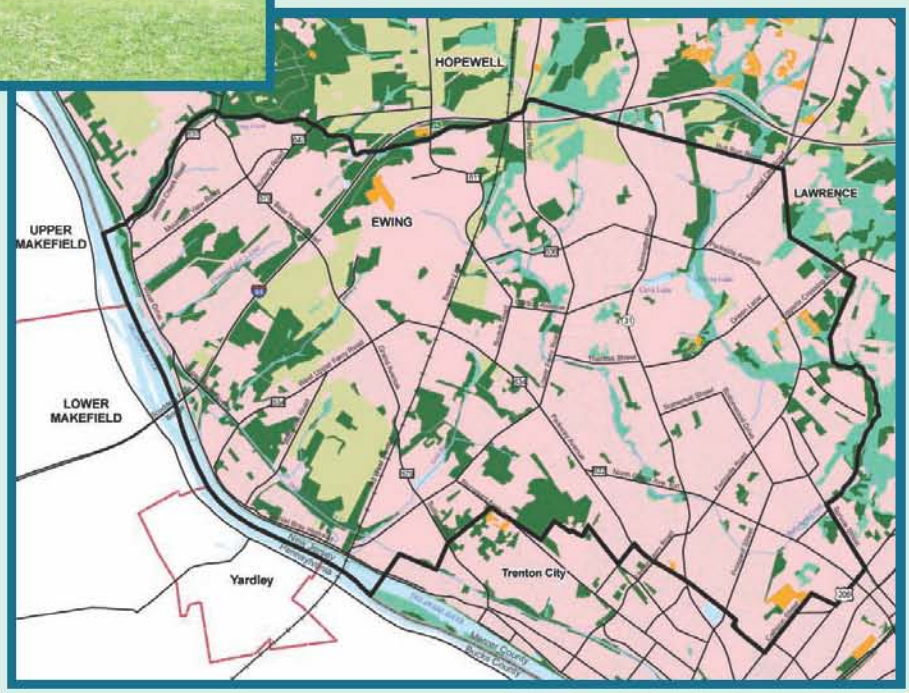
ENVIRONMENTAL RESOURCE INVENTORY

for the TOWNSHIP of

EWING

MERCER COUNTY, NEW JERSEY



prepared by:

Delaware Valley Regional Planning Commission

with:

The Environmental Commission of Ewing Township

MARCH 2005

Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency that provides continuing, comprehensive and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.

Our logo is adapted from the official DVRPC seal, and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole, while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for its findings and conclusions, which may not represent the official views or policies of the funding agencies.

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- The New Jersey Department of Community Affairs, Office of Smart Growth
- The Township of Ewing
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Township Committee, Township of Ewing
Mayor Wendell Pribila
President Les Summiel
Vice President Kathleen Wollert
Councilman Donald Apai
Councilman Jack Ball
Councilman Bert Steinmann

The impetus for the creation of the document, and its guidance and review, came from the Ewing Township Environmental Commission.

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INTRODUCTION

The purpose of an Environmental Resource Inventory (ERI), also called a Natural Resource Inventory (NRI), is to identify and describe the natural resources of a community. A community's natural resources – its soil, water, air, forests, fields, and waterways – are fundamental to its character. They are the foundation for its economic success and its quality of life. The protection and wise use of those resources is essential for the public health, safety, and welfare of current and future residents.

The Environmental Resource Inventory serves numerous fundamental purposes. To begin with, the ERI provides the baseline documentation of the community's environmental resources, which in turn serves as the foundation for the Conservation Element of the Master Plan and the development of goals and strategies to preserve, conserve, and utilize the township's natural resources. Having baseline documentation also allows the municipality to measure and evaluate resource protection, and make changes to policies, procedures and actions, as needed. In addition, the Conservation Element can shape the land use element of the Master Plan, by identifying areas appropriate for various land uses and densities of development. The combination of an ERI and Conservation Element can also provide the basis for implementing natural resource protection ordinances. Furthermore, the ERI can be used regularly by both the Environmental Commission and the Planning Board to evaluate subdivision and land development plans for their impacts to the environment, and the ERI can be used by developers in designing site plans to better conform to sites' environmental features.

In the past, Ewing Township's natural resources made the township an agricultural community. In addition, its position along the Delaware River and its transportation network made the area an important industrial and commercial center in the 19th and 20th centuries. Today, Ewing Township is almost entirely developed. Documentation of its resources has become a necessity, especially if it is to support residents of the future. Ewing's remaining forest and wetlands, which provide significant habitat for endangered and threatened plants and animals, will be vital to the continued health of the community and the enjoyment of its citizenry.

Preparing an Environmental Resource Inventory requires gathering all the existing information that can be found about the community's resources, and presenting it in a form that is usable by a broad audience. The Inventory reflects a particular moment in time, and it is assumed that it will be updated as new data becomes available.

Numerous documents and reports were utilized in preparing the *Environmental Resource Inventory for Ewing Township*. These references are listed at the end of this document. The maps and data relating to Ewing Township's natural resources are primarily derived from the New Jersey Department of Environmental Protection Geographic Information System mapping, and from *The Landscape Project* produced by the Endangered and Nongame Species Program of the New Jersey Fish and Wildlife Division.

BRIEF TOWNSHIP HISTORY

There is an excellent history of Ewing Township on the Ewing Township website: *http://www.ewingtwp.net*. It is excerpted below with minor additions.

Although Ewing Township was officially established in 1834, the history of the region ranges back thousands of years. The earliest inhabitants of the land area today known as Ewing Township were the Lenape Indians. These migratory people ranged throughout New Jersey along the banks of the Delaware River, and the township's many creeks provided rich natural resources for hunting, fishing, pottery-making, and simple farming.

Early Native American communities relied on the township's natural resources until the arrival of Europeans. Indeed, most pre-European settlements were associated with stream corridors. The Lenape Indians were the original owners of the land, but by 1801, nearly a century after the arrival of the first settlers, they had sold virtually all of their land to the settlers and moved from the area.

When the region was first settled by European colonists around 1699, it was part of Hopewell Township, and continued under that name until the City of Trenton was established in 1719. From 1719 until 1834, the area was named Trenton Township. On February 22, 1834, the name was changed from Trenton Township to Ewing Township in honor of Charles Ewing, who was posthumously honored for his work as Chief Justice of the New Jersey State Supreme Court from 1824-1832.

Ewing was settled by a mixture of European and American colonists. Emigrants from Long Island and the East Jersey Province were largely of English and Scotch ancestry, with a sprinkling of Welsh, Dutch and French Huguenots. Other English families came from Burlington County and the New England colonies.

Thomas Hutchinson and Daniel Cox are thought to be two of the first settlers in Ewing. Daniel Cox bought 30,000 acres, the original area of Hopewell Township, and sold large parcels to other settlers. Thomas Hutchinson arrived in 1687 from England. He had a 5,000-acre plantation. Today Ewing Township occupies a total area of 15.6 square miles (9,960 acres). Of this amount, 15.29 miles is land, including marshland, and 0.31 miles is water.

Religion played a prominent role in the lives of the people who lived in the region. In 1702, a group formed an Anglican Church on what are today the grounds of the Trenton Psychiatric Hospital between Stuyvesant Avenue and Sullivan Way. The church has long since disappeared, but a small cemetery remains. In 1708, Andrew Lockart deeded land on Scotch Road for the establishment of a Presbyterian Church to fulfill the religious needs of the early settlers. Their first services were held under two large oak trees, one of which is still standing. The congregation has erected four church buildings: the first of logs in 1712, the second a frame church in 1728, the third of brick in 1795, and the present stone structure in 1867, all on the same site. The adjacent cemetery contains the graves of many Revolutionary soldiers. Prior to 1823 when the Reverend Eli Field Cooley became the first full-time pastor, several congregations shared their ministers. At various times the congregation had been led by supply ministers, the

most historically famous being the Reverend John Witherspoon, president of the College of New Jersey (now Princeton University) and signer of the Declaration of Independence.

The populace of Ewing (Trenton) Township was sympathetic to the American cause during the Revolution, and many served in the war. General George Washington, after ferrying the American army across the Delaware River on Christmas morning, December 25, 1776, marched his troops down Bear Tavern Road to attack the Hessian mercenary forces stationed in Trenton.

In the early years of settlement, Ewing was chiefly a woodland area; however, after the Revolution, Ewing embarked upon a long period of agricultural growth and activity. In 1844, historians Barber and Howe described the township as having some of the richest soil in New Jersey. Early development was in the form of small hamlets scattered throughout the township, including Birmingham (now known as West Trenton), Ewing, Ewingville, and Greensburg (now Wilburtha). Most of these hamlets were located on the main transportation routes through the township: on roads such as Scotch Road or Pennington Road, on the Delaware & Raritan Canal, or near ferries across the Delaware River.

By the early 20th century, Trenton had become a major industrial center, and the population of the city rapidly increased. The areas of Ewing adjacent to Trenton began to take on urban characteristics, absorbing the population overflow from the city. Many Trenton residents discovered the advantages of living in Ewing, and the township began to change from an agricultural to a residential community. Trains and streetcars enabled people to live further from the center of Trenton. Areas such as Homecrest, Prospect Heights, Prospect Park, and Weber Park were established near the borders of the City of Trenton, some of the earliest “suburban” developments in Ewing.

Despite the early development of the streetcar suburbs, Ewing grew slowly in the first quarter of the 20th century: by 1920 the population of the township stood at 3,500. The area remained predominantly rural in nature until just prior to World War II, when new industries would begin a long period of growth and development for the township. With the construction of the General Motors plant in 1938 and the employment opportunities that accompanied it, new communities such as Glendale and Fernwood began to be built. By 1940, only 20 years later, the township’s population had almost tripled to 10,146.

Important industries were attracted to the area by the proximity of the Reading Railroad. Companies such as Homasote, Roller Bearing, Winner Manufacturing, Nassau China, and Heath Lumber benefited from this major transportation system, and some even installed spurs connecting to the main rail line.

During World War II, factories in the area devoted themselves wholeheartedly to the war effort. General Motors became Eastern Aircraft, and made a critical contribution to the war effort through the production of the Navy Avenger Torpedo Bomber. Assemblies from other plants on the East Coast were transported via the Reading Railroad to the Ewing plant, where they joined Ewing-fabricated sections in final assembly. Bombers off the line were sent to the Skillman (now Trenton-Mercer) airport, where they were tested before delivery to the navy.

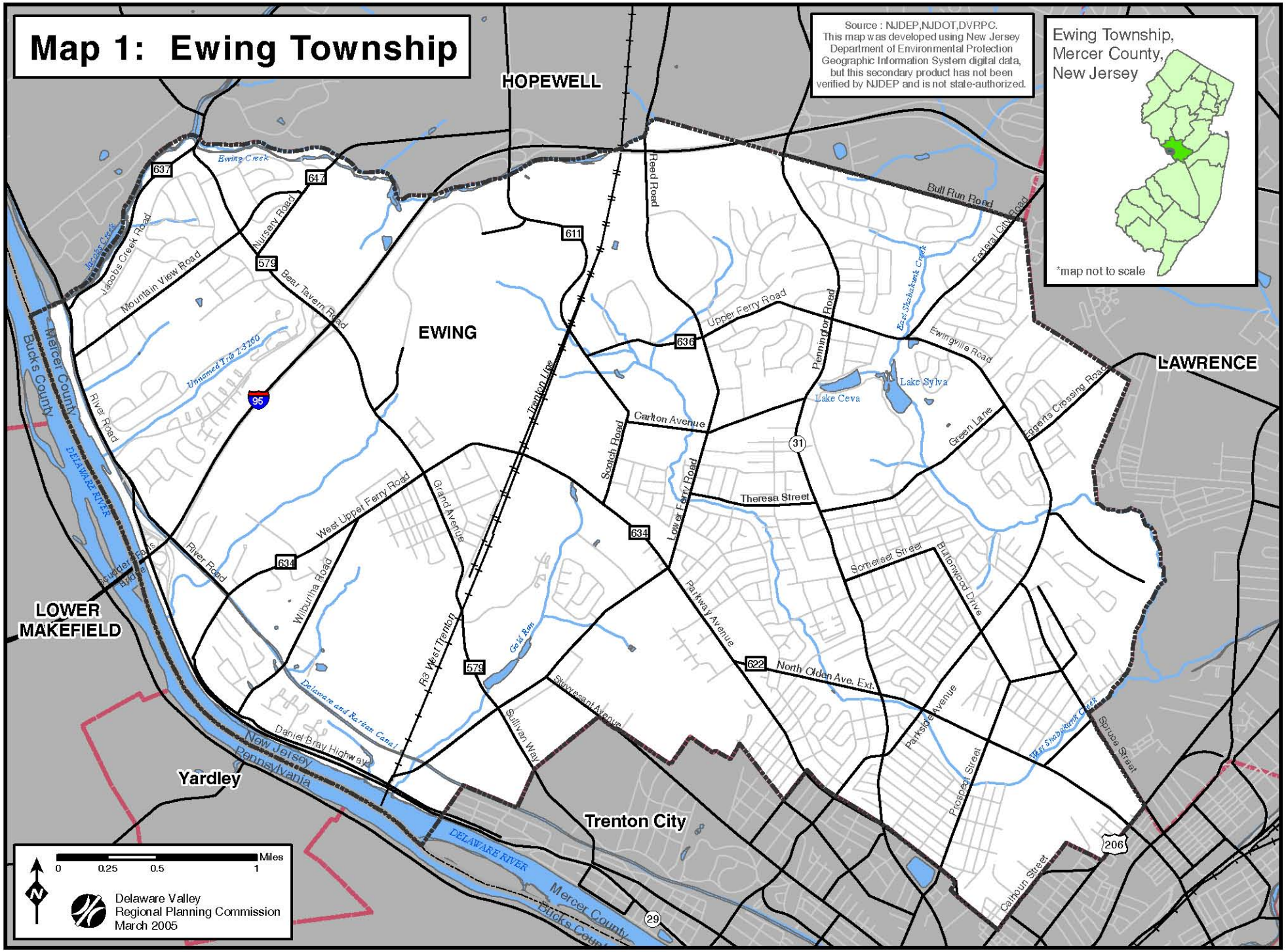
After World War II, Ewing Township grew rapidly, reflected by the construction of a variety of housing, including Parkway Village, Moss Homes, Wynnwood Manor and Fleetwood Village. Later subdivisions include Hampton Hill, Hillwood Manor, Sherbrooke, Hickory Hills and Village on the Green. By 1960, the population of the township had grown to 26,828.

Through the years, the State of New Jersey has established a number of important institutions in Ewing Township. These include the Trenton Psychiatric Hospital, The College of New Jersey (formerly Trenton State College), Marie Katzenbach New Jersey School for the Deaf, and the State Department of Transportation complex. Another significant governmental installation was the Naval Air Warfare Center on Parkway Avenue, which developed many major aeronautical defense weapons, such as the cruise missile, for the US Navy.

Today Ewing has become an ethnically and socially diverse community of residents. According to the 2000 census, the population of the township stood at 35,707, and is expected to rise to 39,000 by 2025. The economy of the township is strongly rooted in government, light manufacturing and education. With easy access to both Philadelphia and New York, the township remains a viable business center. It continues to function as a corridor for the vital components of air, rail and land transportation, including the Trenton-Mercer Airport and Interstate 95.

Under the initiative of the new Mayor-Council form of government, established in 1995, the township is now preparing to review and define several areas for redevelopment and community renewal. This initiative will maximize the potential for future growth, and help the township meet the challenges of the 21st century. Ewing remains a vital community in Mercer County and Central New Jersey for growth, opportunity and progress; and although much changed from its agrarian roots, its character remains intact for future generations in neighborhoods, people, and special places.

West Trenton Train Station


Map 1: Ewing Township
Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.
Ewing Township, Mercer County, New Jersey
*map not to scale
HOPEWELL
EWING
LAWRENCE
LOWER MAKEFIELD
Yardley
Trenton City
Lake Sylva
Lake Ceva
Ewing Creek
Jacobs Creek
Unnamed Trib 2-3200
East Shabbakunk Creek
West Shabbakunk Creek
Gold Run
Delaware and Raritan Canal
DELAWARE RIVER
New Jersey
Pennsylvania
Bucks County
Mercer County
Reed Road
Nursery Road
Bear Tavern Road
Mountain View Road
Jacobs Creek Road
River Road
Trenton Line
Grand Avenue
West Upper Ferry Road
Wilburtha Road
Scotch Road
Lower Ferry Road
Upper Ferry Road
Carlton Avenue
Theresa Street
Somerset Street
Parkway Avenue
North Olden Ave. Ext.
Stuyvesant Avenue
Sullivan Way
Daniel Bray Highway
Pennington Road
Ewingville Road
Eggerts Crossing Road
Green Lane
Bullionwood Drive
Parkside Avenue
Prospect Street
Spruce Street
Calhoun Street
Bull Run Road
Federal City Road
637
647
579
611
636
95
634
31
622
206
29
0
0.25
0.5
1
Miles
N
Delaware Valley Regional Planning Commission
March 2005

EWING TOWNSHIP LOCATION, SIZE, AND LAND USE

Ewing is an incorporated township located in the west of Mercer County, New Jersey. Three communities bound the township within Mercer County: Hopewell Township to the north, Lawrence Township to the east, and the City of Trenton to the south. Jacobs Creek and its tributary, Ewing Creek, form a portion of the northern boundary. Ewing's western boundary is the Delaware River, which forms the dividing line between Pennsylvania and New Jersey.

Ewing Township occupies 9,960 acres or 15.6 square miles situated in the Piedmont section of New Jersey. It is in a region that continues to be mostly rural to the north, in Hopewell Township, and very developed to the south, in Trenton. Most land within the township is occupied by residential development or industrial and commercial facilities. This development arose, in part, because of Ewing's proximity to the Philadelphia and New York City metropolitan areas and easy access to major highways. Residential development in the last three decades has been extending north, across the border, into Hopewell Township.

The information in the tables that follow (Tables 1, 2, and 3) are derived from two main sources: the NJDEP 95/97 Land Use and Land Cover Map and the DVRPC 2000 Land Use Map. The NJDEP map was originally compiled using infrared ortho-photography to map vegetation and development. The DVRPC map was derived from interpretations of ortho-digital aerial photography. In 2002 NJDEP updated its infrared ortho-photography images. These images became available to the public in 2004. As a result, the maps and the tables below reflect updates that were made to the original maps, based on review of the 2002 ortho-photography. Table 2 has not been updated, given the specific nature of the data.

Table 1: Ewing Township General Land Use & Land Cover Classes (1995/97 updated to 2002)

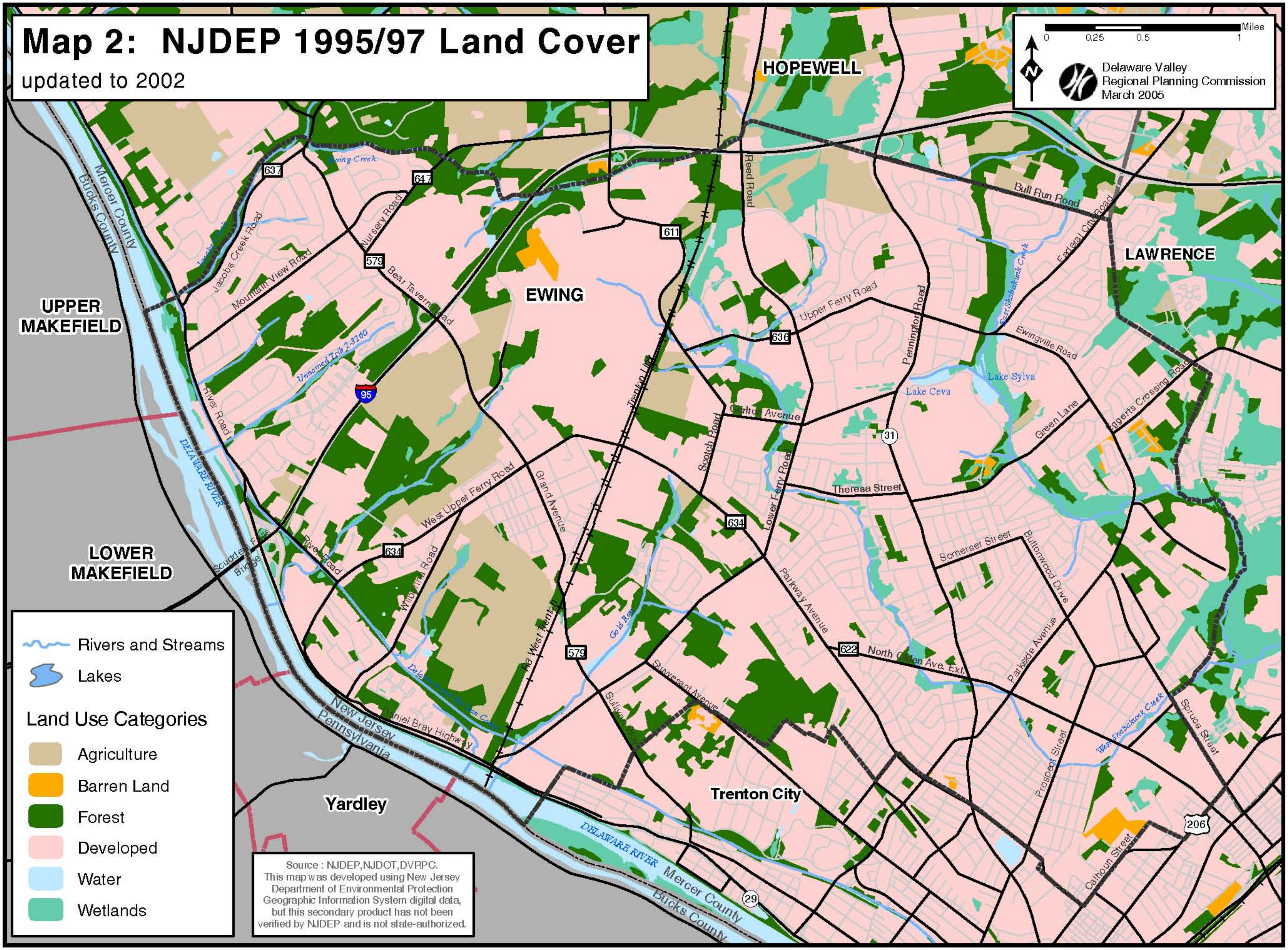
General Land Classes	95/97 Acres	% of land (95/97)	2002 Acres	% of land (2002)	95/97 - 2000 Change in Acres
Agriculture	695	7%	687	7%	**-8**
Barren Land	68	1%	51	1%	**-17**
Forest	1445	15%	1366	14%	**-79**
Urban	7092	71%	7197	72%	**105**
Water	216	2%	216	2%	**0**
Wetlands	444	4%	443	4%	**-1**
Total	**9960**	**100%**	**9960**	**100%**	

Source: NJDEP

Table 2: Ewing Township Specific Land Use (1995/97) NOT updated to 2002

Land Use Category	Acres	Percent
Residential, single unit, medium density	2327	23.35%
Other urban or built-up land	1132	11.37%
Residential, single unit, low density	960	9.64%
Commercial/Services	875	8.79%
Deciduous forest (>50% crown closure)	837	8.40%
Cropland and pastureland	673	6.75%
Recreational land	444	4.46%
Transportation/communications/utilities	369	3.70%
Deciduous wooded wetlands	346	3.48%
Residential, high density, multiple dwelling	319	3.21%
Industrial	284	2.85%
Old field (<25% brush covered)	208	2.08%
Residential, rural, single unit	208	2.08%
Deciduous brush/shrubland	206	2.06%
Streams and canals	181	1.81%
Mixed deciduous/coniferous brush/shrubland	130	1.31%
Athletic fields (schools)	129	1.29%
Transitional areas	50	0.51%
Deciduous forest (10-50% crown closure)	40	0.41%
Military reservations	38	0.38%
Deciduous scrub/shrub wetlands	37	0.37%
Artificial lakes	22	0.23%
Altered lands	18	0.18%
Disturbed wetlands (modified)	17	0.17%
Confined feeding operations	14	0.14%
Coniferous brush/shrubland	14	0.14%
Herbaceous wetlands	14	0.14%
Natural lakes	13	0.13%
Agricultural wetlands (modified)	9	0.09%
Other agriculture	8	0.08%
Managed wetland in maintained lawn greenspace	7	0.07%
Former agricultural wetland (becoming shrubby, not built-up)	7	0.07%
Mixed urban or built-up land	7	0.07%
Mixed forest (>50% coniferous with 10%-50% crown closure)	5	0.05%
Wetland rights-of-way (modified)	4	0.04%
Coniferous forest (>50% crown closure)	3	0.03%
Coniferous forest (10-50% crown closure)	2	0.02%
Mixed forest (>50% Deciduous with > 50% crown closure)	1	0.01%
Managed wetland in built-up maintained recreational area	1	0.01%
Mixed scrub/shrub wetlands (deciduous dominant)	1	0.01%
Total	**9960**	**100%**

Source: NJDEP


Map 2: NJDEP 1995/97 Land Cover
updated to 2002
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Miles
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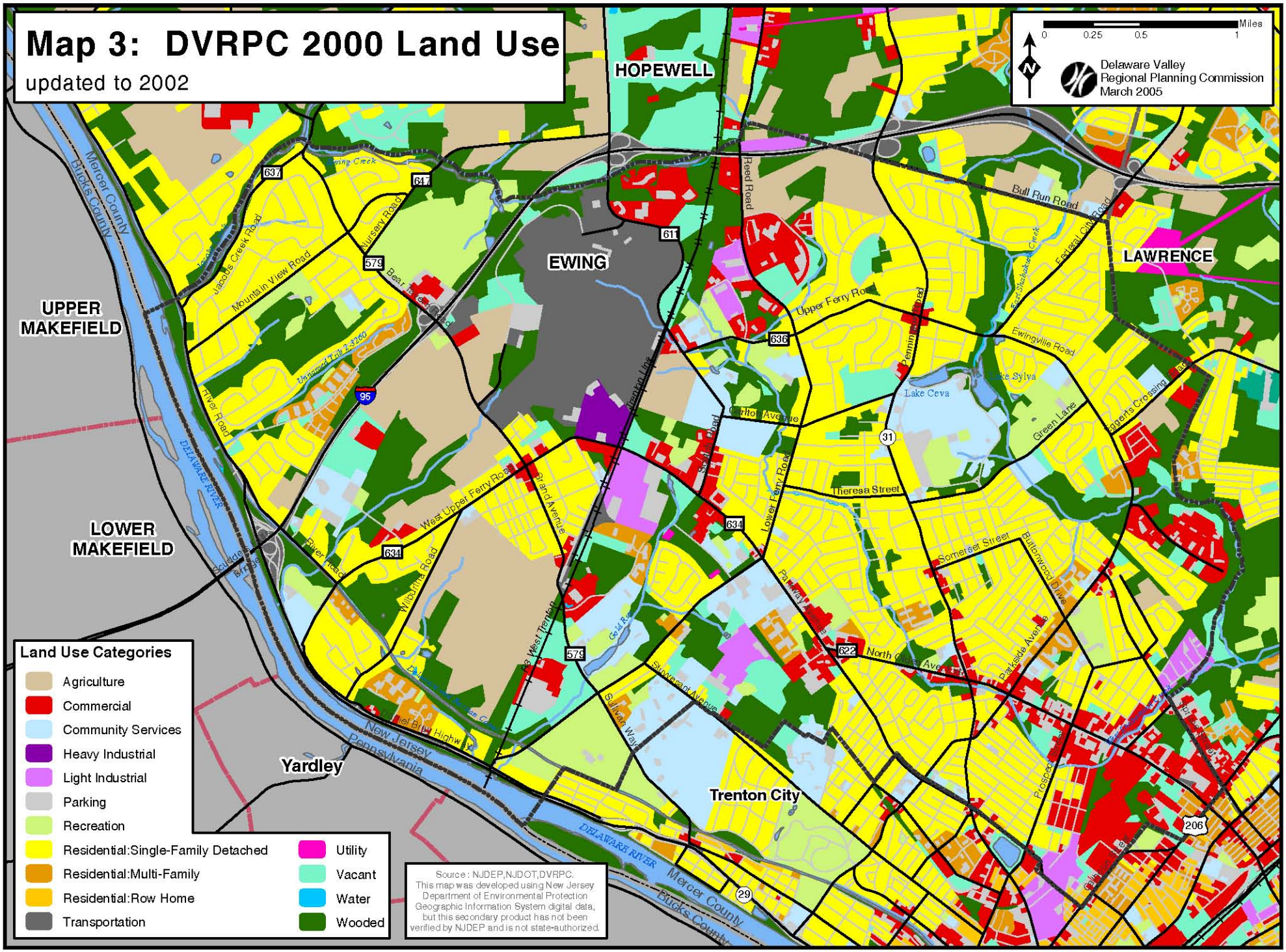
Delaware Valley
Regional Planning Commission
March 2005
HOPEWELL
LAWRENCE
EWING
UPPER MAKEFIELD
LOWER MAKEFIELD
Trenton City
Yardley
Mercer County
Bucks County
New Jersey
Pennsylvania
DELAWARE RIVER
Reed Road
Bull Run Road
Federal City Road
Upper Ferry Road
Pennington Road
Ewingville Road
Eggerts Crossing Road
Green Lane
Lake Sylva
Lake Ceva
Carlton Avenue
Scotch Road
Lower Ferry Road
Theresa Street
Somerset Street
Buttonwood Drive
Parkside Avenue
Parkway Avenue
North Olden Ave. Ext.
Prospect Street
Calhoun Street
Spruce Street
West Shabakunk Creek
East Shabakunk Creek
Jacobs Creek Road
Mountain View Road
Nursery Road
Bear Tavern Road
Unnamed Trib 2-3260
River Road
West Upper Ferry Road
Grand Avenue
Trenton Line
Wildflower Road
Scudders Falls Bridge
Daniel Bray Highway
Stuyvesant Avenue
Sullivan Way
Gold Run
637
647
579
611
636
31
634
622
95
206
29
Rivers and Streams
Lakes
Land Use Categories
Agriculture
Barren Land
Forest
Developed
Water
Wetlands
Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Table 3: DVRPC 2000 Land Use, updated to 2002

Land Use Description	2000 Acres	% of Land (2000)	2002 Acres	% of Land (2002)	2000 - 2002 Change in Acres
Agriculture	738	7.41%	738	7.41%	0
Commercial	715	7.18%	715	7.18%	0
Community Services	484	4.86%	484	4.86%	0
Manufacturing: Heavy Industrial	38	0.38%	38	0.38%	0
Manufacturing: Light Industrial	165	1.66%	165	1.66%	0
Parking: Commercial	207	2.08%	207	2.08%	0
Parking: Community Services	85	0.86%	85	0.86%	0
Parking: Heavy Manufacturing	5	0.05%	5	0.05%	0
Parking: Light Manufacturing	37	0.38%	37	0.38%	0
Parking: Multi-Family	41	0.41%	41	0.41%	0
Parking: Recreation	12	0.12%	12	0.12%	0
Parking: Transportation	22	0.22%	22	0.22%	0
Recreation	553	5.55%	553	5.55%	0
Residential: Multi-Family	214	2.15%	219	2.20%	5
Residential: Row Home	7	0.07%	7	0.07%	0
Residential: Single-Family Detached	3714	37.32%	3730	37.48%	16
Transportation	640	6.43%	640	6.43%	0
Utility	2	0.02%	2	0.02%	0
Vacant	460	4.62%	441	4.43%	-19
Water	228	2.29%	228	2.29%	0
Wooded	1593	16.00%	1591	15.99%	-2
Total	**9960**	**100%**	**9960**	**100%**	

Source: DVRPC

Gold Run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Delaware Valley
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Transmission Line
Route 29 West Trenton
Delaware & Raritan Canal
Canal Feeder
Jacobs Creek
Bear Run
Unnamed Trib 2-3200
Soldiers Bridge
95
637
647
579
61
636
634
622
31
206
29
Land Use Categories
Agriculture
Commercial
Community Services
Heavy Industrial
Light Industrial
Parking
Recreation
Residential:Single-Family Detached
Residential:Multi-Family
Residential:Row Home
Transportation
Utility
Vacant
Water
Wooded
Source : NJDEP,NJDOT,DVRPC.
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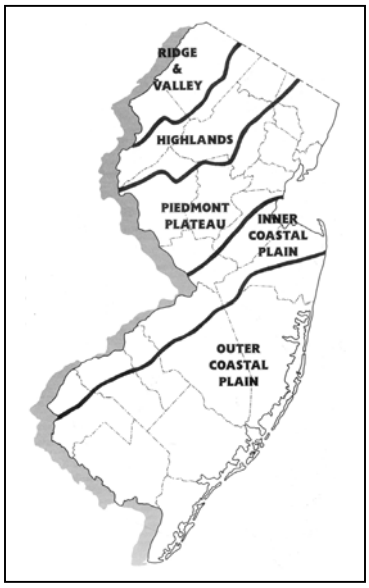
NATURAL RESOURCES

PHYSIOGRAPHY

Physiography is the study of a location in relation to its underlying geology. Four physiographic provinces characterize New Jersey. The rocky terrain of the Appalachian Province is at one extreme and the sands of the coast are at the other extreme. Ewing Township is located in the Piedmont Plateau, the most central of the four provinces in New Jersey.



The dividing line between Northern New Jersey and Southern New Jersey is the fall line, a drop in land level that separates the Piedmont Plateau from the Atlantic Coastal Plain. The fall line runs nearly parallel with U.S. Route 1 from Trenton to New York City and has numerous waterfalls marking its course. It is a boundary between the older, consolidated rock in the north and the younger, less consolidated rock, mostly gravels and sands, in the south. Ewing Township is situated just north of U.S. Route 1, on the northern side of the fall line, in the Piedmont Plateau.

The Piedmont Plateau

The Piedmont Plateau extends from Massachusetts to Georgia and occupies nearly 1,500 square miles or one-fifth (20%) of New Jersey's total land area. In New Jersey, the Piedmont formation is primarily composed of sandstone, shale, and argillite. Generally, the rocks in this area are more susceptible to erosion than the rocks to the north, in the Highlands physiographic province. The soils of the Piedmont Plateau are rich and well watered and the topography is gently rolling.

Geologic Outcrops

Three rock formations outcrop in Ewing Township: the Stockton Formation, the Lockatong Formation, and the Brunswick Formation. The two most prominent rock formations are the Stockton Formation, found in the southern portion of the township, and the Lockatong Formation, found in the northern portion of the township. The New Brunswick formation occupies a small area of Ewing, in the north of the township.

During the early Triassic Period, which began about 225 million years ago and lasted for approximately 30 million years, a large basin was formed in New Jersey, called the Newark Basin. Uplands, called the Eastern Uplands, formed the basin's eastern edge and the Highlands formed the basin's western edge. Sediments from the Eastern Uplands were deposited in the basin, forming the Stockton Formation. The Stockton Formation is composed of sandstone and gets its name from the sandstone quarries of Stockton, NJ, where the sandstone came to be

known as “brownstone.” Brownstone was shipped by canal to urban areas and used as a building material around the turn of the twentieth century.

In the mid to late Triassic Period, shallow lakes formed in the Newark Basin, where fine-grained sediments commingled with dissolved materials to form a rock known as argillite. The largest lake may have covered an area 25 miles wide by 90 miles long. As the lakes in the basin successively dried up and reformed over half-million year cycles, muddy deltaic sediments were transported by rivers from the Highlands and deposited in the area. This alternation of lake sediments and deltaic muds gave rise to the mixed layers of argillites, mudstones and shales that make up the Lockatong Formation.

Mercer County is relatively unique in the occurrence of argillitic rocks of the Lockatong Formation. They are restricted to a small portion of the Piedmont in Mercer County and in adjacent Bucks and Montgomery counties in Pennsylvania. In Ewing the Lockatong outcrops in the northern third of the township. Argillite is an excellent building stone that can last for centuries and preserves fossils such as dinosaur footprints.

Many of the rock layers in the Lockatong are dark gray to black, rich in carbon, and naturally elevated in metals including uranium. The radioactive decay of uranium and its daughter products may cause elevated levels of radon gases in homes – a health concern.

Radon

Radon is a radioactive gas that comes from the natural decay of uranium found in nearly all soils. It is invisible, odorless, and tasteless. It moves up through the ground to the air above, and into all types of homes through cracks and other holes in foundations. A buildup of radon-contaminated air within a home can pose a long-term health hazard to residents, specifically for lung cancer. The only method of detection is to conduct a test of the air within a home. Fortunately, radon testing is simple and inexpensive, and elevated levels can readily be lowered.

