2			HL
Long-beak Bald-rush	*Rhynchospora scirpoides*	G4	S2			HL
Long-beak Water Buttercup	*Ranunculus longirostris*	G5	S2			HL
Long-bract Green Orchid	*Coeloglossum viride var. virescens*	G5T5	S2			HL
Long-head Anemone	*Anemone cylindrica*	G5	S1		E	LP, HL
Long-leaf Rush-grass	*Sporobolus compositus var. compositus*	G5T5	S2			HL
Long-leaf Summer Bluet	*Houstonia longifolia*	G4G5	SX			HL
Long's Bittercress	*Cardamine longii*	G3	SH		E	LP, HL
Long's Blackberry	*Rubus longii*	G4?Q	S1			HL
Long's Bugleweed	*Lycopus americanus var. longii*	G5TNRQ	S2S3			HL
Long's Woolgrass	*Scirpus longii*	G2G3	S2		E	LP, HL
Long-spur Violet	*Viola rostrata*	G5	S3			HL
Loose-spike Milkwort	*Polygala ambigua*	G5?	S2			HL
Louisiana Sedge	*Carex louisianica*	G5	S1		E	LP, HL
Low Pine Barren Milkwort	*Polygala ramosa*	G5	SX.1			HL
Low Rough Aster	*Aster radula*	G5	S1			LP.HL
Low Sand Cherry	*Prunus pumila var. depressa*	G5T5	S1			HL
Low Service-berry	*Amelanchier humilis*	GS	S1S2			HL
Low Spearwort	*Ranunculus pusillus var. pusillus*	G5T4?	S2			HL
Low Spike Sedge	*Cyperus tenuifolius*	G5	SH		E	LP, HL
Lowland Fragile Fem	*Cystopteriz protrusa*	G5	S2			HL
Lowland Loosestrife	*Lysimachia hybrida*	G5	S3			HL
Mackenzie's Mermaidweed	*Proserpinaca intermedia*	G3G4Q	S3			HL
Maiden-cane	*Panicum hemitomon*	G5?	S2			LP, HL
Maple-leaf Goosefoot	*Chenopodium simplex*	G5	S2			HL
Marsh Bedstraw	*Galium palustre*	G5	S3			HL
Marsh Cinquefoil	*Potentilla palustris*	G5	SH		E	LP, HL
Marsh Fimbry	*Fimbristylis castanea*	G5	S3			HL
Marsh Flat Sedge	*Cyperus pseudovegetus*	G5	S1		E	LP, HL
Marsh New York Aster	*Aster novi-belgii var. elodes*	GSTNR	S3			HL
Marsh Rattlesnake-master	*Eryngium aquaticum var. aquaticum*	G4T4	S3			HL HL
Marsh Water-starwort	*Callitriche palustris*	G5	S2			HL
Maryland Hawkweed	*Hieracium marianum*	G5?	SU			HL
Maryland Milkwort	*Polygala mariana*	G5	S2			LP, HL
Maryland Spurge	*Euphorbia marilandica*	GNR	SNA		E	LP, HL
Matted Spike-rush	*Eleocharis intermedia*	G5	S2			HL

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Meadow Cuckoo-flower	*Cardamine pratensis var. palustris*	G5T5	S3			HL
Meadow Horsetail	*Equisetum pratense*	G5	S1		E	LP, HL
Mead's Sedge	*Carex meadii*	G4G5	Sl			HL
Midland Sedge	*Carex mesochorea*	G4G5	S2			HL
Minute Duckweed	*Lemna perpusilla*	G5	S1		E	LP,H L
Mississippi Arrowhead	*Sagittaria calycina var. calycina*	G5T5?	S2			HL
Missouri Gooseberry	*Ribes missouriense*	G5	S1		E	LP, HL
Missouri Rockcress	*Arabis missouriensis*	G5?Q	Sl.l			HL
Mist-flower	*Eupatorium coelestinum*	G5	S3			HL
Mitchell's Sedge	*Carex mitchelliana*	G4	S2			HL
Mountain Azalea	*Rhododendron prinophyllum*	G5	S3			HL
Mountain Nailwort	*Paronychia montana*	G4	SH			HL
Mountain Spleenwort	*Asplenium montanum*	G5	S2			HL
Mud Sedge	*Carex limosa*	G5	S1		E	LP, HL
Mudbank Crown Grass	*Paspalum dissectum*	G4?	S2			HL
Muskflower	*Mimulus moschatus var. moschatus*	G5T5	S2			HL
Narrow-leaf Primrose-willow	*Ludwigia linearis*	G5	S1			LP, HL
Narrow-leaf Arrowhead	*Sagittaria filiformis*	G4G5	SH			HL
Narrow-leaf Bluecurls	*Trichostema setaceum*	G5	S2			HL
Narrow-leaf Burr-reed	*Sparganium angustifolium*	G5	SH		E	LP, HL
Narrow-leaf Fireweed	*Epilobium angustifolim ssp. circumvagum*	G5T5	SH			HL
Narrow-leaf Gentian	*Gentiana linearis*	G4G5	SH		E	LP, HL
Narrow-leaf Goosefoot	*Chenopodium pratericola*	G5	S2			HL
Narrow-leaf Horse-gentian	*Triosteum angustifolium*	G5	SH		E	LP, HL
Narrow-leaf Loosestrife	*Lythrum lineare*	G5	S3			HL
Narrow-leaf Meadow-sweet	*Spiraea alba var. alba*	G5T5	S1			HL
Narrow-leaf Pinweed	*Lechea tenuifolia*	G5	S1		E	LP, HL
Narrow-leaf Sedge	*Carex amphibola var. amphibola*	G4Q	S1		E	LP, HL
Narrow-leaf Vervain	*Verbena simplex*	G5	S1		E	LP, HL
Narrow-panicle Rush	*Juncus brevicaudatus*	G5	S2			HL
Navel Cornsalad	*Valerianella umbilicata*	G4G5	SH		E	LP, HL
New England Bulrush	*Schoenoplectus novae-angliea*	G5	S2			HL
New England Grape	*Vitis novae-angliae*	G4G5Q	S1		E	LP, HL
New Jersey Dewberry	*Rubus novocaesarius*	G1	S1.1			HL
New Jersey Rush	*Juncus caesariensis*	G2	S2		E	LP, HL
Northem Blazing-star	*Liatris scariosa var. novae-angliae*	G5?T3	SH		E	LP, HL
Northern Manna Grass	*Glyceria laxa*	G5	Sl			HL
Northern Adder's-tongue	*Ophioglossum pusillum*	G5	S3			HL
Northern Bedstraw	*Galium boreale*	G5	S3			HL
Northern Beech Fern	*Phegopteris connectilis*	G5	S2			HL
Northern Blue Violet	*Viola septentrionalis*	G5	S1		E	LP, HL
Northern Bog Club-moss	*Lycopodiella inundata*	G5	S1			HL
Northern Jack-in-the-pulpit	*Arisaema triphyllum ssp. stewardsonii*	G5T4	S2			HL
Northern Panic Grass	*Panicum boreale*	G5	S1		E	LP, HL
Northern Pondweed	*Potamogeton alpinus*	G5	S1		E	LP, HL
Northern Wild Comfrey	*Cynoglossum virginianum var. boreala*	G5T4T5	SH.1		E	LP, HL
Northern Yellow-eyed-grass	*Xyris montana*	G4	S1.1		E	LP, HL
Nuttall's Mudwort	*Micranthemum micranthemoides*	GH	SH		E	LP, HL
Nuttall's Tick Trefoil	*Desmodium nuttallii*	G5	S3			HL
Oak Fern	*Gymnocarpium dryopteris*	G5	S1S2			HL
Oakes' Evening-primrose	*Oenothera oakesiana*	G4G5Q	S2			HL
Oakes' Pondweed	*Potamogeton oakesianus*	G4	S2			HL
Occluded Bindweed	*Calystegia sepium ssp. erratica*	G5TNR	SH.l		E	LP, HL
Ohio Spiderwort	*Tradescantia ohiensis*	G5	S2			HL
Old-pasture Spear Grass	*Poa saltuensis*	G5	SH		E	LP, HL
One-sided Wheatgrass	*Elymus trachycaulus ssp. subsecundus*	G5T5	Sl			HL
Opelousas Water-pepper	*Polygonum hydropiperoides var. opelousanum*	G5TNRQ	S2			HL
Orange Coneflower	*Rudbeckia fulgida*	G5T4?	S1		E	LP, HL
Oswego-tea	*Monarda didyma*	G5	S2			HL
Overcup Oak	*Quercus lyrata*	G5	S1		E	LP, HL
Painted Trillium	*Trillium undulatum*	G5	S2			HL
Pale Beaked-rush	*Rhynchospora pallida*	G3	S3			HL
Pale Dogwood	*Cornus amomum var. schuetzeana*	G5T5	S1		E	LP, HL
Pale Duckweed	*Lemna valdiviana*	G5	S1		E	LP, HL

