

ENVIRONMENTAL RESOURCE INVENTORY

ERI

APRIL 2017

For the Township of:

LAWRENCE

Mercer County, New Jersey



by:



with:

The Environmental
Resources and Sustainability
Green Advisory Committee
of Lawrence Township



The Delaware Valley Regional Planning Commission is dedicated to uniting the region's elected officials, planning professionals, and the public with a common vision of making a great region even greater. Shaping the way we live, work, and play, DVRPC builds consensus on improving transportation, promoting smart growth, protecting the environment, and enhancing the economy.

We serve a diverse region of nine counties: Bucks,

Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey. DVRPC is the federally designated Metropolitan Planning Organization for the Greater Philadelphia Region — leading the way to a better future.



The symbol in 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.

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Acknowledgments

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Cathleen Lewis, Councilperson
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Introduction

The purpose of an Environmental Resource Inventory (ERI) 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 and quality of life. The protection and wise use of those resources is essential to the public health, safety, and welfare of both current and future residents. The ERI provides the basis for the development of methods to preserve, conserve, and utilize those resources, although it does not include specific recommendations to those ends. It is, instead, a compendium of all the existing information that can be found about a township's natural resources, presented in a form that is useful to a broad audience.

The ERI is an important tool for environmental commissions, open space committees, planning boards, and zoning boards of adjustment. Environmental commissions advise local governments on environmental problems and opportunities in their communities. New Jersey planning boards are strongly encouraged to adopt the ERI as part of the municipal master plan, either as an appendix or as part of a master plan conservation element. As part of the master plan, the ERI can provide the foundation and documentation for the development of resource protection ordinances and resource-based land use planning. The 2016 update to the Lawrence Township ERI was prepared at the request of the Lawrence Township Environmental Resources and Sustainability Green Advisory Committee (ERSGAC). The ERI reflects a particular moment in time and should be updated as new data becomes available.

Although Lawrence Township is a highly developed municipality, it still retains many natural areas with great ecological integrity. Special measures to protect and enhance the natural environment become even more important when faced with the pressures of increased population and development. Lawrence's water, wetlands, forests, and grasslands provide

Cows at Cherry Grove Farm



Source: DVRPC

significant high-quality habitat for a wide variety of plants and animals. These areas are critically important in maintaining the health and vitality of the township. Detailed documentation of these resources will help Lawrence's citizens to balance the pressures of growth with conservation and maintain and shape the community's unique identity, while protecting its rich historic fabric and critical natural environment.

Sources

Several documents and reports were utilized in preparing this ERI, including Lawrence Township's Master Plan (1995), the Open Space Plan (2000), the 2008 Environmental Resource Inventory, and the Green Buildings and Environmental Sustainability Element of the Master Plan (2010), as well as a number of reference works. These are listed at the end of this document.

The maps and data relating to Lawrence's natural resources are principally derived from the New Jersey Department of Environmental Protection's (NJDEP's) Geographic Information System mapping, the Landscape Project produced by the Endangered and Nongame Species Program of the New Jersey Division of Fish and Wildlife (NJDFW), reports by the U.S. Geologic Service and New Jersey Geologic Service, and mapping data compiled and prepared by the Delaware Valley Regional Planning Commission (DVRPC). Information from these sources that is specific to Lawrence Township has been included whenever it was available. Information from other reports about specific sites has also been incorporated, along with data provided by township and county staff. The ERI has been reviewed by members of the ERSGAC and other township officials.



Historic house in Lawrenceville

Source: DVRPC

Overview

Lawrence is an incorporated township located in central Mercer County, north of the City of Trenton, which is the county seat and capital of New Jersey. The township is bounded by six Mercer County municipalities: Hopewell and Ewing Townships to the west; Princeton and West Windsor Townships to the north and east; and the City of Trenton and Hamilton Township to the south. The Assunpink Creek forms part of the township's southern boundary, and the Shabakunk Creek forms part of the township's western boundary. See **Map 1: Lawrence Township** and **Map 2: Aerial Photograph**.