If radon levels are high in a home, NJDEP suggests that the homeowners take the following actions: (1) prevent radon from entering the house by repairing cracks and insulation; and (2) dilute radon concentrations currently in the house. Radon mitigation systems can be installed at an average cost of $1,200, and NJDEP provides a list of certified businesses that offer both testing and mitigation services.

NJDEP classifies townships into three categories as to the risk of having high radon levels. Ewing Township is listed as a Tier 1 municipality with high risk of having high radon levels in homes. Tier 3 is the lowest level. NJDEP estimates that the average radon level found in a Ewing home is 4.93 picocuries per liter in the air. The level at which homeowners should take immediate action is 4.0 picocuries per liters in the air. The adjacent townships of Lawrence and Hopewell also have high average levels of 6.24 and 4.18p/Ci/l, respectively.

TOPOGRAPHY AND SURFACE LANDSCAPES

Ewing Township is an average-sized municipality in Mercer County, with just under 10,000 acres. The topography of the township is relatively mild, with gentle slopes, flat areas, and occasional steep slopes along the Delaware River tributaries. Most wetlands in the township are located in the east, primarily along the Shabakunk Creek. Upland forest is found to the west, along the Delaware and Raritan Canal and small stream corridors, and to the east, along the Shabakunk Creek. A gently rising landscape lies between the watersheds. The landscape on Ewing's northern side, in Hopewell Township, supports gently rolling farmland. The landscape to the south is urban, merging seamlessly with the City of Trenton.

The upland area is characterized by rich soils that once supported forests of mixed oak, hickory, yellow poplar, and ash. The streams have steep gradients, as in most of central and northern New Jersey, with rocky bottoms and high stream velocities. Smaller streams flowing to the larger channels form connecting networks of wetland marsh.

Ewing Township's highest elevation is found northwest of the Mercer County Airport, on the grounds of the Mountain View Golf Course. It is approximately 220 feet above Mean Sea Level (USA). Generally, high elevations occur between watershed boundaries. See **Map 6: Watersheds**. The lowest elevation, located near the Delaware River, is 40 feet above Mean Sea Level.

Rapids on the Delaware River

SOILS

Soil is the foundation for all land uses. A region's soil defines what vegetation is possible, influencing agricultural uses. It also determines how land can be developed for other purposes. Soil is a natural resource that cannot be replenished on the human time scale.

Ewing's soils are predominantly silty, shaley, or stony soils. The township's soils consist of 27 series types and 60 variations within those series (excluding Water), as identified by the US Department of Agriculture's Natural Resources Conservation Service. These are listed in ***Table 5: Ewing Township Soils*** and shown on **Map 4: Soils**.

Ewing's soils are rich in agricultural value. Forty-seven percent (47%) of the soils in Ewing Township are considered Prime Farmlands (P-1). Prime Farmlands are lands that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. They can sustain high yields of crops when managed with correct farming methods. Prime Farmlands are not excessively erodible or saturated with water for long periods of time and do not flood frequently.

Farmlands of Statewide Importance (S-1) occupy twenty-six percent (26%) of the township surface. These soils are close in quality to Prime Farmland and can sustain high yields of crops when correctly managed with favorable conditions. Only one percent (1%) of Ewing's soils falls into the remaining classification, Farmland of Local Importance (L-1). Farmland of Local Importance are soils that can support the production of high-value, regional, indigenous, horticultural crops like tomatoes, sweet corn, blueberries, strawberries, cranberries, and peaches. See ***Table 4: Agricultural Values for Ewing Soils*** below for the acreage of each of these categories of farmland. [1]

Table 4: Agricultural Values for Ewing Soils

Designation	Type	Area (In Acres)	Percent
P-1	Prime Farmland	4,639	47%
S-1	Statewide Importance	2,620	26%
L-1	Local Importance	103	1%
Other Soil	Wet soils, pits, steep slopes, etc.	2,388	24%
Water	Water	195	2%
Totals		**9945**	**100%**

Source: NJ Farmlands Inventory, NJ Natural Resources Conservation Service

[1] See New Jersey Soils of Statewide Importance, New Jersey Natural Resources Conservation Service, September 24, 1990, available online at www.nj.nrcs.usda.gov/technical/soils/njfarmindex.html.

Soil Series

Several soil series appear more frequently in Ewing Township than others, and are briefly described below.[2]

Matapeake

Of Ewing's soils, 16.2% are in the Matapeake series. These soils tend to be very deep and well drained, with slopes ranging from 0-30 percent. They have moderate to moderately slow permeability and surface runoff is also moderate. Almost all Matapeake soil was once cultivated. Commonly grown crops include corn, soybeans, and small grains. Oaks dominate the native vegetation and some cutover areas have loblolly, Virginia, or shortleaf pine. (Capability Units I, II, and III, depending on variation)

Bucks

Nearly 16% of Ewing's soils are in the Bucks series. Bucks soils are deep, well-drained soils, located on upland divides and rolling slopes. Their surface runoff is moderate and their permeability is moderate or moderately slow. Much of the soil has been cleared of mixed oaks, yellow-poplar, hickory and ash. Agriculturally, it was used mostly for growing corn, small grains, soybeans, hay, pasture, and to a small extent for vegetables, fruits, and nursery plants. (Capability Units I, II, and III, depending on variation)

Quakertown

There is 12.4% of Quakertown series soils in Ewing. These soils are deep, well drained, and located on uplands. They have an undulating topography and slopes ranging from 2-18 percent. Their surface runoff is moderate and their permeability is moderately slow. Most of this type of soil has been cleared for growing corn, small grain, and grasses. Vegetation native to this soil includes oak, hickory, yellow poplar, and ash. (Capability Units II, III, and IV, depending on variation)

Capability Units

I – Soils have few limitations that restrict their use.

II – Soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

III – Soils have severe limitations that reduce the choice of plants, require very careful management, or both.

IV – Soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

V – Soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, woodland, or wildlife habitat.

VI – Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, woodland, or wildlife habitat.

VII – Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture, woodland, or wildlife habitat.

VIII – Soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, water supply, or to aesthetic purposes.

[2] Soil Conservation Service. *Soil Survey of Mercer County New Jersey*, USDA and New Jersey Agricultural Experiment Station, January 1972.

Udorthents

This series consists of somewhat poorly drained to very poorly drained soils that have been altered mainly by filling. This type of soil is located mainly in low areas, such as depressions and drainage ways. (On-site investigation is needed to determine the suitability of this unit for any use.)

Urban Land

The Urban Land series consists of cut and filled land that is mostly developed. The land is used for residential, commercial, industrial, or highway purposes. Typically 70 percent of the original soil horizon has been destroyed in these areas. There are moderate limitations for woodland or wildlife, and severe limitations for crops. Urban land is very impermeable and low in fertility where the original soil is removed. However, where the original soil is moved from one area to another area, the soil has moderate but slow permeability, due to compaction of the soil during construction (Capability Unit Unclassified)

Birdsboro

Birdsboro soils are very deep and well to moderately well drained. Commonly they are found on sloping stream terraces, with slopes ranging from 0-15 percent. Their permeability is moderate and their runoff is slow to rapid. A large percentage of this soil was used for agriculture. Mixed hardwood forests are found on the remaining wooded areas. (Capability Units II, III, and IV, depending on variation.)

Sassafras

Sassafras soils are usually found on sandy flats along the Delaware River. Slopes can range from nearly level to very steep. These soils can support vegetation consisting of mixed oaks and scattered pines. They are considered farmland of statewide importance. Sassafras soils are easy to work, have a low natural fertility, and respond to fertilization. (Capability Units I, II, and III, depending on variation.)

Readington and Abbottstown

Readington soils are deep or very deep, moderately well drained soils that have slopes ranging from 0-15 percent. They are located on concave, nearly level to sloping lower hillsides, upland flats, drainageways, and stream heads. Their permeability is moderately slow. At one time, approximately 85 percent of this series was used for cropland. Woodland areas have oak-hickory mixed hardwoods. Abbottstown series are deep, somewhat poorly drained soils. They are also located on concave upland flats, depressions, and drainageways. Slopes range from 0-15 percent and their permeability is slow. Runoff is moderate on nearly level slopes, high on gentle slopes, and very high on strongly sloping or moderately steep areas. Like Readington, approximately 85 percent of this series was, or continues to be used for, cropland and pasture. Wooded areas consist mostly of hardwoods, mainly hickory and oak. (Capability Unit III)

Soil characteristics can severely restrict the use of sites for construction and development. ***Table 6: Soil Limitations for Development*** records the soils and their possible limitations for building foundations and septic systems. As indicated in the table, the township has some soils that are severely limited for on-site septic systems. Septic systems require soils that have a low water table, below five feet, and slow permeability to allow for proper drainage of wastewater. High water tables, five feet or less from the surface, create a potential for erosion, wet basements, alteration of plant life, and early frost for agricultural crops.

Table 5: Ewing Township Soils

Mercer County Soil Survey Code	SSURGO Soil Code	Soil Name	Ewing Acres	Percentage of all Soils (%)	Designations *
BbB	BhmB	Birdsboro loam, 3 to 8 percent slopes	16	0.16%	P-1
BbB2	BhmB2	Birdsboro loam, 3 to 8 percent slopes, eroded	6	0.06%	P-1
BbC2	BhmC2	Birdsboro loam, 8 to 15 percent slopes, eroded	94	0.94%	S-1
BdB	BhnB	Birdsboro silt loam, 3 to 8 percent slopes	8	0.08%	P-1
BnB	BhrsB	Birdsboro Variant soils, sandy subsoil, 3 to 8 percent slopes	139	1.40%	P-1
BnC	BhrsC	Birdsboro Variant soils, sandy subsoil, 8 to 15 percent slopes	258	2.59%	S-1
BoB	BhsgB	Birdsboro Variant soils, gravelly solum, 0 to 8 percent slopes	103	1.03%	L-1
Bt	Boy	Bowmansville silt loam	207	2.09%	S-1
BuA	BucA	Bucks silt loam, 0 to 3 percent slopes	56	0.56%	P-1
BuB	BucB	Bucks silt loam, 3 to 8 percent slopes	1023	10.29%	P-1
BuB2	BucB2	Bucks silt loam, 3 to 8 percent slopes, eroded	247	2.48%	P-1
BuC	BucC	Bucks silt loam, 8 to 15 percent slopes	55	0.55%	S-1
BuC2	BucC2	Bucks silt loam, 8 to 15 percent slopes, eroded	210	2.12%	S-1
CdA	ChcA	Chalfont silt loam, 0 to 3 percent slopes	22	0.22%	S-1
CdB	ChcB	Chalfont silt loam, 3 to 8 percent slopes	91	0.91%	S-1
CdC2	ChcC2	Chalfont silt loam, 8 to 15 percent slopes, eroded	92	0.93%	S-1
DgA	DOZA	Doylestown silt loam and Reaville Variant silt loam, 0 to 3 percent slopes	111	1.11%	L-1
DgB	DOZB	Doylestown silt loam and Reaville Variant silt loam, 3 to 8 percent slopes	19	0.19%	L-1
DwB	DRWB	Dragston and Woodstown sandy loams, 0 to 5 percent slopes	22	0.22%	P-1
Ek	EkbA	Elkton silt loam, 0 to 2 percent slopes	195	1.96%	S-1
Ae	Fmht	Fluvaquents, loamy, frequently flooded	39	0.39%	NA
Km	GASB	Galloway Variant soils, 0 to 5 percent slopes	28	0.28%	NA
LcC2	LbnC2	Lansdale channery loam, 8 to 15 percent slopes, eroded	4	0.04%	S-1
LcD2	LbnD2	Lansdale channery loam, 15 to 25 percent slopes	7	0.07%	NA
Lk	LenB	Lenoir-Keyport silt loams, 0 to 5 percent slopes	29	0.29%	S-1
Fm	Mba	Marsh, fresh water	3	0.03%	NA
MoA	MbpA	Matapeake loam, 0 to 2 percent slopes	143	1.44%	P-1
MoB	MbpB	Matapeake loam, 2 to 5 percent slopes	1394	14.02%	P-1
MoC2	MbpC2	Matapeake loam, 5 to 10 percent slopes, eroded	78	0.78%	S-1
Mq	MBYA	Mattapex and Bertie loams, 0 to 2 percent slopes	685	6.89%	S-1
Ot	Oth	Othello silt loam	25	0.25%	S-1
PeB	PeoB	Penn channery silt loam, 3 to 8 percent slopes	39	0.40%	NA

PeC	PeoC	Penn channery silt loam, 8 to 15 percent slopes	30	0.30%	S-1
PeD	PeoD	Penn channery silt loam, 15 to 25 percent slopes	109	1.10%	NA
Pg	PHG	Pits, sand and gravel	112	1.13%	NA
QkB	QukB	Quakertown silt loam, 3 to 8 percent slopes	721	7.25%	P-1
QkB2	QukB2	Quakertown silt loam, 3 to 8 percent slopes, eroded	153	1.54%	P-1
QkC	QukC	Quakertown silt loam, 8 to 15 percent slopes	130	1.31%	S-1
QkC2	QukC2	Quakertown silt loam, 8 to 15 percent slopes, eroded	169	1.70%	S-1
QuB	QumB	Quakertown channery silt loam, 3 to 8 percent slopes	1	0.01%	P-1
QuD2	QumD2	Quakertown channery silt loam, 15 to 25 percent slopes, eroded	60	0.60%	NA
RaA	REFA	Readington and Abbottstown silt loams, 0 to 3 percent slopes	55	0.55%	P-1
RaB	REFB	Readington and Abbottstown silt loams, 3 to 8 percent slopes	221	2.22%	P-1
RaB2	REFB2	Readington and Abbottstown silt loams, 3 to 8 percent slopes, eroded	32	0.33%	P-1
RaC2	REFC2	Readington and Abbottstown silt loams, 8 to 15 percent slopes, eroded	0	0.00%	S-1
ReA	RehA	Reaville silt loam, 0 to 3 percent slopes	7	0.07%	S-1
ReB	RehB	Reaville silt loam, 3 to 8 percent slopes	10	0.10%	S-1
ReC2	RehC2	Reaville silt loam, 8 to 15 percent slopes, eroded	11	0.11%	S-1
Ro	Ror	Rowland silt loam	45	0.45%	NA
SdE	SaaE	Sandy and silty land, steep	3	0.03%	NA
SrB	SacB	Sassafras sandy loam, 2 to 5 percent slopes	16	0.16%	P-1
SrC	SacC	Sassafras sandy loam, 5 to 10 percent slopes	9	0.09%	S-1
SrC2	SacC2	Sassafras sandy loam, 5 to 10 percent slopes, eroded	209	2.10%	S-1
SsB	SadB	Sassafras gravelly sandy loam, 2 to 5 percent slopes	237	2.39%	P-1
To	ThoA	Tioga fine sandy loam, 0 to 3 percent slopes	148	1.49%	P-1
Ct	Udt	Udorthents, bedrock substratum	571	5.74%	NA
Cg	Udu	Udorthents, gravelly substratum	152	1.52%	NA
Cu	Udv	Udorthents, stratified substratum	293	2.95%	NA
Cf	Udx	Udorthents, clayey substratum	103	1.04%	NA
U	UR	Urban land	709	7.12%	NA
w	Water	Water	196	1.96%	NA
		TOTAL ACRES	**9960**	**100.00%**	

Source: NJDEP (based on Soil Survey of Mercer County)

***Explanation of Designations**

P–1	Prime Farmland
S–1	Statewide Importance
L–1	Local Importance
NA	Land not appropriate for farming, e.g. eroded, very steep slopes, pits permanently wet soils, water, etc.

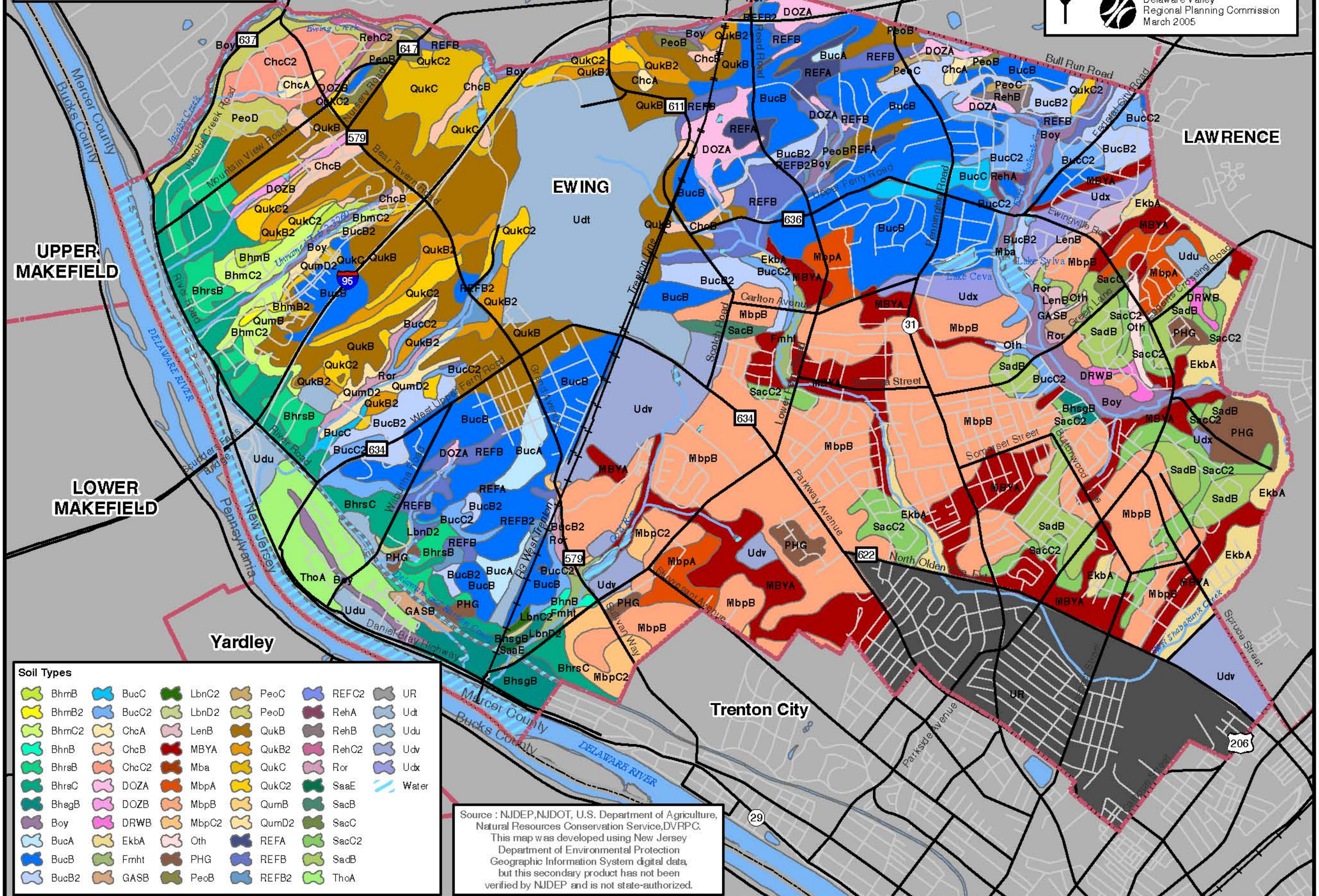
Table 6: Soil Limitations for Development

Soil Series	Soil Codes	Acreage	Building with basement	Building without basement	Septic Systems	Limitations
Birdsboro	BhmB, BhmB2, BhC2, BhnB, BhrsB, BhrsC, BhsgB	623.24	B	A	C	2,3
Bowmansville	Boy	207.47	C	C	C	1
Bucks	BucA, BucB, BucB2, BucC, BucC2	1590.66	B	A	C	2,3
Chalfont	ChcA, ChcB, ChcC2	205.05	C	C	C	1,2,3
Doylestown	DOZA, DOZB	129.89	C	C	C	1
Dragston and Woodstown	DRWB	21.51	C	B	C	1
Elkton	EkbA	194.53	C	C	C	1
Fluvaquents	Fmht	39.18	C	C	C	1
Galloway	GASB	28.34	B	A	B	1
Lansdale	LbnC2, LbnD2	11.35	A	A	C	3,2
Lenoir-Keyport	LenB	28.89	B	B	C	1
Matapeake	MbpA, MbpB, MbpC2	1614.46	A	A	B	3
Mattapex	MBYA	685.01	B	B	C	1
Othello	Oth	25.03	C	B	C	1
Penn	PeoB, PeoC, PeoD	178.02	B	A	C	2,3
Quakertown	QukB, QukB2, QukC, QukC2, QumB, QumD2	1235.57	B	A	C	2,3
Readington and Abbottstown	REFA, REFB, REFB2, REFC2	308.09	B	A	C	1,2,3
Reaville	RehA, RehB, RehC2	28.75	C	B	C	1,2,3
Rowland	Ror	45	C	C	C	1
Sassafras	SacB, SacC, SacC2, SadB	471.15	A	A	A	N/A
Tioga	ThoA	148.21	A	A	A	1
Udorthants	Udt, Udu, Udv, Udx	1118.28	C	C	C	1
Urban land	UR	694.22	A	A	A	N/A

Key to Land Use Implications	*Key to Limitations*
A = Slight. Little or no limitation(s) or easily corrected by use of normal equipment and design techniques.	1: High water table (0 to 3 feet)
B = Moderate. Presence of some limitation, which normally can be overcome by careful design and management at somewhat greater cost.	2: Shallow depth to bedrock (less than 5 feet)
C = Severe. Limitations that, normally, cannot be overcome without exceptional, complex, or costly measures.	3: Strongly sloping (15% or over)

Source: *Soil Survey of Mercer County*

Map 4: Soils


HOPEWELL
LAWRENCE
EWING
UPPER MAKEFIELD
LOWER MAKEFIELD
Yardley
Trenton City
Mercer County
Bucks County
New Jersey
Pennsylvania
DELAWARE RIVER
0 0.25 0.5 1
Miles
Delaware Valley Regional Planning Commission
March 2005
Soil Types
BhmB
BhmB2
BhmC2
BhnB
BhrsB
BhrsC
BhsgB
Boy
BucA
BucB
BucB2
BucC
BucC2
ChcA
ChcB
ChcC2
DOZA
DOZB
DRWB
EkbA
Fmht
GASB
LbnC2
LbnD2
LenB
MBYA
Mba
MbpA
MbpB
MbpC2
Oth
PHG
PeoB
PeoC
PeoD
QukB
QukB2
QukC
QukC2
QumB
QumD2
REFA
REFB
REFB2
REFC2
RehA
RehB
RehC2
Ror
SaaE
SacB
SacC
SacC2
SadB
ThoA
UR
Udt
Udu
Udv
Udx
Water
Source : NJDEP,NJDOT, U.S. Department of Agriculture, Natural Resources Conservation Service,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

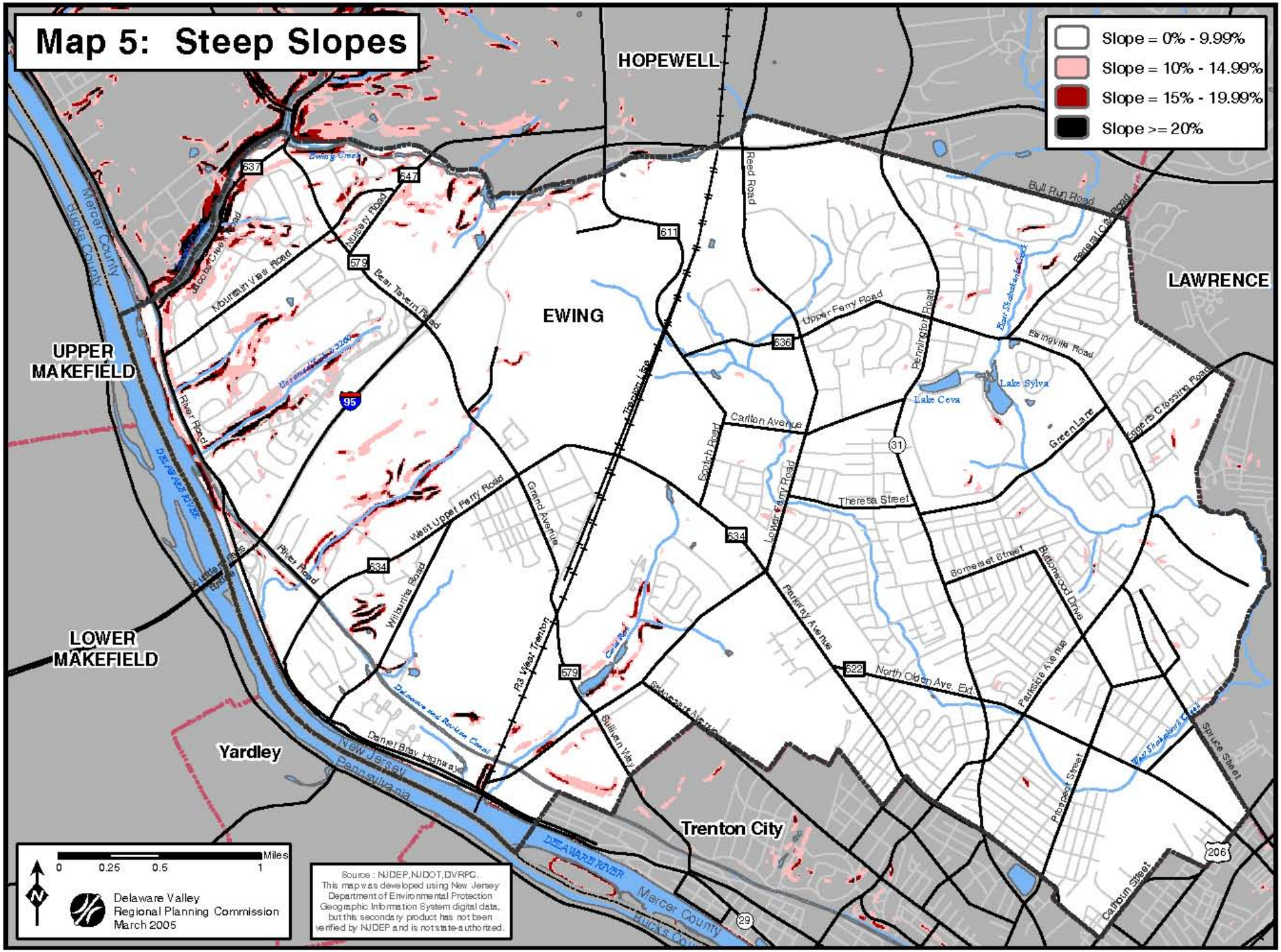
STEEP SLOPES

Only a small percentage of Ewing Township has slopes of over 10% (the percent of vertical rise to horizontal distance). However, the steepest slopes are very steep indeed – ranging from 40% to 60% along Jacobs Creek. Steep slopes are found mainly around Jacobs Creek and to a lesser extent around the smaller Delaware River tributaries. Most of these slopes are well vegetated. In some locations development has occurred on the edge of very steep slopes. In these instances, it is important that natural buffers and other storm water best-management practices are used to separate the slope from the development and prevent runoff from eroding the slope.

In general, development of steep slope areas is inadvisable because it can result in soil instability, erosion, sedimentation of the stream below, increased stormwater runoff and flooding. This causes habitat destruction and potential damage to property. Erosion on steep slopes is especially prevalent where excessive tree removal has taken place.

Most of Ewing's slopes are made up of Quakertown series soils found in the Piedmont section of the country. These soils are deep, well drained, and located on uplands. They have an undulating topography and slopes ranging from 2-18 percent. Their surface runoff is moderate and their permeability is moderately slow. Vegetation native to this soil includes oak, hickory, yellow poplar, and ash.

Steep Slopes by Jacobs Creek


Map 5: Steep Slopes
Slope = 0% - 9.99%
Slope = 10% - 14.99%
Slope = 15% - 19.99%
Slope >= 20%
HOPEWELL
EWING
LAWRENCE
UPPER MAKEFIELD
LOWER MAKEFIELD
Yardley
Trenton City
Mercer County
Bucks County
Delaware River
New Jersey
Pennsylvania
Reed Road
Bull Run Road
Upper Ferry Road
Pennington Road
Lake Sylva
Lake Ceva
Ewingville Road
Rogers Crossing Road
Green Lane
Carlton Avenue
Scotch Road
Lower Ferry Road
Theresa Street
Somerset Street
Buttonwood Drive
Parkway Avenue
North Olden Ave. Ext.
Parkside Avenue
Prospect Street
Spruce Street
Calhoun Street
Grand Avenue
West Upper Ferry Road
River Road
Wilburtha Road
Taylors Lane
Nursery Road
Bear Tavern Road
Mountain View Road
Stockton Road
Ewing Creek
Bear Swamp Creek
Canal Road
Sullivan Way
Delaware and Raritan Canal
Daniel Bray Highway
Rt 31 West Trenton
Delaware Valley Regional Planning Commission March 2005
Miles
0 0.25 0.5 1
Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

SURFACE WATER RESOURCES

Most of Ewing's land drains to the Delaware River by way of two main, stream systems – the Jacob's Creek system and the Shabakunk Creek system. Jacob's Creek is located on the northwestern end of the township and Shabakunk Creek is located toward the center and eastern part of the township. Certain tributaries of both Jacob's Creek and Shabakunk Creek are wholly contained within Ewing's boundaries. Drainage also occurs by way of four small tributaries to the Delaware River; three are small, unnamed tributaries and the fourth is named Gold Run.

Watersheds

A watershed is all the land that drains to a particular waterway such as a river, stream, lake, or wetland. The boundaries of a watershed are defined by the high points in the terrain, such as hills and ridges. A watershed includes not only the water body or waterway itself, but also the entire land area that drains to it. Large watersheds are made up of smaller ones, down to the catchment level of a local site. So, for example, the Delaware River watershed is made up of many smaller watersheds, such as the Shabakunk Creek. The Shabakunk Creek watershed, in turn, is formed of several subwatersheds, consisting of the land that drains to a major section or branch of the creek or to a large, branching tributary. These subwatersheds can be further subdivided into smaller ones, each surrounding the smaller tributaries that flow to the larger channel, and so on down to the catchment level. Watersheds are natural ecological units, where soil, water, air, plants, and animals interact in a complex relationship.

The Hydrologic Unit Code (HUC) is a numerical identification code given to every drainage system in the United States by the U.S. Geological Survey. Hydrologic Unit Codes begin with a number representing the largest drainage area. For example, the first level divides the entire country into 21 major drainage areas. From there, numbers are added as the defined area becomes smaller. The numbers to the right represent the most local watershed. HUC-11 codes are 11 digit numbers applied to a part of a drainage area that is approximately 40 square miles in size. Ewing Township falls into two HUC-11 watersheds, the Alexauken Creek/Moore Creek/Jacobs Creek watershed, and the Assunpink Creek Watershed (below Shipetauken Creek). HUC-11 watersheds are further subdivided into HUC-14 subwatersheds, with the identification number for each one having 14 digits. There are five HUC-14 watersheds in Ewing, listed in Table 7. See **Map 6: Watersheds** and **Map 7: Stream Order.**

Table 7: Watersheds in Ewing Township

Watershed	USGS Watershed Code (HUC 11 Number)	Stream Classification	Acreage within Ewing	% of Ewing land	HUC14
Alexauken Ck / Moore Ck / Jacobs Ck	2040105**210**	FW2-NT	3983	40%	02040105210**080**
Alexauken Ck / Moore Ck / Jacobs Ck	2040105**210**	FW2-NT	906	9%	02040105210**070**
Assunpink Creek (below Shipetaukin Ck)	2040105**240**	FW2-NT	2983	30%	02040105240**020**
Assunpink Creek (below Shipetaukin Ck)	2040105**240**	FW2-NT	1886	19%	02040105240**010**
Assunpink Creek (below Shipetaukin Ck)	2040105**240**	FW2-NT	201	2%	02040105240**050**

Alexauken Creek / Moore Creek / Jacob's Creek

The Alexauken Creek/Moore Creek/Jacob's Creek watershed is a complex system of streams that drains a total of 63 square miles of land. It crosses two counties – Hunterdon and Mercer counties, and six municipalities – West Amwell, Hopewell, Hamilton, and Ewing townships; the boroughs of Stockton and Pennington; and the city of Lambertville. The watershed covers approximately one quarter of New Jersey Watershed Management Area 11. In Ewing, this watershed occupies 4,889 acres.

Jacob's Creek and its tributary, Ewing Creek, are the main creeks within the Alexauken Creek/Moore Creek/Jacob's Creek watershed, in Ewing Township. Jacob's Creek begins in Hopewell Township, at two locations, both near Harbourton Road. From these starting points, the creek flows southeast, through Hopewell Township, into Ewing Township, to form a small portion of the border between the two townships. Finally, it empties into the Delaware River, near Jacob's Creek Road, in Ewing Township.

Assunpink Creek

The Assunpink Creek watershed covers an area of 91 square miles. Of this area, 5,070 acres are located within Ewing Township. The Shabakunk Creek, a main waterway in Ewing, is part of the Assunpink Creek watershed. It has two branches, an east branch and a west branch. The east branch of the Shabakunk begins at two points. One point is located in Hopewell Township, near the Twin Pine Airport. The other point is located in Lawrence Township, near the intersection of Federal City Road and Keefe Road. The west branch begins at various points near the Trenton-Mercer Airport. The east and the west branch of the Shabakunk converge in Lawrence Township, near Notre Dame High School, on Lawrence Road. Ultimately, all tributaries to the Shabakunk Creek empty into the Assunpink Creek, located at the border of Lawrence and Hamilton townships. The Assunpink Creek eventually drains into the Delaware River in the City of Trenton.

Streams

In Ewing Township, there are a total of 25 stream miles flowing across the land. A few of the streams are considered to be headwater streams. That is, they are the initial sections of stream channels with no contributing tributaries (first order streams), or they are stream channels formed from only one branching section of tributaries above them (second order streams). The headwaters are where a stream is "born," and actually begins to flow. In Ewing Township, 24 miles of the total 25 miles of streams are first or second order streams, or headwaters.

These headwaters are of particular importance because they tend to contain a diversity of aquatic species and their condition affects the water quality found downstream. They are also the most vulnerable to human intrusion. They drain only a small area of land, usually no larger than one square mile (640 acres). First and second order streams are narrow and often shallow, and are characterized by relatively small base flows. This makes them subject to greater temperature fluctuations, especially when forested buffers on their banks are removed. They are also easily

oversilted by sediment-laden runoff and their water quality can be rapidly degraded. In addition, first order streams are greatly affected by changes in the local water table because they are fed by groundwater sources. Headwaters are important sites for the aquatic life that is at the base of the food chain, and often serve as spawning or nursery areas for fish.

Delaware River

Ewing Township is located on one of the Northeast's greatest natural resources, the Delaware River. The Delaware River is the longest un-damned river east of the Mississippi, flowing for 330 miles, and provides drinking water for nearly 15 million people, equivalent to 5% of the country's population. The Delaware River Basin covers 13,539 square miles in four states: New York, New Jersey, Pennsylvania, and Delaware. Three quarters of the non-tidal Delaware River are designated as "Wild and Scenic" by the U.S. National Park Service. The lower section of the Delaware River's "Wild and Scenic" designation begins just above Ewing Township, at Washington Crossing, Pennsylvania and extends to the Delaware River Gap. The river's head of tide is located at Trenton, just below Ewing, and the tidal portion of the river and the Delaware Bay, together known as the Delaware Estuary, is included in the National Estuary Program, a project set up to protect estuarine systems of national significance.