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Pale Indian Plantain	*Cacalia atriplicifolia*	G4G5	S1		E	LP.HL
Pale Sedge	*Carex pallescens*	G5	S2			HL
Pale St. John's-wort	*Hypericum ellipticum*	G5	S2			HL
Pale-laurel	*Kalmia polifolia*	G5	S1		E	LP, HL
Paper Birch	*Betula papyrifera var. papyfera*	G5T5	S2			HL
Papillosa Nut-rush	*Scleria pauciflora var. pauciflora*	G5T5?	S1?			HL
Parker's Pipewort	*Eriocaulon parkeri*	G3	S2			HL
Pawpaw	*Asimina triloba*	G5	SJ		E	LP, HL
Pear Hawthorn	*Crataegus calpodendron*	G5	S1		E	LP, HL
Peck's White-tinged Sedge	*Carex peckii*	G4G5	S1		E	LP, HL
Pencil-flower	*Stylosanthes biflora*	G5	S3			HL
Pennsylvania Hawthorn	*Crataegus pennsylvanica*	G3Q	S1.1			HL
Pickering's Morning-glory	*Stylisma pickeringii var. pickeringii*	G4T3	S1		E	LP, HL
Pickering's Reed Grass	*Calamagrostis pickeringii*	G4	Sl		E	LP, HL
Pine Barren Gentian	*Gentiana autumnalis*	G3	S3			LP, HL
Pine Barren Bellwort	*Uvularia puberula var. nitida*	G5T3?	S2		E	LP, HL
Pine Barren Boneset	*Eupatorium resinosum*	G3	S2		E	LP, HL
Pine Barren Foxglove	*Agalinis fasciulata*	G5	S3			HL
Pine Barren Rattlesnake-root	*Prenanthes autumnalis*	G4G5	S2			LP, HL
Pine Barren Smoke Grass	*Muhlenbergia torreyana*	G3	S3			LP, HL
Pine Barren Spike-rush	*Eleocharis olivacea var. reductiseta*	G5T1T2	S1S2			HL
Pineland Tick-trefoil	*Desmodium strictum*	G4	S2			LP, HL
Pink Milkwort	*Polygala incarnata*	G5	SH		E	LP, HL
Plantain-leaf Sedge	*Carex plantaginea*	G5	S1.1		E	LP, HL
Plukenet's Flat Sedge	*Cyperus plukenetii*	G5	SH		E	LP, HL
Poison-oak	*Toxicodendron pubescens*	G5	S3			HL
Pollock's Mill Blackberry	*Rubus gnarus*	G3?	SH.1			HL
Pond Pine	*Pinus serotina*	G5	S2			HL
Potato Dwarf-dandelion	*Krigia dandelion*	G5	SH.1		E	LP, HL
Prairie Goldenrod	*Solidago rigida*	G5T5	S1		E	LP.HL
Prairie Sedge	*Carex prairea*	G5?	S2			HL
Prickly Gooseberry	*Ribes cynosbati*	G5	SU			HL
Prostrate Crown Grass	*Paspalum setaceum var. psammophilum*	G5T4?	S2S3			HL
Prostrate White Heath Aster	*Aster ericoides var. prostratus*	G5T4T5Q	S3			HL
Pumpkin Ash	*Fraxinus profunda*	G4	S1		E	LP, HL
Purple Bergamot	*Monarda media*	G4?	SH			HL
Purple Bittercress	*Cardamine douglassii*	G3	S2			HL
Purple Bladderwort	*Utricularia purpurea*	G5	S3			LP, HL
Purple Clematis	*Clematis occidentalis var. occidentalis*	G5T5	S2			HL
Purple Fringed Orchid	*Platanthera psycodes*	G5	S2			HL
Purple Fringeless Orchid	*Platanthera peramoena*	G5	S1		E	LP, HL
Purple Giant-hyssop	*Agastache scrophulariifolia*	G4	S2			HL
Purple Meadow-parsnip	*Thaspium trifoloiatum var. trifoliatum*	G5T5	S3			HL
Purple Oat	*Schizachne purpurascens*	G5	S1.1		E	LP, HL
Puttyroot	*Aplectrum hyemale*	G5	Sl		E	LP, HL
Queen-of-the-prairie	*Filipendula rubra*	G4G5	SX		E	LP, HL
Quill Sedge	*Carex tenera*	G5	S2			HL
Racemed Milkwort	*Polygala polygama*	G5	S2			HL
Rare-flower Beaked-rush	*Rhynchospora rariflora*	G5	S1		E	LP, HL
Red Baneberry	*Actaea rubra var. rubra*	G5T5	S2			HL
Red Goosefoot	*Chenopodium rubrum*	G5	S1		E	LP, HL
Red Milkweed	*Asclepias rubra*	G4G5	S2			LP, HL
Red Pine	*Pinus resinosa*	G5	S1.1		E	LP, HL
Red Spruce	*Picea rubens*	G5	S1		E	LP, HL
Redbud	*Cercis canadensis*	G5T5	S1		E	LP, HL
Reddish Bulrush	*Scirpus pendulus*	G5	S3			HL
Red-stem Hairy Lettuce	*Lactuca hirsuta var. sanguinea*	G5?T5?	S2			HL
Reflexed Flat Sedge	*Cyperus refractus*	G5	SH		E	LP, HL
Retrorse Sedge	*Carex retrorsa*	G5	S2			HL
Reversed Bladderwort	*Utricularia respuniata*	G4	S1		E	LP, HL
Rhodora	*Rhododendron canadense*	G5	S1		E	LP, HL
Richard's Yellow-eyed-grass	*Xyris jupicai*	G5	S2			HL
Riverbank Anemone	*Anemone virginiana var. alba*	G5T4T5	S2			HL
Robbin's Pondweed	*Potamogeton robbinsii*	G5	S2		E	LP, HL
Robin-run-away	*Dalibarda repens*	G5	SH.l		E	LP, HL

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Rock Buttercup	*Ranunculus micranthus*	G5	S2			HL
Rock Elm	*Ulmus thomasii*	G5	SX.1			HL
Rock Sandwort	*Arenaria stricta*	G5T5	SH		E	LP, HL
Rock Spike-moss	*Selaginella rupestris*	G5	S2			HL
Roland's Seablite	*Suaeda rolandii*	G1G2Q	SH.1		E	LP, HL
Rose-color Coreopsis	*Coreopsis rosea*	G3	S2			LP, HL
Rosy Twisted-stalk	*Streptopus roseus*	G5T5?	S1		E	LP, HL
Rough Cotton-grass	*Eriophorum tenellum*	G5	S1		E	LP, HL
Rough Flatsedge	*Cyperus retrofractus*	G5	SH		E	LP, HL
Rough Ox-eye	*Heliopsis helianthoides var. scabra*	G5T5	SU			HL
Rough Panic Grass	*Panicum leucothrix*	G4?Q	S2			HL
Rough Rush-grass	*Sporobolus clandestinus*	G5	S3			HL
Round-fruit Hedge-hyssop	*Gratiola virginiana*	G5	S2			HL
Round-leaf Bittercress	*Cardamine rotundifolia*	G4	Sl		E	LP, HL
Round-leaf Orchid	*Platanthera orbiculata*	G5	S1		E	LP, HL
Round-leaf Service-berry	*Amelanchier sanguinea*	G5T5	S1.1		E	LP, HL
Round-spike Brownish Sedge	*Carex brunnescens*	G5T5	Sl		E	LP, HL
Running Service-berry	*Amelanchier stolonifera*	G5	S3			HL
Rush Aster	*Aster borealis*	G5	Sl		E	LP, HL
Saline Orache	*Atriplex subspicata*	G5	Sl		E	LP, HL
Saltmarsh Alkali Grass	*Puccinellia fasciculata*	G3G5	S1			HL
Saltmarsh Bulrush	*Scirpus maritimus*	G5	SH		E	LP, HL
Salt-marsh Spike-rush	*Eleocharis halophila*	G4	S2			HL
Sand Yellow-eyed-grass	*Xyris caroliniana*	G4G5	S1		E	LP, HL
Sand-plain Blue-eyed Grass	*Sisyrinchium fuscatum*	G5?	S2			HL
Sandplain Flax	*Linum intercursum*	G4	S1		E	LP, HL
Scarlet Hawthorn	*Crataegua pedicellata*	G5	S1S2			HL
Scarlet Indian-paintbrush	*Castilleja coccinea*	G5	S2			HL
Schweinitz's Flat Sedge	*Cyperus schweinitzii*	G5	S1		E	LP, HL
Scribner's Panic Grass	*Panicum oligosanthes var. scribnerianum*	G5T5	S2			HL
Seabeach Amaranth	*Amaranthus pumilus*	G2	Sl	LT	E	LP, HL
Sea-beach Evening-primrose	*Oenothera humifusa*	G5	S2		E	LP, HL
Sea-beach Knotweed	*Polygonum glaucum*	G3	S1		E	LP, HL
Seabeach Purslane	*Sesuvium maritimum*	G5	S2			HL
Seabeach Sandwort	*Honckenya peploides var. robusta*	G5T4	S1			HL
Seabeach Sedge	*Carex silicea*	G5	S2			HL
Sea-milkwort	*Glaux maritima*	G5	SX.l		E	LP, HL
Seaside Arrow-grass	*Triglochin maritima*	G5	S1		E	LP, HL
Seaside Buttercup	*Ranunculus cymbalaria*	G5	SH		E	LP, HL
Seaside Plantain	*Plantago maritima var. juncoides*	G5T5	S2			HL
Seneca Snakeroot	*Polygala senega*	G4G5	S1.1		E	LP, HL
Sensitive Joint-vetch	*Aeschynomene virginica*	G2	Sl	LT	E	LP, HL
Sessile Water-speedwell	*Veronica catenata*	G5	S1		E	LP, HL
Sessile-leaf Tick-trefoil	*Desmodium sessilifolium*	G5	Sl		E	LP, HL
Sheathed Pondweed	*Potamogeton vaginatus*	G5	SU			HL
Sheathed Cotton-grass	*Eriophorum vaginatum var. spissum*	G5T5	SH		E	LP, HL
Sheathed Panic Grass	*Panicum scabriusculum*	G4	S2			HL
Shingle Oak	*Quercus imbricaria*	G5	S1.1		E	LP, HL
Shining Aster	*Aster firmus*	G5T5	SX.1		E	LP, HL
Shining Bedstraw	*Galium concinnum*	G5	SX.1			HL
Shining Ladies'-tresses	*Spiranthes lucida*	G5	S2			HL
Shining Willow	*Salix lucida ssp. Lucida*	G5T5	S1?			HL
Shore Quillwort	*Isoetes riparia var. riparia*	G5?TS?Q	S3			HL
Shore-line Sedge	*Carex hyalinolepis*	G4G5	SX.1			HL
Short-awn Meadow-foxtail	*Alopecurus aequalis var. aequalis*	G5T5?	S2			HL
Short-beaked Bald-rush	*Rhynchospora nitens*	G4?	S2			HL
Short-fruit Rush	*Juncus brachycarpus*	G4G5	S1		E	LP, HL
Short-leaf Skeleton Grass	*Gymnopogon brevifolius*	G5	SH		E	LP, HL
Showy Coneflower	*Rudbeckia fulgia var. speciosa*	G5T4?	SH.1?			HL
Showy Goldenrod	*Solidago speciosa var. speciosa*	G5T5?	S2			HL
Showy Lady's-slipper	*Cypripedium reginae*	G4	S1		E	LP, HL
Showy Meadow-beauty	*Rhexia interior*	G5T4T5	Sl		E	LP, HL
Shrubby St. John's-wort	*Hypericum prolificum*	G5	S1		E	LP, HL
Sickle-leaf Golden-aster	*Pityopsis falcata*	G3G4	S3			LP, HL
Sidebells	*Orthilia secunda*	G5	S2			HL