Lawrence occupies 14,059 acres, or 21.97 square miles, and is situated on the Piedmont and Coastal Plain sections of New Jersey. Lawrence Township is a very diverse community in that the southern part of the township has compact building patterns and is well served by infrastructure, such as streets, transit, and public sewer and water, while the northern part of the township consists of large residential lots, typically on well and septic, and institutional properties, as well as expansive agricultural lands and open space.

Several major transportation corridors pass through Lawrence, including Interstate Highways 95 and 295, Route 1, and the Amtrak Northeast Corridor railroad.

Because of its strategic location in the Mid-Atlantic region—only 54 miles from New York City and 33 miles from Philadelphia—the area is part of the “commuter shed” for these two large cities. In fact, many new home buyers in Lawrence are professionals who have taken jobs in Manhattan and commute into the city.

Lawrence is still experiencing development with new condominiums, single-family homes, town houses, office complexes, and shopping centers. While such growth poses challenges for the township, Lawrence has been successful at retaining much of its colonial charm, nurturing a productive agricultural industry, and protecting over 27 percent of its land area as open space.

BRIEF TOWNSHIP HISTORY

Lawrence Township is one of the oldest municipalities in New Jersey. Although the township was officially established in 1697, the human history of the region dates back hundreds of years. The earliest inhabitants of the land area today known as Lawrence Township were the Lenape Indians (called “the Delawares” by the English). These migratory people ranged throughout New Jersey along the banks of the Delaware River and its tributaries, leaving a legacy of stream names throughout the area. For example, Assunpink Creek is widely thought to be Lenape for “rocky place that is watery.” Creeks such as this 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. In February of 1697, the Colonial Supreme Court at Burlington officially authorized the formation of the area north of the Assunpink Creek as the Township of Maidenhead. Maidenhead became the most important settlement in the area at that time

because of its rich soils, easily cultivatable land, nearby stone quarries, and central location between the Raritan and the Delaware rivers. Maidenhead was part of Burlington County and the colony of West Jersey until 1714, when the township became part of Hunterdon County. In 1798 the township was legally incorporated through an act of the New Jersey legislature. On January 24, 1816, the name of the township was changed to Lawrence. The municipality chose this name in honor of Captain James Lawrence, naval captain of the frigate *USS Chesapeake* during the War of 1812, who is renowned for his final order, “Don’t give up the ship.”

In 1838, Lawrence became part of Mercer County, which was formed from parts of Middlesex, Burlington, and Hunterdon counties. In 1844, Lawrence annexed an area of land across the Shabakunk Creek known as East Trenton (area #30; See **Appendix A: Mercer County Civil Outlines**). In 1858, Ewing Township incorporated a small area on the western side of Lawrence Township (#26). The last major boundary change occurred in 1882, when two other parcels of land (#30 and #11) seceded and became known as Millham Township (Millham was eventually incorporated into Trenton).

Lawrence was a popular place to settle throughout the 1800s because of its excellent agricultural soils. The village of Maidenhead (now Lawrenceville) served as the center of trade for the farming community. Many acres of forest were cleared for farming up through the early 1900s. Throughout the twentieth and twenty-first centuries, the acreage used for farming declined as more and more land was converted to residential and commercial uses. Even so, a large portion of northern Lawrence remains in agricultural use today as a result of farmland preservation efforts.