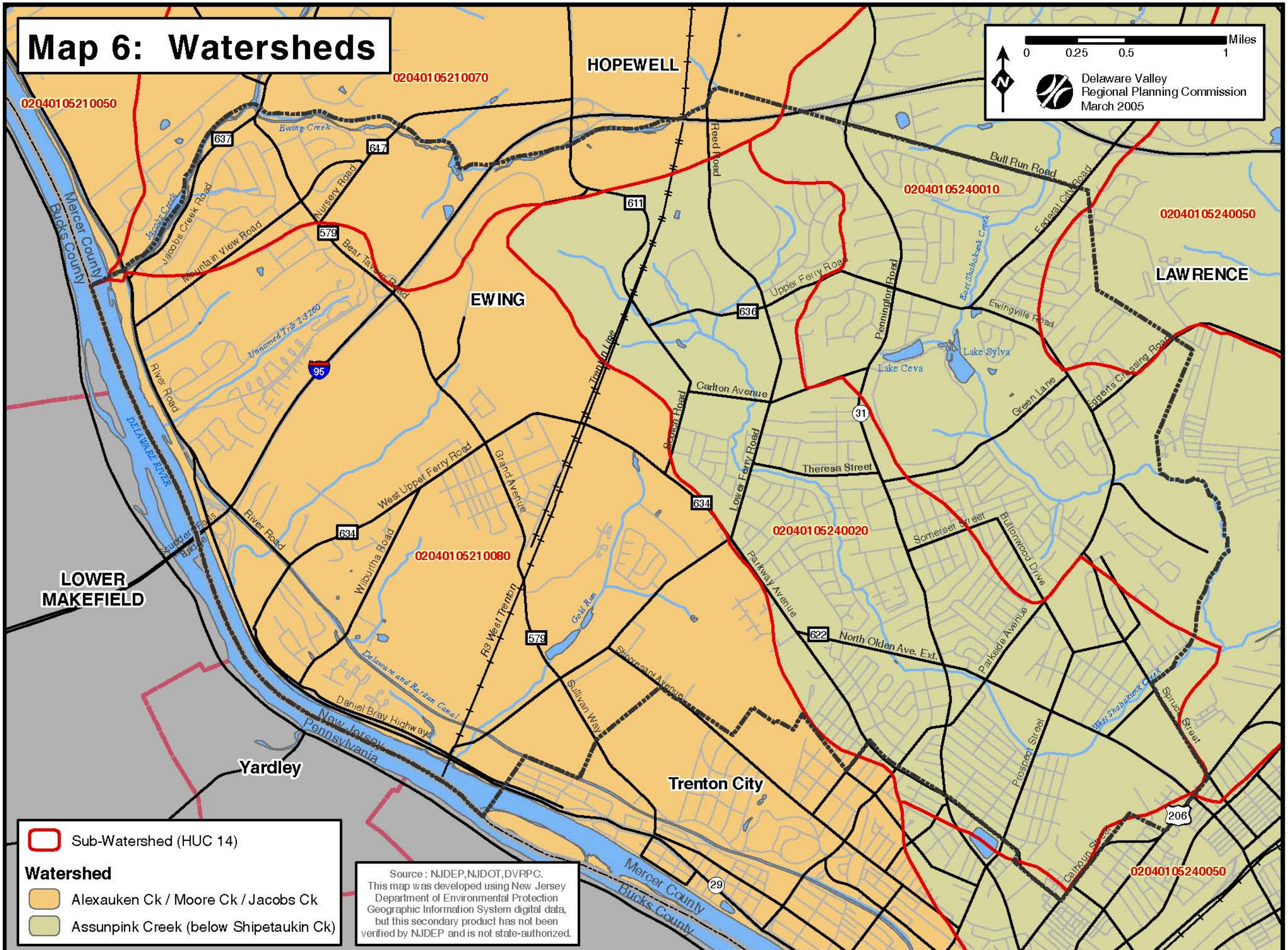
Table 8: Ewing Township Streams

Stream Order	Miles
First Order streams (smallest)	13
Second Order streams	11
Third Order streams	1
Total	**25**

Source: NJDEP

Ewing Creek

Map 6: Watersheds

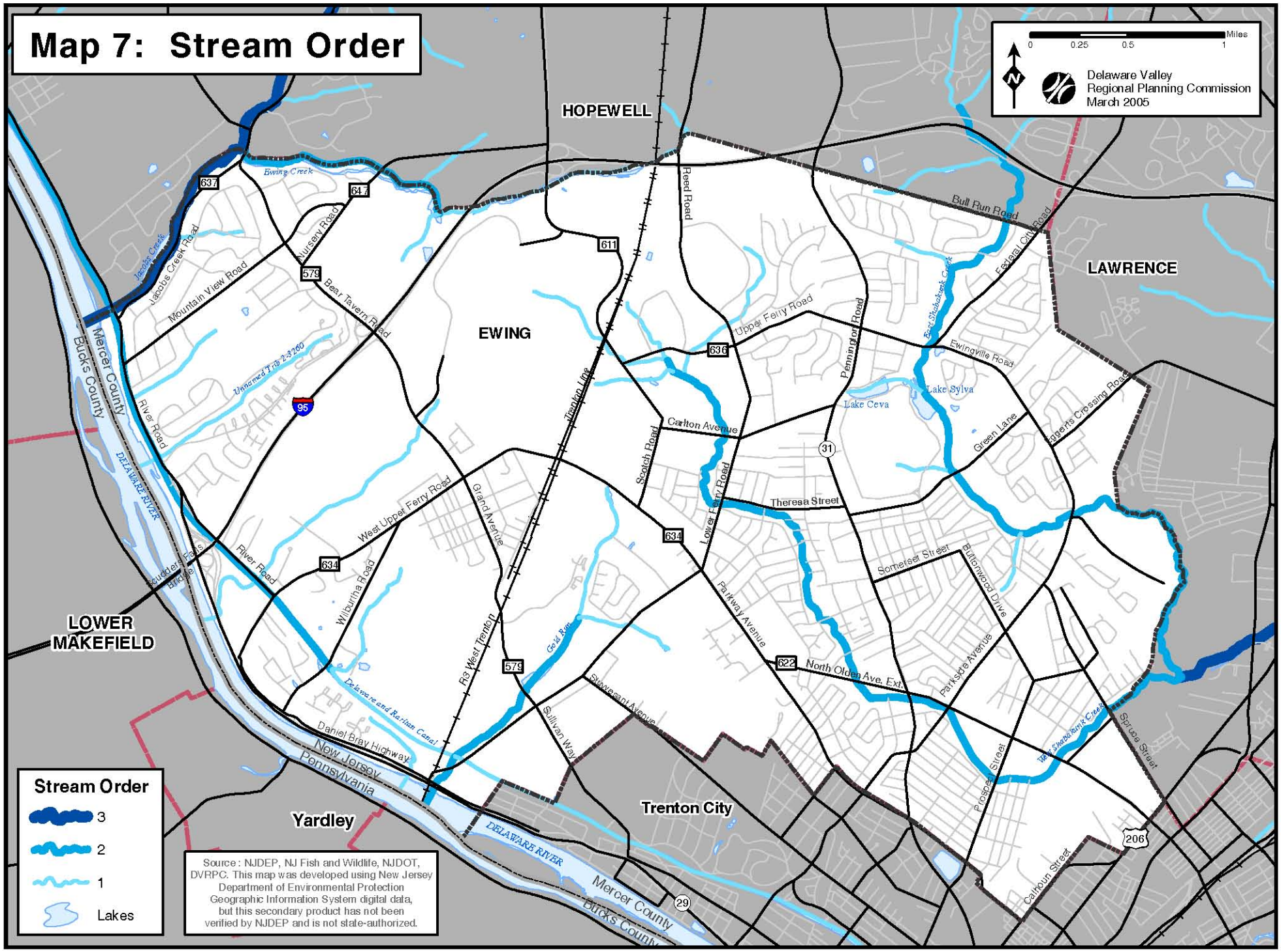

HOPEWELL
EWING
LAWRENCE
LOWER MAKEFIELD
Yardley
Trenton City
02040105210050
02040105210070
02040105210080
02040105240010
02040105240020
02040105240050
Mercer County
Bucks County
New Jersey
Pennsylvania
DELAWARE RIVER
Delaware and Raritan Canal
Ewing Creek
Jacobs Creek
Unnamed Trib 2-3-260
Gold Run
East Shabakunk Creek
West Shabakunk Creek
Lake Ceva
Lake Sylva
Bull Run Road
Federal City Road
Upper Ferry Road
Pennington Road
Ewingville Road
Eggerts Crossing Road
Green Lane
Carlton Avenue
Scotch Road
Lower Ferry Road
Theresa Street
Somerset Street
Buttonwood Drive
Parkway Avenue
North Olden Ave. Ext.
Parkside Avenue
Prospect Street
Spruce Street
Calhoun Street
Reed Road
Trenton Line
R3 West Trenton
Grand Avenue
West Upper Ferry Road
Wilburtha Road
River Road
Sullivan Way
Stuyvesant Avenue
Daniel Bray Highway
Nursery Road
Bear Tavern Road
Mountain View Road
Jacobs Creek Road
Scudders Falls Bridge
95
31
29
206
579
611
634
636
637
647
622
Miles
0
0.25
0.5
1
N
Delaware Valley
Regional Planning Commission
March 2005

Sub-Watershed (HUC 14)

Watershed

- Alexauken Ck / Moore Ck / Jacobs Ck
- Assunpink Creek (below Shipetaukin Ck)

Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.


Map 7: Stream Order
Miles
0
0.25
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1
Delaware Valley
Regional Planning Commission
March 2005
HOPEWELL
LAWRENCE
EWING
LOWER MAKEFIELD
Yardley
Trenton City
Mercer County
Bucks County
DELAWARE RIVER
New Jersey
Pennsylvania
Ewing Creek
Jacobs Creek
Unnamed Trib 2-3260
Gold Run
Delaware and Raritan Canal
Reed Road
Bull Run Road
Federal City Road
Mountain View Road
Bear Tavern Road
Nursery Road
River Road
Trenton Line
Upper Ferry Road
Pennington Road
Ewingville Road
Lake Sylva
Lake Ceva
Eggerts Crossing Road
Green Lane
Carlton Avenue
Scotch Road
Lower Ferry Road
Theresa Street
Somerset Street
Buttonwood Drive
Parkside Avenue
Parkway Avenue
North Olden Ave. Ext.
Grand Avenue
West Upper Ferry Road
Wilburtha Road
Rt 3 West Trenton
Stuyvesant Avenue
Sullivan Way
Daniel Bray Highway
Scudders Falls Bridge
Prospect Street
Spruce Street
Calhoun Street
637
647
579
611
636
634
622
206
29
31
95
Stream Order
3
2
1
Lakes
Source : NJDEP, NJ Fish and Wildlife, NJDOT, DVRPC. This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Lakes

There are two major lakes in Ewing Township: Lake Ceva and Lake Sylva. These open bodies of water are permanent waters and were created by damming Shabakunk Creek. Although they are classified as true lakes by federal and state maps, these lakes are man-made impoundments. Lake Sylva covers 10.6 acres and Lake Ceva covers 6.4 acres. There are also a few unnamed ponds located in Ewing Township. There are no recreational use lakes in Ewing Township.

See **Map 8: Surface Water, Wetlands, and Vernal Ponds**.

Wetlands

Wetlands support unique communities that serve as natural water filters and as incubators for many beneficial species. The term "wetland" is applied to areas where water meets the soil surface and supports a particular biological community. Under normal circumstances, wetlands are those areas that support a prevalence of defined wetland plants on a wetland soil. The US Fish & Wildlife Service designates all large vascular plants as wetland (hydric), non-wetland (non-hydric) or in-between (facultative). Wetland soils, also known as hydric soils, are areas where the land is saturated for at least seven consecutive days during the growing season. The source of water for a wetland can be a stream or lake edge, as well as groundwater that rises close to the land surface.

New Jersey protects freshwater wetlands under the New Jersey Freshwater Wetlands Protection Act Rules: N.J.A.C.7:7A. The law also protects transition areas or "buffers" around freshwater wetlands. The New Jersey freshwater wetlands maps provide guidance on where wetlands are found in New Jersey, but they are not the final word. Only an official determination from DEP, called a "letter of interpretation" (LOI), can determine for sure if there are freshwater wetlands on a property. An LOI verifies the presence, absence, or boundaries of freshwater wetlands and transition areas on a site. Activities permitted to occur within wetlands are very limited and permits are required for most of them. Additional information on wetlands rules and permits is available through NJDEP and on its website under "landuse." See **Sources of Information**.

Ewing Township has freshwater wetlands along all of its stream corridors, with the majority of its wetlands found around Shabakunk Creek. Wetlands of all types total 443 acres within the township. Of this total, 346 acres are wooded wetlands, 38 acres are scrub/shrub wetlands, 14 acres are herbaceous wetlands, and 45 acres are modified wetlands. See **Map 8: Surface Water, Wetlands, and Vernal Ponds**. A more detailed description of wetland areas is found in the Biological Resources section, under "Wetlands," page 54.

Agricultural Wetlands

Agricultural wetlands occupy only a very small amount of acreage (9 acres) in Ewing Township. These "quasi-wetlands" are found scattered as small sites. Agricultural wetlands are lands under cultivation that are modified former wetland areas, but which still exhibit evidence of soil

saturation in aerial infrared photo surveys. See **Map 8: Surface Water, Wetlands, and Vernal Ponds**.

The Natural Resources Conservation Service sponsors the Wetlands Reserve Program, a voluntary program that offers landowners a chance to receive payments for restoring and protecting wetlands on their properties. This program provides technical and financial assistance to eligible landowners who can enroll eligible lands through permanent easements, 30-year easements, or restoration cost-share agreements.

Vernal Ponds

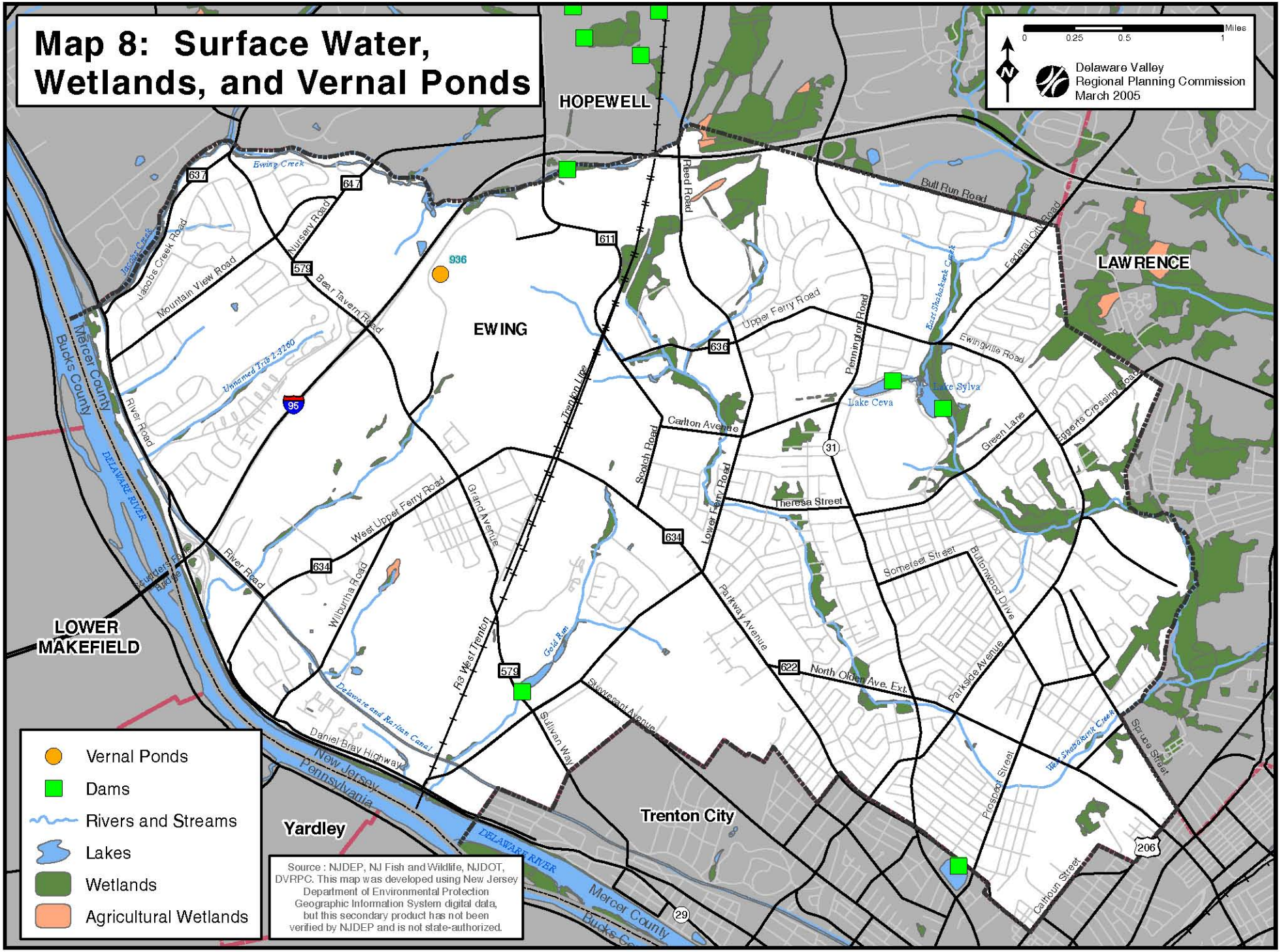
Vernal ponds are bodies of water that appear following snow melt and during spring rains but which disappear or are dry during the rest of the year. They are highly important sites for certain rare species of amphibians. Particular types of frogs and salamanders will only breed in vernal ponds (obligate breeders), which provide their offspring with a measure of protection because the pond's impermanence prevents residence by predators who would consume the eggs and young.

Vernal ponds are so intermittent that their existence as wetlands has frequently not been recognized. Consequently, many of them have disappeared from the landscape, or have been substantially damaged. This, in turn, is a principal cause of the decline of their obligate amphibian species.

The New Jersey Division of Fish and Wildlife has been conducting a Vernal Pool Survey project since 2001, to identify, map, and certify vernal ponds through the state. Once a vernal pond is certified, regulations require that a 75-foot buffer be maintained around the pond. NJDEP's Division of Land Use Regulation oversees this designation and restricts development around vernal ponds by denying construction permits. Local municipalities can provide additional protection by instituting restrictive zoning or negotiating conservation easements on the land surrounding the pond.

The state has identified one vernal pond in Ewing Township, located near the Trenton Mercer Airport between the airport and Interstate 95. A survey of the pond is needed to determine what species are present and, indeed, if the pond is still in existence as a natural habitat. This site was not surveyed by mid-2004. See **Map 8: Surface Water, Wetlands, and Vernal Ponds**.

A pond by the Marie Katzenbach New Jersey School for the Deaf


Map 8: Surface Water, Wetlands, and Vernal Ponds
Miles
0
0.25
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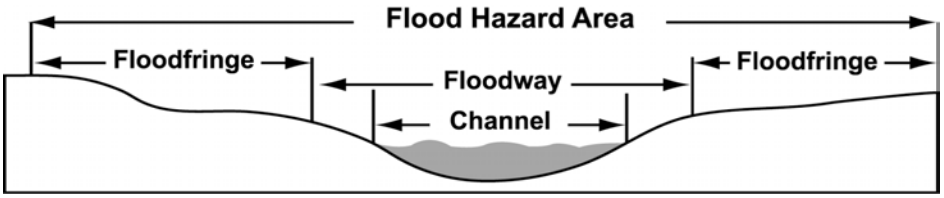
1
Delaware Valley Regional Planning Commission
March 2005
HOPEWELL
LAWRENCE
EWING
LOWER MAKEFIELD
Yardley
Trenton City
Ewing Creek
Jacobs Creek
Mountain View Road
Nursery Road
Bear Tavern Road
Unnamed Trib 2-3260
Mercer County
Bucks County
DELAWARE RIVER
River Road
Scudders Falls Bridge
West Upper Ferry Road
Grand Avenue
Wilburtha Road
Gold Run
Delaware and Raritan Canal
Daniel Bray Highway
New Jersey
Pennsylvania
Reed Road
Trenton Line
Scotch Road
Lower Ferry Road
Upper Ferry Road
Pennington Road
Carlton Avenue
Bull Run Road
Federal City Road
East Shabbakunk Creek
Ewingville Road
Lake Sylva
Lake Ceva
Green Lane
Eggerts Crossing Road
Theresa Street
Somerset Street
Butlerwood Drive
Parkway Avenue
North Olden Ave. Ext.
Parkside Avenue
Prospect Street
West Shabbakunk Creek
Spruce Street
Calhoun Street
Stuyvesant Avenue
Sullivan Way
Rt 9 West Trenton
936
637
647
579
611
636
95
634
31
622
206
29
Vernal Ponds
Dams
Rivers and Streams
Lakes
Wetlands
Agricultural Wetlands
Source : NJDEP, NJ Fish and Wildlife, NJDOT, DVRPC. This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Flood Hazard Areas

Flood hazard areas are defined as the combination of the 100-year floodplains and the adjacent flood fringe areas that help to hold and carry excess water during overflow of the normal stream channel. The 100-year floodplains are defined as the land area that will be inundated by the overflow of water resulting from a 100-year flood (a flood that has a 1% chance of occurring in any given year).



Parts of a Flood Hazard Area

Flood hazard areas require protection in order to prevent serious loss to residents. Equally important is the preservation of the environmentally sensitive aquatic communities that exist in these flood hazard areas, as well as in the stream corridors themselves. These communities are often the first link in the food chain of the aquatic ecosystem. In addition, floodplain areas serve the function of removing and mitigating various pollutants, through the uptake by their vegetation of excess chemical loads in the water and by the filtering of sediments generally. All efforts to maintain these flood hazard areas will help to preserve the flood-carrying capacity of the streams and their water quality.

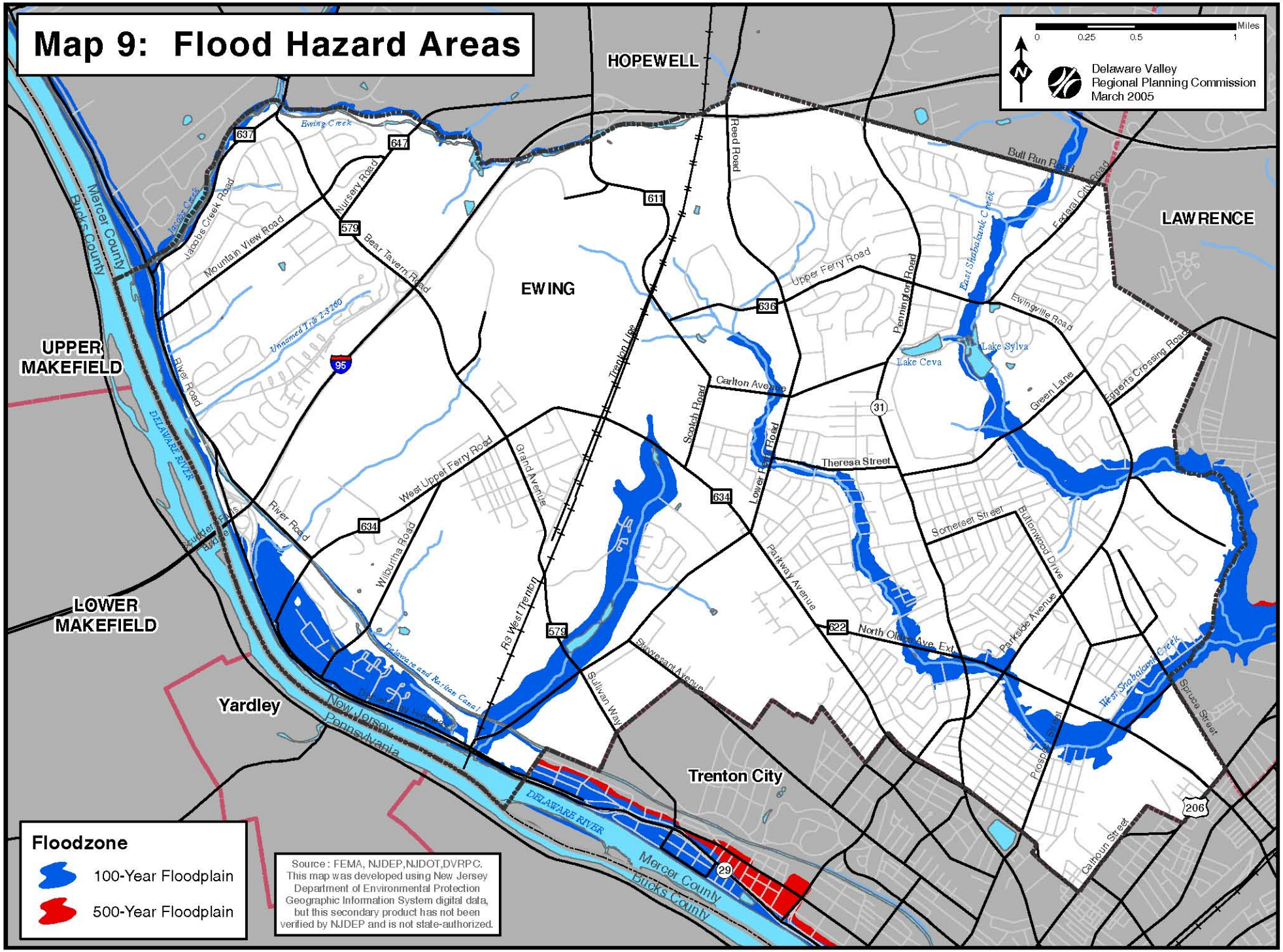
In New Jersey and throughout the country, building in areas subject to flooding is regulated to protect lives, property, and the environment. New Jersey regulates construction in the flood plain under the Flood Hazard Area Control Act, N.I.S.A. 58:16A-50 et seq., and its implementing rules at N.J.A.C. 7:13. Activities that are proposed to occur in a flood hazard area will require issuance of a stream encroachment permit or a letter of non-applicability from the NJDEP. Additional information on floodplain activities is available from NJDEP and from its website under "Landuse." See **Sources of Information**.

Ten percent (10%) of Ewing Township's land is characterized as flood hazard area, principally surrounding Gold Run and Shabakunk Creek, and along the Delaware River. See **Map 9: Flood Hazard Areas**.

Table 9: Flood Hazard Area Acreage

Category	Acres
Area inundated by 100-year flooding	1032

Source: Federal Emergency Management Agency (FEMA)


Map 9: Flood Hazard Areas
Miles
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0.5
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N
Delaware Valley
Regional Planning Commission
March 2005
HOPEWELL
EWING
LAWRENCE
UPPER MAKEFIELD
LOWER MAKEFIELD
Yardley
Trenton City
Ewing Creek
Jacobs Creek
Jacobs Creek Road
Mountain View Road
Nursery Road
Bear Tavern Road
Unnamed Trib 2-3200
River Road
Mercer County
Bucks County
DELAWARE RIVER
Scudders Falls Bridge
West Upper Ferry Road
Wilburtha Road
Grand Avenue
Trenton Line
Reed Road
Upper Ferry Road
Carlton Avenue
Scotch Road
Lower Ferry Road
Theresa Street
Somerset Street
Parkway Avenue
Sullivan Way
Stuyvesant Avenue
Rt 3 West Trenton
Delaware and Raritan Canal
New Jersey
Pennsylvania
Bull Run Road
Federal City Road
East Shabakunk Creek
Pennington Road
Ewingville Road
Lake Sylva
Lake Ceva
Green Lane
Eggerts Crossing Road
Buttonwood Drive
Parkside Avenue
North Olden Ave. Ext.
West Shabakunk Creek
Spruce Street
Prospect Street
Calhoun Street
637
647
579
611
636
634
31
322
206
29
95
Floodzone
100-Year Floodplain
500-Year Floodplain
Source : FEMA, NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Surface Water Quality

Water quality standards are established by federal and state governments to ensure that water is suitable for its intended use. The Federal Clean Water Act (P.L. 95-217) requires that wherever possible the water-quality standards provide water suitable for fish, shellfish, and wildlife to thrive and reproduce and for people to swim and boat. All waterbodies in New Jersey are classified by NJDEP as either freshwater (FW), pinelands water (PL), saline estuarine water (SE) or saline coastal water (SC). Freshwater is further broken down into freshwater that originates and is wholly within federal or state parks, forests, or fish and wildlife lands (FW1) and all other freshwater (FW2). The water quality for each of these groups must be able to support designated uses that are assigned to each waterbody classification (see *Surface Water Qualtiy Standards N.J.A.C. 7:9B-1.12*). In addition to being classified as FW1 and FW2, fresh waterbodies are classified as trout-producing (TP), trout-maintaining (TM) or nontrout waters (NT). Each of these classifications may also be subject to different water quality standards.

The determination of whether or not water quality is sufficient to meet a waterbody's designated use(s) is based on numerous surface water quality parameters. Some examples of surface water quality parameters include fecal coliform, dissolved oxygen, pH, phosphorous, and toxic substances (see *N.J.A.C. 7:9B-1.14*). NJDEP also evaluates water quality by examining the health of aquatic life in a stream. NJDEP operates two water quality monitoriong networks: the Ambient Surface Water Monitoring Network (ASWM) and the Ambient Biomonitoring Network (AMNET). NJDEP runs the ASWM network in cooperation with United States Geological Society (USGS). This network contains 115 stations and monitors for nutrients (i.e., phosphorous and nitrogen), bacteria, dissolved oxygen, metals, sediments, chemicals, and other parameters. AMNET, which is administered solely by NJDEP, evaluates the health of in-stream benthic (bottom-dwelling) macroinvertebrate communities (aquatic life) as a biological indicator of water quality. This network includes 820 monitoring stations located throughout the state. Each station is sampled once every five years. The first round of sampling for all stations took place between 1992 and 1996, the second round occurred between 1997 and 2001, and a third round is currently taking place.

All the creeks in Ewing are classified as FW2–NT, which means that they are freshwater streams that are not trout producing or trout maintaining water. According to NJDEP rules, FW2-NT waters must provide for (1) the maintenance, migration and propagation of the natural and established biota; (2) primary and secondary contact recreation (i.e., swimming and boating); (3) industrial and agricultural water supply; (4) public potable water supply after conventional filtration and disinfections; and (5) any other reasonable uses. See ***Table 10: Water Quality Classifications of Streams in Ewing Township.***

Table 10: Water Quality Classifications of Streams in Ewing Township

Streams	Classification
Shabakunk Creek	FW 2 – NT
Jacob's Creek	FW 2 – NT
Ewing Creek	FW 2 – NT
Gold Run	FW 2 – NT

Source: NJDEP

Ewing Township Stream Water Quality

There are five AMNET sites within Ewing Township or along its borders. NJDEP sampled each of the five AMNET sites in January 1993, in January 1998, and again in 2003. Ewing's AMNET stations are listed in ***Table 11: Water Quality of Non-tidal Waters in the Region*** and are depicted on **Map 10: Water Quality – Nontidal Waters**. Note that results of the 2003 sampling have not been mapped, and therefore do not appear on Map 10, although they are included in the *2004 Integrated List of Waterbodies*, and Table 11, which is explained below.

New Jersey's Integrated Water Quality Monitoring and Assessment Report

The Federal Clean Water Act under Section 303(d) requires states to identify "Impaired Waters" where specific designated uses are not fully supported. Accordingly, NJDEP prepares a biennial list of impaired waters – the 303(d) List. The Federal Clean Water Act also requires states to periodically assess and report on the quality of all their waters, not just impaired waters. This biennial water quality report is entitled New Jersey's Water Quality Inventory Report (also known as the 305(b) Report). However, in 2002, the U.S. Environmental Protection Agency (EPA) recommended that states integrate their Water Quality Inventory Report [305(b)] and their Impaired Waterbodies List [303(d)]. Following EPA's guidance, NJDEP combined the 303(d) List and the 305(b) Report into a single document called the *2002 Integrated List of Waterbodies*. NJDEP is now preparing to finalize and release the *2004 Integrated List of Waterbodies*. The Integrated List of Waterbodies (for both 2002 and 2004) includes five sublists. Sublists 1 through 4 comprise what was formerly the 305(b) Report. Sublist 5 is the 303(d) List.

There are three AMNET stations in Ewing Township and two stations just outside Ewing Township. The three stations located directly in Ewing Township are AN0103, AN0106, and AN0107. According to the most recent 1997/1998 data, stations AN0106 and AN0107 are non-impaired. Station AN0103 was moderately impaired in 1992/1993, but became non-impaired in 1997/1998. Station AN0113, located in Hopewell Township, was severely impaired in 1992/1993, but improved by 1997/1998, so that it was only moderately impaired. Station AN0114, located in Lawrence Township, was moderately impaired, both in 1992/1993 and in 1997/1998. This station is also placed on Sublist 5 (303(d) List) in the 2004 Integrated Water Quality Monitoring and Assessment Report.

NJDEP has issued guidance for associating stream segments with monitoring stations. Based on this guidance the following waters in Ewing are impaired for aquatic life:

- The east branch of the Shabakunk and all of its tributaries.

There is currently no known water quality monitoring taking place on the west branch of the Shabakunk.

For impaired waters (waters on *Sublist 5*), the state is required to establish total maximum daily loads (TMDLs). A TMDL represents the assimilative or carrying capacity of a waterbody, taking into consideration point and nonpoint sources of the pollutant of concern, natural background conditions and surface water withdrawls. A TMDL quantifies the amount of a pollutant a waterbody can assimilate without violating a state's water quality standards. A TMDL is intended to reduce pollutant loads so that a waterbody can meet its surface water quality standards.

Table 11: Water Quality of Nontidal Waters in the Region

Macroinvertebrate Assessments

Site ID	Water Body	Location	Municipality	On 2004 Sublist	1993 NJ Impairment Score	1998 NJ Impairment Score
AN0113	Shabakunk Creek	Bull Run Road and Federal City Road	Hopewell Township	3	3	15
AN0103	Ewing Creek	Bear Tavern Road and Jacobs Creek Road	Ewing Township	1	18	30
AN0106	Jacobs Creek	Jacobs Creek Road and Route 29	Ewing Township	1	24	24
AN0114	Shabakunk Creek	Route 206 and Eggerts Crossing	Lawrence Township	5 (Low Priority)	15	18
AN0107	Gold Run	Route 29 and Lower Ferry Road	Ewing Township	1	24	24

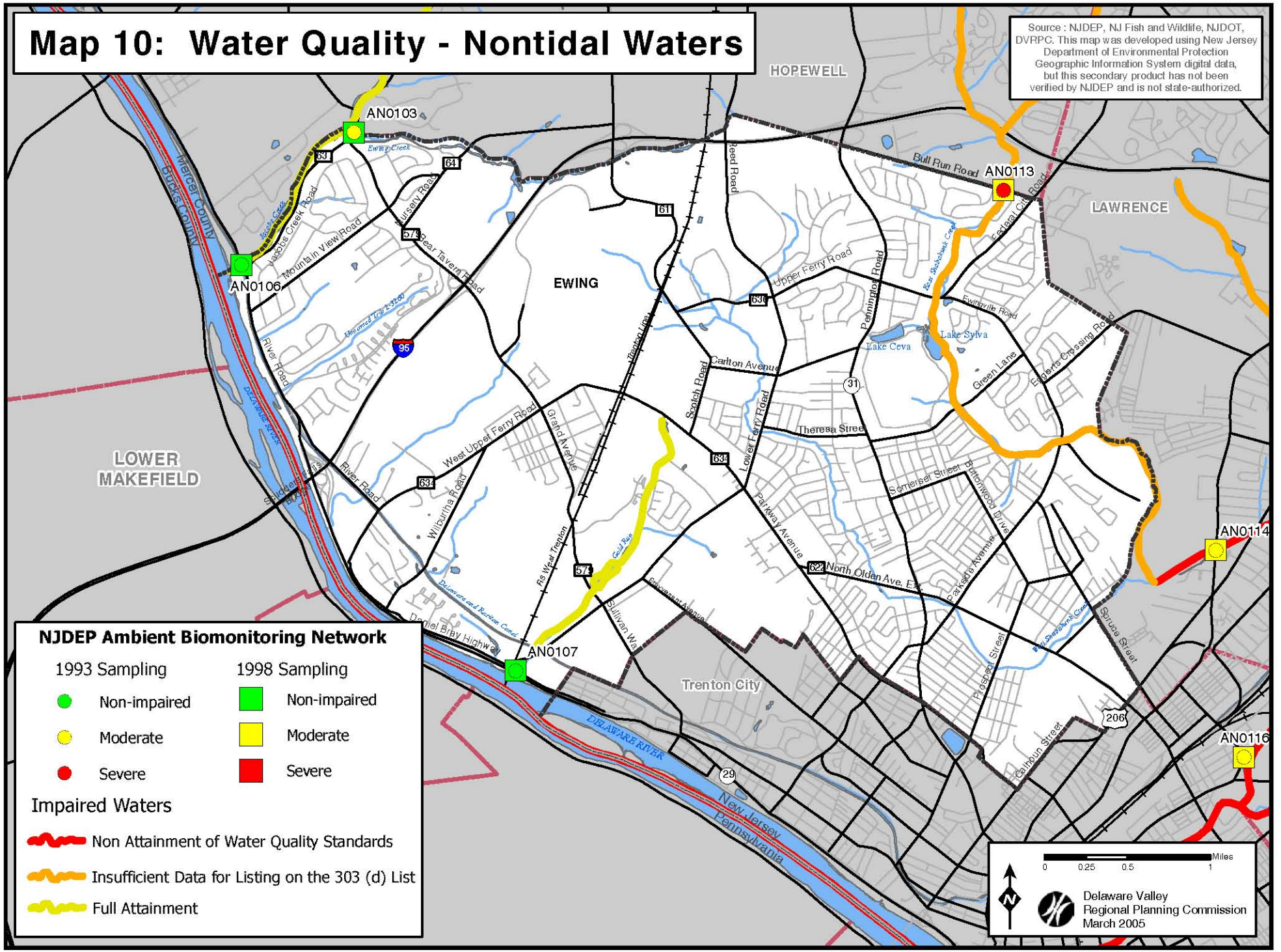
Sources:
NJDEP - Bureau of Freshwater and Biological Monitoring "Upper Delaware River Drainage Basin 1997-1998 Benthic Macroinvertebrate Data"
NJ DEP - New Jersey 2004 Integrated Water Quality Monitoring and Assessment Report (includes 305(b) Report & 303 (d) List)

NJ Impairment Score	Biological Assessment
0-6	Severely Impaired
9-21	Moderately Impaired
24-30	Non-impaired

Source: NJDEP

2004 Sublist	Biological Assessment
1	Fully attaining standards
3	Insufficient Data
5	Impaired

Stream surveys by local organizations are much needed, along with regular monitoring of water quality on all of a community's waterways. Knowing the actual condition of streams and stream banks, and planning for their improvement, requires fuller surveys and more frequent monitoring than the state can provide. The state only monitors main channels and only does biological assessments on a five-year cycle.