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Side-oats Grama Grass	*Bouteloua curtipendula*	G5T5	Sl		E	LP, HL
Silver Plume Grass	*Saccharum alopecuroidum*	G5	SH			HL
Silvery Beardgrass	*Andropogon ternarius var. ternarius*	G5T5?	S2			HL
Silvery Sedge	*Carex canescens var. canescens*	G5T5	SU			HL
Skunk Currant	*Ribes glandulosum*	G5	S1.1		E	LP, HL
Slender Arrowhead	*Sagittaria teres*	G3	S1			LP, HL
Slender Cotton-grass	*Eriophorum gracile*	G5T4T5	SH		E	LP, HL
Slender Dayflower	*Commelina erecta*	G5T5	SH.I		E	LP, HL
Slender Horned-rush	*Rhynchospora inundata*	G4?	S2			LP, HL
Slender Least Moonwort	*Botrychium simplex var. tenebrosum*	G5T4?Q	S2			HL
Slender Marsh-pink	*Sabatia campanulata*	G5	S3			HL
Slender Mountain-rice Grass	*Oryzopsis pungens*	G5	SH.1		E	LP, HL
Slender Panic Grass	*Panicum xanthophysum*	G5	SH.1		E	LP, HL
Slender Rockbrake	*Cryptogramma stelleri*	G5	SH.1		E	LP, HL
Slender Six-weeks Grass	*Vulpia octoflora var. glauca*	G5T5	S2			HL
Slender Toothwort	*Cardamine angustata*	G5	S3			HL
Slender Water-milfoil	*Myriophyllum tenellum*	G5	S1		E	LP, HL
Slender Wheatgrass	*Elymus traclrycuulus*	G5	Sl		E	LP, HL
Slender Wheatgrass	*Elymus trachycaulus ssp. trachycaulus*	G5T5	Sl			HL
Slender Wood-reed	*Cinna latifolia*	G5	S1		E	LP, HL
Small Floating Manna Grass	*Glyceria borealis*	G5	SH.l		E	LP, HL
Small Bedstraw	*Galium trifidum*	G5T5	S2		E	LP, HL
Small Burr-reed	*Sparganium minimum*	G5	Sl		E	LP, HL
Small Cranberry	*Vaccinium oxycoccos*	G5	S2			HL
Small Everlasting	*Gnaphalium helleri*	G4G5T3?	SH		E	LP, HL
Small Rush-grass	*Sporobolus neglectus*	G5	S1		E	LP, HL
Small Skullcap	*Scutellaria leonardii*	G4T4	S1		E	LP, HL
Small Spike-rush	*Eleocharis minima*	G4G5	SX.l		E	LP.HL
Small Swollen Bladderwort	*Utricularia radiata*	G4	S3			HL
Small Waterwort	*Elatine minima*	G5	S3			HL
Small White Lady's-slipper	*Cypripedium candidum*	G4	S1		E	LP, HL
Small Whorled Pogonia	*Isotria medeoloides*	G2	S1	LT	E	LP, HL
Small Yellow Pond-lily	*Nuphar microphyllum*	G5T4T5	SH		E	LP, HL
Small Yellow Sedge	*Carex cryptolepis*	G4	S2			HL
Smaller White Snakeroot	*Eupatorium aromaticum var. aromaticum*	G5T5	S1			HL
Small-fruit Grooveburr	*Agrimonia microcarpa*	G5	S2			HL
Small-flower False Foxglove	*Agalinis paupercula var. paupercula*	G5T5	S2			HL
Small-flower Halfchaff Sedge	*Hemicarpha micrantha*	G5	Sl		E	LP, HL
Small-fruit Beggar ticks	*Bidens mitis*	G4?	Sl			HL
Small-head Beaked-rush	*Rhynchospora microcephala*	G5T5	S1		E	LP, HL
Small's Groundsel	*Senecio anonymus*	G5	S2			HL
Small's Knotweed	*Polygonum buxiforme*	G5	S2			HL
Small-spike Rough Barnyard Grass	*Echinochloa muricata var. microstachya*	G5T5	SlS2			HL
Smartweed Dodder	*Cuscuta polygonorum*	G5	S2			HL
Smith's Club-rush	*Schoenoplectus smithii*	G5?	S2			HL
Smooth Beach-pea	*Lathyrus japonicus var. maritimis*	G5T4TS	SU			HL
Smooth Beardtongue	*Penstemon laevigatus*	G5	S1		E	LP, HL
Smooth Blackberry	*Rubus canadensis*	G5	S1		E	LP, HL
Smooth Cliffbrake	*Pellaea glabella var. glabella*	G5T5	S2			HL
Smooth Hedge-nettle	*Stachys tenuifolia*	G5	S3			HL
Smooth Orange Milkweed	*Asclepias lanceolata*	G5	S2			HL
Smooth Rattlesnake-root	*Prenanthes racemosa*	G5TNR	SH		E	LP, HL
Smooth Rose	*Rosa blanda var. blanda*	G5T5	SU			HL
Smooth Tick-trefoil	*Desmodium laevigatum*	G5	S3			HL
Snowy Catchfly	*Silene nivea*	G4?	S1		E	LP, HL
Snowy Orchid	*Platanthera nivea*	G5	S1		E	LP, HL
Soapwort Gentian	*Gentiana sapanaria var. saponaria*	G5T5	S3			HL
Soft Fox Sedge	*Carex conjuncta*	G4G5	S3			HL
Soft-leaf Sedge	*Carex disperma*	G5	S1S2			HL
Southern Twayblade	*Listera australis*	G4	S2			LP, HL
Southern Adder's-tongue	*Ophioglossum vulgatum var. pycnostichum*	G5	S1		E	LP, HL
Southern Arrowhead	*Sagittaria australis*	G5	S1		E	LP, HL
Southern Boltonia	*Boltonia asteroides var. glastifolia*	G5TNR	S1		E	LP, HL
Southern Long Sedge	*Carex lonchocarpa*	G5	SX.1			HL
Southern Rein Orchid	*Platanthera flava var. flava*	G4T4?Q	S1		E	LP, HL