Map 10: Water Quality - Nontidal Waters
Source : NJDEP, NJ Fish and Wildlife, NJDOT, DVRPC. This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.
HOPEWELL
LAWRENCE
EWING
LOWER MAKEFIELD
Trenton City
AN0103
AN0106
AN0107
AN0113
AN0114
AN0116
Mercer County
Bucks County
Ewing Creek
Jacobs Creek
Mountain View Road
Nursery Road
Bear Tavern Road
River Road
Reed Road
Bull Run Road
Federal City Road
Upper Ferry Road
Pennington Road
Lake Sylva
Lake Ceva
Carlton Avenue
Scotch Road
Lower Ferry Road
Green Lane
Eggerts Crossing Road
Theresa Street
Somerset Street
Princeton Avenue
Parkside Avenue
Spruce Street
Calhoun Street
West Upper Ferry Road
Grand Avenue
Wilburtha Road
Gulf Run
Sullivan Way
Daniel Bray Highway
Delaware and Raritan Canal
DELAWARE RIVER
New Jersey
Pennsylvania
NJDEP Ambient Biomonitoring Network
1993 Sampling
Non-impaired
Moderate
Severe
1998 Sampling
Non-impaired
Moderate
Severe
Impaired Waters
Non Attainment of Water Quality Standards
Insufficient Data for Listing on the 303 (d) List
Full Attainment
Miles
0 0.25 0.5 1
N
Delaware Valley Regional Planning Commission
March 2005

Causes of Water Quality Impairments

Stormwater Runoff and Impervious Cover

Stormwater runoff and other nonpoint source pollution (pollution coming from a wide variety of sources rather than from a single point such as a discharge pipe) have the largest effect on the water quality and channel health of streams in Ewing. These sources are also the most difficult to identify and remediate because they are diffuse, widespread, and cumulative in their effect. Most nonpoint source pollution in the three watersheds is known to derive from stormwater drainage off paved surfaces such as streets, commercial/industrial areas, and residential sites (with and without detention basins), and from agricultural fields that lack adequate vegetative buffers. Some of this runoff comes to the waterways from similar sources in upstream townships and some of it derives from Ewing land uses.

The volume of runoff that is carried to a stream also impacts stream channel condition. Increased volume usually results from increased impervious surface within a subwatershed. As an area becomes developed, more stormwater is directed to the streams from neighborhood storm drains, residential and commercial stormwater facilities, and road drainage. In general, scientists have found that levels of impervious cover of 10% or more within a subwatershed are directly linked to increased stormwater runoff, enlargement of stream channels, increased streambank erosion, lower dry weather flows, high stream temperatures, lower water quality, and declines in aquatic wildlife diversity. When impervious cover reaches 25% to 30%, streams are found to be severely degraded. **See Map 11: Impervious Surface.**

Table 12: Acreage of Impervious Surface in Ewing

Impervious Surface	Acres
Less Than 5%	3,692
5 - 10%	987
10 - 25%	1,100
Greater Than 25%	4,181
Total	**9,960**

Inadequate Stream Buffers

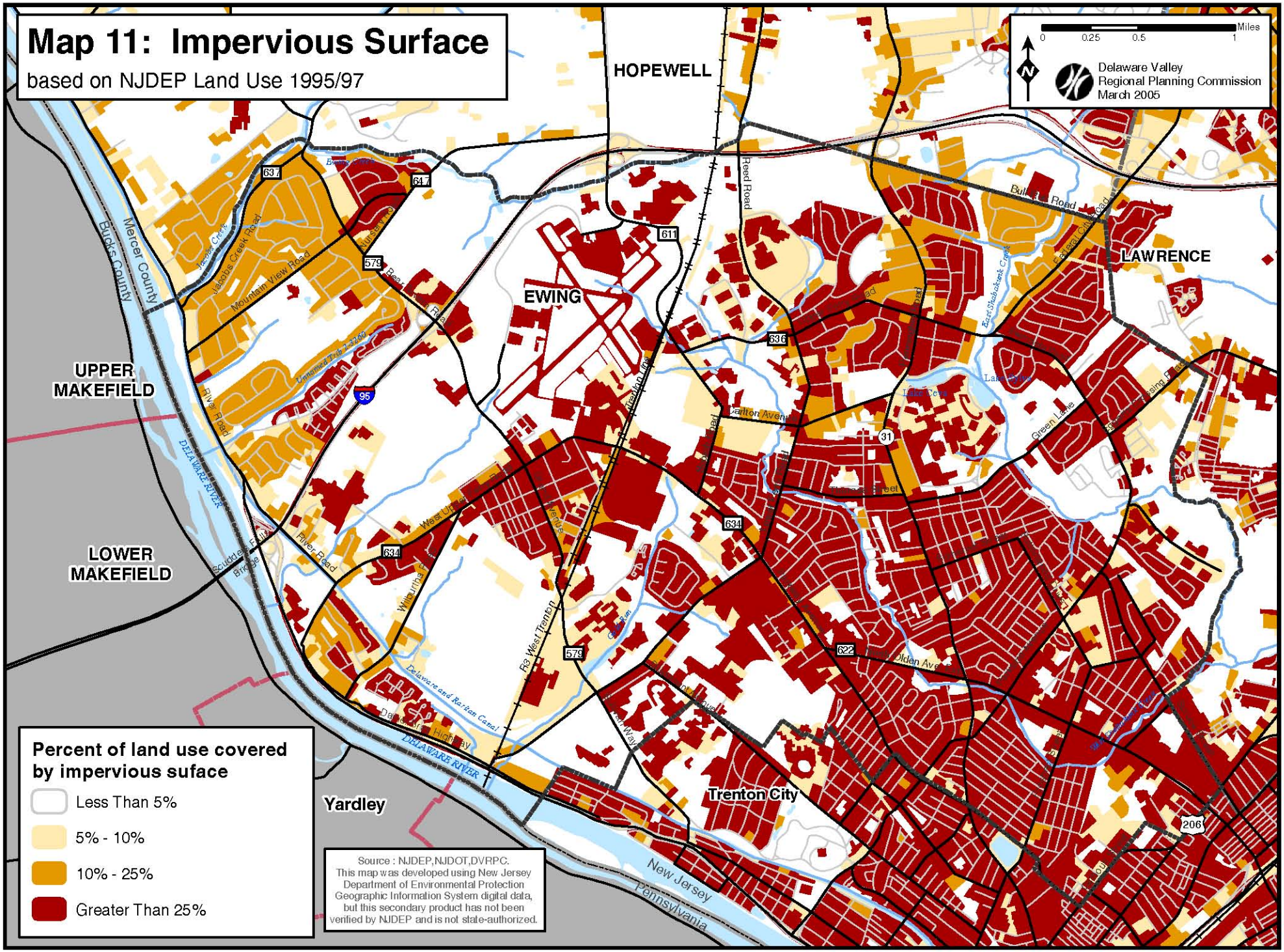
The stream buffer is the region immediately beyond the banks of a stream that serves to limit the entrance of sediment, pollutants, and nutrients into the stream itself. Stream buffers are quite effective at filtering substances washing off the land. The vegetation of the buffer traps sediment and can actually utilize (uptake) a percentage of the nutrients flowing from lawns and farm fields. When forested, a stream buffer promotes bank stability and serves as a major control of water temperature. The buffer region also serves as a green corridor for wildlife to move between larger forested habitat areas. This greenway can be utilized for recreation by residents as well, through trails, bikeways, and access points to the water for fishing and canoe/kayak launching.

The importance of a healthy, intact buffer zone (also referred to as a "riparian corridor") has been well documented scientifically over the past 20 years, especially for headwater streams. There is less agreement and much continuing research on the appropriate minimum width of a buffer. In literature on this issue, a recommended minimum buffer width of 100 feet is most common, with differing activities permitted in each of three zones within the buffer. Buffers of up to 300 feet are recommended for wildlife corridors and potential passive recreational use, such as walking trails.

The New Jersey Freshwater Wetlands Protection Act *(N.J.A.C. 7:7A)* incorporates buffer requirements into its wetland protection regulations. The width of the "transition zone" extending beyond a wetland is determined by the value of the wetland, based on its current use and on the documented presence/absence of threatened or endangered species. Municipalities may not establish buffers on wetlands that exceed those required by the state statute. However, the municipality can make certain that those limits are accurate through its review of the wetlands delineation process, and it can also monitor use of the land within the transition area and take action against encroachments.

Restoration of stream buffers on agricultural lands is supported by various programs of the US Department of Agriculture and the New Jersey Department of Agriculture, such as the Conservation Reserve Program (CRP), administered by the United States Department of Agriculture's (USDA) Farm Service Agency (FSA). This program compensates farming landowners for the loss of land being converted to a buffer or other habitat. It also funds or directly creates new buffers where they are absent. Programs such as the Environmental Quality Incentive Program (EQIP), administered by the Natural Resources Conservation Service (NRCS) of USDA, encourage the "due care" management of agricultural lands, involving the proper levels of fertilizer and pesticide applications to farmland. It funds up to 75% of the costs of eligible conservation practices. These are all programs in which individual landowners volunteer to take part.

Jones Farm


Map 11: Impervious Surface
based on NJDEP Land Use 1995/97
Miles
0
0.25
0.5
1
Delaware Valley
Regional Planning Commission
March 2005
HOPEWELL
EWING
LAWRENCE
UPPER
MAKEFIELD
LOWER
MAKEFIELD
Yardley
Trenton City
Bucks County
Mercer County
DELAWARE RIVER
Reed Road
Mountain View Road
Jacobs Creek Road
River Road
Princeton Pike
Carlton Avenue
Olden Ave
Green Lane
Delaware and Raritan Canal
New Jersey
Pennsylvania
Percent of land use covered
by impervious suface
Less Than 5%
5% - 10%
10% - 25%
Greater Than 25%
Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey
Department of Environmental Protection
Geographic Information System digital data,
but this secondary product has not been
verified by NJDEP and is not state-authorized.

Point Sources of Pollution

Point sources of pollution, which come from a single source or "point" such as an industrial pipe discharge, are regulated by NJDEP through the New Jersey Pollution Discharge Elimination System (NJPDES). New Jersey created NJPDES in response to the Federal Clean Water Act of 1972 *(P.L.95-217)*, which mandated that each state develop water quality standards and regulate the amount of pollution entering water bodies. The Act classified all water pollution into one of two categories: "point source" pollution and "nonpoint source" pollution, but only required states to regulate point sources.

NJDEP, through the Division of Water Quality and the Bureau of Point Source Permitting, administers the NJPDES program (*N.J.A.C. 7:14A*). Under NJPDES, any facility discharging domestic or industrial wastewater directly into surface or ground water must apply for and obtain a permit for discharging. Rather than creating individually tailored permits for each and every facility, the Division of Water Quality uses scientific standards to create and issue general permits for different categories of dischargers. Permits are available and required for surface water, groundwater, storm water, combined sewer overflow, and residual discharges. NJDEP enforces the terms of NJPDES permits by visiting discharging facilities and conducting water quality, biological, and toxicological analyses, and thermal impact and cooling water assessments.

Under the Open Public Records Act (OPRA) of 2002 *(N.J.A.C.10:1B)*, a list of active NJPDES permits is available. As of September 30, 2004, sixteen NJPDES permits were issued to individual facilities in Ewing Township. These are shown in ***Table 13: Ewing Township NJPDES Permits.***

Since the adoption of the Federal Clean Water Act in 1972 and the implementation of NJPDES in subsequent years, water pollution from point sources has decreased drastically. NJDEP is now focusing on nonpoint sources of water pollution, which have increased as farmlands and forestlands are covered over with impervious materials like concrete, asphalt, and buildings.

Delaware River

Table 13: New Jersey Pollution Discharge Elimination System (NJPDES) Permits

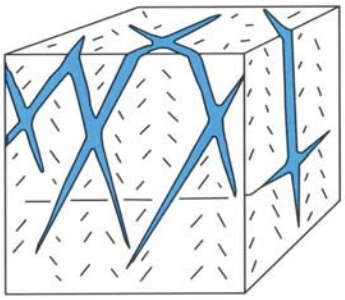
NJPDES Permit Number	PI Number	Facility Name	Effective Start Date	Expiration Date	Discharge Category Description	Document Status	Street Address Line1	Municipality
NJ0034321	46384	Roller Bearing, Inc.	8/1/00	7/31/03	Stormwater	Expired	370 Sullivan Way	Ewing Twp
NJG0117943	46452	Homasote Company	6/1/02	5/31/07	Basic Industrial Stormwater	Approved	Lower Ferry Road	Ewing Twp
NJG0119032	48538	Mercer City Transfer Station	6/1/02	5/31/07	Basic Industrial Stormwater	Approved	Dover & Stokes Avenues	Ewing Twp
NJG0128198	49268	CNJ Power House/Cogen Plant	12/1/03	11/30/08	General Permit GW Petro Prod Cleanup	Approved	Metzger Drive	Ewing Twp
NJG0131440	49531	Air Hangar Inc.	6/1/02	5/31/07	Basic Industrial Stormwater	Approved	Parkway Avenue Entrance (Mercer County Airport)	Ewing Twp
NJG0134171	49747	Mobil Service Station	12/1/03	11/30/08	General Permit GW Petro Prod Cleanup	Approved	1590 Parkside Avenue	Ewing Twp
NJG0143251	194796	Kinetics Industries Inc.	5/21/03	5/31/07	Basic Industrial Stormwater	Approved	140 Stokes Avenue	Ewing Twp
NJG0143707	195210	Stires Bus Co.	6/16/03	5/31/07	Basic Industrial Stormwater	Approved	24 Euchner Lane	Ewing Twp
NJG0145301	197136	Process Research Products	9/29/03	5/31/07	Basic Industrial Stormwater	Approved	1013 Whitehead Road	Ewing Twp
NJG0145513	202689	E M Boehm Inc.	9/23/03	5/31/07	Basic Industrial Stormwater	Approved	25 Princess Diana Lane	Ewing Twp
NJG0146269	214650	All Carbide Tool Services Inc.	1/20/04	5/31/07	Basic Industrial Stormwater	Approved	559 Howell	Ewing Twp
NJG0151912	222714	NJDOC Central Reception & Reassignment	4/1/04	2/28/09	Public Complex Stormwater General Permit	Approved	Whittlesey Road and Stuyvesant Avenue	Ewing Twp
NJG0152358	222775	NJDOT Ewing Complex	4/1/04	2/28/09	Public Complex Stormwater General Permit	Approved	1035 Parkway Avenue	Ewing Twp
NJG0153435	223003	The College of New Jersey	4/1/04	2/28/09	Public Complex Stormwater General Permit	Approved	Pennington Road	Ewing Twp
NJG0154393	191114	Ewing Township	4/1/04	2/28/09	Tier A Municipal Stormwater General Permit	Approved	2 Jake Garzio Drive	Ewing Twp
NJG0155616	229399	Pfizer Aviation Facility-Hanger 1001	6/2/04	5/31/07	Basic Industrial Stormwater	Approved	1001 Jack Stephan Way	Ewing Twp

Source: NJDEP OPRA database

GROUNDWATER

Aquifers

Ewing is located in the Newark Basin, a part of the Piedmont Plateau that extends from the Hudson River Valley to the divide between the Schuylkill and Susquehanna rivers in Pennsylvania. The geology of the Newark Basin is composed of four sedimentary rock formations, three igneous rock formations, and diabase intrusives. The predominate aquifers within the basin are called, collectively, the Newark Group and consist of the Passaic Formation, the Stockton Formation, and the Lockatong Formation. Together, these three bedrock aquifers provide ninety-five percent (95%) of the Newark Basin's water. The Stockton Formation and Lockatong Formation make up the majority of Ewing's geology.



Fractures in Rock
Source: USGS

Water from bedrock aquifers is drawn from fractures, or networks of fractures, in the rock. Shallow parts of bedrock aquifers are generally unconfined, meaning they are not bounded by confining layers made of lower permeable materials, while deeper sections may be semi-confined or fully confined. Confining beds help slow the entry of any surface contaminants into the groundwater. Most water in the Newark Group is found within 200 to 300 feet of the land's surface. Indeed, sixty-five percent (65%) of all water is drawn from within 200 feet of the surface and eighty-five percent (85%) of all water is drawn from within 300 feet of the surface. Below 500 feet, there are fewer and smaller fractures in the rock, thus storing less groundwater.

The Stockton Formation is composed of the oldest sediments in the Newark Basin. The bottom half of the formation contains medium-to course-grained sandstones and conglomerates, while the upper half of the formation contains fine-grained sandstone and shale. Most water in the Stockton Formation is found within 500 feet of the land's surface in weathered and interconnected fractures. The water is frequently located in unconfined places, although, locally, it may be found in semi-confined areas, depending on the layers of shale. The Stockton Formation is one of the most productive aquifers in this region. It can yield as much as 1,500 gallons of water per minute.

The Lockatong Formation is composed of less erodable rock. Therefore, of the three formations, it is the poorest for storing water. The rock has both low permeability and porosity, and the fractures are widely spaced and tight.

The water quality of the Newark Basin aquifers tends to be satisfactory. Large portions of the aquifers are unconfined, or close to the surface of the land. Therefore, they are more susceptible to local contamination. Moreover, the groundwater is generally hard, containing more minerals than are found in surface water.

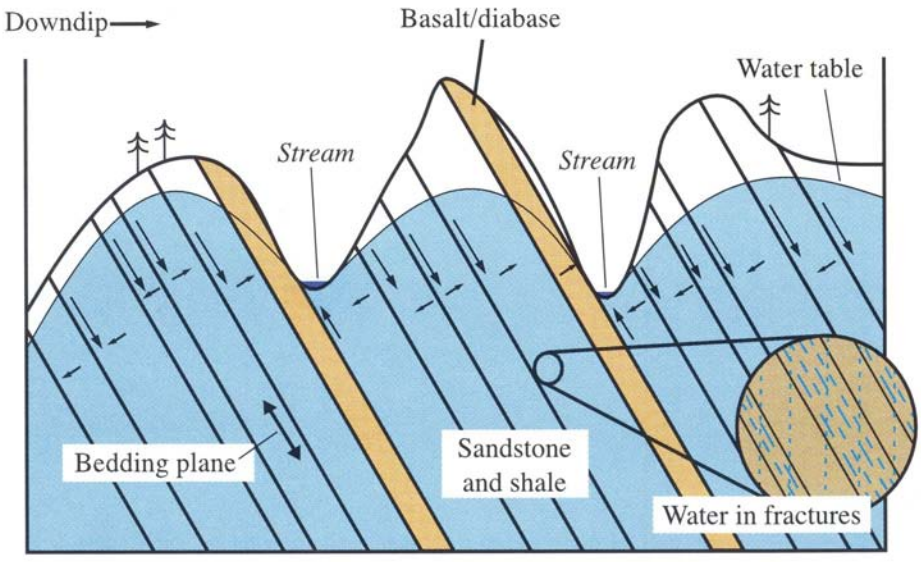
Drinking Water Supply

Almost all of Ewing Township receives its drinking water from the Trenton Water Works, which obtains its water from the Delaware River. In addition, there are nine noncommunity wells located in or near the border of Ewing Township, and several community supply wells located nearby in Lawrence. All have Well Head Protection Areas that have been delineated by the state. These areas are shown on **Map 12: Geologic Outcrops and Water Supply Wells,** and additional data on the noncommunity supply wells within Ewing or close to it are provided in **Table 14** below. **Table 14** includes all noncommunity wells on record with NJDEP. According to members of the Ewing Planning Board, there are probably additional noncommunity wells in Ewing that are not included in this list.

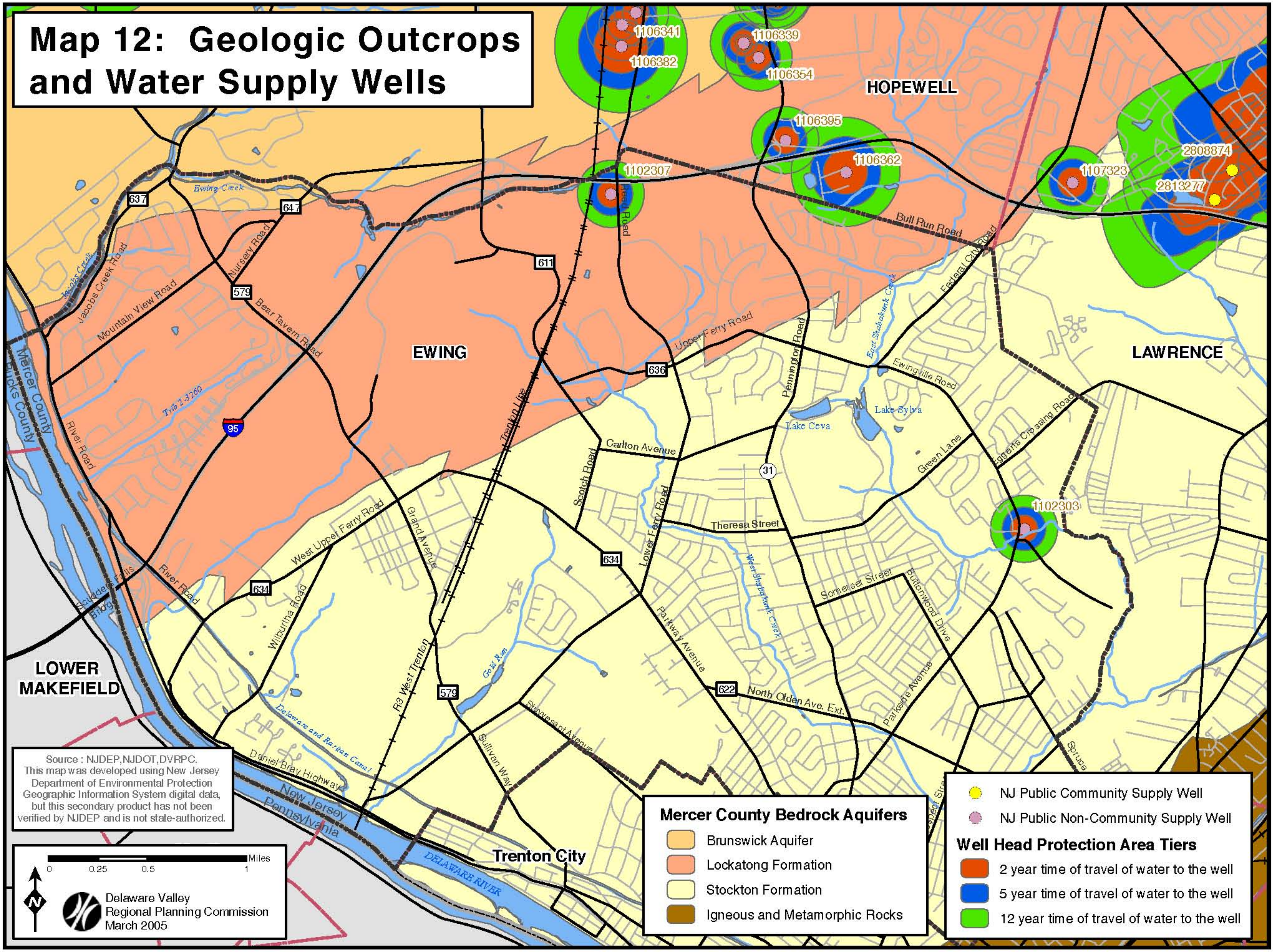
Table 14: Noncommunity Wells in or around Ewing Township

Well ID #	Owner	Aquifer	Depth
1102303	Club 88 Bar	Stockton Formation	250
1102307	Faridy Thorne Maddish PA	Lockatong Formation	250
1106339	Medallion Care Center	Brunswick Aquifer	350
1106341	Hopewell Valley Industrial Park	Brunswick Aquifer	103
1106354	Pennington Road Partners	Lockatong Formation	250
1106362	Camelot Nursery School	Lockatong Formation	95
1106382	Sincak Office Park	Brunswick Aquifer	170
1106395	Princeton Community Church	Lockatong Formation	250
1107323	Children's Express	Stockton Formation	100

Source: NJDEP



Newark Basin Rock Formation
Source: USGS


Map 12: Geologic Outcrops and Water Supply Wells
HOPEWELL
EWING
LAWRENCE
LOWER MAKEFIELD
Trenton City
1106341
1106382
1106339
1106354
1106395
1106362
1102307
1107323
2808874
2813277
1102303
Bull Run Road
Federal City Road
Upper Ferry Road
Pennington Road
Ewingville Road
Eggerts Crossing Road
Green Lane
Lake Ceva
Lake Sylva
East Shabakunk Creek
West Shabakunk Creek
Carlton Avenue
Scotch Road
Lower Ferry Road
Theresa Street
Somerset Street
Buttonwood Drive
Parkway Avenue
North Olden Ave. Ext.
Parkside Avenue
Spruce
Trenton Line
R3 West Trenton
Grand Avenue
West Upper Ferry Road
Wilburtha Road
River Road
Jacobs Creek Road
Jacobs Creek
Mountain View Road
Nursery Road
Bear Tavern Road
Ewing Creek
Trib 2-3760
Gold Run
Sullivan Way
Stuyvesant Avenue
Daniel Bray Highway
Delaware and Raritan Canal
DELAWARE RIVER
New Jersey
Pennsylvania
Mercer County
Bucks County
Scudders Falls Bridge
637
647
579
611
636
634
622
31
95
Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.
Miles
0
0.25
0.5
1
N
Delaware Valley Regional Planning Commission
March 2005
Mercer County Bedrock Aquifers
Brunswick Aquifer
Lockatong Formation
Stockton Formation
Igneous and Metamorphic Rocks
NJ Public Community Supply Well
NJ Public Non-Community Supply Well
Well Head Protection Area Tiers
2 year time of travel of water to the well
5 year time of travel of water to the well
12 year time of travel of water to the well

Wellhead Protection Areas and Water Supply Wells

All community and noncommunity supply wells in and around Ewing draw from the Stockton Formation, the Lockatong Formation, or the Brunswick Aquifer, as identified in **Table 14**. Any other private wells that might be in existence would draw from one of these formations as well, but there is no comprehensive inventory of private wells – their depth or condition – available to municipalities. The recently enacted (2002) Private Well Testing Act requires state-certified laboratory water testing in order to sell a residential property that obtains its water from a well. This will not identify what aquifers are being drawn upon by private wells, but it will eventually provide better documentation of the quality of drinking water from private wells in an area.

As part of its Well Head Protection Program Plan, issued in 1991, the New Jersey Department of Environmental Protection has delineated Well Head Protection Areas (WHPAs) around community and noncommunity wells. A WHPA is the area from which a well draws its water within a specified time frame. Once delineated, these areas become a priority for efforts to prevent and clean up groundwater contamination. Other components of the Well Head Protection Plan include implementing best management practices to protect groundwater, land use planning, and education to promote public awareness of groundwater resources.

Delineating a Wellhead Protection Area (WHPA)

A WHPA consists of three tiers, each based on time of travel to the well:

Tier 1 = two years
Tier 2 = five years
Tier 3 = twelve years

Calculation of the tier boundaries is based on findings of how long specific contaminants can survive in groundwater, how much time would be required for specific remedies to be undertaken, and on the likelihood of natural dilution over distance. The tiers are shown as rings around a well, with the groundwater direction of travel factored in to create plume–like shapes.

Once WHPAs are delineated, potential pollution sources may be managed by owners or municipalities, in relation to the tier locations. Protection of land and restrictions on activities within wellhead zones, relating to uses that generate contaminants, and to the storage, disposal, or handling of hazardous materials are important for maintaining the quality of water in wellhead areas.

Groundwater Recharge

Recharge of groundwater is an important issue in New Jersey because of the dependence on aquifers for drinking supply and for agricultural and industrial use. The amount of rainwater that actually enters an aquifer is a function of many factors, including the nature and structure of the aquifer itself. The amount of precipitation that infiltrates the soil and reaches the saturated zone to become groundwater – the recharge of the aquifer – is also dependent on climatic conditions, the nature of the soil, and the vegetation of an area.

The New Jersey Geological Survey has developed a methodology for evaluating land areas for their ability to transmit water to the subsurface, using precipitation records, soil surveys, and land use/land cover data. The New Jersey Department of Environmental Protection has used this methodology to map and rank land areas throughout the state as to groundwater potential.

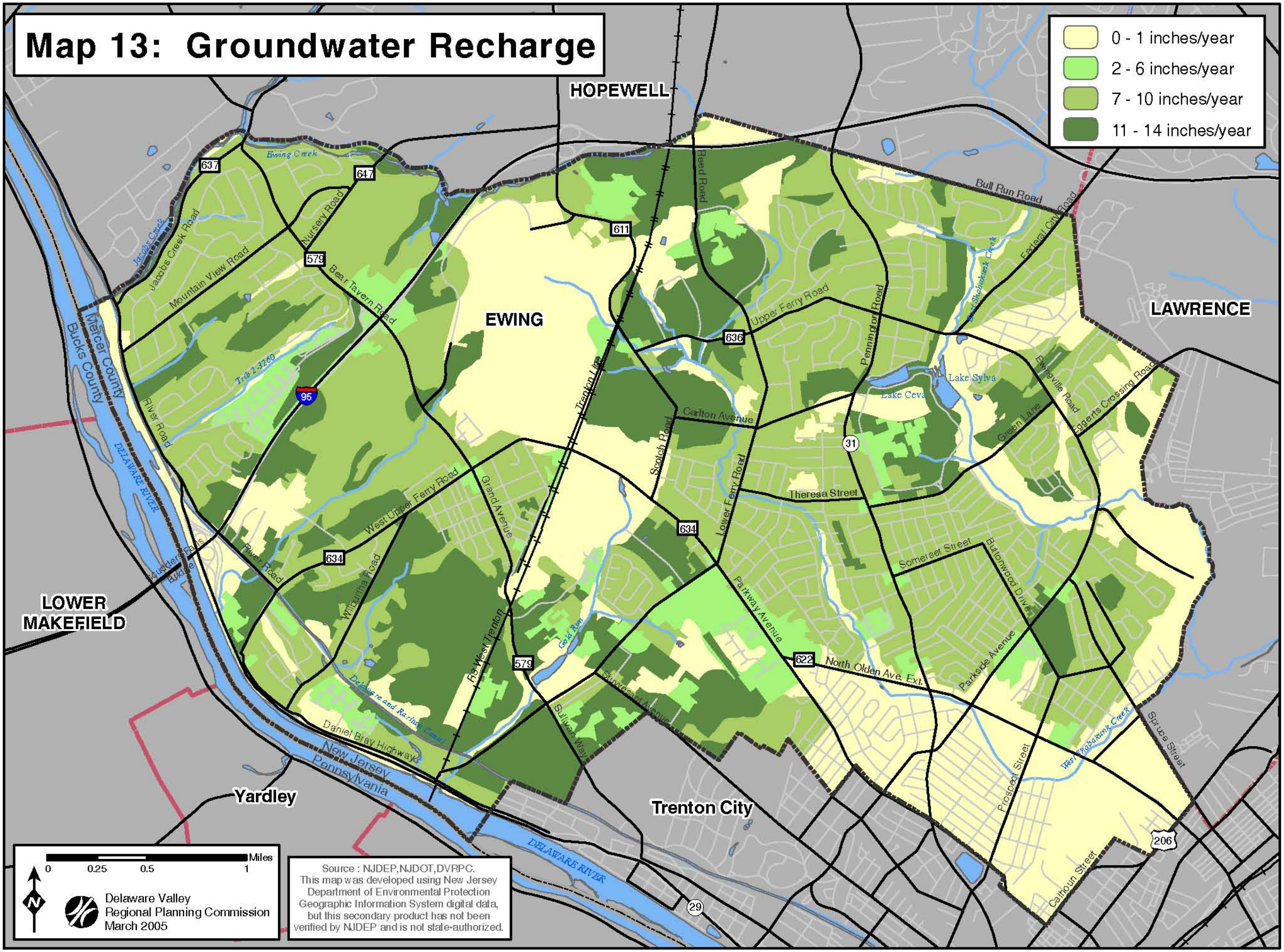
Recharge is equivalent to the amount of precipitation that will reach the water table in an area with a particular combination of soils and land use. It is expressed as inches per year.

In Ewing, lands with recharge of 11 to 14 inches per year, the highest in the township, are found in scattered patches, with the greatest concentration in the area between the R3 West Trenton rail line and Lower Ferry Road, around Lake Ceva, between the R3 rail line and Wilburtha Road, and along Interstate 95. In the case of Ewing, the recharge is to the Stockton Formation and the Lockatong Formation aquifers. See **Map 13: Groundwater Recharge**.

On these high recharge lands, the amount of paving and other impervious cover has the most detrimental impact, although they are also usually the places that are most suitable for building because they are on well-drained soils. Conversely, these are also regions where the dilution of substances from septic systems, such as nitrates, may require a larger land area because the soils are usually more "porous." For example, minimum average lot sizes of 2 to 4 acres are often needed for proper nitrate dilution from septic systems in areas having 10 or more inches per year of groundwater recharge.

This area around Lake Ceva has high groundwater recharge

Map 13: Groundwater Recharge


0 - 1 inches/year
2 - 6 inches/year
7 - 10 inches/year
11 - 14 inches/year
HOPEWELL
LAWRENCE
EWING
LOWER MAKEFIELD
Yardley
Trenton City
Mercer County
Bucks County
New Jersey
Pennsylvania
DELAWARE RIVER
Reed Road
Bull Run Road
Federal City Road
Upper Ferry Road
Pennington Road
Lake Sylva
Lake Ceva
Ewingville Road
Eggerts Crossing Road
Green Lane
Carlton Avenue
Scotch Road
Lower Ferry Road
Theresa Street
Somerset Street
Buttonwood Drive
Parkway Avenue
North Olden Ave. Ext.
Parkside Avenue
Prospect Street
Spruce Street
Calhoun Street
Trenton Line
Rd West Trenton
Grand Avenue
West Upper Ferry Road
River Road
Wilburtha Road
Bear Tavern Road
Nursery Road
Mountain View Road
Jacobs Creek Road
Ewing Creek
Jacobs Creek
Trib 2-3260
Gold Run
Delaware and Raritan Canal
Daniel Bray Highway
Sullivan Way
Stuyvesant Avenue
Scudders Falls Bridge
95
579
637
647
611
636
634
622
31
29
206

Miles
0 0.25 0.5 1

Delaware Valley
Regional Planning Commission
March 2005

Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

BIOLOGICAL RESOURCES

When a community decides to protect wildlife and habitat, they choose to protect biodiversity, which enables many species, including humans, to thrive and live healthy lives. Biodiversity refers to the variety of genetic material within a species population, the variety of species (plants, animals, microorganisms) within a habitat, and the variety of ecosystems within a given region.[3] Biodiversity facilitates adaptation and evolution, improving a species' chance of survival as the environment changes. A diversity of plant and animal species is also necessary to maintain healthy human environments, working landscapes, and productive ecosystems. Lower organisms, many not well known, contribute to nutrient cycling, decomposition of organic matter, soil rehabilitation, pest and disease regulation, pollination, and water filtering. Once biodiversity declines, it is extremely hard for an ecosystem to recover or replace species.