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Southern Seabeach Grass	*Panicum amarum var. amarulum*	G5T3T5	S3			HL
Southern Water-nymph	*Najas guadalupensis var. guadalupensis*	G5T5	S3			HL
Southern Wood Violet	*Viola hirsutula*	G4	S2			HL
Sphagnum	*Sphagnum angustifolium*	G5	S1		E	LP, HL
Sphagnum	*Sphagnum austinii*	G4	SX		E	LP, HL
Sphagnum	*Sphagnum capillifolium*	G5	S2			HL
Sphagnum	*Sphagnum centrale*	G5	Sl		E	LP, HL
Sphagnum	*Sphagnum contortum*	G5	Sl		E	LP, HL
Sphagnum	*Sphagnum cyclophyllum*	G3	S2			HL
Sphagnum	*Sphagnum fuscum*	G5	S2			HL
Sphagnum	*Sphagnum macrophyllum*	G4G5	S2			HL
Sphagnum	*Sphagnum macrophyllum var. floridanum*	G3G5	S1		E	LP, HL
Sphagnum	*Sphagnum majus ssp. norvegicum*	G5?TNR	S1.1		E	LP, HL
Sphagnum	*Sphagnum perichaetiale*	G5	S2			HL
Sphagnum	*Sphagnum platyphyllum*	G5	SX.1		E	LP, HL
Sphagnum	*Sphagnum portoricense*	G5	S2			HL
Sphagnum	*Sphagnum quinquefarium*	G5	Sl.l		E	LP, HL
Sphagnum	*Sphagnum riparium*	G5	Sl		E	LP, HL
Sphagnum	*Sphagnum squarrosum*	G5	S2			HL
Sphagnum	*Sphagnum strictum*	G5	Sl		E	LP, HL
Sphagnum	*Sphagnum subfulvum*	GNR	S1.1		E	LP, HL
Sphagnum	*Sphagnum subsecundum*	G5	S1		E	LP, HL
Sphagnum	*Sphagnum subtile*	G5?Q	S2			HL
Sphagnum	*Sphagnum tenellum*	G5	S2			HL
Sphagnum	*Sphagnum teres*	G5	S2			HL
Sphagnum	*Sphagnum warnstorfi*	G5	S2			HL
Spiny Coontail	*Ceratophyllum echinatum*	G4?	S1		E	LP, HL
Spiny Wild Crabapple	*Malus angustifolia var. puberula*	G5?T2T4	S2			HL
Spllagnum	*Sphagnum carolinianum*	G3	52			HL
Spotted Phlox	*Phlox maculata var. maculata*	G5T4T5	S2			HL
Spotted-sheath Panic Grass	*Panicum dichotomum var. yadkinense*	G5T3T4Q	SH			HL
Spreading Chervile	*Chaerophyllum procumbens var. procumbens*	G5T5	S3			HL
Spreading Globe Flower	*Trollius laxus ssp. Laxus*	G4T3	S1		E	LP, HL
Spreading Pogonia	*Cleistes divaricata*	G4	S1		E	LP, HL
Spring Avens	*Geum vernum*	G5	S2			HL
Spring Coralroot	*Corallorhiza wisteriana*	G5	SX			HL
Spurred Butterfly-pea	*Centrosema virginianum*	G5	SH		E	LP, HL
Squirrel-corn	*Dicentra canadensis*	G5	Sl		E	LP, HL
Squirrel-tail Six-weeks Grass	*Vulpia elliotea*	G5	SU			HL
Stalked Water-hoarhound	*Lycopus rubellus*	G5	S2			HL
Stalked Woolgrass	*Scirpus pedicellatus*	G4	SH		E	LP, HL
Stanley's Goosefoot	*Chenopodium standleyannum*	G5	S2			HL
Star Chickweed	*Stellaria pubera*	G5	SH		E	LP, HL
Star Duckweed	*Lemna trisulca*	G5	S2			HL
Stiff Club-moss	*Lycopodium annotinum*	G5	S1		E	LP, HL
Stiff Dogwood	*Cornus foemina*	G5	S2			HL
Stiff Gentian	*Gentianella quinquefolia var. qinquefolia*	G5T4T5	S2			HL
Stinking Fleabane	*Pluchea foetida*	G5T5	SH		E	LP, HL
Stout Love Grass	*Eragrostis hirsuta*	G5	S1.1			HL
Stout Ragged Goldenrod	*Solidago squarrosa*	G4?	S2			HL
Strawberry-tomato	*Physalis grisea*	G5?	SH			HL
Strict Blue-eyed Grass	*Sisyrinchium montanum*	G5T4T5	S2		E	LP, HL
Striped Gentian	*Gentiana villosa*	G4	SXJ			HL
Stueve's Downy Bush-clover	*Lespedeza stuevei*	G4?	S2			HL
Summer Goldenrod	*Solidago rugosa ssp. rugosa var. sphagnophila*	G5T3T5	S3			HL
Sundial Lupine	*Lupinus perennis var. perennis*	G5T5?	S3			HL
Swamp Cottonwood	*Populus heterophylla*	G5	S2			HL
Swamp Oats	*Sphenopholis pensylcanica*	G4	S2			HL
Swamp Red Currant	*Ribes triste*	G5	SU			HL
Swampe Birch	*Betula pumila var. pumila*	G5T5?	S2			HL
Swampe Lousewort	*Pedicularis lanceolata*	G5	S3			HL
Swamp-pink	*Helionias bullata*	G3	S3	LT	E	LP, HL
Sweetgale	*Myrica gale*	G5	S3			HL

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Sweet-scent Indian-plantain	*Hasteola suaveolens*	G3	SX.l			HL
Sword Bogmat	*Wolffiella floridana*	G5	S1		E	LP, HL
Table Mountain Pine	*Pinus pungens*	G4	S1.1		E	LP, HL
Tall Boneset	*Eupatorium altissimum*	G5	S2			HL
Tall Cinquefoil	*Potentilla arguta var. arguta*	G5T5?	S2			HL
Tall Millet Grass	*Milium effusm*	G5	SH.1		E	LP, HL
Tall Rattlesnake-master	*Eryngium yuccifolium var. yuccifolium*	G5T5	SX			HL
Tall Thistle	*Cirsium altissimum*	G5	SX.l			HL
Think-leaf Sedge	*Carex cephaloidea*	G5	S2			HL
Thin-leaf Cotton-grass	*Eriophorum viridicarinatum*	G5	S3			HL
Threadfoot	*Podostemum ceratophullum*	G5	S2			HL
Thread-leaf Beaked-rush	*Rhynchospora filifolia*	G5	Sl		E	LP, HL
Thread-leaf Water Buttercup	*Ranunculus trichophyllus var. trichophyllus*	G5T5	S2			HL
Three Birds Orchid	*Triphora trianthophora*	G3G4	S1		E	LP, HL
Three-leaf False Solomon's seal	*Smilacina trifolia*	G5	S1		E	LP, HL
Three-toothed Cinquefoot	*Potentilla tridentata*	G5	S1.1		E	LP, HL
Ticklegrass	*Agrostis geminata*	G5	Sl?			HL
Tidal Arrowhead	*Sagittaria calycina var. spongiosa*	G5T4	S3			HL
Toothcup	*Rotala ramosior*	G5	S3			HL
Toothed Tick-trefoil	*Desmodium cuspidatum var. cuspidatum*	G5T5?	S2			HL
Torrey's Bulrush	*Schoenoplectus torreyi*	G5?	Sl		E	LP, HL
Torrey's Mountain-mint	*Pycnanthemum torrei*	G2	S1		E	LP, HL
Torrey's Rush	*Juncus torreyi*	G5	S1		E	LP, HL
Tradescant's Aster	*Aster tradescantii*	G4Q	S2			HL
Trailing Tick-trefoil	*Desmodium humifusum*	G1G2Q	S1		E	LP, HL
Tubercled Rein Orchid	*Platanthera flava var. herbiola*	G4T4Q	S2			HL
Tuberous White Water-lily	*Nymphaea odorata ssp. tuberosa*	G5T5	S2			HL
Tuckerman's Quillwort	*Isoetes tuckermanii*	G4?	SH.l		E	LP, HL
Tuckerman's Sedge	*Carex tuckermanii*	G4	S1		E	LP, HL
Tucker's Island Primrose-willow	*Ludwigia brevipes*	G2G3	SX. l			HL
Tufted Hair Grass	*Deschampsia caepitosa*	G5	S3			HL
Tufted Loosestrife	*Lysimachia thyrisflora*	G5	S3			HL
Tufted Meadow-foxtail	*Alopecurus carolinianus*	G5	S2			HL
Twinflower	*Linnaea borealis*	G5T5	SH		E	LP, HL
Twinleaf	*Jeffersonia diphylla*	G5	S1		E	LP, HL
Twisted Spike-rush	*Eleocharis tortilis*	G5	S1		E	LP, HL
Two-flower Bladderwort	*Utricularia biflora*	G5	S1		E	LP, HL
Two-leaf Toothwort	*Cardamine diphylla*	G5	S3			HL
Upland Least Moonwort	*Botrychium simplex var. laxifolium*	GSTNR	SH			HL
Variable Sedge	*Carex polymorpha*	G3	S1		E	LP, HL
Variable-leaf Water-milfoil	*Myriophyllum heterophyllum*	G5	S2			HL
Variegated Horsetail	*Equisetum variegatum*	G5T5	S1		E	LP.HL
Vasey's Boneset	*Eupatorium album var. vaseyi*	G5T3T5	S2			HL
Veined Skullcap	*Scutellaria nervosa*	G5	S2			HL
Veiny Vetchling	*Lathyrus venosus*	G5	SX		E	LP, HL
Veiny-leaf Arrow-wood	*Viburnum dentatum var. venosum*	G5T4T5	S2			HL
Velvety Tick-treefoil	*Desmodium viridiflorum*	G5?	S2			HL
Virginia Bluebells	*Mertensia virginica*	G5	S3			HL
Virginia Bunchflower	*Melanthium virginicum*	G5	S1		E	LP, HL
Virginia False-gromwell	*Onosmodium virginianum*	G4	S1		E	LP, HL
Virginia Pennywort	*Obolaria virginica*	G5	S2			HL
Virginia Snakeroot	*Aristolochia serpentaria*	G4	S3			HL
Virginia Thistle	*Cirsium virginianum*	G3	Sl		E	LP, HL
Wafer-ash	*Ptelea trifoliata*	G5T5	S1		E	LP, HL
Wahoo	*Euonymus atropurpurea var. atropurpurea*	G5T5	S1?			HL
Wall-rue	*Asplenium ruta-muraria var. cryptolepis*	G5T5	S2			HL
Walter Benner's Panic Grass	*Panicum acuminatum var. acuminatum*	G5T5	SX			HL
Walter's St. John's-wort	*Triadenum walteri*	G5	S1		E	LP, HL
Wand-like Goldenrod	*Solidago stricta*	G5	S3			LP, HL
Wand-like Three-awn Grass	*Aristida virgata*	G5T4T5	S2			HL
Warty Spike-rush	*Eleocharis tennis var. verrucosa*	G5T3T5	S1.1		E	LP, HL
Water Lobelia	*Lobelirr dortmanna*	G4G5	SH		E	LP, HL
Water Oak	*Quercus nigra*	G5	S1		E	LP, HL
Water Sedge	*Carex aquatilis*	G5	S1		E	LP, HL
Water-marigold	*Bidens beckii*	G4G5	Sl		E	LP, HL

List of Endangered Plant Species and Plant Species of Concern
January 2010

Common Name	Scientific Name	G Rank	S Rank	Federal Status	State Status	Otber Status
Water-plantain Spearwort	*Ranunculus ambigens*	G4	S2			HL
Weft Fern	*Trichomanes intricatum*	G4G5	S1.1		E	LP, HL
Western False Lily-of-the valley	*Maianthemum canadense var. interius*	G5T4	S1.1		E	LP, HL
Western Hairy Rockcress	*Arabis hirsuta var. pycnocarpa*	G5T5	Sl			HL
White Adder's-mouth	*Malaxis monophyllos*	G4Q	SH		E	LP, HL
White Bear Lake Sedge	*Carex albursina*	G5	S2		E	LP, Hl
White Heath Aster	*Aster ericoides var. ericoides*	G5T5	S1S2			H.L
White Milkweed	*Asclepias variegata*	G5	S2			HL
White Twisted-stalk	*Streptopus amplexifolius*	G5T5	S1		E	LP, HL
White-edge Panic Grass	*Panicum tenue*	G5T4T5	SH			HL
White-grained Mountain-rice Grass	*Oryzopsis asperifolia*	G5	S1		E	LP, HL
White-stem Pondweed	*Potamogeton praelongus*	G5	S1		E	LP, HL
Whorled Marsh-pennywort	*Hydrocotyle verticillata var. verticillata*	SG5T5	S3			HL
Whorled Milkweed	*Asclepias verticillata*	G5	S2			HL
Whorled Nut-rush	*Scleria verticillata*	G5	S1		E	LP, HL
Whorled Water-milfoil	*Myriophyllum verticillatum*	G5	SH		E	LP, HL
Wild Bleeding-heart	*Dicentra eximia*	G4	SH.1		E	LP, HL
Wild Blue Phlox	*Phlox divaricata*	G5T3T5	S1		E	LP, HL
Wild Calla	*Calla palustris*	G5	S3			HL
Wild Comfrey	*Cynoglossum virginianum var. virginianum*	G5T5	S2			HL
Wild Kidney Bean	*Phaseolus polystachios var. polystachios*	G5T5?	S2			HL
Wild Lupine	*Lupinus perennis*	G5	S3			HL
Wild-pink	*Silene caroliniana var. pensylvanica*	G5T4T5	S3			HL
Willdenow's Sedge	*Carex willdenowii var. willdenowii*	G5T5	S2			HL
Willow-leaf Aster	*Aster praeltus*	G5T5?	Sl		E	LP, HL
Winged Cudweed	*Gnaphalium macounii*	G5	SH		E	LP.HL
Winged Loosestrife	*Lythrum alatum var. alatum*	G5T5	S2			HL
Winged Monkey-flower	*Mimulus alatus*	G5	S3			HL
Wiry Panic Grass	*Panicum flexile*	G5	S1		E	LP, HL
Witch-hobble	*Viburnum alnifolium*	G5	Sl		E	LP, HL
Wood Lily	*Lilium philadelphicum var. philadelphicum*	G5T4T5	S2			HL
Woodland Dropseed	*Muhlenbergia sylvatica var. sylvatica*	G5T3T5	S3			HL
Woodland Flax	*Linum virginianum*	G4G5	S3			HL
Woodland Horsetail	*Equisetum sylvaticum*	G5	S3			HL
Woodland Spear Grass	*Poa sylvestris*	G5	SH			HL
Wood's Sedge	*Carex woodii*	G4	S1.1			HL
Woolly Ragwort	*Senecio tomentosus*	G4G5	S2			HL
Woolly Three-awn Grass	*Aristida lanosa*	G5	Sl		E	LP, HL
Wright's Panic Grass	*Panicum wrightianum*	G4	S2			HL
Wrinkled Jointgrass	*Coelorachis rugosa*	GS	S1		E	LP, HL
Yellow Clintonia	*Clintonia mariana*	G5	S3			HL
Yellow Fringed Orchid	*Platanthera ciliaris*	G5	S2			LP, HL
Yellow Fringeless Orchid	*Platanthera integra*	G3G4	S1		E	LP, HL
Yellow Giant-hyssop	*Agastache nepetoides*	G5	S2			HL
Yellow Oak	*Quercus muehlenbergii*	G5	S3			HL
Yellow Water Buttercup	*Ranunculus flabellaris*	G5	S3			HL
Yellowish Nodding Ladies'-tresses	*Spiranthes ochroleuca*	G4	S3			HL
Yellow-pimpernel	*Taenidia integerrima*	G5	S3			HL

EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

FEDERAL STATUS CODES

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 61, No. 40; F.R. 50 CFR Part 17). Federal Status codes reported for species follow the most recent listing.

LE Taxa formally listed as endangered.

LT Taxa formally listed as threatened.

PE Taxa already proposed to be formally listed as endangered.

PT Taxa already proposed to be formally listed as threatened.

C Candidate taxa for which the Service currently has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.

S/A Similarity of appearance species.

STATE STATUS CODES

Two animal lists provide state status codes after the Endangered and Nongame Species Conservation Act of 1973 (NSSA 23:2A-13 et. seq.): the list of endangered species (N.J.A.C. 7:25-4.13) and the list defining status of indigenous, nongame wildlife species of New Jersey (N.J.A.C. 7:25-4.17(a)). The status of animal species is determined by the Nongame and Endangered Species Program (ENSP). The state status codes and definitions provided reflect the most recent lists that were revised in the New Jersey Register, Monday, June 3, 1991.

D Declining species-a species which has exhibited a continued decline in population numbers over the years.

E Endangered species-an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors - a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.

EX Extirpated species-a species that formerly occurred in New Jersey, but is not now known to exist within the state.

I Introduced species-a species not native to New Jersey that could not have established itself here without the assistance of man.

INC Increasing species-a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long term period.

T Threatened species-a species that may become endangered if conditions surrounding the species begin to or continue to deteriorate.

P Peripheral species-a species whose occurrence in New Jersey is at the extreme edge of its present natural range.

S Stable species-a species whose population is not undergoing any long-term increase/decrease within its natural cycle.

U Undetermined species-a species about which there is not enough information available to determine the status.

Status for animals separated by a slash(/) indicate a duel status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

SC Special Concern - applies to animal species that warrant special attention because of some evidence of decline, inherent vulnerability to environmental deterioration, or habitat modification that would result in their becoming a Threatened species. This category would also be applied to species that meet the foregoing criteria and for which there is little understanding of their current population status in the state.

Plant taxa listed as endangered are from New Jersey's official Endangered Plant Species List N.J.S.A. 131B-15.151 et seq.

E Native New Jersey plant species whose survival in the State or nation is in jeopardy.

REGIONAL STATUS CODES FOR PLANTS AND ECOLOGICAL COMMUNITIES

LP Indicates taxa listed by the Pinelands Commission as endangered or threatened within their legal jurisdiction. Not all species currently tracked by the Pinelands Commission are tracked by the Natural Heritage Program. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan.

HL Indicates taxa or ecological communities protected by the Highlands Water Protection and Planning Act within the jurisdiction of the Highlands Preservation Area.

EXPLANATION OF GLOBAL AND STATE ELEMENT RANKS

The Nature Conservancy developed a ranking system for use in identifying elements (rare species and ecological communities) of natural diversity most endangered with extinction. Each element is ranked according to its global, national, and state (or subnational in other countries) rarity. These ranks are used to prioritize conservation work so that the most endangered elements receive attention first. Definitions for element ranks are after The Nature Conservancy (1982: Chapter 4, 4.1-1 through 4.4.1.3-3).

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 (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout its range; with the number of occurrences in the range of 21 to 100.

G4 Apparently secure globally; although it may be quite rare in parts of its range, especially at the periphery.

G5 Demonstrably secure globally; although 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.

GU Possibly in peril range-wide but status uncertain; more information needed.

GX Believed to be extinct throughout range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered.

G? Species has not yet been ranked.

GNR Species has not yet been ranked.

STATE ELEMENT RANKS

S1 Critically imperiled in New Jersey because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.

S2 Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.

S3 Rare in state with 21 to 100 occurrences (plant species and ecological communities in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

S4 Apparently secure in state, with many occurrences.

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

SA Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include European strays or western birds on the East Coast and vice-versa.

SE Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).

SH Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work with the expectation they may be rediscovered.

SP Element has potential to occur in New Jersey, but no occurrences have been reported.

SR Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.

SRF Elements erroneously reported from New Jersey, but this error persists in the literature.

SU Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.

SX Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.

SXC Elements presumed extirpated from New Jersey, but native populations collected from the wild exist in cultivation.

SZ Not of practical conservation concern in New Jersey, because there are no definable occurrences, although the taxon is native and appears regularly in the state. An SZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped and protected. In other words, the migrant regularly passes through the state, but enduring, mappable element occurrences cannot be defined.

Typically, the SZ rank applies to a non-breeding population (N) in the state - for example, birds on migration. An SZ rank may in a few instances also apply to a breeding population (B), for example certain lepidoptera which regularly die out every year with no significant return migration.

Although the SZ rank typically applies to migrants, it should not be used indiscriminately. Just because a species is on migration does not mean it receives an SZ rank. SZ will only apply when the migrants occur in an irregular, transitory and dispersed manner.

B Refers to the breeding population of the element in the state.

N Refers to the non-breeding population of the element in the state.

T Element ranks containing a "T" indicate that the infraspecific taxon is being ranked differently than the full species. For example *Stachys palustris* var. *homotricha* is ranked "G5T? SH" meaning the full species is globally secure but the global rarity of the var. *homotricha* has not been determined; in New Jersey the variety is ranked historic.

Q Elements containing a "Q" in the global portion of its rank indicates that the taxon is of questionable, or uncertain taxonomical standing, e.g., some authors regard it as a full species, while others treat it at the subspecific level.

.1 Elements only, ever documented from a single location.

Note: To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2?). A range is indicated by combining two ranks (e.g., G1G2, S1S3).

IDENTIFICATION CODES

These codes refer to whether the identification of the species or community has been checked by a reliable individual and is indicative of significant habitat.

These codes are not included on all Natural Heritage Reports.

Y Identification has been verified and is indicative of significant habitat.

BLANK Identification has not been verified but there is no reason to believe it is not indicative of significant habitat.