Scientists have discovered and named somewhere between 1.5 and 1.8 million plant and animal species in the world. Of these, only 4,000 are mammals and 9,500 are birds. Over half of all known species are insects. Far more species, possibly ten to twenty times the number of known species, are unknown to science. Alarmingly, this great diversity of species is now diminishing at an unprecedented rate. Researchers generally agree that the extinction rate is now catastrophically high, somewhere between one thousand and ten thousand times the rate before human beings began to exert significant pressure on the environment. Given these trends, and barring significant increases in conservation efforts, approximately one-half of the world's species will be gone by the end of this century.

Ewing contains various types of ecosystems. Ecosystems are made up of abiotic factors (air, water, rocks, energy) and biotic factors (plants, animals, and microorganisms). Upland forest is the most abundant type of natural ecosystem in Ewing and grasslands are the second most common ecosystem in Ewing. Along Ewing's stream corridors and lakeshores are wetlands, which support plants that require constantly saturated soils; and within and around waterbodies are submerged communities, which require persistent standing water.

NATURAL VEGETATION

Vegetation is controlled by many factors, the most important of which are climate and soils. Ewing's climate is a cool temperate type associated with a coastal, permanently humid-warm summer condition. Rainfall in the region averages 44-46 inches per year.[4]

Ewing's natural vegetation types, along with human-influenced types of land cover, have been tabulated and mapped by NJDEP's 1995/97 land cover analysis. This data, based on infrared aerial photography, is the most recent available. The designation of a particular land cover as a vegetation type is based on definitions provided by the Anderson Land Use Classification

[3] Commonwealth of Australia. Department of the Environment, Sport and Territories. "Biodiversity Series Paper No. 1: Biodiversity and its value." 1993.
[4] United States Department of Agriculture. Natural Resource Conservation Center. New Jersey Precipitation Data/Maps. ftp://ftp.ftw.nrcs.usda.gov/pub/ams/prism/maps/nj.pdf

System, created by the U.S. Geological Survey. New infrared aerial photography was taken in 2002. However, analysis of this photography has not yet been completed. Updated NJDEP land cover maps are expected to be available in 2005. See **Map 14: Natural Vegetation (1995/97)**.

Table 15: Ewing Township Natural Vegetation

Land Use	Acres	% of Total Natural Vegetation Land Area
Deciduous Forest	877	45.6%
Coniferous Forest	5	0.3%
Mixed Deciduous/Coniferous Forest	6	0.3%
Brushland/Shrubland	558	29.0%
Lakes	35	1.8%
Interior Wetlands	398	20.7%
Modified Wetlands	45	2.3%
Total	**1924**	**100%**

Source: NJDEP (1995/97 Land Cover)

Wetlands

Wetlands are defined as areas that are inundated or saturated by surface or ground waters at a frequency to support vegetation suited for life in saturated soils.[5] New Jersey's wetlands are located around the numerous interior stream systems, and along coastal rivers and bays. NJDEP classifies wetlands with naturally occurring vegetation into two major categories: (1) *coastal wetlands*, wetlands associated with tidal portions of the Delaware River system and waterways draining into the Atlantic Ocean; and (2) *interior wetlands*, wetlands found in nontidal lowlands associated with waterways, and isolated wetlands surrounded by uplands. NJDEP also identifies *modified wetlands*, which are areas that have been altered by human activities and do not support typical natural wetland vegetation, but which do show signs of soil saturation on aerial infrared surveys.

Wetlands are a critical ecological resource, supporting both terrestrial and aquatic animals and boasting biological productivities far greater than those found on dry land. Wetlands play a vital role in maintaining water quality by cleaning surface and ground waters. The ecological importance of wetlands, however, has not always been appreciated. For over three centuries people drained, dredged, filled and leveled wetlands to make room for development and agriculture. Although the pace of wetland destruction has slowed markedly in the past three decades, human activities have destroyed approximately 115 million of the original 221 million acres of wetlands in the United States since the beginning of European settlement.

[5] NJDEP. "Anderson Land Use Classification System." Originally derived from "A Land Use and Land Cover Classification System for Use with Remote Sensor Data" U. S. Geological Survey Professional Paper 964, 1976.

The location and type of vegetation are key features for classifying wetlands. Virtually all wetlands in Ewing Township are found in association with the major streams and their tributaries. Freshwater, deciduous wooded wetlands, particularly along the main channel of the Shabakunk Creek, are the dominant category of wetlands in the township. These wetlands are "palustrine" wetlands (stream-associated, versus "lacustrine" or lake-associated) and are usually covered with deciduous trees or shrubs, although some evergreen trees or shrubs may be present. Shrubs are also the dominant plants where wetlands are recovering from past impacts. See **Map 8: Surface Water, Wetlands, and Vernal Ponds**.

In Ewing, modified wetlands encompass agricultural wetlands, former agricultural wetlands, disturbed wetlands and wetlands that occur in maintained greenspaces such as open lawns, golf courses, and storm water swales. Modified wetlands differ from non-modified wetlands in that they do not support the typical natural wetland vegetation found in analogous unaltered natural areas, although they do exhibit evidence of soil saturation. In total, modified wetlands occupy just 45 acres or approximately 2 percent of Ewing's total land area.

Upland Forests

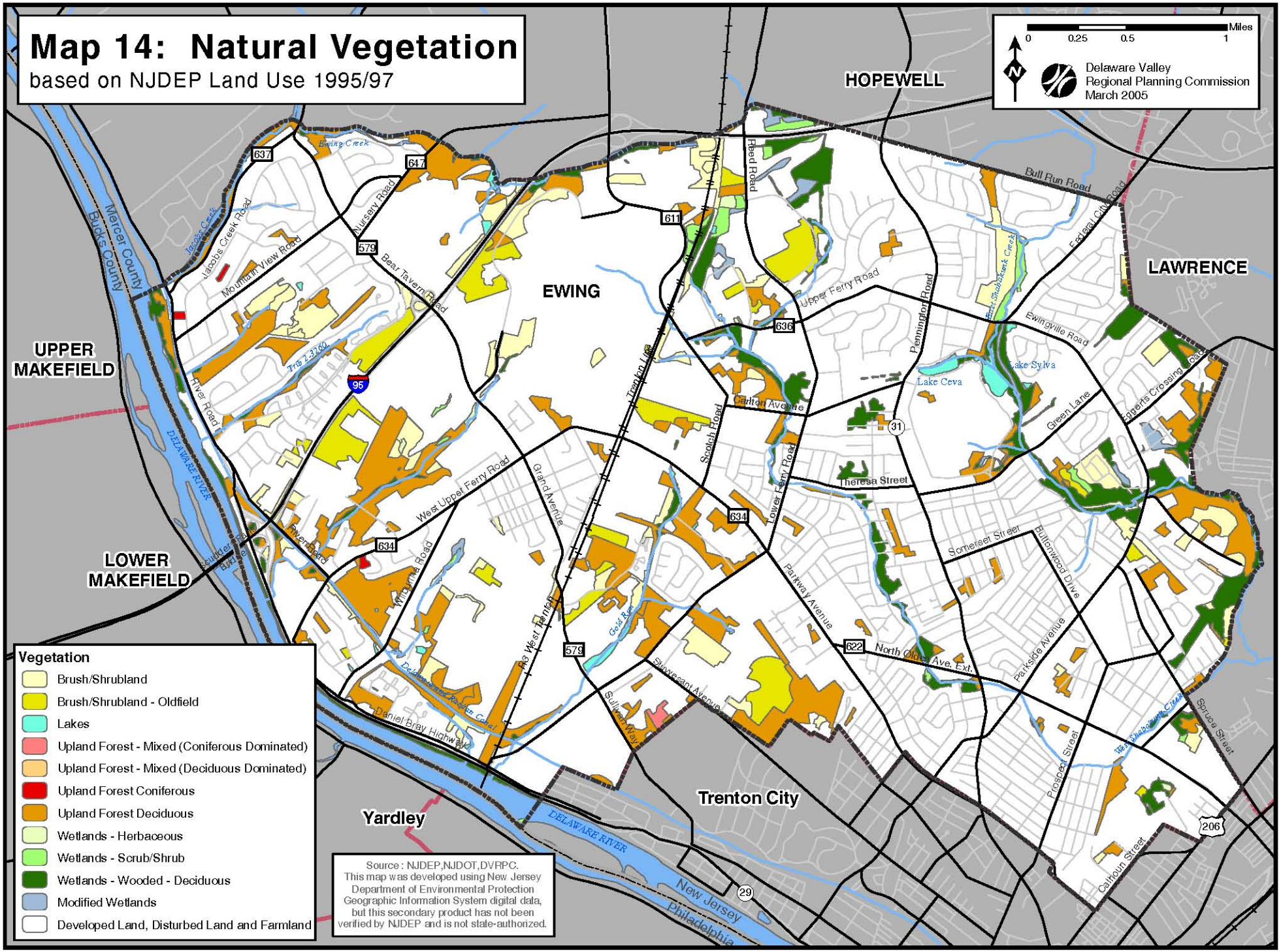
Upland areas are those locations without water at or near the soil surface. Upland forests are located on drainage divides, terraces and slopes where water is not the controlling factor. Almost all of Ewing's upland forests have been cleared and converted to farms or residential or commercial development. The remaining uplands are relegated to a few remnants along stream corridors or are patchy woodlands associated with large farms or parks.

Approximately 46%, or 888 acres, of Ewing's vegetation is upland forest, according to the 1995/97 land cover analysis prepared by the New Jersey Department of Environmental Protection. This data is the most recent available based on infrared aerial photography. See **Map 14: Natural Vegetation (1995/97)**.

Grasslands and Agricultural Lands

A small percentage of Ewing consists of brush or shrubland, principally in the form of fallow fields, pasture, and old fields. Old fields are lands that were cleared or disturbed at one time and then abandoned. Following abandonment, perennial herbs and grasses succeed to become the dominant species for a length of time from 3 to 20 years. Later, woody plants begin to take over. This habitat is visible especially along wood edges, roadsides, and in landscapes where mowing is infrequent and where woody plants are not yet the dominant vegetation. This habitat, along with agricultural cropland, constitutes "grassland" habitat utilized by species that forage or nest on open land.

In Ewing, 558 acres, or 29%, of the natural vegetation is classed as brushland or shrubland, as of the 1995/97 land cover analysis by NJDEP. See **Map 14: Natural Vegetation (1995/97)**.


Map 14: Natural Vegetation
based on NJDEP Land Use 1995/97
Miles
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0.25
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1
Delaware Valley
Regional Planning Commission
March 2005
HOPEWELL
EWING
LAWRENCE
UPPER MAKEFIELD
LOWER MAKEFIELD
Yardley
Trenton City
Mercer County
Bucks County
DELAWARE RIVER
New Jersey
Philadelphia
Jacobs Creek Road
Mountain View Road
Nursery Road
Bear Tavern Road
River Road
West Upper Ferry Road
Grand Avenue
Trenton Line
Reed Road
Upper Ferry Road
Pennington Road
Bull Run Road
Federal City Road
Ewingville Road
Lake Sylva
Lake Ceva
Green Lane
Eggerts Crossing Road
Carlton Avenue
Scotch Road
Lower Ferry Road
Theresa Street
Somerset Street
Bullionwood Drive
Parkway Avenue
North Olden Ave. Ext.
Parkside Avenue
Prospect Street
Spruce Street
Calhoun Street
Stuyvesant Avenue
Sullivan Way
Daniel Bray Highway
Delaware and Raritan Canal
637
647
579
611
636
634
31
622
206
29
95
Vegetation
Brush/Shrubland
Brush/Shrubland - Oldfield
Lakes
Upland Forest - Mixed (Coniferous Dominated)
Upland Forest - Mixed (Deciduous Dominated)
Upland Forest Coniferous
Upland Forest Deciduous
Wetlands - Herbaceous
Wetlands - Scrub/Shrub
Wetlands - Wooded - Deciduous
Modified Wetlands
Developed Land, Disturbed Land and Farmland
Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

LANDSCAPE PROJECT PRIORITY HABITATS

The Landscape Project, developed by the Endangered and Nongame Species Program of the NJDEP Division of Fish & Wildlife, documents the value of various types of habitats within New Jersey. It then ranks these habitats as to their importance. The highest ranking goes to habitat areas where there has been a documented occurrence of one or more species that are on either the federal or the state Threatened and Endangered Species lists and where there is a sufficient amount of habitat type to sustain these species ("critical habitat"). A second category includes habitats that have documented occurrences of species of special concern in New Jersey. Another rank consists of lands with habitat deemed suitable for species that are included in the higher categories but for which there are no documented occurrences or sightings ("suitable habitat").

Landscape Project data for Ewing Township identifies locations with the most important habitats for wildlife and categorizes them as either "critical habitat" (the highest) or as "suitable habitat." It is important to preserve both levels of habitat, in order to maintain the diversity of species that still exists in the township.

The Landscape Project data is based on mid-1990s information. It should be noted that since this time, Ewing Township has developed a significant portion of its critical habitat. For example, the new commercial development along the Shabakunk Creek, between Spruce Street and Eggerts Crossing Road, is situated on land listed in the table below as critical habitat. The acreage listed in ***Table 16: Landscape Project Habitat Rankings – Acreage in Ewing Township*** has *not* been adjusted to reflect these new developments on landscape priority habitats. See **Map 15: Landscape Project Habitat Priorities**.

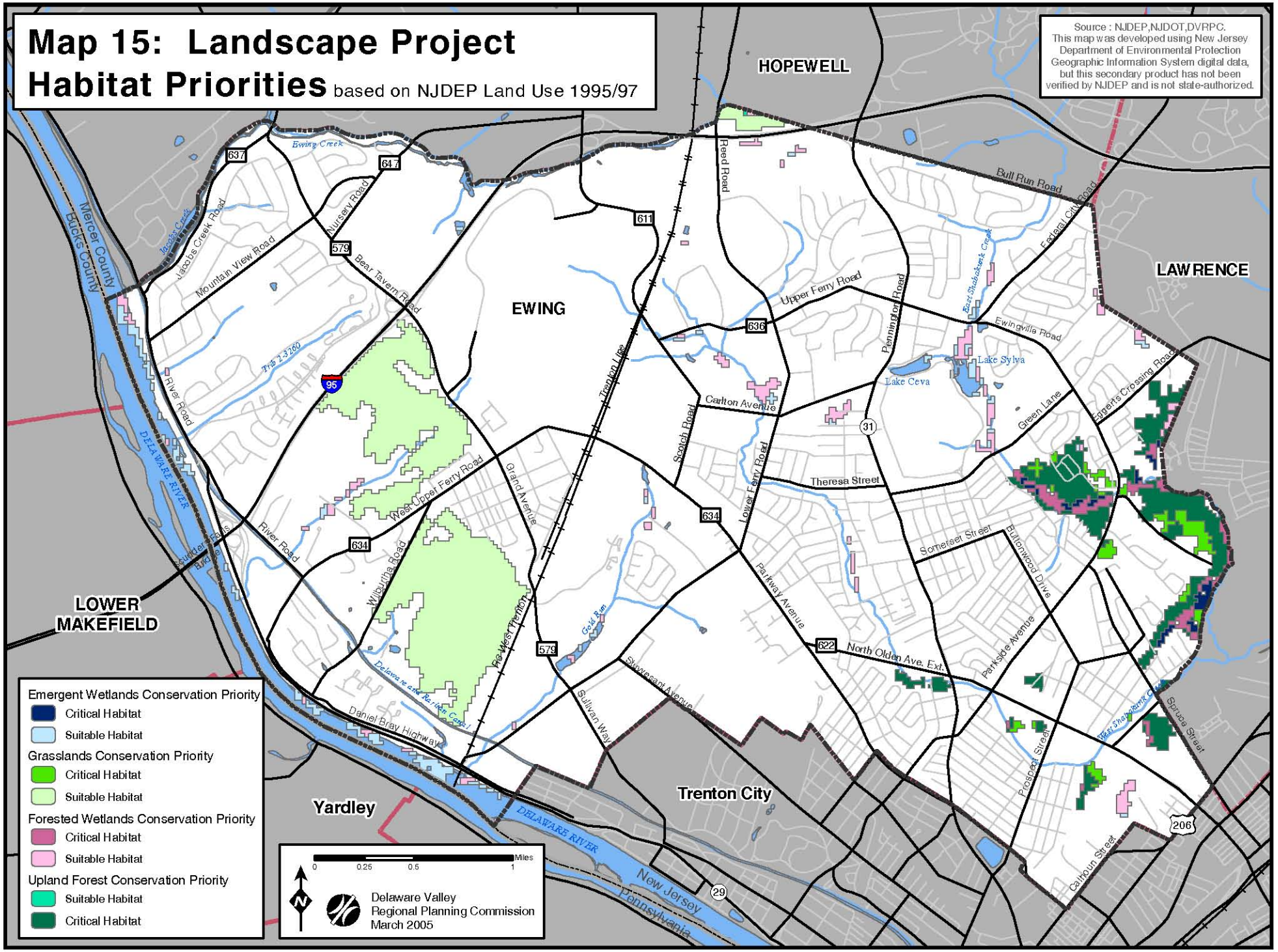
Table 16: Landscape Project Habitat Rankings – Acreage in Ewing Township

Type	Rank	Acres	Subtotals by Category	% of Total Landscape Project Acreage	% of Total Township Acreage
Emergent Wetlands	Suitable Habitat	52.16	69	8%	1%
	Critical Habitat	16.87			
Grasslands	Suitable Habitat	494.97	533	58%	5%
	Critical Habitat	38.17			
Upland Forest	Suitable Habitat	0.94	217	24%	2%
	Critical Habitat	216.55			
Forested Wetlands	Suitable Habitat	62.65	99	11%	1%
	Critical Habitat	36.47			
Total Landscape Project Acres		**918.78**		100%	9%
Total Township Acres		**9,959.31**			

Source: NJDEP

Map 15: Landscape Project Habitat Priorities based on NJDEP Land Use 1995/97

Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.



Landscape Project Data on Wetland Habitat

The Landscape Project divides wetland habitats into two types – forested and emergent wetlands. They can also be home to various rare amphibians (frogs and salamanders). Emergent wetlands are marshy areas characterized by low-growing shrubs and herbaceous plants in standing water, usually. They can be tidal or nontidal. Animal species that can be found there include endangered turtles, rare fish, mollusks, crustaceans, and insects.

About 32% of the wetland acreage in Ewing that is ranked as critical (the highest value) is emergent wetland (17 acres). Forested wetlands make up the other 68% of wetlands ranked at the highest level (36 acres). Emergent wetlands ranked at the suitable habitat level occupy 52 acres and forested wetlands ranked at the suitable habitat level occupy 63 acres. Nearly all critical and suitable wetlands are located along the Shabakunk Creek.

Landscape Project Data on Upland Forest Habitat

The Landscape Project has ranked upland forests in the same manner as wetlands. What remains of Ewing's highest ranked "critical habitat" upland forests are also found along the Shabakunk Creek. Critical upland habitat constituted 217 acres when the Landscape Project was originally conducted – however, much of this land has since been developed for commercial uses. One acre was ranked at the suitable level.

Landscape Project Data on Grassland Species Habitat

Nearly all of the land ranked as critical habitat for grassland-dependent species is located along the Shabakunk Creek (38 acres). Land rated at the lower level, as "suitable habitat" (495 acres), is located in the western part of the township, mainly in the areas with remaining farmland. This includes the open fields between Interstate 95 and West Upper Ferry Road and also, the fields between the West Trenton rail line and Wilburtha Road. Examples of grassland-dependent species that use this kind of habitat for nesting or feeding include various grassland birds.

Grassland Species Habitat

ANIMAL COMMUNITIES

Although no comprehensive inventory of the different animal species within New Jersey, Mercer County, or Ewing Township exists, there are records of sightings, biological studies of range, and assessment of endangered and threatened status. Using federal, state, scientific, and nonprofit sources, it is possible to identify and describe known and possible animal communities of Ewing Township. A list of animal and plant species from New Jersey's Washington Crossing State Park, which is located just north of Ewing in Hopewell Township on the Delaware River, is provided in Appendix B. According to a resource specialist at the park, the list generally applies to Ewing Township.[6]

Invertebrates

Invertebrates are the basis of a healthy environment and are part of every food chain – either as food for amphibians and fish, or as a part of nutrient cycling systems that create and maintain fertile soils. Though they are the most abundant animal life forms, once extinct they are the hardest species to replace.

Invertebrates consist of insects (beetles, butterflies, moths, ants, termites, bees, wasps, and others), arachnids (spiders, ticks and mites), crustaceans (crayfish, microscopic copepods), mollusks (mussels, clams, snails and slugs), and worms.

Macroinvertebrates are invertebrates that are visible to the naked eye but smaller than 50 millimeters. Benthic (bottom dwelling) macroinvertebrate communities provide a basis for ecological monitoring and are relatively simple to collect from shallow stream bottoms. Monitoring the presence of macroinvertebrates reveals the effect of pollutants over a long period of time. The Ambient Biomonitoring Network (AMNET) surveys streams for macroinvertebrate communities, which indicate certain levels of water quality, as was discussed in the Surface Water Quality section of this document.

There are nine endangered invertebrate species (two beetle species, four butterfly species, and three mussel species) and eight threatened invertebrate species (three butterfly species and five mussel species) in the State of New Jersey. Of particular interest are mussels; at one time freshwater mussels were abundant in the Delaware River and its tributaries and a major food source for native peoples. Unfortunately, due to over-harvesting, especially in the Delaware Bay in the 19th century, and destruction of suitable aquatic habitats by dams and pollution, the native mussel population has sharply declined and shows no signs of rebounding. Of those species on the New Jersey Endangered and Threatened list, one, the dwarf wedgemussel, is listed as endangered under the federal Endangered Species Act.

[6] E-mail correspondence with Wayne Henderek, Resource Interpretive Specialist, Washington Crossing State Park. 11/20/04.

Vertebrates

Vertebrates are less numerous than invertebrates but their larger size makes them much more visible, and thus better studied and recorded. Fish species are fairly well documented, as are mammals. Birds that nest in the township are known, but migrants that depend on Ewing's wet forests as stopover sites in which to rest and feed are not as thoroughly inventoried.

Mammals

Mammals appear to be abundant because they tend to be larger and live in habitats also ideal for human development. There are over 500 mammal species in New Jersey, of which only nine are listed as endangered and none are listed as threatened by the state. Some common mammals found in Ewing Township include cottontail rabbits, eastern gray squirrels, skunks, little brown bats, and raccoons.

Deer Management in New Jersey

While many residents prize the presence of mammalian life, certain mammals often come into conflict with humans in suburban areas. The white-tailed deer presents a classic case of this conundrum. Indeed, the argument over whether New Jersey has too many, just enough, or not enough deer often causes controversy. On one hand, there is inherent value in New Jersey's deer population; deer are a beloved symbol of wildlife, a visible subject for wildlife education and research, a part of human recreation activities like wildlife watching and hunting, and they can be a food source for carnivores and humans. On the other hand, conflicts often arise when humans and deer compete for the same space. According to the US Department of Agriculture, deer cause more damage to agricultural crops than any other vertebrate wildlife species, and farmers in densely human-populated areas appear to be the most effected. Additionally, deer can devastate the understory of forests through overgrazing, destroying the local ecosystem. Finally, as most motorists are well aware, collisions between deer and automobiles frequently result in serious damage.

Controlling deer numbers has become increasingly difficult in New Jersey for numerous reasons, including: (1) there are no natural deer predators, only humans; (2) suburban development patterns are spreading into rural areas; (3) some communities pass ordinances prohibiting hunting; (4) hunters have less access to land inhabited by deer; (5) some public and private groups oppose deer hunting; and (6) hunters are leaving the state to hunt in nearby states.

To minimize human-deer conflicts, the New Jersey Agricultural Experiment Station recommends both lethal and nonlethal deer management options for community-based deer management programs. For example, municipalities can extend the hunting season, issue depredation permits to private landowners, engage in sharpshooting, and employ traps and euthanasia to reduce deer numbers. Alternately, communities and private landowners can choose to apply more costly, nonlethal deer management strategies such as installing reflectors and reducing speed limits on rural roads to decrease deer-vehicle collisions, modifying habitat by planting bad tasting plants on commercial and residential properties, using taste-based and odor-based repellents, and

employing traps and translocation techniques. For a list of deer tolerant/resistant plants native to the Ewing Township vicinity, please see **Appendix C.**

While current deer problems should be addressed, it is important to note that New Jersey's white-tailed deer population has actually remained relatively stable throughout the state over the past decade and that increasing conflicts between deer and human populations arise as suburban communities spread into once rural areas. The most effective way then to avoid a continuing expansion of conflicts between deer and humans is to preserve the wild habitats to which deer naturally belong.

Deer in Banchoff Park

Fish

When European settlers arrived in present-day Mercer County, they encountered Native Americans who regularly fished along the inland streams and gathered mussels in the Delaware River. Due to the unintended consequences of urban development, industrial advancement, and mechanized agriculture, the amount and diversity of aquatic life has decreased dramatically throughout most of New Jersey.

The New Jersey Division of Fish and Wildlife, under the Bureau of Freshwater Fisheries, monitors and actively aids the propagation, protection, and management of the state's freshwater fisheries. The bureau raises several million fish for stocking in suitable waterbodies, and conducts research and management surveys. Based on survey data supplied by the bureau, Ewing's freshwater streams may contain the following fish: blacknose dace, american eel, banded killfish, tadpole madtom, tessellated darter, spottail shiner, common shiner, golden

N.J. DEPARTMENT OF ENVIRONMENTAL PROTECTION FRESHWATER FISH ADVISORIES

Fishing provides enjoyable and relaxing recreation and many people like to eat the fish they catch. Fish are an excellent source of protein, minerals and vitamins, are low in fat and cholesterol, and play an important role in maintaining a healthy, well-balanced diet.

However, certain fish may contain toxic chemicals, such as polychlorinated biphenyls (PCBs), dioxins, and mercury, which accumulate in water and aquatic life. Chemical contaminants such as dioxin and PCBs are classified by the U.S. Environmental Protection Agency as probably cancer-causing substances in humans. Elevated levels of mercury can pose health risks to the human nervous system. Infants, children, pregnant women, nursing mothers, and women of childbearing age are considered to be at higher risk from contaminants in fish than other members of the general public. Since 1982, NJDEP catches fish at numerous sampling stations throughout the state and tests for contaminant levels, adopting advisories to guide residents on safe consumption practices.

NJDEP issued a fish advisory in 2004 for the following species of fish in Mercer County: American Eel, Striped Bass, Channel Catfish, Bluefish, Striped Bass, White Perch, Channel Catfish, White Catfish, Largemouth Bass, Chain Pickerel. Recreational fishermen and women should regularly check for local fish advisories on NJDEP's Division of Science, Research and Technology website: http://www.state.nj.us/dep/dsr/njmainfish.htm/.

U.S. EPA GENERAL CONSUMPTION GUIDELINES

- If possible, eat smaller amounts of several different types of fish rather than a large amount of one type that may be high in contaminants. Consume species of fish that have lower levels of contaminants, such as fluke or flounder.
- Smaller fish of a species will usually have lower chemical levels than larger fish in the same location because contaminants tend to build up in the fish over time. It is advisable to eat smaller fish (of legal size) more often than larger fish.

shiner, satinfin shiner, creek chub, white sucker, pumpkin seed, bluegill, largemouth bass, brown trout, stonecat, redbreast sunfish, green sunfish, common carp, creek chubsucker.

Birds

There are over 500 species of birds in New Jersey, which is an exceptional number given the state's small size. New Jersey is an important location for migratory birds heading south for winter. Not only is the state an important "rest stop" for birds migrating to warmer climates in Central and South America, the New Jersey Atlantic Coast and the Delaware Bay are the termini for three to four major North American flyways (established migratory air route).

Additionally, the State of New Jersey now has a "resident" Canada goose population of approximately 100,000 birds that no longer migrate to more southern locales, and may double in the next 5 to 10 years. While geese are a valuable component of the urban/suburban environment, providing enjoyable wildlife opportunities for the public, they can also cause property and environmental damage. Goose droppings that wash into lakes during storm events can elevate coliform bacteria to unhealthy levels, closing lakes to swimming. Goose droppings limit human use of grassy areas in parks; and because geese can be quite aggressive during the nesting season, they can also injure humans.

However, removing geese or preventing them from residing in park areas is a difficult task. Because geese move freely, the most effective management solutions are best conducted at the community level. Canada geese are protected by the Migratory Bird Treaty Act, therefore a management program may require the US Department of Agriculture's approval and permits. Management techniques include planting shrubby vegetation around streams, lakes, and ponds to block waterfowl access; discouraging humans from feeding geese; and removing geese eggs and replacing with decoys.

Common Reptiles and Amphibians

Reptiles can be quite elusive when surveys attempt to document them. Some species, such as the endangered bog turtle, have been documented in Ewing. Amphibians of some types are abundant, such as bullfrogs. Other species are rare because they depend on vernal ponds, as was discussed in the Surface Waters – Vernal Ponds section of this document.

FEDERAL ENDANGERED SPECIES ACT*

An "Endangered" species is in danger of extinction throughout all or a significant portion of its range.

A "Threatened" species is one that is likely to become endangered in the near future.

NEW JERSEY ENDANGERED SPECIES ACT**

An "Endangered" species is in danger of immediate extinction within the state due to one of several factors: loss or degradation of habitat, over-exploitation, predation, competition, disease, or environmental pollution.

A "Threatened" species is one that may become endangered if environment conditions continue to deteriorate. It is vulnerable due to one of several factors: small population size, restricted range, narrow habitat affinities, or significant population decline.

A species of "Special Concern" is one that warrants special attention because of the evidence of population decline, environmental deterioration, or habitat modification that would result in becoming Threatened. Special Concern status also extends to species whose population size is unknown or unstudied.

* Definitions adapted from U.S. Fish and Wildlife Service, "Listing a Species as Threatened or Endangered: Section 4 of the Endangered Species Act." Washington, DC: February 2001.
** Definitions adapted from N.J. Division of Fish, Game, and Wildlife, Endangered and Non-game Species Program, "Status Definition." Trenton, NJ: April 2002.

Rare and Endangered Vertebrates

According to the Natural Heritage Database and the Landscape Project, a small number of rare wildlife has been sighted in Ewing Township over the course of 100 years. Brief descriptions of the species and their preferred habitats, provided by the New Jersey Fish and Wildlife Service, follow.

The Bog Turtle (*Clemmys muhlenbergii*) is an endangered species in many eastern states, including New Jersey, and is listed as threatened on the federal list. It is the smallest native species of its type in the United States. Bog turtles lay their eggs in stream banks and cover them with vegetation for protection. These turtles are one of the most difficult animals to find, as they are rare, elusive, and often dwelling on swamp bottoms where they bury themselves in several inches of mud to escape predators. Suitable habitats are dwindling as wetlands are destroyed for human settlement or by pollution. The greatest numbers of bog turtles in the nation are found in the wetland areas of agricultural lands in northwestern and southwestern New Jersey.

The Cooper's Hawk (*Accipiter cooperii*) is a member of the Accipiter family – woodland hawks that prey on smaller birds – and is especially adapted to fly through dense cover chasing prey. In New Jersey, Cooper's hawks breed in remote wooded wetlands dominated by red maple or black gum. Adjacent upland pine or mixed oak/pine forests usually provide a buffer for nesting hawks. These hawks generally nest in forests composed of trees 30 years or older creating a closed canopy. On average, a hawk will place his or her nest more than a third of a mile away from the nearest human inhabitant. While other raptor species were threatened due to hunting practices and predator elimination, Cooper's hawk populations were not threatened until widespread suburbanization. Additionally, the pesticide DDT impaired many bird species' reproduction and contributed to declining populations from the 1950s to 1970s. Populations began to recover due to the nationwide ban of DDT in 1972 coupled with the reforestation of old fields throughout New Jersey. The hawk was listed as endangered in 1974 and downgraded to threatened in 1999 on the state list. The loss of large, contiguous forests remains a threat to this species and warrants the continued protection of Cooper's hawk nesting habitats.

See:

- **Appendix A** for a list of *Vertebrate Animals Known, Probable or Possible in Ewing Township*.
- **Appendix B** for a list of *Animal and Plant Species found in Washington Crossing State Park, New Jersey*. (This park is just upstream the Delaware River from Ewing Township, and many of the species found there are likely to also be found in Ewing.)
- **Appendix C** for a list of *Deer Tolerant/Resistance Native Plants from Bowman's Hill Wildlife Preserve.*
- **Table 17** for a list of *Rare Wildlife Species or Habitat in Ewing Township Presently Recorded in the NJ Natural Heritage Database for Ewing Township.*
- **Table 18** for a list of *Rare Plant Species and Natural Communities Presently Recorded in the NJ Natural Heritage Database for Ewing Township.*

NJ NATURAL HERITAGE DATABASE AND NATURAL HERITAGE PRIORITY SITES

Natural Heritage Priority (NHP) sites are areas designated by the New Jersey Division of Parks and Forestry's Office of Natural Lands Management as critically important remaining habitat for rare species and as exemplary natural communities within the state. These areas are to be considered as top priorities for the preservation of biological diversity in New Jersey.

Designation as a Natural Heritage Priority site does not carry any specific requirements or restrictions on the land. Rather, the designation is made because of the high value of a site from a biological and diversity standpoint. Owners of NHP sites are encouraged to become informed stewards of the property and to consider working with the local community or nonprofit groups to preserve the land permanently.

NHP designations are based on the records of the Natural Heritage Database, which lists documented sightings of endangered and threatened species. Information on particular sites may also be provided by the Nature Conservancy or by the NJDEP Endangered and Nongame Species Program, especially through the latter agency's Landscape Project. There are 410 Natural Heritage Priority Sites in the state of New Jersey. None of them are located in Ewing Township.

The Natural Heritage Database lists several species of threatened and endangered plants and animals, or rare natural communities that have been found in areas of Ewing Township. The recorded sightings for the plants (only) are shown on topographic maps. These indicate where the sightings occurred, although the map information is deliberately nonspecific. The locations with the most rare plants and natural communities are in the northwest and southwest corners of the township. Natural Heritage individual records of animals have been incorporated into the Landscape Project, but plant listings are not a basis for that modeling.

It is important to note that the Natural Heritage Database lists primarily those sightings that have been submitted to it, along with some ecological community data. It incorporates both historically and recently documented sightings. Areas without sightings may never have been surveyed. Conversely, land use in areas with sightings may have changed considerably over recent years, and the species once found there may be gone. Local surveys to update the database, and regular consultation of records before any development is approved are two measures that would help to increase threatened and endangered species' protections. See "Cautions and Restrictions on Natural Heritage Data," located in **Appendix D**.

Table 17: Rare Wildlife Species or Habitat in Ewing Township

Common Name	Scientific Name	Federal Status	State Status	State Rank
clubtail dragonfly	Gomphus septima	NA	NA	S1
common map turtle	Graptemys geographica	NA	Undetermined	S3
Cooper's hawk	Accipiter cooperii	NA	Threatened	SB3, S4N
eastern box turtle	Terrapene carolina	NA	Special Concern	S5B
Fowler's toad	Bufo woodhousii fowleri	NA	Special Concern	S4
shortnose sturgeon	Acipenser brevirostrum	LE	Endangered	S3
wood turtle	Clemmys insculpta	NA	Threatened	S3
Yellow lampmussel	Lampsilis cariosa	NA	Threatened	S1

S1	Critically imperiled in NJ because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres)
S3	Rare in state with 21 to 100 occurrences (plant species in this category have only 21 to 50 occurrences)
S4	Apparently secure in state, with many occurrences
S5	Demonstrably secure in state and essentially ineradicable under present conditions
N	Refers to the nonbreeding population of the element in the state
B	Refers to the breeding population of the element in the state
LE	Taxa formally listed as endangered
NA	Data not available

Source: NJDEP, NJ Natural Heritage Database – see Appendix D for Cautions and Restrictions

Table 18: Rare Plant Species and Natural Communities

Scientific Name	Common Name	Federal Status	NJ Status	State Rank
Vascular Plants				
Agastache nepetoides	yellow giant-hyssop	NA	NA	S2
Crataegus chrysocarpa Var.	fireberry hawthorn	NA	NA	S1
Ellisia nyctelea	aunt lucy	NA	Endangered	S1
Potamogeton vaginatus	sheathed pondweed	NA	NA	SH
S1	Critically imperiled in NJ because of extreme rarity (5 or fewer occurrences or very few remaining individual acres).			
S2	Imperiled in NJ because of rarity (6-20 occurrences).			
S3	Rare in state with 21 to 50 occurrences. Includes elements that are widely distributed but with small populations/acreage, or with restricted distribution but locally abundant.			
SH	Elements of historical occurrence in NJ. Despite some searching of historical occurrences and/or potential habitat, no existent occurrences are known.			
NA	Data not available			

Source: NJDEP, NJ Natural Heritage Database – see Appendix D for Cautions and Restrictions

THE BUILT ENVIRONMENT

DEMOGRAPHICS

The 1990 US Census listed a population of 34,185 residents for Ewing Township. By the 2000 Census it grew to 35,707, an increase of 4.5%. DVRPC forecasts 36,370 residents for Ewing Township by 2005; 37,030 by 2010; and 39,020 by 2025. The number of jobs in Ewing Township, according to DVRPC's adjustment of the 2000 Census count is 28,437. DVRPC's proposed employment forecasts for Ewing for 2005, 2010, 2020 and 2030 are 28,031; 27,619; 27,209; and 25,620 respectively. The township's forecasted employment change from 2000 to 2030 is –2,853 jobs, or a 10% decrease in employment.

TRANSPORTATION

Ewing has always been at the center of good transportation, in comparison to many communities in southern New Jersey. Its transportation, especially commercial transport, has utilized every significant mode; from the days of water travel as the only practical conveyance, to the construction of rail lines (still in operation), to the 20th century's modern highways.

The modern transportation corridors that serve Ewing have also fostered much of its past and current growth. These corridors include Interstate 95, U.S. highway Route 206, and state routes 29 and 31. U.S. highway Route 206 enters Ewing from the southwest and makes its way north, heading slightly east, toward Princeton. Route 31 comes from Trenton, enters from the south, and continues north through the township. Route 29 also comes from Trenton, in the south, and travels north, following the path of the Delaware River. Interstate 95 was built in the 1960s. It comes from Pennsylvania, crosses over the Delaware River, and begins its route through New Jersey in Ewing. Two exits are located in Ewing Township, exits 1 and 2. Another three exits - exits 3, 4, and 5 - are all very near to Ewing's northern border.

County roads within the township include routes 579, 634, 637, 647, 611, 636, and 622. These roads provide access and connections within the township and are remnants of past land uses that connected farming centers of activity. Smaller roads in the township are a mixture of old rural lanes and newer subdivision streets.

In addition to excellent roadways, Ewing Township also benefits from the R3 West Trenton Regional Rail Line. Presently, New Jersey Transit is doing a feasibility study, looking at the potential for passenger service to New York, via the West Trenton line, connecting to the Raritan Valley Line.

TOWNSHIP UTILITIES

Drinking Water

Almost all of Ewing Township receives its drinking water from the Trenton Water Works, which obtains its water from the Delaware River. Two noncommunity wells serve businesses in the township. There may be other private wells located throughout the township, but they were not part of NJDEP's database. See **Map 12** and pages 47-49.

Sewer

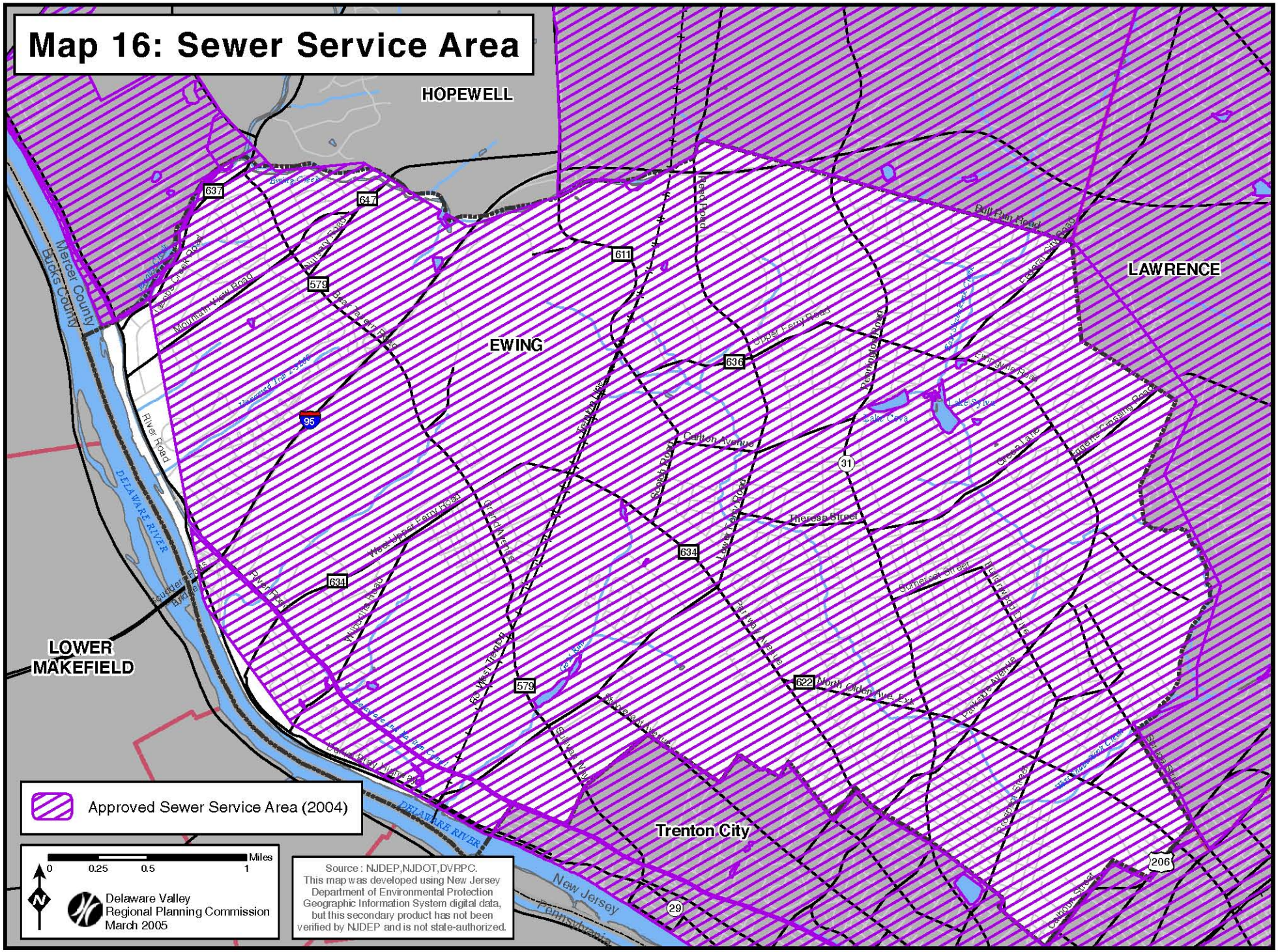
Sewerage service is provided through the Ewing-Lawrence Sewage Authority, which operates a treatment plant, located at 600 Whitehead Road in Lawrenceville, and discharges into the Assunpink Creek. The approved sewer service area is shown on **Map 16**. Township officials suspect malfunctioning septic systems just outside of the sewer service area in neighboring Hopewell Township.

PARKS AND RECREATION

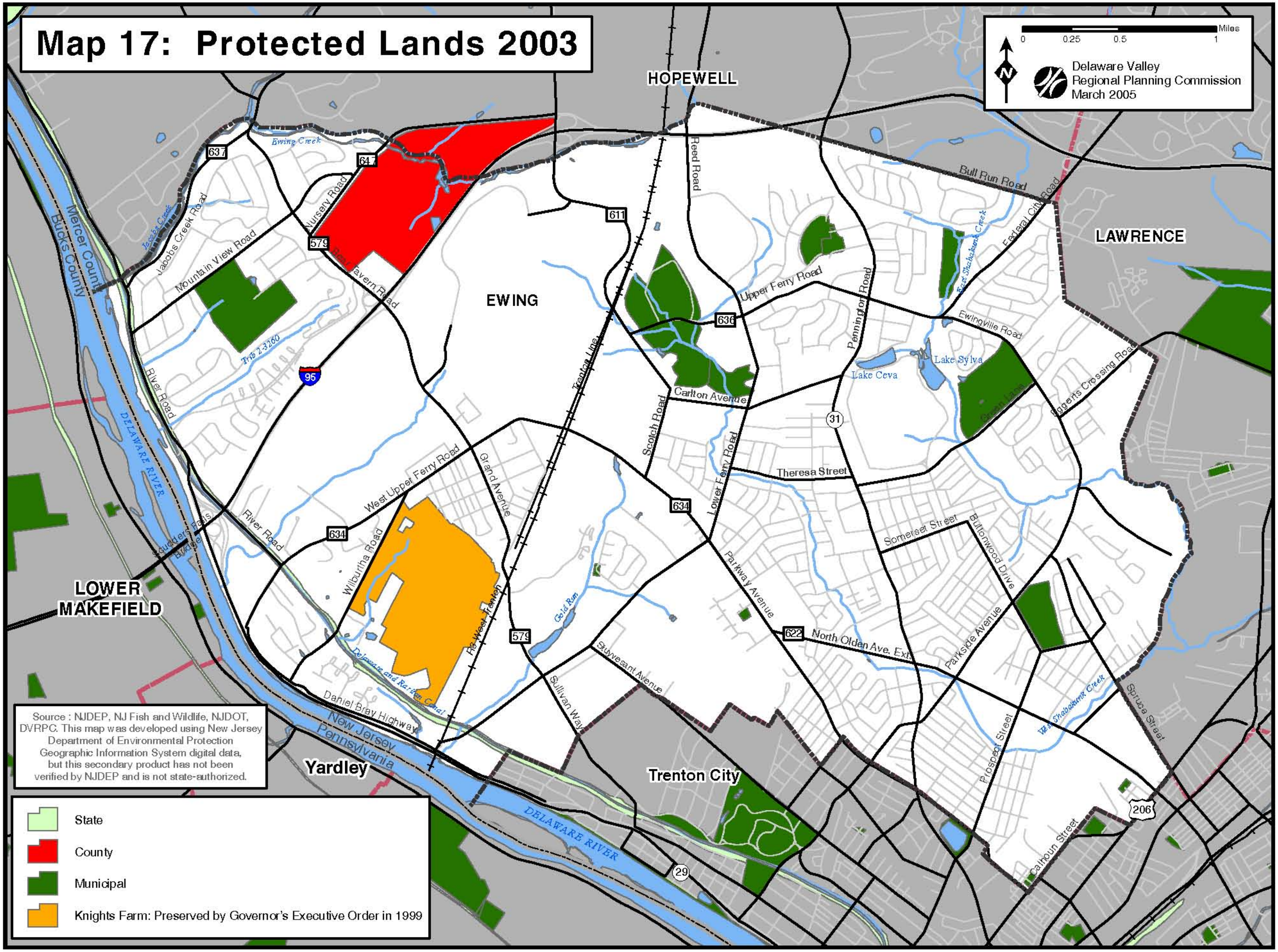
Altogether, there are approximately 631 acres of parkland in Ewing Township. About 355 acres are municipal open space lands reserved as parkland, active recreation fields, natural resource protection and farmland scattered around the township. The state protects 80 acres of land located along the banks of the Delaware and Raritan Canal, and there is one county park, the Mountain View Golf Club, which has 196 acres in Ewing located to the northwest of the Trenton-Mercer County Airport. In addition, approximately 261 acres of farmland known as Knight Farm, owned and operated by the New Jersey Department of Corrections, were preserved by Governor Christine Todd Whitman on October 21, 1999 by Executive Order. See **Map 17**: **Protected Lands 2003**.

There are four main municipal parks in Ewing Township: Moody Park, John S. Watson Park, Banchoff Park, and the Municipal Complex Park. Moody Park is 32 acres in size and located between Parkside Avenue at Buttonwood Drive. John S. Watson Park is located off of Upper Ferry Road, on 66 acres. Banchoff Park is situated on 70 acres, off of Mountain View Road. The Municipal Complex Park is 40 acres and located next to the municipal building, on Upper Ferry Road.

Many of the parks listed above have ball and soccer fields, basketball courts, tennis courts, barbeque facilities, hiking and biking trails, and playground equipment. Two of the parks, Banchoff Park and Municipal Complex Park, are relatively new and were financed with funds from the New Jersey Green Acres Program.


Map 16: Sewer Service Area
HOPEWELL
EWING
LAWRENCE
LOWER MAKEFIELD
Trenton City
Mercer County
Bucks County
DELAWARE RIVER
Approved Sewer Service Area (2004)
Miles
0
0.25
0.5
1
N
Delaware Valley Regional Planning Commission
March 2005
Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Map 17: Protected Lands 2003



Miles
0
0.25
0.5
1
N
Delaware Valley
Regional Planning Commission
March 2005
HOPEWELL
LAWRENCE
EWING
LOWER MAKEFIELD
Yardley
Trenton City
Mercer County
Bucks County
New Jersey
Pennsylvania
DELAWARE RIVER
Ewing Creek
Jacobs Creek
Jacobs Creek Road
Mountain View Road
Nursery Road
Bear Tavern Road
River Road
Trib 2-3260
West Upper Ferry Road
Grand Avenue
Wilburtha Road
Daniel Bray Highway
Delaware and Raritan Canal
Scudders Falls Bridge
Trenton Line
Reed Road
Upper Ferry Road
Pennington Road
Carlton Avenue
Scotch Road
Lower Ferry Road
Theresa Street
Parkway Avenue
North Olden Ave. Ext.
Stuyvesant Avenue
Sullivan Way
Gold Run
Somerset Street
Buttonwood Drive
Parkside Avenue
Prospect Street
Calhoun Street
Spruce Street
West Shabakunk Creek
East Shabakunk Creek
Bull Run Road
Federal City Road
Ewingville Road
Lake Sylva
Lake Ceva
Green Lane
Eggerts Crossing Road
637
647
579
611
636
31
634
622
206
29
95

Source : NJDEP, NJ Fish and Wildlife, NJDOT, DVRPC. This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

- State
- County
- Municipal
- Knights Farm: Preserved by Governor's Executive Order in 1999

The pond at Banchoff Park

Ewing Township has a unique location on two major greenways, the Delaware and Raritan Canal and the Delaware River. The Delaware and Raritan Canal was built between 1830 and 1834 and created the final link in the intercoastal waterway that extended from Massachusetts to Georgia. In 1871 the Pennsylvania Railroad leased the canal, resulting in the decline of coal transport. Due to the success of the railroads, the canal ceased operations in 1932. By 1934 the state of New Jersey took over the canal to use it for water supply. Some portions became filled in to become a part of the state's expanding highway system. By the 1970's, the canal was being heavily used for recreation, and citizen activists promoted the need to save the canal from total destruction. In 1973, the canal and it remaining structures were entered into the National Register of Historic Places, and by 1974, the state established the Delaware and Raritan Canal State Park. In 1992 the park's trail system was designated a National Recreation Trail.

Today the D and R Canal State Park is 70 miles long, including the feeder canal portion, which parallels the Delaware River from above Frenchtown south to Bordentown (passing through Ewing Township), and the main canal portion, which runs from Trenton to New Brunswick. The canal provides canoeing, jogging, hiking, biking, fishing, horseback riding, picnicking and camping opportunities. The path along the main canal portion is part of the East Coast Greenway, an urban equivalent to the Appalachian Trail, and is planned to extend from Maine to Florida. Fish including bass, sunfish, catfish, pickerel and perch occupy the canal's water year-round, and in the spring the canal is stocked with trout. Fishing is allowed along the entire canal. There are two canoe rental sites, in Griggstown and Princeton, and numerous launch sites, with the nearest to Ewing located in Lambertville. In addition, there are four bike rental spots and one campground, Bull's Island, located 7 miles north of Lambertville. The canal park is also an important wildlife corridor. Recent bird surveys revealed 160 species, with 90 thought to nest in the park. Furthermore, the D & R canal is a source of public water, pumping out about 75 million gallons per day.

Ewing is also located on the Delaware River, another major greenway and natural and recreational resource. There are hiking, boating, fishing, canoeing, tubing, birding and biking opportunities along various parts of the Delaware River, as well as scenic vistas from a few access points within Ewing. As a result of clean-ups of the river, shad and other species are increasing in number, bringing more people back to the river for shad festivals and other events.

Delaware and Raritan Canal State Park

HISTORIC RESOURCES

Ewing Township hosts half a dozen places on the National and State Registers of Historic Places, as well as six more sites given a State Historic Preservation Officer Opinion (SHPO Opinion), and numerous other sites of local importance on the township's own Historic Register. See **Table 19: Historic Sites in Ewing Township**.

Protection of historic structures and education about them is primarily run by two organizations in Ewing: the Ewing Township Historic Preservation Commission, a municipal board, and the Ewing Township Historic Preservation Society, a private group. The Ewing Township Historic Preservation Society maintains the Benjamin Temple House, a historic house dating back to colonial times, which also serves as its headquarters. The society displays its permanent collection of artifacts and memorabilia, and hosts temporary exhibits of special themes. The historic building also houses the society's local history and genealogy library, including historic maps, photographs, and letters pertaining to the history of Ewing Township.

The brief township history provided in the beginning of the ERI describes some of what has taken place in the township over the last several hundred years, and **Table 19** lists important historic resources in the township. However, the mere existence of these places, as well as preserving them in their historic context, should not be taken for granted. In fact, many historic structures have either been demolished to make room for newer buildings, have fallen into disrepair due to lack of maintenance and investments, or still stand but have lost their integrity due to inappropriate alterations and/or inappropriate surrounding development. Similarly, many potentially significant archaeological artifacts may never be excavated and interpreted because they have been paved over.

Yet, it is largely the historic structures in their landscape (whether that be an urban historic district, historic industrial complex, or farm structures in their agrarian setting) that provide places with their unique character and identity. Combined with a clean environment, good recreational opportunities, a solid economy and well-designed development, historic preservation efforts are extremely important toward maintaining a township's unique identity, attracting people, boosting community pride, and stimulating interest and investment.

There are various mechanisms to enhance historic preservation from the federal down to the local level. At the federal level, placing sites and districts on the National Register of Historic Places affords them added consideration in the planning for federally assisted projects, and makes properties eligible for certain tax benefits and grant programs. It does not, however, prevent properties from being altered or demolished. Local historic districts, on the other hand, can be created by municipalities to preserve significant historic sites by regulating the erection, alteration, restoration, and demolition of buildings within the historic district. Historical commissions are government bodies that oversee historic preservation planning and decision making in their communities, and the establishment of these commissions is typically the first step in implementing local preservation efforts.

Benjamin Temple House

Hill's Hollow House

Table 19: Historic Sites in Ewing Township

Site Name	Address	Designation
Aeronautical Turbine Laboratory Complex Historic District	Naval Air Warfare Center, Parkway Avenue	SHPO
Anthony Cook Farmhouse	1189 Parkside Avenue	TR
Benjamin Temple House	27 Federal City Road	TR
Burt / Hendrickson / Atchley Farmstead	Pennington Road	SHPO
David Howell House	2 Peck Avenue	TR
Delaware and Raritan Canal Historic District	Entire Canal Bed and 100 feet to either side of center line	NR, SR
Ewingville School	440 Ewingville Road	TR
Fish-Howell House	481 Grand Avenue	TR
Green-Reading House	107 Wilburtha Road	NR, SR
Hill's Hollow	26 Wilburtha Road	TR
Nathanial Lanning House	2051 Pennington Road	TR
NJ State Highway Department Laboratory, Building 18	999 Parkway Avenue	SHPO
Odd Fellows Home	1001 Pennington Avenue	SHPO, COE
Quarry Workman's Houses	Off Wilburtha Road	TR
Reading-Knight Farmhouse	NJ State Hog Farm, Wilburtha Road	TR
Spafford Bergen House	2061 Pennington Road	TR
St. Michael's Cemetary	NJ State Psychiatric Hospital, Sullivan Way	TR
State Police Log Cabin	NJ State Police, Dept. of Law and Public Safety, Trooper Drive	TR
Temple-Ryan Farmhouse	27 Federal City Road	NR, SR
The Scudder-Reeder House	295 West Upper Ferry Road	TR
Tindall-Lanning House	2071 Pennington Road	TR
Traction RR Bridge	Trolley line over the West Branch of the Shabakunk	SHPO
Trenton Bath House	Jewish Community Center, 999 Lower Ferry Road	NR, SR, TR
Trenton Psychiatric Hospital District	7717 Stuyvesant Avenue	SHPO
West Trenton Railroad Station	400 Sullivan Way	NR, SR, TR
William Green House	Trenton State College Campus, Green Lane	NR, SR, TR
Wilmot House	9 Wilburtha Road	TR

SHPO: 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.

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

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

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.

TR: Ewing Township Historic Register

ENVIRONMENTAL ISSUES

KNOWN CONTAMINATED SITES

There are sixty-six known contaminated sites in Ewing Township and an additional six known contaminated sites located very close to Ewing, along its border within the City of Trenton. See ***Table 20: Known Contaminated Sites in Ewing Township & Region*** on the following page. See also **Map 18: Known Contaminated Sites**.

The New Jersey *Known Contaminated Sites List* includes former factory sites, landfills, locations of current or former leaking underground storage tanks, sites where chemicals or wastes were once routinely discharged, and places where accidents have resulted in spills and pollution. Contamination may have affected soil, groundwater, surface water, or a combination of site conditions. The most dangerous sites, from a human health standpoint, are listed as Superfund sites. Superfund sites are eligible for federal cleanup funds. Other sites are handled by state or individual programs, or through private funds.

There was one site identified as a *potential* Superfund site in Ewing Township: Kenny's Cleaners. According to the U.S. Environmental Protection Agency (EPA), a Superfund site is any land in the United States that has been contaminated by hazardous waste and identified by the Environmental Protection Agency as a candidate for cleanup because it poses a risk to human health and/or the environment. Kenny's Cleaners is located at 1680 Pennington Road and was identified for assessment in 1996. According to the Superfund Info System website, there was also a preliminary assessment in 1996, but no subsequent site inspections. The site is not currently listed on the National Priorities List (NPL), meaning that it is not considered a Superfund site, and will not receive Superfund Trust funds for site remediation. The EPA states that the NPL is a list of the worst hazardous waste sites that have been identified by Superfund. Any site on the NPL is eligible for cleanup using Superfund Trust money. This information was retrieved using the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). CERCLIS is the national database and management system EPA uses to track activities at hazardous waste sites considered for cleanup under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund. See ***Table 20: Known Contaminated Sites in Ewing Township & Region***.

In addition to Kenny's Cleaners, there are eight sites with high levels of contamination, either at the C3 level or at the D level. The D level often means the site has been designated a Superfund site, however both of the D level sites in Ewing do not appear in the Superfund database (CERCLIS).

Table 20: Known Contaminated Sites in Ewing Township & Region

Site ID	Name	Address	Town	Status	Status Date	Lead Agency*	Remedial Level**
NJL600045660	Amoco Service Station - Ewing Township	1496 Pennington Road	Ewing Township	Active	3/12/92	BUST	C2
NJL600059067	Ewing Township Board of Education	220 Ewingville Road	Ewing Township	Active	8/30/93	BUST	C2
NJL800046088	Ewing Township Road Department	401 4th Street	Ewing Township	Active	11/23/94	BUST	C2
NJL600146567	Ewing TV	1760 N Olden Avenue	Ewing Township	Pending	3/22/96	BFO-S	C2
NJD986607976	Exxon Service Station - Ewing Township	1500 Pennington Road	Ewing Township	Active	3/24/94	BUST	C2
NJD986596922	Exxon Service Station - West Trenton	53 Grand Avenue & Upper Ferry Road	Ewing Township	Active	2/23/00	BUST	C2
NJL500042585	Fitzpack Incorporated	310 Dryden Avenue	Ewing Township	Active	1/18/95	BFO-IN	B
NJD002353951	General Motors Corporation - Fisher Body Division	1445 Parkway Avenue	Ewing Township	Active	4/21/92	BCM	C3
NJL000069369	Ground Water Contamination	Claflin & St. Paul Avenues	Ewing Township	Active	3/30/94	BSM	NA
NJL000030981	Ground Water Contamination	Harding Street	Ewing Township	Active	2/26/96	BSM	NA
NJL000072793	Ground Water Contamination	Brenwal & Central & Florence Avenues	Ewing Township	Pending	9/24/99	BFO-CA	C3
NJL500014105	H&B Enterprise Corporation	1150 Southard Street	Ewing Township	NFA-A	9/21/93	BFO-IN	B
NJP000776807	Hess Service Station - Ewing Township	1513 Princeton Avenue	Ewing Township	Active	5/9/94	BUST	C2
NJD986601433	Hess Service Station - Ewing Township	1517 North Olden Avenue Exit	Ewing Township	Active	10/21/91	BUST	C2
NJD011788130	Hough Petroleum	340 4th Street	Ewing Township	NFA-A	6/30/00	BUST	C2
NJL000060772	Incarnation Roman Catholic Church	1545 Pennington Road	Ewing Township	NFA-A	9/11/97	BUST	C1
NJL800012734	Jewish Community Center	999 Lower Ferry Road	Ewing Township	Active	10/8/93	BFO-IN	C1
NJD035677939	Kenny's Cleaners	1680 Pennington Road	Ewing Township	Active	9/28/99	BFMCR	C1
NJL800534265	Lost River Golf	1471 Prospect Street	Ewing Township	Active	9/22/99	BFO-S	C1
NJD153781182	Mercer County Airport	300 Scotch Road	Ewing Township	Active	1/24/01	BUST	C2
NJL600199566	Mercer County Public Works	Scotch Road (Mercer County Airport)	Ewing Township	Active	9/8/92	BUST	C2
NJL000058800	Mini mall Ewing Township	1879 N Olden Avenue	Ewing Township	Active	7/24/96	BUST	C2
NJD986605723	Mobil Service Station - Ewing Township	West Upper Ferry Road & Grand Avenue	Ewing Township	Active	3/10/93	BUST	C2
NJD986606788	Mobil Service Station - Ewing Township	Spruce Street & Parkside Avenue	Ewing Township	Active	10/5/89	BUST	C2
NJD986606606	Mobil Service Station - Ewing Township	2085 Pennington Road	Ewing Township	Active	2/8/89	BUST	C2
NJD986585529	Mobil Service Station - Ewing Township	North Olden Avenue & Prospect Street	Ewing Township	Active	8/18/88	BUST	C2
NJD986611234	Mobil Service Station - Ewing Township	Parkway& Olden Avenues	Ewing Township	Active	2/23/90	BUST	C2
NJD982536344	Morris Wheeler &	82 TO 90 Stokes Avenue	Ewing	Active	12/5/89	BFO-S	C1

	Company Incorporated		Township				
NJD986601110	Nassau Chemical Corporation	4 Jane Street	Ewing Township	NFA	3/8/00	BEECRA	D
NJL000056622	National Beer Distributors	100C Lexington Avenue	Ewing Township	Active	12/23/94	BUST	C2
NJ9170022694	Naval Air Warfare Center - Aircraft Division	1440 Parkway Avenue	Ewing Township	Active	2/11/93	BCM	D
NJL600004444	NJ Department of Military & Veterans Affairs	Mercer County Airport	Ewing Township	Pending	4/1/92	BFMCR	C1
NJD981077670	NJ Manufacturers Insurance Company	301 Sullivan Way	Ewing Township	Active	7/1/94	BFO-S	C2
NJD980762157	NJ State Police Headquarters	River Road	Ewing Township	Active	3/16/92	BFO-S	C1
NJL800396616	NJDOT Fernwood	950 Parkway Avenue	Ewing Township	Active	3/5/99	BFO-S	C1
NJD980769764	NJDOT Fernwood Building 2	951 Parkway Avenue	Ewing Township	Active	4/8/98	BFO-S	C2
NJL000053488	Pelican Pools	1757 North Olden Avenue	Ewing Township	Active	8/15/94	BFO-S	C2
NJD054740378	Petroleum Products Company	300 Stokes Avenue	Ewing Township	NFA-E	6/6/00	BEECRA	C3
NJL800593881	Pierce Roberts Rubber Company	1450 Heath Avenue	Ewing Township	Active	3/10/00	BFO-S	C1
NJL600134340	Private Residence	Southard & Hammitt Streets	Ewing Township	Active	10/2/00	BUST	C2
NJL800011470	Private Residence	250 Claflin Avenue	Ewing Township	Pending	1/9/01	BFO-CA	C1
NJL800011454	Private Residence	18 St. Paul Avenue	Ewing Township	Pending	8/25/93	BFO-CA	C1
NJL800011488	Private Residence	171 Upland Avenue	Ewing Township	Pending	5/13/94	BFO-CA	C1
NJL800011496	Private Residence	175 Upland Avenue	Ewing Township	Pending	8/25/93	BFO-CA	C1
NJL800057705	Private Residence	1716 Olden Avenue North	Ewing Township	Active	1/4/01	BUST	C2
NJL800470874	Private Residence	31 Main Boulavard	Ewing Township	Active	8/25/93	BFO-S	C1
NJL800538779	Private Residence	2 Beth Ann Way	Ewing Township	Active	2/8/00	BFO-S	C1
NJL800554727	Private Residence	9 Colleen Circle	Ewing Township	Active	7/13/00	BFO-S	C2
NJL800582728	Private Residence	24 Colleen Circle	Ewing Township	Active	8/25/93	BFO-S	C1
NJL800606246	Private Residence	30 Malaga Drive	Ewing Township	Active	1/8/01	BFO-S	C2
NJL800609729	Private Residence	18 Colleen Circle	Ewing Township	Active	3/5/99	BFO-S	C1
NJL800611451	Private Residence	15 Hilltop Road	Ewing Township	Active	2/13/01	BFO-S	C1
NJL800618761	Private Residence	8 David Drive	Ewing Township	Active	4/5/00	BFO-S	C1
NJL800507311	Private Residence	1200 Southard Street	Ewing Township	Active	12/29/99	BFO-S	NA
NJD002502466	Rhein Chemie Corporation	1008 Whitehead Road Exit	Ewing Township	NFA-A	2/20/91	BUST	C2
NJD002325991	Roller Bearing Company of America	400 Sullivan Way	Ewing Township	Active	11/13/91	BEECRA	D

NJD132387457	Ryder Truck Rental Incorporated	230 4th Street	Ewing Township	Active	3/1/94	BUST	C2
NJL800449845	Scozzari & Sons Inc.	1441 Heath Avenue	Ewing Township	Active	12/16/98	BFO-S	C1
NJL600186894	Seven Eleven Store	Route 31 & North Olden Avenue	Ewing Township	Active	11/1/91	BUST	C2
NJL800528085	Sierra Office Park	380 Scotch Road, Building 2	Ewing Township	NFA-A	12/29/00	BUST	NA
NJL000061200	Solomons Service Center	804 River Road	Ewing Township	Pending	7/1/94	BFMCR	C1
NJD000701243	Sunoco Service Station - Ewing Township	2098 Pennington RD	Ewing Township	Active	8/17/89	BUST	C2
NJL000052977	Texaco Service Station - Ewing Township	2095 Pennington Road	Ewing Township	Active	8/21/89	BUST	C2
NJD986579159	Trenton Printing Company	1201 Southard Street	Ewing Township	NFA	2/3/95	BEECRA	C3
NJD030315980	Trenton State College	Route 31 (Pennington Road)	Ewing Township	Active	6/3/94	BUST	C2
NJL000075887	Trentypo Incorporated	304 Stokes Avenue	Ewing Township	Pending	3/16/00	BFO-CA	C2
NJL600246987	Carrols Service Center	Grand & Railroad Avenue	Trenton City	Active	1/8/98	BUST	C2
NJL600145338	Faigle Properties	328 Stokes Avenue	Trenton City	Active	10/5/91	BUST	C2
NJL600003438	Grant Company Incorporated	45 Lexington Avenue	Trenton City	Active	1/6/95	BUST	C2
NJL600204507	Nexus Properties Incorporated	1621 N Olden Avenue	Trenton City	Active	6/1/00	BFO-S	C1
NJL000011205	NJ DOT Fernwood Garage	1035 Parkway Avenue	Trenton City	Active	3/8/95	BCM	C3
NJL600013106	Waters & Bugbee Incorporated	314 Dickenson Street	Trenton City	NFA-A	3/16/00	BUST	C2

Source: NJDEP

A case manager is assigned to every *Known Contaminated Site* case and can provide further information on each site. The Case Manager can be reached by contacting NJDEP's Site Remediation Program's lead agency, which is listed in the table for each site. Go to http://www.state.nj.us/dep/srp/kcs-nj/Mercer/index.html for contact information or call 1-800-253-5647.

Naval Air Warfare Center

Status

Code	Meaning
NFA–A	No further action for a partial area of a site
NFA	No further action
Pending	A site identified as pending assignment to the Division of Publicly Funded Site Remediation will eventually be scheduled for remediation with public funds, by NJDEP, based on the threat to human health and the environment posed by the site in relation to other sites awaiting publicly funded action

Lead Agencies

Initials	Full Name
BCM	Bureau of Case Management
BEECRA	Bureau of Environmental Evaluation, Cleanup and Responsibility Assessment
BFCM	Bureau of Federal Case Management
BFO	Bureau of Field Operations
BFO–CA	Bur. of Field Operations – Case Assignment Section
BFO–S	Bur. of Field Operations – Southern
BFO-IN	Bur. of Field Operations – Initial Notice
BFMCR	Bur. of Fund Management, Compliance and Recovery
BUST	Bureau of Underground Storage Tanks

Explanation of Remedial Levels

Remedial Level	Explanation of Site Complexity
B	A single-phase remedial action in emergency response; simple removal activities of contaminants; usually no impact to soil or groundwater.
C1	A remedial action with simple sites; one or two contaminants localized to soil and the immediate spill or discharge area.
C2	A remedial action with more complicated contaminant discharges; multiple site spills and discharges; more than one contaminant, with both soil and groundwater impacted or threatened.
C3	A multiphase remedial action with high complexity and threatening sites. Multiple contaminants some at high concentrations with unknown sources continuing to impact soils, groundwater, and possibly surface waters and potable water resources. Dangerous for direct contact with contaminated soils.
D	Same conditions as C3 except that D levels are also usually designated federal "Superfund Sites."
ND	Not designated

Groundwater Contamination

Seventeen contaminated sites in Ewing also experience groundwater contamination. These sites are further restricted by a *Classification Exception Area (CEA)* or a *Currently Known Extent (CKE)* area designation. A CEA can be established for a contaminated site's aquifer if state drinking water quality standards are not or will not be met due to: (1) natural groundwater quality, (2) discharges from a NJPDES permitted site, or (3) pollution caused by human activity, sometimes associated with a pollution remedy conducted under a NJDEP Administrative Consent Order, within a contaminated site. A CEA designation suspends aquifer use in the affected area until state drinking water standards are met. It is not a groundwater remedy; it is an institutional control established in conjunction with an approved remedy. NJDEP may revise or establish a CEA at any time to more accurately reflect the groundwater conditions using revised

data. If possible, NJDEP or the entity responsible for the remediation or monitoring of the site (known as the Responsible Party) estimates the duration the CEA will remain in effect. Often times, a responsible party applying for a NJPDES permit or submitting a remediation plan for a contaminated site will also submit a CEA designation application, called a CEA Fact Sheet, detailing the aquifer contamination. Four sites in Ewing Township are estimated to take 18 to 30 years to return to acceptable drinking water standards.

A CKE Area is a contaminated area within a drinking water well. Unfortunately, less information is available about CKE Areas. There is one designated area in Ewing Township – in Hillwood Lakes.

See ***Table 21: Sites with CEA and CKE Area Designations***. Information about the dangers of different types of pollutants found in aquifers or wells can be found at the Environmental Defense Scorecard website: www.scorecard.org.