? Either it has not been determined if the record is indicative of significant habitat or the identification of the species or community may be confusing or disputed.

APPENDIX A-3

Dwellings and Small Commercial Buildings Report

Dwellings and Small Commercial Buildings

Morris County, New Jersey

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdrAt:							
Adrian, frequently flooded	85	Very limited		Very limited		Very limited	
		Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Ponding	1.00	Organic matter content	1.00
		Ponding	1.00			Ponding	1.00
BhdAt:							
Biddeford, frequently flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
BohB:							
Boonton, moderately well drained	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Slope	0.50
						Depth to saturated zone	0.39
BohC:							
Boonton, moderately well drained	85	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to saturated zone	1.00	Slope	1.00
		Depth to saturated zone	0.39	Slope	0.63	Depth to saturated zone	0.39
BOXCC:							
Boonton, moderately well drained, extremely stony	45	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to saturated zone	1.00	Slope	1.00
		Depth to saturated zone	0.39	Slope	0.63	Depth to saturated zone	0.39
Haledon, extremely stony	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to saturated zone	1.00

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CarAt:							
Carlisle, frequently flooded	85	Very limited		Very limited		Very limited	
		Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00	Organic matter content	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
FmhAt:							
Fluvaquents, loamy, frequently flooded	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Fluvaquents, loamy, frequently flooded	10	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Udifluvents, frequently flooded	10	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.99		
FNAT:							
Fluvaquents, wet, frequently flooded	55	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Udifluvents, loamy, frequently flooded	45	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
HanB:							
Haledon	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HanB:							
Boonton, moderately well drained	10	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
Boonton	5	Not limited		Not limited		Somewhat limited	
						Slope	0.50
HanC:							
Haledon	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to saturated zone	1.00
HhmCa:							
Hibernia, stony	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.04	Slope	0.04	Slope	1.00
Ridgebury, very stony	5	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.04	Slope	0.04	Slope	1.00
HhmDb:							
Hibernia, very stony	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
HokCg:							
Holyoke, rocky	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
HomE:							
Holyoke	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop	40	Not rated		Not rated		Not rated	

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MknA:							
Minoa	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Parsippany, frequently flooded	3	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Preakness, frequently flooded	2	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
MknB:							
Minoa	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Slope	0.50
OtsC:							
Otisville	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
OtsD:							
Otisville	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
PafAt:							
Palms, frequently flooded	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Shrink-swell	0.50	Organic matter content	1.00

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PbpAt:							
Parsippany, frequently flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Great Piece	10	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
PbphAt:							
Parsippany, sandy loam substratum, frequently floode	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
PdtB:							
Pattenburg	85	Not limited		Not limited		Not limited	
Annandale	5	Not limited		Not limited		Not limited	
Cokesbury, very stony	5	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
Croton	5	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Depth to hard bedrock	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
PgmD:							
Penn	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.06		

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PgmD:							
Klinesville	40	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Depth to soft bedrock	1.00
PHG:							
Pits, sand and gravel	100	Not rated		Not rated		Not rated	
PohA:							
Pompton	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Horseneck	10	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.67	Depth to saturated zone	1.00	Depth to saturated zone	0.67
Preakness, poorly drained	10	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
PohB:							
Pompton	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Slope	0.50
PrkAt:							
Preakness, poorly drained	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
Pompton	10	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
PrsdAt:							
Preakness variant, very poorly drained, frequently flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PrsdAt:							
Preakness	10	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
RkgBb:							
Ridgebury, very stony	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
RkgBc:							
Ridgebury, extremely stony	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
RksA:							
Riverhead	85	Not limited		Not limited		Not limited	
RksB:							
Riverhead	85	Not limited		Not limited		Somewhat limited	
						Slope	0.50
Annandale	5	Not limited		Not limited		Somewhat limited	
						Slope	0.50
Gladstone	5	Not limited		Not limited		Somewhat limited	
						Slope	0.50
Parker	5	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Depth to hard bedrock	0.99	Slope	1.00
				Slope	0.04		
RksC:							
Riverhead	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Annandale, eroded	5	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Gladstone, eroded	5	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Parker	5	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Depth to hard bedrock	0.99	Slope	1.00
				Slope	0.04		

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RksnB:							
Riverhead variant, neutral	85	Not limited		Not limited		Somewhat limited	
						Slope	0.13
RNRE:							
Rock outcrop	60	Not rated		Not rated		Not rated	
Rockaway, moderately well drained, extremely stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to saturated zone	0.99		
RobCb:							
Rockaway, very stony	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Depth to saturated zone	0.99	Slope	1.00
				Slope	0.04		
RobDc:							
Rockaway, extremely stony	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to saturated zone	0.99		
RocB:							
Rockaway	85	Not limited		Somewhat limited		Somewhat limited	
				Depth to saturated zone	0.99	Slope	0.50
RocC:							
Rockaway	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Depth to saturated zone	0.99	Slope	1.00
				Slope	0.63		
RomC:							
Rockaway, moderately well drained, extremely stony	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Depth to saturated zone	0.99	Slope	1.00
				Slope	0.04		
Rock outcrop	30	Not rated		Not rated		Not rated	

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RomD:							
Rockaway, extremely stony	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to saturated zone	0.99		
Rock outcrop	25	Not rated		Not rated		Not rated	
RomE:							
Rockaway, moderately well drained, very stony	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to saturated zone	0.99		
Rock outcrop	30	Not rated		Not rated		Not rated	
UR:							
Urban land	95	Not rated		Not rated		Not rated	
Udorthents	5	Not rated		Not rated		Not rated	
URWETB:							
Urban land, wet substratum	85	Not limited		Not limited		Not limited	
USRHVB:							
Urban land	60	Not rated		Not rated		Not rated	
Riverhead	40	Not limited		Not limited		Somewhat limited	
						Slope	0.50
USROCD:							
Urban land	45	Not rated		Not rated		Not rated	
Rockaway, stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to saturated zone	0.99		
USWHHB:							
Urban land	45	Not rated		Not rated		Not rated	
Whippany, occasionally flooded	40	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50			Shrink-swell	0.50

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WATER:							
Water	100	Not rated		Not rated		Not rated	
WhphA:							
Whippany, sandy loam substratum	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
Hasbrouck, very stony	5	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Parsippany, frequently flooded	5	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Preakness, frequently flooded	5	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
WhphB:							
Whippany, sandy loam substratum	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50			Slope	0.50
						Shrink-swell	0.50
WhvAb:							
Whitman, very stony	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00

Dwellings and Small Commercial Buildings

Morris County, New Jersey

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WkkAt:							
Willette, frequently flooded	85	Very limited		Very limited		Very limited	
		Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Ponding	1.00	Organic matter content	1.00
		Ponding	1.00			Ponding	1.00

Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

"Dwellings" are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

"Small commercial buildings" are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

APPENDIX A-4

Sewage Disposal (NJ) Report

Sewage Disposal (NJ)
Montville Township, New Jersey

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
AdrAt - Adrian muck, 0 to 3 percent slopes, frequently flooded								
Adrian, frequently flooded	85	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00	IIWr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not permitted-Hydric Soil	1.00
BhdAt-Biddeford silt loam, 0 to 2 percent slopes, frequently flooded								
Biddeford, frequently flooded	85	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIWr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIIHr	1.00
			Not permitted-Flooding	1.00	Not permitted-Flooding	1.00	IIISr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not permitted-Hydric Soil	1.00
BohB-Boonton moderately well drained gravelly loam, 3 to 8 percent slopes								
Boonton, moderately well drained	85	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.99	C drain	0.99	IIWp	0.99
BohC-Boonton moderately well drained gravelly loam, 8 to 15 percent slopes								
Boonton, moderately well drained	85	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.99	C drain	0.99	IIWp	0.99
BOXCC- Boonton and Haledon soils, 8 to 15 percent slopes, extremely stony								
Boonton, moderately well drained, extremely stony	45	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.99	C drain	0.99	IIWp	0.99

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
Haledon, extremely stony	40	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	0.99	SRB, SRE	0.99	IIISr	1.00
CarAt-Carlisle muck, 0 to 2 percent slopes, frequently flooded								
Carlise, frequently flooded	85	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00	IIIWr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not permitted-Hydric Soil	1.00
FmhAt- Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded								
Fluvaquents, loamy, frequently flooded	80	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00	IIWr	1.00
Fluvaquents, loamy, frequently flooded	10	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00	IIIWr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not permitted-Hydric Soil	1.00
Udifluvents, frequently flooded	10	Somewhat limited	Depth to apparent zone of saturation	0.83	M	0.83	IIWr	0.83
FNAT-Fluvaquents and udifluvents, 0 to 3 percent slopes, frequently flooded								
Fluvaquents, wet, frequently flooded	55	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00	IIIWr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not permitted-Hydric Soil	1.00
Udifluvents, loamy, frequently flooded	45	Very limited	Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00	Not permitted-Flooding	1.00
			Depth to apparent zone of saturation	0.99	M	0.99	IIWr	1.00
HanB-Haledon silt loam, 3 to 8 percent slopes								
Haledon	85	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
			Restrictive horizon	1.00	SRB, SRE	0.99	IIISr	0.99
Boonton, moderately well drained	10	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.99	C drain	0.99	IIWp	0.99
Boonton	5	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
HanC-Haledon silt loam, 8 to 15 percent slopes								
Haledon	85	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	0.99	IIISr	1.00
HhmCa- Hibernia loam, 3 to 15 percent slopes, stony								
Hibernia, stony	85	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	0.99	IIISr	1.00
Ridgebury, very stony	5	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	0.99	IIISr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	0.99	Not Permitted-Hydric Soil	1.00
HhmDb- Hibernia loam, 15 to 25 percent slopes, very stony								
Hibernia, very stony	85	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	0.99	IIISr	1.00
HokGc- Holyoke silt loam, 0 to 15 percent slopes, rocky								
Holyoke, rocky	85	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIISr	1.00
			Depth to massive bedrock	1.00	Depth to massive bedrock	1.00	IIISr	1.00