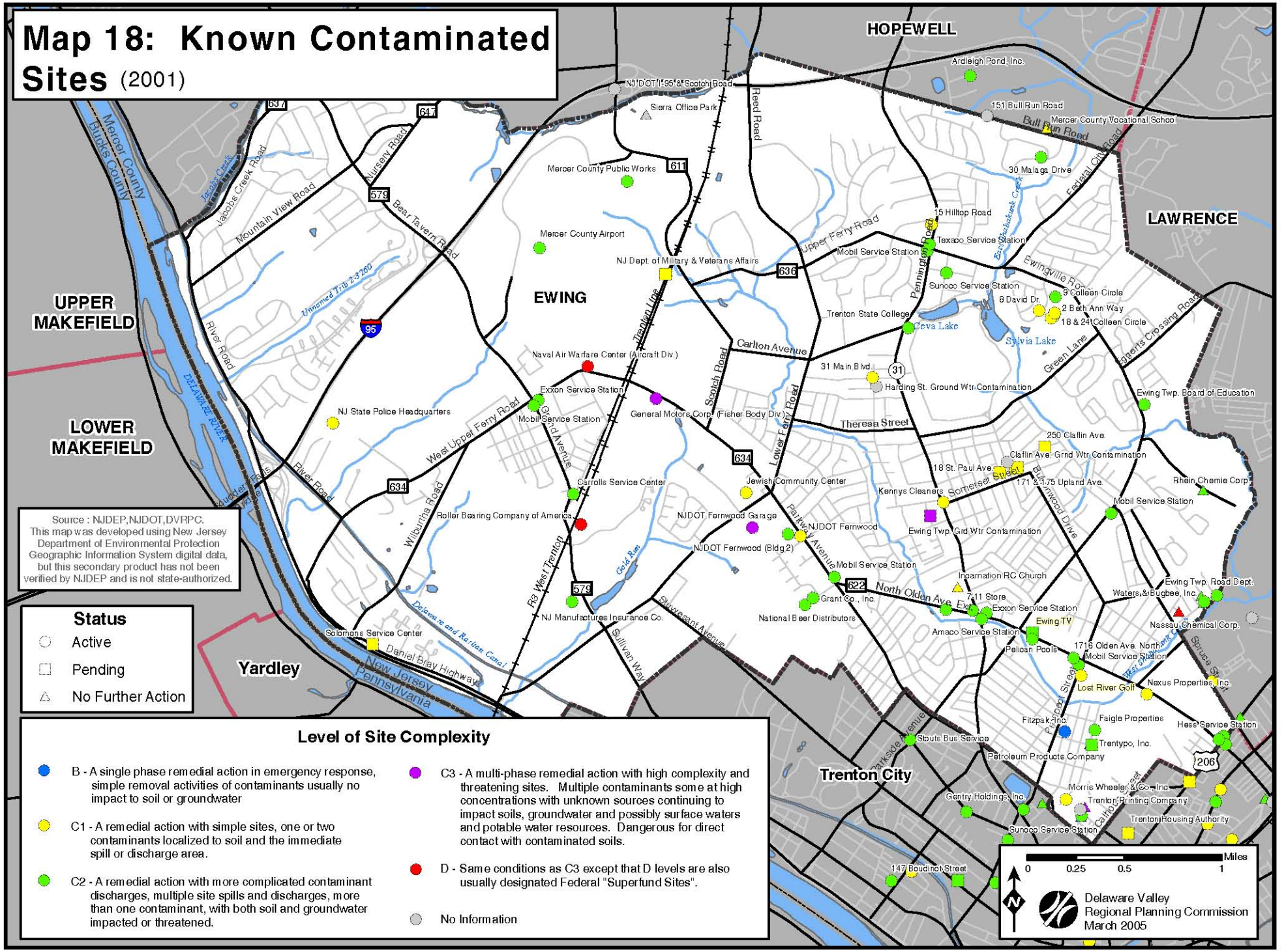
Table 21: Sites with CEA and CKE Area Designations

Site ID	Name	Date CEA approved	Duration of CEA (years)	Area of CEA (square feet)	Type of Contaminants	Perimeter of CEA Boundary (feet)
NJL000058800	Partricelli Mini Mall	6/19/97	Indeterminant	1,285	Benzene	130
NJD986596922	Exxon Service Station #3-6625	7/23/97	Indeterminant	10,000	Benzene, Toluene, Xylenes	548
NJL000060772	Incarnation Church/School	9/11/97	Indeterminant	185,747	(none listed)	1,752
NJD153781182	Mercer County Airport	11/6/97	5	47,040	Benzene, Methyl Tertiary Butyl Ether, Tentatively Identified Compounds (TICs)	879
NJL600045660	Amoco Service Station	11/13/97	Indeterminant	17,195	Benzene, Methyl Tertiary Butyl Ether, t-Butyl Alcohol, Lead (Pb)	546
NJD986607976	Exxon Service Station #3-9788	11/28/97	Indeterminant	46,262	Benzene, Methyl Tertiary Butyl Ether, t-Butyl Alcohol, Lead (Pb)	884
Not available	Power House Facilities	2/4/98	Indeterminant	70,079	(none listed)	1,014
NJL000056622	National Beer Distributors	6/20/01	3	65,581	Tentatively Identified Compounds (TICs)	1,104
NJL800046088	Ewing Twp Road Department	2/24/99	20	35,513	Benzene, Methyl Tertiary Butyl Ether	718
NJL600134340	Private Property	3/6/00	17.8	578,585	Benzene	2,870
NJD011788130	Hough Petroleum	2/1/00	18	45,166	Benzene, Methyl Tertiary Butyl Ether, t-Butyl Alcohol, Tentatively Identified Compounds (TICs)	903
NJP000776807	Hess Service Station #30239	11/12/97	Indeterminant	30,228	Benzene, Methyl Tertiary Butyl Ether, t-Butyl Alcohol, naphthalne, Lead (Pb), Ethylbenzene	677
NJD980763452	Stoudt's Bus Service	2/25/99	9	28,383	Benzene, t-Butyl Alcohol,	741

Site ID	Name	Date CEA approved	Duration of CEA (years)	Area of CEA (square feet)	Type of Contaminants	Perimeter of CEA Boundary (feet)
NJ9170022694	Naval Air Warfare	6/6/00	30	1,675,930	Benzene, Vinyl Chloride, Lead (Pb), Arsenic, Chromium, Cadmium, Mercury, Volatile Organic Contaminants, Aluminum, barium, Iron, Manganese, Nickel	8,506
NJD153781182	Johnson & Johnson Flight Source	12/5/97	7	9,375	Benzene, Methyl Tertiary Butyl Ether, Bis(2-ethylhexyl)phthalate	466
NJL600013106	Wates & Bugbee, Inc	3/16/00	8	6,471	Benzene, Methyl Tertiary Butyl Ether, Xylenes	296
Site ID	**Name**	**Date CKE was approved**	**Duration of CKE (years)**	**Area of CKE (square feet)**	**Type of Contaminants**	**Perimeter of CKE Boundary (feet)**
Unknown	Hillwood Lakes	(Unknown)	(not listed)	3,220,129	(none listed)	7,635

Source: NJDEP

Map 18: Known Contaminated Sites (2001)



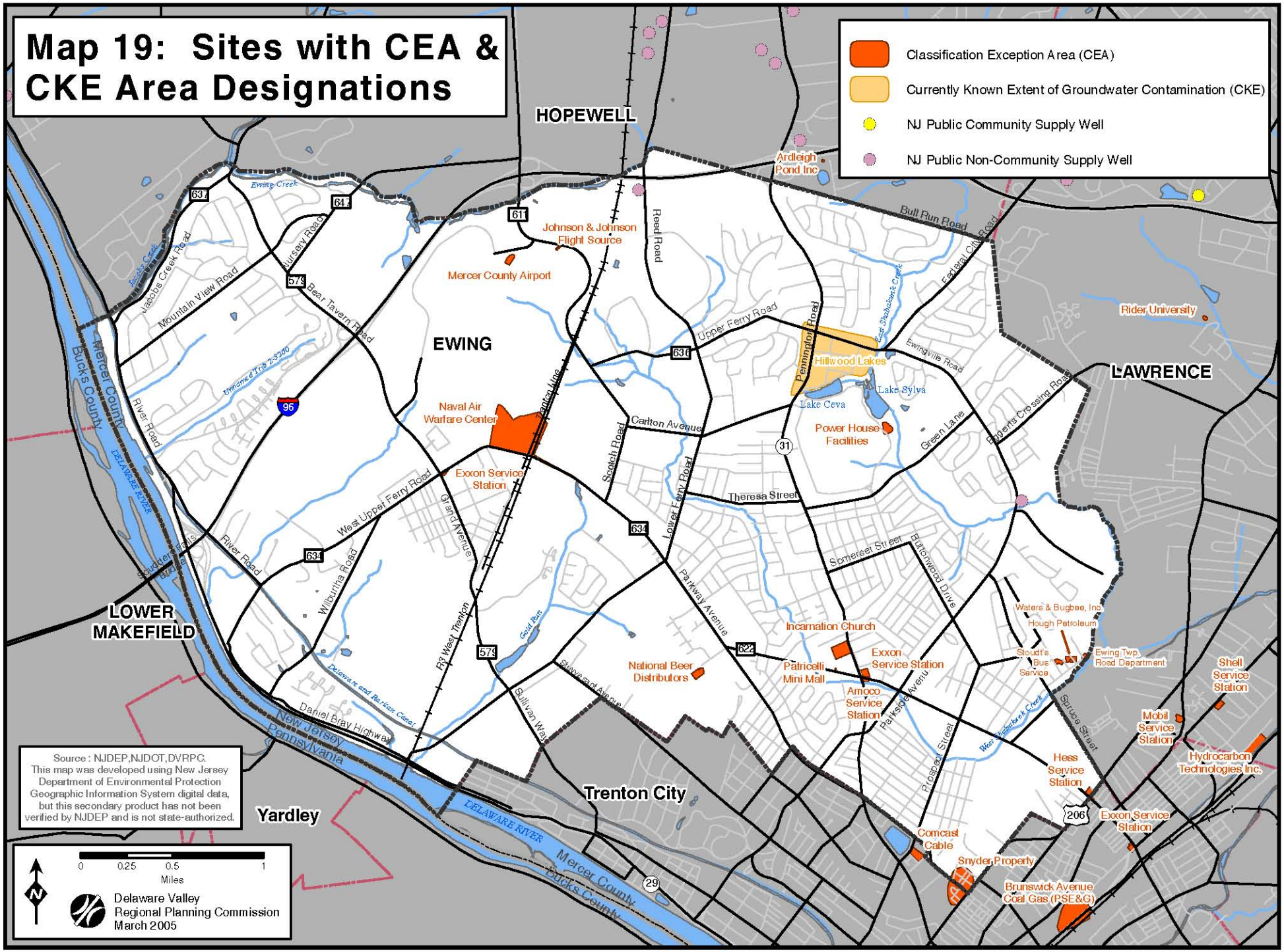
Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Status

- Active
- Pending
- No Further Action

Level of Site Complexity

- B - A single phase remedial action in emergency response, simple removal activities of contaminants usually no impact to soil or groundwater
- C1 - A remedial action with simple sites, one or two contaminants localized to soil and the immediate spill or discharge area.
- C2 - A remedial action with more complicated contaminant discharges, multiple site spills and discharges, more than one contaminant, with both soil and groundwater impacted or threatened.
- C3 - A multi-phase remedial action with high complexity and threatening sites. Multiple contaminants some at high concentrations with unknown sources continuing to impact soils, groundwater and possibly surface waters and potable water resources. Dangerous for direct contact with contaminated soils.
- D - Same conditions as C3 except that D levels are also usually designated Federal "Superfund Sites".
- No Information


Map 19: Sites with CEA & CKE Area Designations
Classification Exception Area (CEA)
Currently Known Extent of Groundwater Contamination (CKE)
NJ Public Community Supply Well
NJ Public Non-Community Supply Well
HOPEWELL
EWING
LAWRENCE
LOWER MAKEFIELD
Trenton City
Yardley
Ardleigh Pond Inc
Johnson & Johnson Flight Source
Mercer County Airport
Naval Air Warfare Center
Exxon Service Station
Hillwood Lakes
Lake Sylva
Lake Ceva
Power House Facilities
Rider University
Incarnation Church
National Beer Distributors
Patricelli Mini Mall
Exxon Service Station
Amoco Service Station
Waters & Bugbee, Inc
Hough Petroleum
Stoudt's Bus Service
Ewing Twp. Road Department
Shell Service Station
Mobil Service Station
Hydrocarbon Technologies, Inc.
Hess Service Station
Exxon Service Station
Comcast Cable
Snyder Property
Brunswick Avenue Coal Gas (PSE&G)
Bull Run Road
Federal City Road
Upper Ferry Road
Pennington Road
Ewingville Road
Reed Road
Nursery Road
Bear Tavern Road
Jacobs Creek Road
Mountain View Road
River Road
Carlton Avenue
Scotch Road
Lower Ferry Road
Green Lane
Eggerts Crossing Road
Theresa Street
Somerset Street
Buttonwood Drive
Parkway Avenue
Parkside Avenue
Prospect Street
Spruce Street
West Upper Ferry Road
Grand Avenue
Wilburtha Road
Daniel Bray Highway
Sullivan Way
Silvester Avenue
Gold Run
Ewing Creek
Jacobs Creek
Unnamed Trib 2-32940
West Shabbakunk Creek
Delaware and Raritan Canal
Delaware River
New Jersey
Pennsylvania
Bucks County
Mercer County
Source : NJDEP,NJDOT,DVRPC.
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.
0 0.25 0.5 1
Miles
Delaware Valley Regional Planning Commission
March 2005

TRENTON MERCER AIRPORT

The Trenton Mercer Airport is owned and operated by Mercer County, New Jersey. It is located in Ewing Township, near the border with Hopewell Township, and between Interstate 95 and the CSX rail line. The facility is composed of two main runways, a control tower, a two-gate terminal, and various corporate storage and maintenance hangars. According to the county, the existing 1970s terminal is outdated, and enhancements are needed to meet current and future travel demands. Mercer County would like to upgrade the facility by constructing a new, two-gate terminal, but not expand its capacity.

In 1997, the county hired DMJM + Harris, Inc. to conduct a preliminary study and present airport expansion concepts. The study concluded that it would be more cost effective to construct a new airport terminal, rather than renovate the existing terminal. In 1998, two alternatives were considered. The first alternative involved construction of a two-gate, 44,000-square-foot facility that could meet existing and future needs. The second alternative involved construction of a four-gate, 64,000-square-foot terminal that could accommodate a low-fare/high-frequency commercial air carrier. In both alternatives, the original terminal would remain and be used for airport-related activities.

The Federal Aviation Administration (FAA) reviewed the expansion/upgrade alternatives and decided a full environmental assessment was necessary. The final environmental assessment was published in November of 2002. A copy of the report can be found on the Mercer County website: www.mercercounty.org.

The environmental assessment focused on the 44,000-square-foot alternative and reviewed possible environmental and socioeconomic impacts of such a scenario. A number of areas of concern were evaluated: noise levels, land use and zoning impacts, social impacts, environmental justice concerns, air and water quality standards, possible disruption to biotic communities, historic or cultural resources, endangered or threatened species, wetland disturbance, solid waste concerns, construction impacts, and consistency with federal, state and local master plans.

According to the report, noise levels would be within acceptable limits; there would be no land use or zoning revisions needed; and the construction of a new airport terminal would not "induce growth and development in the surrounding airport environs." Low income or minority populations would not be displaced, and increases in air emissions would not be worse than what is considered acceptable.

Biotic communities would be affected. According to the assessment, 33.95 acres of currently vegetated areas would be impacted. The impacted areas would include 28 acres of maintained lawn, 4.33 acres of scrub-shrub, 1.55 acres of mixed upland hardwood forest, and 0.07 of wetlands. There would be an increased amount of storm water runoff. However, to mitigate the effects of this runoff, a storm water detention facility would be constructed to hold the runoff and release it at a volume and rate that would not exceed pre-expansion levels.

At the time of this report, there were no approved plans for the Trenton Mercer Airport. There continues to be a significant amount of controversy over any airport modifications. For

resources regarding the Trenton Mercer Airport, please refer to the Trenton Mercer Airport section of the Works Cited section.

Trenton Mercer Airport Terminal

Source: Trenton Mercer Airport website <http://www.mercercounty.org/airport/index.htm>

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- www.state.nj.us/dep/srp/kcs–nj/mercer/– To check the Known Contaminated Site List pertaining to the township for periodic updates.

- www.state.nj.us/dep/srp/contacts – To reach the case manager for a Known Contaminated Site.
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GLOSSARY OF ACRONYMS

AMNET	Ambient Biomonitoring Network
ASWM	Ambient Surface Water Monitoring Network
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CRP	Conservation Reserve Program
DVRPC	Delaware Valley Regional Planning Commission
ELSA	Ewing-Lawrence Sewage Authority
EPA	Environmental Protection Agency (United States)
EQIP	Environmental Quality Incentive Program
ERI	Environmental Resource Inventory
FEMA	Federal Emergency Management Agency
FSA	Farm Service Agency
HUC	Hydrologic Unit Code
LOI	Letter of Interpretation
NHP	National Heritage Priority
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NJPDES	New Jersey Pollution Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resource Conservation Service
NRI	Natural Resource Inventory
OPRA	Open Public Records Act
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WMA	Watershed Management Area

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CONTACTS AND RESOURCES

Regional and State Affiliated Offices & Organizations

Delaware River Basin Commission

P.O. Box 7360
West Trenton, NJ 08628-0360
609/883-9500
www.nj.gov/drbc/edweb/edweb.htm

The DRBC is an inter-governmental organization focused on managing the natural resources of the Delaware River, the longest un-dammed river east of the Mississippi, and its tributaries.

Delaware Valley Regional Planning Commission (DVRPC)

111 S. Independence Mall East
Philadelphia, PA 19106
215/592-1800
www.dvrpc.org

DVRPC is an interstate governmental organization, serving nine counties in the New Jersey/Pennsylvania area. DVRPC works to foster regional cooperation between city, county, and state governments and focuses on transportation, land use, environmental and economic development issues. DVRPC also provides services and advice to member governments through planning.

New Jersey Watershed Ambassadors Program

AmeriCorps and NJ Department of Environmental Protection sponsor the Watershed Ambassadors Program, employing individuals committed to environmental and watershed education. There are 20 ambassadors for the 20 Watershed Management Areas (WMAs) in New Jersey. Ambassadors do school presentations on various watershed subjects, bring students out to local water-bodies, and organize community members into River Assessment Teams (RATs) and Biological Assessment Teams (BATs). Ewing Township falls in to WMA 11 – Central Delaware Tributaries. Read more about the Watershed Ambassadors Program at www.state.nj.us/dep/watershedmgt/. Following is the contact information for the Ambassadors serving Ewing Township and Mercer County:

WMA 11 Central Delaware
Valerie Benesh
C/o the Delaware River Basin Commission
Valerie.benesh@drbc.state.nj.us
609-883-9500 ext. 246

New Jersey Department of Environmental Protection:

- To report environmental incidents, abuses, and complaints, call 1-877-WARNDEP.
- For information on water quality, visit the **Division of Water Quality** at www.state.nj.us/dep/dwq or call 609/633-1208.
- For information on the **Private Well Testing Act**, visit www.state.nj.us/dep/pwta or call 1-866/4PW-TEST.
- For information on Certified Water Testing Laboratories in New Jersey, visit www.state.nj.us/dep/dwq/labcert.htm
- **Division of Fish & Wildlife:** www.state.nj.us/dep/fgw/
- **New Jersey Geological Survey:** Information on NJ geology, aquifers, groundwater, and wells. www.state.nj.us/dep/njgs.
- **Office of Natural Lands Management.** Information on state management and planning programs. http://www.state.nj.us/dep/parksandforests/natural/
- **Green Acres Program.** Created in 1961, this program works in concert with local governments and nonprofits to protect, preserve, and enhance New Jersey's natural environment and its historic, scenic, and recreational resources for public use and enjoyment. Through voter referendum, the state has authorized tens of millions of funding for preservation efforts. http://www.state.nj.us/dep/greenacres/

New Jersey Environmental Infrastructure Trust

Dirk Hofman, Executive Director
P.O. Box 440
Trenton, NJ 08625
609/219-8600

The mission of the New Jersey Environmental Infrastructure Trust is to assist the people of New Jersey in achieving a cleaner and healthier

environment by providing low-cost financing for the construction of environmental infrastructure projects that enhance and protect ground and surface water resources, ensure the safety of drinking water supplies, and make possible responsible and sustainable economic development.

New Jersey's Landscape Project

New Jersey Division of Fish and Wildlife -The Endangered and Nongame Species Program
PO Box 400
Trenton, NJ 08625-0400
609-292-9400
http://www.state.nj.us/dep/fgw/ensp/landscape/

The Landscape Project, initiated in 1994, is a proactive, ecosystem-level approach to long-term protection of imperiled species and their habitat in New Jersey. Its goal is to protect New Jersey's biological diversity by maintaining and enhancing imperiled wildlife populations within healthy, functioning ecosystems.

New Jersey's Vernal Pools

Grant F. Walton Center for Remote Sensing & Spatial Analysis
Natural Resources & Environmental Sciences Building
Cook College, Rutgers University
14 College Farm Road
New Brunswick, NJ, USA, 08901-8551
732/932-1582
http://www.crssa.rutgers.edu/projects/biodiv/

The number of healthy ecologically intact vernal pools has declined significantly over the past several decades in New Jersey as a result of development in rural areas. The loss of this critical habitat has consequently put the species that depend on vernal pools for breeding habitat at risk. To stave off the destruction of vernal pools, NJDEP recently adopted regulations that afford them protection under the State Freshwater Wetlands Protection Act. NJDEP and ENSP need volunteers to survey vernal pools to protect imperiled species and their habitat. To learn more about the vernal pools in your area, visit Rutgers University's CRSSA website, which assisted NJDEP in identifying vernal pools throughout the state.

County Offices

Mercer County 4-H

Rutgers Cooperative Extension of Mercer County
930 Spruce Street
Trenton, NJ 08648-4584
609/989-6833
www.mgofmc.org/rutgers.html

An informal education program for school-age boys and girls, 4-H is the Youth Development Program of Rutgers Cooperative Extension of Gloucester County. Programs and activities are designed to provide youth with life skills such as public speaking, leadership and citizenship. The "School Enrichment program" offers free classroom presentations for grades K – 5 on some environmental topics. There are also 4–H curricular resources that can be found at www.n4hccs.org.

Mercer County Park Commission

http://www.mercercounty.org/parks/index.htm

The Mercer County Park Commission began consolidating public land and acquiring more land in the 1970s. Today, the county manages over 4,000 acres of public facilities. County facilities include four public golf courses, ice skating center, six indoor tennis courts, 26 outdoor tennis courts, the Howell Living History Farm (in Hopewell Township), the Mercer County Equestrian Center (in Hopewell Township), Waterfront Park, and several other parks and picnic areas.

Mercer County Planning Division,

McDade Administration Building
640 South Broad Street
PO Box 8068
Trenton, NJ 08650-0068
609/989-645
http://www.mercercounty.org/planning/index.htm

The Planning Division creates the County Master Plan, does transportation and environmental planning, and serves as the representative agency and coordinator for regional and state planning projects. It also does subdivision and site plan reviews, serves as a data management resource center, and provides mapping services and maps to other agencies and to municipalities.

Mercer County Soil Conservation District

William F. Brash, Jr.
District Director
508 Hughes Drive
Hamilton Square, NJ 08690
301 Hollydell Drive, Sewell, NJ 08080
609/598-9603
http://mercerscd.org/

Soil Conservation Districts are special-purpose political subdivisions of the New Jersey Department of Agriculture, and are charged with implementing natural resource conservation and assistance programs. The Mercer County Soil Conservation District provides conservation education, watershed planning, technical assistance, and regulatory enforcement. The district provides educational opportunities to K-12 students through classroom demonstrations, and participates in fairs and festivals.

Rutgers Cooperative Extension of Mercer County

930 Spruce Street
Trenton, NJ 08648-4584
609/989-6833
http://www.mgofmc.org/rutgers.html

Rutgers University, working with County agencies, offers research-based information and advice to improve people's daily lives in the areas of agriculture and resource management, family and community health, programs for youth (4-H), and home horticulture assistance. The Agricultural Extension Agent and the Master Gardeners program provide direct aid on gardening, pest problems, and other matters.

Federal Resources

USDA NRCS Service Center Office

Janice Reid, District Conservationist
Freehold Service Center
Monmouth Agriculture Building
4000 Kozloski Road, Suite D
Freehold, NJ 07728
732/462-0075
http://www.nj.nrcs.usda.gov/

The Natural Resources Conservation Service (NRCS), a division with the U.S. Department of Agriculture, provides technical assistance to private landowners in the conservation and management of their soil, water, and other natural resources. NRCS administers the Environmental Quality Incentive Program (EQIP), a voluntary program that encourages the "due care" management of agricultural lands, which involves the regulated use of fertilizer and pesticide applications to farmland. EQIP funds up to 75 percent of the costs of eligible conservation practices.

Township Resources

Ewing Township Municipal Offices

2 Jake Garzio Drive
Ewing, NJ 08626
609/883-2900
http://www.ewingtwp.net/

Ewing Township Historical Preservation Society

Judith Peoples, President
Benjamin Temple House
Ewing, New Jersey
609/530-1220
609/883-2455
http://www.ethps.org/

NonProfit Organizations and Institutions

Association of New Jersey Environmental Commissions

PO Box 157
Mendham, NJ 07945
971-539-7547
http://www.anjec.org/

ANJEC is a statewide nonprofit organization that assists the efforts of environmental commission, local officials, interested citizens, private organizations, and government agencies. ANJEC supports the protection of a community's natural resources through smart growth and coordination with the State Plan, open space preservation, water resource protection, and stewardship of urban environments.

Delaware Riverkeeper Network

P.O. Box 326
Washington Crossing, PA 18977
215/369-1181
www.delawareriverkeeper.org

The Riverkeeper is a nonprofit, membership organization founded in 1988 to strengthen citizen protection of the Delaware River and its tributary watersheds. The organization works throughout the entire 13,000-square-mile watershed area, which

includes portions of NY, NJ, PA, and DE. Programs include an advocacy program, restoration projects, volunteer-based monitoring programs, pollution hotlines, and enforcement task force. Call 1-800-8-DELAWARE.

The College of New Jersey

Department of Biology
Biology Building P.O. Box 7718
2000 Pennington Rd.
Ewing, NJ 08628-0718
Phone: (609) 771-2371 Fax: (609) 637-5118
http://www.tcnj.edu/%7Ebiology/

A leading public institution, The College of New Jersey (TCNJ) combines liberal education with professional preparation. TCNJ provides a collaborative, learning-centered environment in which highly qualified and diverse faculty, staff, and students integrate teaching, research, scholarship, creative activity, and community service. Through intellectual, social, and cultural contributions, TCNJ enriches the lives of those in the campus community and surrounding region.

Richard Stockton College of New Jersey

Environmental Studies and Geology Program Coordinator
PO Box 195
Pomona, NJ 08240-0195
Phone: (609) 652-4546
http://talon.stockton.edu/eyos/page.cfm?siteID=14&pageID=83&program=ENVL

The Richard Stockton College of New Jersey and its Environmental Studies program is known for embracing southern New Jersey's unique ecology and its extraordinary citizens and leaders. Richard Stockton College funds large, long-term research projects in the Pinelands area and facilitates short informational programs and academic courses for citizens regarding their local ecosystem.

Delaware and Raritan Greenway Land Trust

1327 Canal Road
Princeton, NJ 08540
609/924-4646
www.drgreenway.org

The D&R Greenway Land Trust is central New Jersey's nonprofit land preservation organization, founded in 1989 through the collaboration of four active organizations: Stony Brook-Millstone Watershed Association, Friends of Princeton Open Space, Regional Planning Partnership, and the Delaware & Raritan Canal Commission. In recent years, land preservation work expanded beyond the Delaware & Raritan Canal, throughout a 1,500-square-mile area including Delaware, Raritan, and Millstone watersheds (all of Mercer County and parts of Hunterdon, Somerset, Middlesex, Burlington, and Monmouth counties). The Land Trust's main goal is to safeguard the water quality, environment and livability of our region by establishing greenways surrounding stream corridors, headwaters, water recharge areas, and significant ecosystems.

Assunpink Creek Watershed Association

45 Ewingville Rd
Ewing, NJ 08638-2713
http://www.assunpinkcreekwa.org/

The Assunpink Creek Watershed Association is a grassroots organization of concerned citizens committed to the preservation of natural resources in the Assunpink watershed. It is an active organization that uses citizen volunteers and community organizing to address technical issues such as low stream flow, flooding, development and increased stormwater runoff, groundwater resources, and restoration of stream corridors. The association identifies land preservation as a significant action that would preserve natural resources as well as restore ecological health to the threatened watershed.

APPENDIX A: Vertebrate Animals Known or Probable in the Township of Ewing

Species	General Habitat	Township Locations
Mammals		
Opossum	All Habitats	Throughout
Short-tailed Shrew	Woodlands	Throughout
Eastern Mole	Uplands	Throughout
Star-nosed Mole	Uplands	Throughout, Occasional
Little Brown Bat	Uplands	Throughout
Eastern Pipistrel	Uplands	Throughout
Eastern Cottontail	All Habitats	Throughout, Common
Eastern Chipmunk	Woodlands	Throughout
Woodchuck	Woodlands and Fields	Throughout
Gray Squirrel	Woodlands	Throughout, Common
White-footed Mouse	Woodlands	Throughout
Jumping Mouse	Fields	Throughout
Meadow Vole	Open Fields	Throughout
Red-backed Vole	Woodlands	Throughout
Muskrat	Wetlands	Throughout
Brown Rat	Wetlands, Homes, Farms	Throughout
House Mouse	Homes and Residential areas	Throughout
Red Fox	All Habitats	Throughout
Raccoon	All Habitats	Throughout, Common
Long-tailed Weasel	Wetlands	Throughout
Striped Skunk	Uplands	Throughout, Common
White-tailed Deer	All Habitats	Throughout, Common
Mink	Wetlands	Throughout
Birds		
Great–crested Cormorant	Open Water	Delaware River; Tidal waters
Great Blue Heron	Open Marsh, Lake Edges	Throughout
Great Egret	Open Marsh, Lake Edges	Throughout
Snowy Egret	Open Marsh, Lake Edges	Throughout
Green-backed Heron	Open Marsh, Lake Edges	Throughout
Mute Swan	Open Water	Large Lakes
Snow Goose	Winter Migrant in Fields	Open farms
Canada Goose	Open Water, Fields	Throughout, Common
Wood Duck	Forested Wetlands	Throughout
Blue-winged Teal	Wetlands	Winter Migrant
Green-winged Teal	Wetlands	Winter Migrant
Black Duck	Marsh, Lakes	Throughout
Mallard	Wetlands	Throughout
Gadwall	Open Water	Winter Migrant
Northern Shoveler Duck	Open Water	Winter Migrant
Ring-necked Duck	Open Water	Winter Migrant
Greater & Lesser Scaup	Open Water	Winter Migrant
Bufflehead	Open Water	Winter Migrant

Species	General Habitat	Township Locations
Hooded Merganser	Open Water	Winter Migrant
Ruddy Duck	Open Water	Winter Migrant
Black Vulture	Open fields	Throughout
Turkey Vulture	All Habitats	Throughout
Osprey	Open Water	Lakes and Ponds
Northern harrier	Open Fields	Throughout
Sharp-shinned Hawk	Woodlands	Throughout
Cooper's Hawk	Woodlands	Throughout
Broad-winged Hawk	Open Fields	Throughout
Red-tailed Hawk	All Habitats	Throughout
American Kestrel	Open Fields	Throughout
Ringed-neck Pheasant	Old Fields, Farms	Released; Throughout
Wild Turkey	Woodlands	Throughout
Bobwhite	Old Field, Woodlands	Throughout
Killdeer	Bare Ground, Lake Edges	Throughout
Lesser Yellowlegs	Lake Edges	Throughout
Solitary Sandpiper	Lake Edges	Throughout
Spotted Sandpiper	Lake Edges	Throughout
American Woodcock	Wetland Forests	Throughout
Laughing Gull	Open Water, Parking Lots	Summer Visitor
Ring-billed Gull	Open Water, Parking Lots	Throughout
Herring Gull	Open Water, Dumps	Winter Visitor
Rock Dove	Houses and Bridges	Throughout, Common
Mourning Dove	Woodlands and Fields	Throughout, Common
Black-billed Cuckoo	Woodlands	Occasional
Yellow-billed Cuckoo	Woodlands	Throughout
Barn Owl	Farmland	Throughout
Eastern Screech Owl	Woodlands	Throughout
Great Horned Owl	Woodlands	Throughout
Barred Owl	Wetland Forests	Wooded Wetlands
Saw-whet Owl	Wetland Forests	Wooded Wetlands
Common Nighthawk	Upland Woodlands, Flat–roofed Buildings	Summer Night Sky
Chimney Swift	Bridges, House Chimneys	Residential areas
Ruby-throated Hummingbird	Woodlands and Fields	Throughout
Belted Kingfisher	Wetlands	Throughout
Red-bellied Woodpecker	Woodlands	Throughout
Yellow-bellied Sapsucker	Woodlands	Fall Migrant
Downy Woodpecker	Woodlands	Throughout
Hairy Woodpecker	Woodlands	Throughout
Northern Flicker	Woodlands	Throughout
Wood Pee-wee	Woodlands	Upland Woods
Eastern Phoebe	Woodlands	Throughout
Great Crested Flycatcher	Woodlands	Upland Woods
Eastern Kingbird	Fields, Farmland	Throughout
Purple Martin	Open Fields, Wetlands	Agricultural areas
Tree Swallow	Wetlands	Throughout
Barn Swallow	Buildings, Bridges, Open Fields	Throughout
Blue Jay	Woodland, Parks, Residential Areas	Throughout; Common
American Crow	All Habitats	Throughout, Common
Carolina Chickadee	Woodlands	Throughout, Common
Eastern Tufted Titmouse	Woodlands	Throughout, Common

Species	General Habitat	Township Locations
White Breasted Nuthatch	Woodlands	Throughout
Brown Creeper	Woodlands	Throughout
Carolina Wren	Woodland Edges, Yards	Throughout, Common
House Wren	Suburbs, Woodland Edges	Throughout
Golden and Ruby crowned Kinglets	Woodlands	Fall Migrant
Blue–gray Gnatcatcher	Woodlands, Wetland Forests	Throughout
Eastern Bluebird	Woodland Edges	Throughout
Wood Thrush	Woodlands	Throughout
American Robin	All Habitats	Throughout, Common
Catbird	Woodland Edges, Yards	Throughout
Mockingbird	Hedgerows, Yards	Throughout, Common
Brown Thrasher	Woodlands	Throughout
Cedar Waxwing	Old Fields, Young Woodlands	Throughout
European Starling	All Habitats	Residential areas; Pest
White-eyed Vireo	Woodlands	Throughout
Philadelphia Vireo	Woodlands	Migrant
Red-eyed Vireo	Woodlands	Wetland Forests
Yellow Warbler	Upland Forest	Throughout
Chestnut-side Warbler	Woodlands	Migrant
Black-throated Blue Warbler	Woodlands	Migrant
Yellow-rumped Warbler	Woodlands	Throughout
Pine Warbler	Woodlands	Throughout
Prairie Warbler	Shrubby Areas	Throughout
Palm Warbler	Pine Woodlands	Throughout
Black and White Warbler	Pine Woodlands	Migrant
Northern Parula warbler	Woodlands	Throughout
American Redstart	Rich Woodlands	Throughout
Ovenbird	Woodlands	Throughout
Common Yellowthroat	Shrubby Areas	Throughout
Scarlet Tanager	Woodlands	Throughout
Northern Cardinal	Woodland Edges, Residential Areas	Throughout; Common
Indigo Bunting	Woodland Edges, Old Fields	Throughout
Rufous–sided Towhee	Pine Woodlands; Wetland Forests	Throughout
Chipping Sparrow	Woodlands, Suburbs	Throughout
Field Sparrow	Old Fields	Throughout
Song Sparrow	Old Fields	Throughout
American Tree Sparrow	Open Areas	Throughout
White-throated Sparrow	Woodlands, Suburban Feeders	Winter Migrant
Dark-eyed Junco	Woodlands	Winter Migrant
Red-winged Blackbird	Open Wetlands, Marsh	Throughout
Common Grackle	All Habitats	Throughout; Common
Brown-headed Cowbird	Open Areas	Throughout; Pest
Orioles: Orchard and Baltimore	Woodlands, Edges	Throughout
House Finch	Open Areas, Old Fields	Throughout
American Goldfinch	Open Areas, Old Fields	Throughout
House Sparrow	Residential Areas, Old Fields	Residential areas; Common
Reptiles		
Bog Turtle	Muddy Agricultural Fields/Wetlands	Endangered

Species	General Habitat	Township Locations
Common Snapping Turtle	Ponds and Lakes	Throughout
Stinkpot Turtle	Wetlands	Throughout
Spotted Turtle	Freshwater Wetlands and Ponds	Throughout
Eastern Box Turtle	Uplands	Throughout
Red-bellied Turtle	Lakes and Ponds	Throughout
Eastern Painted Turtle	Lakes and Ponds	Throughout
Northern Fence Lizard	Uplands	Throughout
Northern Water Snake	Wetlands	Throughout
Garter Snake	All Habitats	Throughout
Eastern Ribbon Snake	Wetlands	Throughout
Southern Ring-neck Snake	Woodlands	Throughout
Northern Black Racer	Edge of Woodlands	Throughout
Rough Green Snake	Woodlands	Throughout
Black Rat Snake	All Habitats	Throughout
Amphibians		
Red-backed Salamander	Woodlands	Throughout
Fowler's Toad	Uplands	Throughout
Spring Peeper	Wetlands	Throughout
Bull Frog	Lakes and Ponds	Throughout
Green Frogs	Wetlands	Throughout
Wood Frog	Woodlands	Throughout
Southern Leopard Frog	Wetlands	Throughout
Fish		
Blacknose Dace	Streams	Jacobs Creek
American Eel	Streams	Jacobs Creek, Shabakunk
Danded Killfish	Streams	Jacobs Creek, Shabakunk
Tadpole Madtom	Streams	Jacobs Creek
Tessellated Darter	Streams	Jacobs Creek, Shabakunk
Spottail Shiner	Streams	Jacobs Creek, Shabakunk
Common Shiner	Streams	Jacobs Creek, Shabakunk
Golden Shiner	Streams	Jacobs Creek, shabakunk
Bridle Shiner	Streams	Shabakunk
Satinfin Shiner	Streams	Jacobs Creek
Creek Chub	Streams	Jacobs Creek, Shabakunk
White Sucker	Streams	Jacobs Creek, Shabakunk
Pumpkinseed	Streams/Lakes	Jacobs Creek, Shabakunk
Bluegill	Streams	Jacobs Creek
Largemouth Bass	Streams	Jacobs Creek
Brown Trout	Streams	Jacobs Creek
Stonecat	Streams	Jacobs Creek
Grass Pickerel	Streams	Shabakunk
Redbreast Sunfish	Streams	Jacobs Creek
Common Carp	Streams	Shabakunk
Green Sunfish	Streams	Shabakunk
Creek Shubsucker	Streams	Shabakunk
American Shad	Streams	Delaware River

Source: Modified from the Franklin Township, Gloucester County, New Jersey, Environmental Resource Inventory, Compiled by Joseph Arsenault.

Fish Species Source: NJ DEP - Division of Fish and Wildlife - Bureau of Freshwater Fisheries

APPENDIX B: Plants and Animals of New Jersey's Washington Crossing State Park (located just north of Ewing Township on the Delaware River)

Checklist of Forest Trees and Shrubs of New Jersey's Washington Crossing State Park

Common Name	Scientific Name	Family	Plant Type
Ash, Green	*Fraxinus pennsylvanica*	Olive Family	Tree
Ash, White	*Fraxinus americana*	Olive Family	Tree
Aspen, Bigtooth	*Populus grandidentata*	Willow Family	Tree
Aspen, Quaking	*Populus tremuloides*	Willow Family	Tree
Autumn-olive	*Elaeagnus umbellata*	Elaeagnus Family	Shrub
Basswood, American	*Tilia americana*	Linden Family	Tree
Bayberry, Northern	*Myrica pensylvanica*	Bayberry Family	Shrub
Beech, American	*Fagus grandifolia*	Beech Family	Tree
Birch, Black	*Betula lenta*	Birch Family	Tree
Birch, River	*Betula nigra*	Birch Family	Tree
Bladdernut, American	*Staphylea trifolia*	Bladdernut Family	Shrub
Boxelder	*Acer negundo*	Maple Family	Tree
Bush-honeysuckle	*Lonicera spp*	Honeysuckle Family	Shrub
Catalpa, Common	*Catalpa bignonioides*	Bignonia Family	Tree
Cedar, Eastern Red	*Juniperus virginiana*	Cypress Family	Tree
Cherry, Black	*Prunus serotina*	Rose Family	Tree
Cherry, Sweet	*Prunus avium*	Rose Family	Tree
Dogwood, Flowering	*Cornus florida*	Dogwood Family	Tree
Elderberry	*Sambucus canandenis*	Honeysuckle Family	Shrub
Elm, American	*Ulmus americana*	Elm Family	Tree
Elm, Slippery	*Ulmus rubra*	Elm Family	Tree
Euonymous	*Euonymous spp*	Spindletree Family	Shrub
Fir, Douglas	*Pseudotsuga menziesii*	Pine Family	Tree
Gum, Black (Tupelo)	*Nyssa sylvatica*	Dogwood Family	Tree
Hackberry	*Celtis occidentalis*	Elm Family	Tree
Hawthorn	*Crataegus spp*	Rose Family	Shrub
Hemlock, Eastern	*Tsuga canadensis*	Pine Family	Tree
Hickory, Bitternut	*Carya cordiformis*	Walnut Family	Tree
Hickory, Mockernut	*Carya tomentosa*	Walnut Family	Tree
Hickory, Red	*Carya ovalis*	Walnut Family	Tree
Hickory, Shagbark	*Carya ovata*	Walnut Family	Tree
Holly, American	*Ilex opaca*	Holly Family	Tree
Hophornbeam, Eastern	*Ostrya virginiana*	Birch Family	Tree
Hornbeam, American	*Carpinus caroliniana*	Birch Family	Tree
Larch, Japanese	*Larix japonica*	Pine Family	Tree
Laurel, Mountain	*Kalmia latifolia*	Laurel Family	Shrub
Locust, Black	*Robinia pseudoacacia*	Scholar Tree Family	Tree
Locust, Honey	*Gleditsia triacanthos*	Coffee Tree Family	Tree

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Checklist of Forest Trees and Shrubs of New Jersey's Washington Crossing State Park

Common Name	Scientific Name	Family	Plant Type
Maple, Red	*Acer rubrum*	Maple Family	Tree
Maple, Silver	*Acer saccharinum*	Maple Family	Tree
Maple, Sugar	*Acer saccharum*	Maple Family	Tree
Mulberry, Red	*Morus rubra*	Mulberry Family	Tree
Mulberry, White	*Morus alba*	Mulberry Family	Tree
Native Crabapples	*Pyrus spp*	Rose Family	Shrub
Oak, Black	*Quercus velutina*	Beech Family	Tree
Oak, Northern Red	*Quercus rubra*	Beech Family	Tree
Oak, Pin	*Quercus palustris*	Beech Family	Tree
Oak, Scarlet	*Quercus coccinea*	Beech Family	Tree
Oak, White	*Quercus alba*	Beech Family	Tree
Osage-orange	*Maclura pomifera*	Mulberry Family	Tree
Paulownia, Royal	*Paulownia tomentosa*	Figwort Family	Tree
Persimmon, Common	*Diospyros virginiana*	Ebony Family	Tree
Pine, Eastern White	*Pinus strobus*	Pine Family	Tree
Pine, Red	*Pinus resinosa*	Pine Family	Tree
Privet	*Ligustrum spp*	Olive Family	Shrub
Raspberry	*Rubus spp*	Rose Family	Shrub
Redbud, Eastern	*Cercis canadensis*	Coffee Tree Family	Tree
Rhododendron, Great	*Rhododendron maximum*	Heath family	Shrub
Rose, Wild	*Rosa spp*	Rose Family	Shrub
Sassafras	*Sassafras albidum*	Laurel Family	Tree
Serviceberry, Downy	*Amelanchier arborea*	Rose Family	Tree
Spicebush, Common	*Lindera benzoin*	Laurel Family	Shrub
Sumac, Smooth	*Rhus glabra*	Cashew Family	Tree
Sumac, Staghorn	*Rhus typhina*	Cashew Family	Tree
Sweetgum	*Liquidambar styraciflua*	Whitchhazel Family	Tree
Sycamore, American	*Platanus occidentalis*	Sycamore Family	Tree
Tuliptree	*Liriodendron tulipifera*	Magnolia Family	Tree
Viburnum, Arrowwood	*Viburnum dentatum*	Honeysuckle Family	Shrub
Viburnum, Black Haw	*Viburnum prunifolium*	Honeysuckle Family	Shrub
Viburnum, Maple-leaved	*Viburnum acerifolium*	Honeysuckle Family	Shrub
Walnut, Black	*Juglans nigra*	Walnut Family	Tree
Willow, Black	*Salix nigra*	Willow Family	Tree
Witch-hazel	*Hamamelis virginiana*	Whitchhazel Family	Tree
Zenobia	*Zenobia pulverulenta*	Heath Family	Shrub

Check List of Birds Sighted in New Jersey's Washington Crossing State Park

(S) species is most likely to be observed in spring and summer during the breeding season
(W) species is most likely to be observed during the winter months
(M) species is most likely to be observed in spring and/or autumn during the migration seasons
(Y) species can be observed year-round

☐ Double-crested Cormorant	(Y)	☐ American Woodcock	(Y)	☐ Eastern Phoebe	(S)
☐ Canada Goose	(Y)	☐ Sanderling	(M)	☐ Willow Flycatcher	(M)
☐ Mallard	(Y)	☐ Semiplmtd Sandpiper	(M)	☐ Acadian Flycatcher	(S)
☐ Wood Duck	(S,M)	☐ Gr Black-backed Gull	(W,M)	☐ Least Flycatcher	(S)
☐ Hooded Merganser	(W)	☐ Herring Gull	(Y)	☐ Eastern Wood-pewee	(S)
☐ Turkey Vulture	(Y)	☐ Ring-billed Gull	(Y)	☐ Barn Swallow	(S)
☐ Black Vulture	(Y)	☐ Laughing Gull	(S,M)	☐ Cliff Swallow	(S)
☐ Cooper's Hawk	(Y)	☐ Least Tern	(M)	☐ Tree Swallow	(S)
☐ Sharp-shinned Hawk	(Y)	☐ Common Tern	(M)	☐ N. Rgh-wnged Swllow	(S)
☐ Northern Harrier	(Y)	☐ Mourning Dove	(Y)	☐ Purple Martin	(S)
☐ Red-tailed Hawk	(Y)	☐ Yellow-billed Cuckoo	(S,M)	☐ Blue Jay	(Y)
☐ Broad-winged Hawk	(S)	☐ Black-billed Cuckoo	(S,M)	☐ American Crow	(Y)
☐ Red-shouldered Hawk	(Y)	☐ Eastern Screech-Owl	(Y)	☐ Fish Crow	(Y)
☐ Bald Eagle	(W)	☐ Great Horned Owl	(Y)	☐ Black-c'd Chickadee	(Y)
☐ Osprey	(S)	☐ Long-eared Owl	(Y)	☐ Carolina Chickadee	(Y)
☐ Peregrine Falcon	(M)	☐ Barn Owl	(Y)	☐ Tufted Titmouse	(Y)
☐ Merlin	(M)	☐ Common Nighthawk	(S)	☐ White-br'd Nuthatch	(Y)
☐ American Kestrel	(Y)	☐ Chimney Swift	(S)	☐ Red-br'd Nuthatch	(M)
☐ Wild Turkey	(Y)	☐ Ruby-th. Hummingbird	(S)	☐ Brown Creeper	(W)
☐ Ruffed Grouse	(Y)	☐ Belted Kingfisher	(S)	☐ House Wren	(S)
☐ Northern Bobwhite	(Y)	☐ Northern Flicker	(Y)	☐ Carolina Wren	(Y)
☐ Ring-necked Pheasant	(Y)	☐ Pileated Woodpecker	(Y)	☐ Northern Mockingbird	(Y)
☐ Great Blue Heron	(M)	☐ Red-bellied Woodpecker	(Y)	☐ Gray Catbird	(S)
☐ Snowy Egret	(M,S)	☐ Yellow-bel. Sapsucker	(M)	☐ Brown Thrasher	(S)
☐ Glossy Ibis	(M)	☐ Hairy Woodpecker	(Y)	☐ American Robin	(Y)
☐ Semipalmated plover	(M)	☐ Downy Woodpecker	(Y)	☐ Wood Thrush	(S)
☐ Killdeer	(Y)	☐ Eastern Kingbird	(S)	☐ Hermit Thrush	(W,M)
☐ Spotted Sandpiper	(Y)	☐ Great C'd Flycatcher	(S)	☐ Swainson's Thrush	(M)

Interpretive CENTER
WASHINGTON CROSSING STATE PARK
355 Washington Crossing-Pennington Road
Titusville, New Jersey 08560-1517

Rev. 6/0

Check List of Birds Sighted in New Jersey's Washington Crossing State Park

(S) species is most likely to be observed in spring and summer during the breeding season
(W) species is most likely to be observed during the winter months
(M) species is most likely to be observed in spring and/or autumn during the migration seasons
(Y) species can be observed year-round

☐ Grey- cheeked Thrush	(M)	☐ Chestnut-s'd Warbler	(S)	☐ Purple Finch	(W)
☐ Veery	(S)	☐ Bay-breasted Warbler	(M)	☐ House Finch	(Y)
☐ Eastern Bluebird	(S)	☐ Blackpoll Warbler	(M)	☐ Common Redpoll	(W)
☐ Blue-gray Gnatcatcher	(M)	☐ Pine Warbler	(S)	☐ Pine Siskin	(W)
☐ Golden cr'd Kinglet	(M,W)	☐ Prairie Warbler	(S)	☐ American Goldfinch	(Y)
☐ Ruby-cr'd Kinglet	(M,W)	☐ Palm Warbler	(M)	☐ Eastern Towhee	(Y)
☐ Cedar Waxwing	(Y)	☐ Ovenbird	(S)	☐ Dark-eyed Junco	(W)
☐ European Starling	(Y)	☐ Louisiana Waterthrush	(M)	☐ Savannah Sparrow	(S)
☐ Blue-Headed Vireo	(M)	☐ Common Yellowthroat	(S)	☐ Grasshopper Sparrow	(S)
☐ White-eyed Vireo	(S)	☐ Yellow-breasted Chat	(M)	☐ Americ. Tree Sparrow	(W)
☐ Yellow-throated Vireo	(M)	☐ Mourning Warbler	(M)	☐ Chipping Sparrow	(S)
☐ Red-eyed Vireo	(S)	☐ Hooded Warbler	(M)	☐ Field Sparrow	(W)
☐ Warbling Vireo	(S)	☐ Canada Warbler	(M)	☐ White-thr'd Sparrow	(W)
☐ Black-and-wh. Warbler	(S)	☐ Wilson's Warbler	(M)	☐ Fox Sparrow	(M)
☐ Worm-eating Warbler	(M)	☐ American Redstart	(M)	☐ Lincoln's Sparrow	(M)
☐ Golden- winged Warbler	(M)	☐ House Sparrow	(Y)	☐ Swamp Sparrow	(S)
☐ Blue-winged Warbler	(S)	☐ Bobolink	(M)	☐ Song Sparrow	(S)
☐ Tennessee Warbler	(M)	☐ Eastern Meadowlark	(S)	☐ _____	
☐ Nashville Warbler	(M)	☐ Red-winged Blackbird	(S)	☐ _____	
☐ N. Parula Warbler	(S)	☐ Common Grackle	(Y)	☐ _____	
☐ Yellow Warbler	(S)	☐ Br'n-headed Cowbird	(Y)	☐ _____	
☐ Magnolia Warbler	(M)	☐ Orchard Oriole	(S)	☐ _____	
☐ Cape May Warbler	(M)	☐ Baltimore Oriole	(S)	☐ _____	
☐ Yellow-r'd Warbler	(Y)	☐ Scarlet Tanager	(S)	☐ Name:_____	
☐ Black-th'd Gr'n Warbler	(M)	☐ Northern Cardinal	(Y)	☐ Date:_____	
☐ Black-th'd Bl. Warbler	(M)	☐ Rose-br. Grosbeak	(S)	☐ Notes:	
☐ Cerulean Warbler	(M)	☐ Blue Grosbeak	(S)		
☐ Blackburnian Warbler	(M)	☐ Indigo Bunting	(S)		

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WASHINGTON CROSSING STATE PARK
355 Washington Crossing - Pennington Road
Titusville, New Jersey 08560-1017

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Rev. 6/

WASHINGTON CROSSING STATE PARK
NATURE CENTER

CHECKLIST OF REPTILES AND AMPHIBIANS
OF CENTRAL NEW JERSEY

On this checklist, an "*" indicates that the species is not believed to occur in Washington Crossing State Park; an "E" indicates that the species is endangered in the state of New Jersey, and a "T" indicates that the species is threatened in the state of New Jersey.

TURTLES

Snapping Turtle (Chelydra serpentina)
Stinkpot (Sternotherus odoratus)
Eastern Mud Turtle (Kinosterncn subrubrum)T
Spotted Turtle (Clemmys guttata)
Wood Turtle (Clemmys insculpta)*T
Eastern Box Turtle (Terrapene carolina)
Map Turtle (Graptemys geographica)
Red-bellied Turtle (Chrysemys rubriventris)
Eastern Painted Turtle (Chrysemys picta)

SNAKES

Northern Water Snake (Natrix sipedon)
Northern Brown Snake (Storeria dekayi)
Eastern Garter Snake (Thamnophis sirtalis)
Eastern Ribbon Snake (Thamnophis sauritus)
Eastern Earth Snake (Virginia valeriae)*
Eastern Hognose Snake (Heterodon platyrhinos)*
Northern Ringneck Snake (Diadophis punctatus)
Eastern Worm Snake (Carphophis amoenus)*
Northern Black Racer (Coluber constrictor)
Black Rat Snake (Elaphe obsoleta)
Eastern Milk Snake (Lampropeltis triangulum)

The Northern Copperhead (Agkistrodon contortrix) and the Timber Rattlesnake (Crotalus horridus) E, are the only poisonous snakes found in New Jersey. Neither of them occurs in Washington Crossing State Park.

SALAMANDERS

Marbled Salamander (Ambystoma opacum)
Spotted Salamander (Ambystoma maculatum)
Eastern Tiger Salamander (Ambystoma tigrinum)*E
Red-spotted Newt (Notophthalmus viridescens)*
Northern Dusky Salamander (Desmognathus fuscus)
Red-backed Salamander (Plethodon cinereus)
Northern Red Salamander (Pseudotriton ruber)*
Northern Two-lined Salamander (Eurycea bislineata)
Long-tailed Salamander (Eurycea longicauda)*T

TOADS

American Toad (Bufo americanus)
Fowler's Toad (Bufo woodhousei)

FROGS

Northern Cricket Frog (Acris crepitans)
Northern Spring Peeper (Hyla crucifer)
Gray Tree Frog (Hyla chrysoscelis)*E
Upland Chorus Frog (Pseusacris triseriata)
Bullfrog (Rana catesbeiana)
Green Frog (Rana clamitans)
Wood Frog (Rana sylvatica)
Pickerel Frog (Rana palustris)
Southern Leopard Frog (Rana utricularia)

Wildflowers of Washington Crossing State Park Titusville, NJ Rev 7/98

Common Name	Scientific Name	Period
Agrimony	*Agrimonia pubescens (N)*	July Aug Sept
Anemone, Wood	*Anemone quinquefolia (N)*	April May June
Aster, Heart-leaved	*Aster cordifolius (N)*	Aug Sept Oct
Aster, Heath	*Aster ericoides (N)*	July Aug Sept Oct
Aster, New England	*Aster novae-angliae (N)*	Aug Sept Oct
Aster, White Wood	*Aster divaricatus (N)*	July Aug Sept Oct
Aster, White-topped	*Sericocarpus asteroides (N)*	June July Aug Sept Oct
Avens, Spring	*Geum vernum (N)*	June-July
Avens, White	*Geum canadense (N)*	June-July
Basil	*Satureja vulgaris*	June July Aug Sept
Bean, Trailing Wild	*Strophostyles helvola (N)*	June July Aug Sept Oct
Beardtongues	*Penstemon sp (N)*	May June July
Bedstraw, Fragrant	*Galium trifolium (N)*	June July Aug
Beggar-ticks	*Bidens frondosa (N)*	Aug Sept Oct
Bindweed, Hedge	*Convolvulus sepium (N)*	June July Aug Sept
Bittersweet	*Solanum dulcamara (A)*	May June July Aug Sept
Black-eyed Susan	*Rudbeckia hirta (N)*	June July Aug Sept Oct
Bloodroot	*Sanguinaria canadensis (N)*	late Mar-late April
Blue-eyed Grass	*Sisyrinchium sp (N)*	June-July
Bluecurls	*Trichostema dichotomum (N)*	Aug Sept Oct
Boneset	*Eupatorium perfoliatum (N)*	July Aug Sept Oct
Bouncing Bet	*Saponaria officinalis (A)*	late June July early Aug
Brooklime, American	*Veronica americana (N)*	May June July Aug Sept
Bugleweed	*Lycopus sp (N)*	July Aug Sept Oct
Burdock	*Arctium minus (A)*	July Aug Sept Oct
Bush-clover	*Lespedeza violacea (N)*	July Aug Sept
Bush-clover, Slender	*Lespedeza virginica (N)*	July Aug Sept
Butter-and-eggs	*Linaria vulgaris (A)*	June July Sept
Buttercup, Common	*Ranunculus acris (A)*	mid May-June
Buttercup, Creeping	*Ranunculus repens (A)*	mid May-June
Butterfly-weed	*Asclepias tuberosa (N)*	late June - July
Campion, Bladder	*Silene cucubalus (A)*	April May June July Aug
Catnip	*Nepeta cataria (A)*	June July Aug Sept
Cattail, Common	*Typha latifolia (N)*	May June July

(N) = Native Species *(A)* = Alien / Introduced Species Period = Time of Blooming

Wildflowers of Washington Crossing State Park Titusville, NJ Rev 7/98

Common Name	Scientific Name	Period
Everlasting, Pearly	*Anaphalis margaritacea (N)*	July Aug Sept
Figwort	*Scrophularia lanceolata (N)*	May June
Fireweed	*Epilobium angustifolium (N)*	July Aug Sept
Flag, Blue	*Iris versicolor (N)*	May-June
Fleabane, Common	*Erigeron philadelphicus (N)*	April May June July
Fleabane, Daisy	*Erigeron annuus (N)*	May June July Aug Sept Oct
Flower-of-an-hour	*Hibiscus trionum (A)*	July Aug Sept
Forget-me-not, True	*Myosotis scorpioides (A)*	May June July Aug Sept Oct
Gallant Soldiers	*Galinsoga ciliata (A)*	June July Aug Sept Oct Nov
Garlic, Field	*Allium vineale (A)*	May-April
Garlic-mustard	*Alliaria officinalis (A)*	April May June
Geranium, Wild	*Geranium maculatum (N)*	mid May-mid June
Gerardia Small-flowered	*Gerardia paupercula (N)*	Aug - Sept
Ginger, Wild	*Asarum canadense (N)*	April May June
Goldenrod, Blue-stemmed	*Solidago caesia (N)*	Aug Sept Oct
Goldenrod, Canada	*Solidago canadensis (N)*	July Aug Sept
Ground Ivy	*Glecoma hederacea (N)*	April-May
Ground-cherry, Virginia	*Physalis virginiana (N)*	June July Aug
Hawkweed, Orange	*Hieraciun aurantiacum (A)*	June July Aug Sept
Hawkweed, Rough	*Hieracium scabrum (N)*	June July Aug Sept
Hemlock, Water	*Circuta maculata (N)*	June July Aug Sept
Hemp, Indian	*Apocynum cannabinum*	July-Aug
Henbit	*Lamium amplexicaule (A)*	April May June July Aug Sept
Hepatica, Round-lobed	*Hepatica americana (N)*	Mar April
Honewort	*Cryptotaenia canadensis (N)*	June July Aug Sept
Honeysuckle, Japanese	*Lonicera japonica (A)*	late May June July Aug Sept
Horse-balm	*Collinsonia canadensis (N)*	July Aug Sept
Horse-nettle	*Solanum carolinense (N)*	June July Aug Sept Oct
Hyssop	*Hyssopus officinalis (A)*	July Aug Sept Oct
Hyssop, Purple Giant	*Agastache scrophulariaefolia (N)*	July Aug Sept
Hyssop, Yellow Giant	*Agastache nepetoides (N)*	July Aug Sept
Indian-pipe	*Monotropa uniflora (N)*	June July Aug Sept
Indian-tobacco	*Lobelia inflata (N)*	July Aug Sept Oct
Ironweed, New York	*Veronia noveboracensis (N)*	Aug Sept Oct

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Wildflowers of Washington Crossing State Park — Titusville, NJ — Rev 7/98

Common Name	Scientific Name	Period
Nightshade, Common	*Solanum nigrum (A)*	May June July Aug Sept
Nightshade, Enchanter's	*Circaea quadrisulcata (N)*	July Aug
Onion, Nodding Wild	*Allium cernuum (N)*	July Aug
Oswego Tea	*Monarda didyma (N)*	July Aug
Partridge Berry	*Mitchella repens (N)*	June-July
Peppermint, Wild	*Mentha piperita (N)*	July Aug Sept
Phlox, Blue	*Phlox divaricata (N)*	April May June
Phlox, Garden	*Phlox paniculata (N)*	July Aug Sept
Pickerelweed	*Pontederia cordata (N)*	June July Aug Sept
Pimpernel, Scarlet	*Anagallisa arvensis (A)*	June July Aug
Pineapple-weed	*Matricaria matricarioides (A)*	June July Aug Sept Oct
Pink, Deptfort	*Dianthus armeria (A)*	June-July
Pokeweed	*Phytolacca americana (N)*	July Aug
Poor-man's-pepper	*Lepidium virginicum (N)*	June July Aug Sept
Purslane	*Portulaca oleracea (N)*	April May June
Pussy-toes	*Antennaria sp (N)*	April May June
Queen Anne's Lace	*Daucus carota (A)*	mid July Aug Sept Oct
Radish, Wild	*Raphanus raphanistrum (A)*	June July Aug
Ragweed, Common	*Ambrosia artemisiifolia (N)*	Aug Sept Oct
Ragweed, Great	*Ambrosia trifida (N)*	Aug Sept Oct
Rattlesnake-weed	*Hieracium venosum (N)*	May June July Aug
Rock Cress, Hairy	*Arabis hirsuta (A)*	May-June
Rose, Wild	*Rosa multiflora*	late May-June
Rose-mallow, Swamp	*Hibiscus palustris (N)*	Aug Sept
Rue anemone	*Anemonella thalictroides (N)*	April-May
Rue, Tall Meadow-	*Thalictrum polygamum (N)*	July Aug Sept
Sage, Wood	*Teucrium canadense (N)*	July Aug Sept
Saxifrage, Early	*Saxifraga virginiensis (N)*	late Mar April early May
Selfheal	*Prunella vulgaris (A)*	July Aug Sept Oct
Sensitive-plant,	*Cassia nictitans (N)*	July Aug Sept
Shepherd's purse	*Capsella bursa-pastoris (A)*	April May June July Aug Sept
Skullcap, Hyssop	*Scutellaria integrifolia (N)*	May - June
Skunk Cabbage	*Symplocarpus foetidus (N)*	Mid Feb-Mid Mar
Slender gerardia	*Agalinis tenuifolia (N)*	Aug Sept Oct

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Wildflowers of Washington Crossing State Park Titusville, NJ Rev 7/98

Common Name	Scientific Name	Period
Smartweed, Common	*Polygonum hydropiper (A)*	July Aug Sept Oct
Smartweed, Pennsylvania	*Polygonum pensylvanicum (N)*	June July Aug Sept Oct
Snakeroot , Black	*Cimicifuga racemosa (N)*	June July Aug
Snakeroot, White	*Eupatorium rugosum (N)*	July Aug Sept Oct
Solomon's-seal	*Polygonatum biflorum (A)*	April May June
Solomon's-seal, Great	*Polygonatum canaliculatum*	May-June
Sorrel, Sheep	*Rumex acetosella (A)*	June July Aug Sept Oct
Speedwell, Bird's eye	*Veronica chamaedrys (A)*	May - Sept
Speedwell, Common	*Veronica officinalis (A, N)*	May June July Aug Sept
Spring-beauty	*Claytonia virginica (N)*	mid April-May
St. Johnswort, Canadian	*Hypericum canadense (N)*	July Aug Sept
St. Johnswort, Common	*Hypericum perforatum (A)*	June July August
St. Johnswort, Dwarf	*Hypericum mutilum (N)*	June July
St. Johnswort, Spotted	*Hypericum punctatum (N)*	June July Aug
Star-of-Bethlehem	*Ornithogalum umbellatum (A)*	April May June
Stonecrop, Wild	*Sedum ternatum (N)*	April May June
Strawberry, Barren	*Walsteinia fragarioides (N)*	April-May
Strawberry, Common	*Fragaria vesca (N)*	May June
Strawberry, Indian	*Duchesnea indica (A)*	April May June July Aug
Sundrops	*Oenothera fruiticosa (N)*	June July Aug
Sunflower	*Helianthus sp (N)*	July Aug Sept Oct
Sunflower, Tick-seed	*Bidens sp (N)*	Aug - Oct
Tearthumb, Arrow-leaved	*Polygonum sagittayum (N)*	June July Sept Oct
Tearthumb, Halberd-leaved	*Polygonum arifolium (N)*	July Aug Sept Oct
Thistle, Bull	*Cirsium vulgrae (A)*	June July Aug Sept
Thistle, Field	*Cirsium discolor (N)*	July Aug Sept Oct
Thistle, Pasture	*Cirsium pumilum (N)*	June July Aug Sept
Thistle, Tall Field	*Circium altissimum (N)*	July Aug Sept Oct
Tick Trefoil	*Desmodium sp*	July Aug
Toothwort, Cut-leaved	*Dentaria laciniata (N)*	late April-May
Trefoil, Yellow	*Trifolium aureum (A)*	June July
Trout-lilly	*Erythronium americanum (N)*	mid Mar-mid April
Trumpet-creeper	*Campsis radicans (N)*	July Aug Sept
Turtlehead, White	*Chelone glabra (N)*	July Aug Sept

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Wildflowers of Washington Crossing State Park Titusville, NJ Rev 7/98

Common Name	Scientific Name	Period
Velvet-leaf	*Abutilon theophrasti (A)*	July Sept Oct
Venus' Looking-glass	*Specularia perfoliata (N)*	May June July Aug
Vervain, Blue	*Verbena hastata (N)*	July Aug Sept
Vervain, White	*Verbena urticifolia (N)*	June July Aug Sept
Vetch, Crown	*Coronilla varia (A)*	June July Aug
Vetch, Purple	*Vicia americana (N)*	May June July Aug Sept Oct
Violet, Common Blue	*Viola papilionaceae (N)*	mid April-May
Violet, Smooth Yellow	*Viola pensylvanica (N)*	early April-May
Violet, Wood	*Viola Palmata (N)*	April-May
Watercress	*Nasturtium officinale (A)*	April May June
Wild Mint	*Mentha arvensis (A)*	July Aug Sept
Wintergreen, Spotted	*Chimaphila maculata (N)*	June July Aug
Wood-sorrel, Violet	*Oxalis violacea (N)*	May-June
Wood-sorrel, Yellow	*Oxalis europa (N)*	May June July Aug Sept Oct
Yarrow	*Achillea millefolium (A)*	June July Aug

(N) = Native Species *(A)* = Alien / Introduced Species Period = Time of Blooming

APPENDIX C: Deer Tolerant/Resistant Native Plants of the Bowman's Hill Wildlife Preserve

BOWMAN'S HILL WILDFLOWER PRESERVE
P.O. Box 685
New Hope, Pennsylvania 18938-0685
(215) 862-2924 Fax (215) 862-1846 bhwp@bhwp.org
www.bhwp.org

Deer Tolerant/Resistant Native Plants

There are no truly deer resistant or tolerant plants; any plant when eaten repeatedly will eventually succumb. Deer will eat ANYTHING if they are hungry enough. Also, plants left untouched in one area may be a favorite in another. Nevertheless, the following list is a compilation of native plant species taken from a combination of staff observation over a period of years and several existing lists of "deerproof plants". Check the companion list for plants that deer generally prefer.

Herbaceous plants:

Aconitum uncinatum (monkshood)
Actaea spp. (doll's eyes)
Agastache scrophulariifolia (giant purple hyssop)
Agrimonia parviflora (small agrimony)
Allium cernuum/A. tricoccum (wild onion/leek)
Amsonia hubrectii+/tabernaemontana (blue star)
Andropogon gerardii (big bluestem)
Aquilegia canadensis (wild columbine)
Arisaema spp. (Jack-in-the-pulpit)
Aruncus dioicus (goat's beard)
**Asarum canadense* (wild ginger)
Asclepias spp. (butterflyweed, milkweed)
**Aster novae-angliae* (New England aster)
Aster oblongifolius (aromatic aster)
Baptisia australis (blue false indigo)
Cimicifuga racemosa (black cohosh)
**Clematis virginiana* (Virgin's-bower)
Coreopsis lanceolata+/C. tripteris (tickseed)
Coreopsis rosea (rose coreopsis)
Dicentra eximia (fringed bleeding-heart)
Euphorbia corollata (flowering spurge)
Fern species
Geranium maculatum (wood geranium)
Helenium autumnale (Helen's flower)
Hibiscus moscheutos (swamp rose-mallow)
Iris versicolor (blue flag iris)
Jeffersonia diphylla (twin-leaf)
Liatris spicata (dense blazing star)
**Lobelia siphilitica* (great blue lobelia)
Mimulus ringens/M. alatus (monkey flower)
Monarda fistulosa (wild bergamot)
Panicum virgatum (switch grass)
Penstemon digitalis/P. hirsutus (beardtongue)
Phlox divaricata (blue wood phlox)
Phlox stolonifera (creeping phlox)
Physostegia virginiana (obedient plant)
**Podophyllum peltatum* (may-apple)
Polemonium reptans (Jacob's-ladder)
Rudbeckia fulgida/R. hirta (black-eyed Susan)
Scutellaria incana (skullcap)
Solidago spp. (goldenrods)
Symplocarpus foetidus (skunk-cabbage)
Verbena hastata (blue vervain)
Veronicastrum virginicum (Culver's-root)

Trees and Shrubs

Acer spp. (maple)
Amelanchier spp. (service berry)
Betula spp. (birch)
Calycanthus floridus (Carolina allspice)
Carpinus spp. (hornbeam)
Clethra alnifolia (summersweet)
Dirca palustris (leatherwood)
Fagus spp. (beech)
Fraxinus spp. (ash)
Gleditsia triacanthos (honeylocust)
Hamamelis spp. (witchhazel)
Hypericum prolificum (Shrubby St. John's-wort)
*Hypericum pyramidatum (*Great St. John's-wort)
Leucothoe racemosa (fetterbush)
Lindera benzoin (spicebush)
Liquidambar styraciflua (sweet gum)
Lonicera sempervirens (trumpet honeysuckle)
**Magnolia* spp.
Myrica pensylvanica (bayberry)
Nyssa sylvatica (sourgum)
Quercus spp. (oak) - acorns attract deer, however
Viburnum spp.

+ = Not native to Pennsylvania *=Plants periodically browsed at Bowman's Hill Wildflower Preserve

Appendix D:

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the database. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Land Use Regulation Program, P.O. Box 401, Trenton, NJ 08625-0401.

The Landscape Project was developed by the Division of Fish & Wildlife, Endangered and Nongame Species Program to map critical habitat for rare animal species. Some of the rare species data in the Landscape Project is in the Natural Heritage Database, while other records were obtained from other sources. Natural Heritage Database response letters will list all species (if any) found during a search of the Landscape Project. However, any reports that are included with the response letter will only reference specific records if they are in the Natural Heritage Database. This office cannot answer any inquiries about the Landscape Project. All questions should be directed to the DEP Division of Fish and Wildlife, Endangered and Nongame Species Program, P.O. Box 400, Trenton, NJ 08625-0400.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

Title of Report: Environmental Resource Inventory for Ewing Township, Mercer County, New Jersey

Publication No.: **05008**

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Key Words: **Environment, environmental resource inventory, environmental commission, conservation, water resources, natural resources, biological resources, Ewing**

ABSTRACT: This publication documents the natural and community resources of Ewing Township, Mercer County, New Jersey. The natural resource information includes descriptions, tables and maps of land use; soils; steep slopes; drinking water wells; aquifers; watersheds; streams and lakes; wetlands, flood plains; impacts on water resources; vegetation including forests and grasslands; animal communities; threatened and endangered species; and contaminated sites. Community resources that are briefly described include population, transportation, township utilities and services, protected open space and historic resources. A short history of the township is also included.

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for the TOWNSHIP of

EWING

MERCER COUNTY, NEW JERSEY

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