Sewage Disposal (NJ)
Montville Township, New Jersey

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
HomE-Holyoke-Rock outcrop complex, 15 to 45 percent slopes								
Holyoke	60	Very limited	Depth to massive bedrock	1.00	Depth to massive bedrock	1.00	IIISr	1.00
Rock outcrop	40	Not Rated	Not Rated		Not Rated		Not Rated	
MknA-Minoa silt loam, 0 to 3 percent percent slopes								
Minoa	85	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
Parsippany, frequently flooded	3	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Restrictive Substratum		Restrictive Substratum	1.00	IIIWr	
			Restrictive horizon	1.00	SRB, SRE	1.00	IIIHr	1.00
			Not permitted-Flooding	1.00	Not permitted-Flooding	1.00	IIISr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00
Preakness, frequently flooded	2	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Not permitted-Flooding	1.00	Not permitted-Flooding	1.00	IIIWr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00
MknB-Minoa silt loam, 3 to 8 percent percent slopes								
Minoa	85	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
OtsC-Otisville gravelly loamy sand, 3 to 15 percent slopes								
Otisville	85		Not limited		C		I	
OtsD-Otisville gravelly loamy sand, 15 to 25 percent slopes								
Otisville	85		Not limited		C		I	
PafAt- Palms, 0 to 2 percent slopes, frequently flooded								
Palms, frequently flooded	85	Very limited	Depth to apparent zone of saturation	1.00				
			Restrictive Substratum	1.00				
			Not permitted-Flooding	1.00				
			Not Permitted-Hydric Soil	1.00				

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
PbpAt-Parsippany silt loam, 0 to 3 percent slopes, frequently flooded								
Parsippany, frequently flooded	90	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIWr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIIHr	1.00
			Not permitted-Flooding	1.00	Not permitted-Flooding	1.00	IIISr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00
Great piece	10	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Not permitted-Flooding	1.00	Not permitted-Flooding	1.00	IIIWr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00
PbphAT-Parsippany silt loam, sandy loam substratum, 0 to 3 percent slopes, frequently flooded								
Parsippany, sandy loam substratum, frequently flooded	85	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIWr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIIHr	1.00
			Not permitted-Flooding	1.00	Not permitted-Flooding	1.00	IIISr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00
PdtB-Pattenburg gravelly loam, 3 to 8 percent slopes								
Pattenburg	85	Somewhat limited	Depth to massive bedrock	0.80	M	0.80	IISr	0.80
			Restrictive Substratum	0.80	M	0.80	IISr	0.80
Annandale	5	Very limited	Restrictive substratum	1.00	Restrictive substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
Cokesbury, very stony	5	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00

Sewage Disposal (NJ)
Montville Township, New Jersey

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
Croton	5	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00
			Depth to massive bedrock	0.99	M	0.99	IIISr	0.99
PgmD-Penn-Klinesville channery silt loams, 12 to 18 percent slopes								
Penn	60	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIISr	1.00
			Excessively coarse substratum	0.99	SRE, M	0.99	IISc	0.99
Klinesville	40	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIISr	1.00
			Excessively coarse substratum	0.99	SRE, M	0.99	IISc	0.99
PHG-Pits, sand and gravel								
Pits, sand and gravel	100	Not Rated	Not Rated		Not Rated		Not Rated	
PohH-Pompton sandy loam, 0 to 3 percent slopes								
Pompton	80	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
Horseneck	10	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
Preakness, poorly drained	10	Very limited	Depth to apparent zone of saturation	1.00	Restrictive Substratum	1.00	IIISr	1.00
			Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00
			Not Permitted-Hydric Soil	0.99	Not Permitted-Hydric Soil	0.99	Not Permitted-Hydric Soil	1.00
PohB-Pompton sandy loam, 3 to 8 percent slopes								
Pompton	85	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
PrkAt-Preakness sandy loam, 0 to 3 percent slopes, frequently flooded								
Preakness, poorly drained	90	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00	IIIWr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	0.99	Not Permitted-Hydric Soil	1.00

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
Pompton	80	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
PrsdAT- Preakness dark variant sandy loam, 0 to 3 percent slopes, frequently flooded								
Preakness variant, very poorly drained, frequently flooded	90	Very limited	Depth to apparent zone of saturation	1.00				
			Not Permitted-Flooding	1.00				
			Not Permitted-Hydric Soil	1.00				
Preakness	10	Very limited	Depth to apparent zone of saturation	1.00				
			Not Permitted-Flooding	1.00				
			Not Permitted-Hydric Soil	1.00				
RkgBb-Ridgebury loam, 0 to 8 percent slopes, very stony								
Ridgebury, very stony	85	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive Substratum	1.00	Restrictive Substratum		IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	0.99	Not Permitted-Hydric Soil	1.00
RkgBc-Ridgebury loam, 0 to 8 percent slopes, extremely stony								
Ridgebury, extremely stony	85	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive Substratum	1.00	Restrictive Substratum		IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00	Not Permitted-Hydric Soil	1.00
			Depth to massive bedrock	0.38	M	0.38	Not Permitted-Hydric Soil	0.38
RksA-Riverhead gravelly sandy loam, 0 to 3 percent slopes								
Riverhead	85		Not limited		C		I	
RksB-Riverhead gravelly sandy loam, 3 to 8 percent slopes								
Riverhead	85		Not limited		C		I	
			Restrictive substratum	1.00	Restrictive substratum	1.00	IIIHr	1.00

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
Annandale	5	Very limited	Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to massive bedrock	0.53	M	0.53	IISr	0.53
Gladstone	5		Not limited		C		I	
Parker	5	Very limited	Very limited					
			Depth to massive bedrock	1.00	Depth to massive bedrock	1.00	IIISr	1.00
RksC-Riverhead gravelly sandy loam, 8 to 15 percent slopes								
Riverhead	85	Not limited			C		I	
Annandale, eroded	5	Very limited	Restrictive substratum	1.00	Restrictive substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
Gladstone, eroded	5	Somewhat limited	Excessively coarse substratum	0.99	SRE, M	0.99	IISc	0.99
Parker	5	Very limited	Depth to massive bedrock	1.00	Depth to massive bedrock	1.00	IIISe	1.00
RksnB-Riverhead variant gravelly sandyloam, 3to 8 percent slopes								
Riverhead variant, neutral	85	Not limited			C		I	
RNRE-Rock outcrop-Rockaway complex, 15 to 35 percent slopes								
Rock outcrop	60	Not limited			C		I	
Rockaway, moderately well drained, extremely stony	40	Very limited	Restrictive substratum	1.00	Restrictive substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE		IIISr	1.00
			Depth to perched zone of saturation	0.83	C drain	1.00	IIWp	1.00
			Depth to massive bedrock	0.38	M	0.38	IISr	0.38
RobCb-Rockaway sandy loam, 8 to 15 percent slopes, very stony								
Rockaway, very stony	85	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.83	C drain	0.83	IIWp	0.83
RobDc-Rockaway sandy loam, 8 to 15 percent slopes, very stony								
Rockaway, extremely stony	85	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
			Depth to perched zone of saturation	0.83	C drain	0.83	IIWp	0.83
RocB-Rockaway sandy loam, 15 to 25 percent slopes, extremely stony								
Rockaway	85	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.83	C drain	0.83	IIWp	0.83
RocC-Rockaway sandy loam, 8 to 15 percent slopes								
Rockaway	85	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.83	C drain	0.83	IIWp	0.83
RomC-Rockaway-Rock outcrop complex, 8 to 15 percent slopes								
Rockaway, moderately well drained, extremely stony	70	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.83	C drain	0.83	IIWp	0.83
			Depth to massive bedrock	0.38	M	0.38	IISr	0.38
Rock outcrop	30	Not Rated			Not rated		Not rated	
RomD- Rockaway-Rock outcrop complex, 15 to 25 percent slopes								
Rockaway, extremely stony	60	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.83	C drain	0.83	IIWp	0.83
Rock outcrop	30	Not Rated			Not rated		Not rated	
RomE- Rockaway-Rock outcrop complex, 25 to 45 percent slopes								
Rockaway, moderately well drained, very stony	60	Very limited	Restrictive Substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Not permitted Too Steep	1.00	Not permitted Too Steep	1.00	Not permitted-Too steep	1.00
			Depth to perched zone of saturation	0.83	C drain	0.83	IIWp	0.83

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
			Depth to massive bedrock	0.80	M	0.80	IISr	0.80
Rock outcrop	30	Not Rated			Not rated		Not rated	
UR- Urban land								
Urban land	95	Not Rated			Not Rated		Not Rated	
Udothents	5	Not Rated			Not Rated		Not Rated	
URWETB-Urban land, wet substratum, 0 to 8 percent slopes (SSURGO!)								
Urban land, wet substratum	85	Not Rated			Not Rated		Not Rated	
USPREB- Urban land-Preakness complex, 0 to 8 percent slopes								
Urban land, rarely flooded	45	Not Rated			Not Rated		Not Rated	
Preakness, frequently flooded	40	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted Flooding	1.00
			Not permitted Flooding	1.00	Not permitted Flooding	1.00	IIIWr	1.00
			Not permitted hydric soil	1.00	Not permitted hydric soil	1.00	Not permitted Hydric soil	1.00
USRHVB-Urban land-Riverhead complex, 3 to 8 percent slopes								
Urban land	60	Not rated			Not Rated		Not Rated	
Riverhead	40	Not limited			C		I	
USROCC-Urban land-Rockaway complex, 3 to 15 percent slopes								
Rockawy	45	Very limited	Restrictive substratum	1.00	Restrictive substratum	1.00	IIIHr	1.00
			Restrive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.83	C drain	1.00	IIWp	0.83
Urban land	40	Not Rated			Not Rated		Not Rated	
USROCD-Urban land-Rockway complex, 15 to 25 percent slopes								
Urban land	45	Not Rated			Not Rated		Not Rated	
Rockaway, stony	40	Very limited	Restrictive substratum	1.00	Restrictive substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to perched zone of saturation	0.83	C drain	0.83	IIWp	0.83
USWHHB-Urban land-Whippany, occasionally flooded complex, 0 to 8 percent slopes								
Urban land	45	Not Rated			Not Rated		Not Rated	

Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
Whippany, occasionally flooded	40	Very limited	Depth to perched zone of saturation	1.00	Restrictive substratum	1.00	IIIHr	1.00
			Restrictive substratum	1.00	SRB, SRE	1.00	IIISr	1.00
			Not permitted-Flooding	1.00	C drain	1.00	IIWp	1.00
			Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
WATER- Water								
WATER	100	Not Rated			Not Rated		Not Rated	
WhphA- Whippany silt loa, sandy loam substratum, 0 to 3 percent slopes								
Whippany, sandy loam substratum	85	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive substratum	1.00	Restrictive Substratum	1.00	IIISr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
Hasbrouck, very stony	5	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive substratum	1.00	Restrictive Substratum	1.00	IIISr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Not permitted Hydric Soil	0.38	M	0.38	IISr	0.38
Parsippany, frequently flooded	5	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Restrictive substratum	1.00	Restrictive Substratum	1.00	IIIWr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIIHr	1.00
			Not Permitted Flooding	1.00	Not Permitted Flooding	1.00	IIISr	1.00
			Not permitted Hydric Soil	1.00	Not permitted Hydric Soil	1.00	Not permitted Hydric Soil	1.00
Preakness, frequently flooded	5	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	Not permitted-Flooding	1.00
			Not Permitted-Flooding	1.00	Not Permitted-Flooding	1.00	IIIWr	1.00
			Not permitted hydric soil	1.00	Not permitted hydric soil	1.00	Not permitted hydric soil	1.00
WhphB- Whippany silt loam, sandy loam substratum, 3 to 8 percent slopes								

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Map Symbol and Soil name	Percent of map unit	Rating Class	Disposal field (NJ)		Type Permitted (NJ)		Suitability Class (NJ)	
			Limiting features	Value	Limiting features	Value	Limiting features	Value
Whippany, sandy loam substratum	85	Very limited	Depth to perched zone of saturation	1.00	C drain	1.00	IIIWp	1.00
			Restrictive substratum	1.00	Restrictive Substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
WhvAB- Whitman loam, 0 to 3 percent slopes, very stony								
Whitman, very stony	85	Very limited	Depth to apparent zone of saturation	1.00	Depth to apparent zone of saturation	1.00	IIIWr	1.00
			Restrictive substratum	1.00	Restrictive substratum	1.00	IIIHr	1.00
			Restrictive horizon	1.00	SRB, SRE	1.00	IIISr	1.00
			Not permitted hydric soil	1.00	Not permitted hydric soil	1.00	Not permitted hydric soil	1.00

Description

The technical criteria used to generate this table are in “Standards for Individual Subsurface Sewerage Disposal Services, Subchapter 10. Disposal Fields,” in the State of New Jersey Administrative Code N.J. A.C7:9A. These disposal systems serve a single family home, single building or commercial unit on the same property where the total daily volume of sewage is less than 2,000 gallons. The table evaluates limiting soil features within the upper 10 feet of the soil and assigns the appropriate recommended type of disposal field system(s) permitted and the overall suitability class.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. “Not limited” indicates that the soil has features that are very favorable for the specified use. “Somewhat limited” indicates that the soil has features that are moderately favorable for the specified use. “Very limited” indicates that the soil has one or more features that are unfavorable for the specified use.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

A disposal field is an area where the sanitary sewage is discharged into the ground to treat the sewage in a manner that will retain most of the suspended solids in a septic tank and to discharge the effluent to the disposal field. The soil is evaluated from the surface to a depth of 300 centimeters, or approximately 10 feet. The ratings are based on the soil properties that affect absorption of the effluent, construction, and pollution of ground and surface water. Zone of saturation (apparent and perched water table), permeability, cemented horizon and substratum, and the percentage of rock fragments affect the absorption and treatment of the effluent. Fractured and massive bedrock interferes with installation and absorption of the effluent.

Depth to a zone of saturation has a major influence on the suitability of the soil for a septic system because of public health concerns. A high water table restricts the ability of the system to remove pathogens, nutrients, and other waste components.

Massive bedrock and a hydraulically restrictive substratum or horizon can affect excavation and result in lateral seepage of the effluent. The slow permeability impedes effluent infiltration, increasing the risk of surface-water pollution.

Massive bedrock and a hydraulically restrictive substratum or horizon can affect excavation and result in lateral seepage of the effluent. The slow permeability impedes effluent infiltration, increasing the risk of surface-water pollution.

Very rapid permeability caused by fractured bedrock and/or an excessively coarse textured substratum or horizon may result in inadequate filtering of the effluent and thus in ground-water contamination.

Following is a description of the soil suitability class codes used in this table.

The term “water table” refers to the upper surface of a zone of saturation. The code “Wr” refers to a regional water table, and the code “Wp” refers to a perched water table.

The term “horizon” refers to a layer of soil or rock material in a soil boring or pit differing from the layers of soil above and below it in one or more soil morphological characteristics, including color, texture, content of rock fragments, structure, consistence, and redoximorphic features. The code “Hc” referes to an excessively coarse textured horizon, and the code “Hr” refers to a hydraulically restrictive horizon.

The term “substratum” refers to a layer of soil or rock material with an upper surface that is the deepest observed in the soil boring or pit. The lower extent of the layer is undetermined; the layer is assumed to extend through the required depth of evaluation (10 feet). The code “Sc” refers to an excessively coarse texture, and the code “Sr” refers to a hydraulically restrictive layer.

The following table summarizes the ratings for the limiting features:

Limiting features	Depth (ft)	Suitability class	Type of installation permitted
Zone of saturation, regional	<2	IIIWr	Unsuitable
	2-5	IIWr	M
	>5	I	C
Zone of saturation, perched	<2	IIIWp	C
	2-5	IIWp	C
	>5	I	C
Massive rock, hydraulically restrictive substratum	<4	IIISr	Unsuitable
	4-9	IISr	M
	>9	I	C
Hydraulically restrictive horizon, permeable substratum	<4	IIIHr	SRB, SRE
	4-9	IIHr	SRB,SRE,M
	>9	I	C
Excessively coarse horizon	0-5	IIHC	SRE, M
	>5	I	C
Fractured rock or excessively coarse substratum	0-5	IISc	SRE, M
	>5	I	C

Source: United States Department of Agriculture, Natural Resources Conservation Service (2013). *Web Soil Survey, Sewage Disposal (NJ) Report.* Retrieved from: http://websoilsurvey.nrcs.usda.gov/. Accessed March 2013.

APPENDIX A-5

Natural Heritage Priority Sites – Rank Descriptions

Appendix A-5
Natural Heritage Priority Sites –
Rank Descriptions

Biodiversity Rank	Description
B1	Outstanding significance on a global level, generally the "last of the least" in the world, such as the only known occurrence of any element (species or ecological community), the best or an excellent occurrence of an element ranked critically imperiled globally, or a concentration (4+) of good or excellent occurrences of elements that are imperiled or critically imperiled globally. The site should be viable and defensible for the elements or ecological processes contained.
B2	Very high significance on a global level, such as the most outstanding occurrence of any ecological community. Also includes areas containing other occurrences of elements that are critically imperiled globally, a good or excellent occurrence of an element that is imperiled globally, an excellent occurrence of an element that is rare globally, or a concentration (4+) of good occurrences of globally rare elements or viable occurrences of globally imperiled elements.
B3	High significance on a global level, such as any other viable occurrence of an element that is globally imperiled, a good occurrence of a globally rare element, an excellent occurrence of any ecological community, or a concentration (4+) of good or excellent occurrences of elements that are critically imperiled in the State.
B4	Moderate significance on a global level, such as a viable occurrence of a globally rare element, a good occurrence of any ecological community, a good or excellent occurrence or only viable state occurrence of an element that is critically imperiled in the State, an excellent occurrence of an element that is imperiled in the State, or a concentration (4+) of good occurrences of elements that are imperiled in the State or excellent occurrences of elements that are rare in the State.
B5	Of general biodiversity interest.
V1	Outstanding significance on a state level. Only known occurrence in the state for an element; or Site with an excellent occurrence or the best occurrence in the state for an element ranked critically imperiled in the state; or a concentration (4+) of good or excellent occurrences of elements that are imperiled or critically imperiled in the state.
V2	Very high significance on a state level. Includes sites containing other occurrences of elements that are critically imperiled in the state; or a concentration (4+) of other occurrences of state imperiled elements and/or good or excellent occurrences of state rare elements.
V3	High significance on a state level. Includes sites containing the best occurrence in the state or an excellent occurrence of a state imperiled element; or multiple (2+) other occurrences for state imperiled elements and/or excellent, good or moderate quality occurrences of state rare elements.
V4	Moderate significance on a state level. Includes sites containing the best occurrence in the state or an excellent occurrence of a state rare element; or any site with other occurrences of a state imperiled element; or multiple (2+) other occurrences of state rare elements.
V5	Any site with any other occurrence of a state rare element.

Source: New Jersey Department of Environmental Protection: *NJDEP Natural Heritage Priority Sites, Edition 200703.*