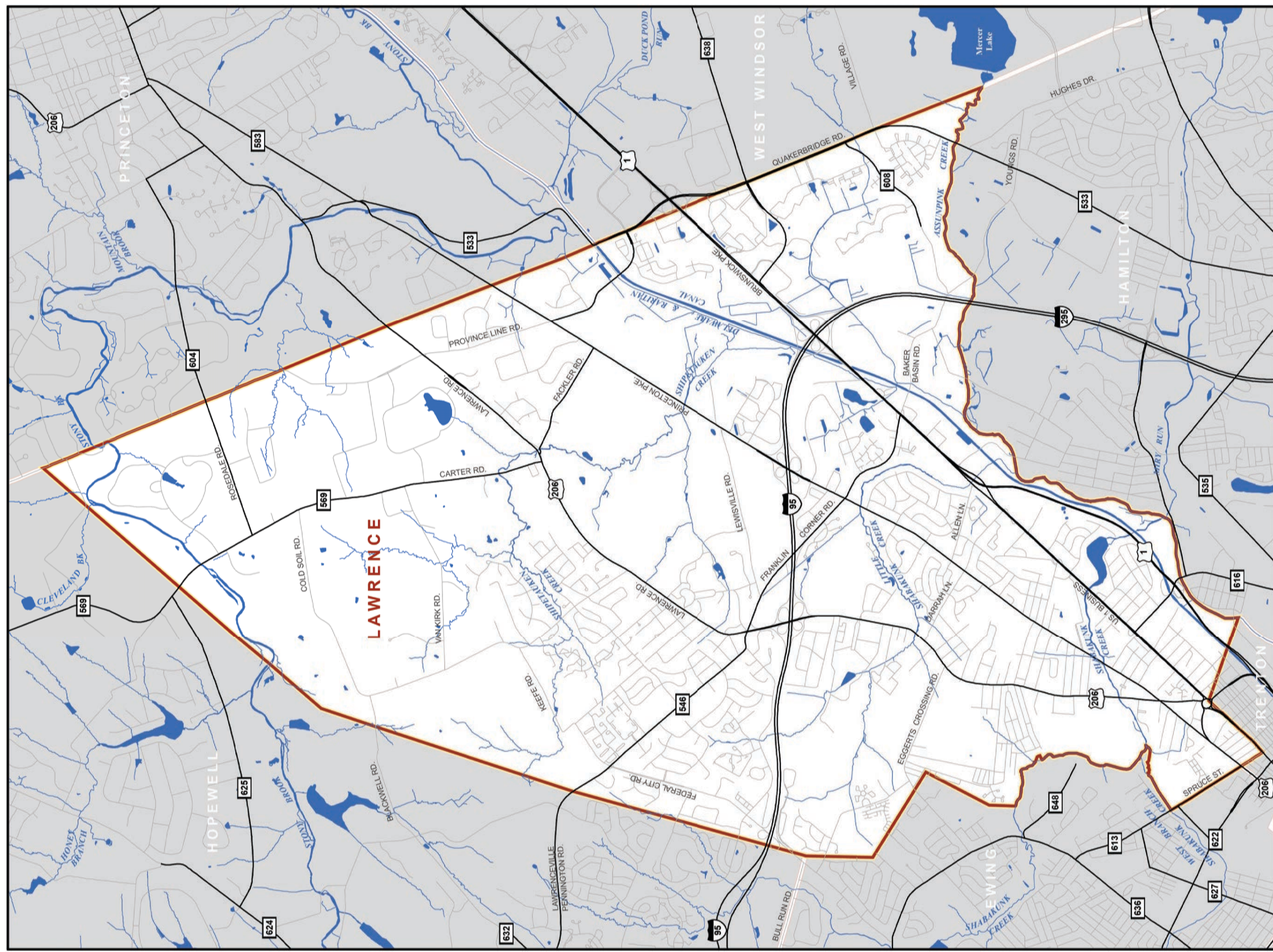
The development of railways in the second half of the 19th century, two trolley lines extending from Trenton in 1899, and the rise of the automobile from the 1920s onward hastened Lawrence’s growth. Lawrence’s proximity to Trenton and accessibility by highway and train made the township an attractive location for commuters, as well as large businesses and industries. By 1930, the population of Lawrence had swelled to 6,293 individuals.

As a growing suburb of Trenton, Lawrence continued to grow rapidly following World War II. Between 1940 and 1950, the population grew from 6,522 to 8,449, an increase of almost 30 percent. With the construction of large housing subdivisions in the central part of the township, from 1950 to 1970 the population more than doubled from 8,500 to over 19,000. As part of that suburban migration, Rider College (today Rider University) moved from Trenton to its current Lawrence campus in 1959.

In the final decades of the twentieth century Lawrence added another 10,000 residents as the northern end of the township emerged as a suburb of Princeton and the Route 1 corridor. The township’s two major corporate campuses—Educational Testing Service (ETS) and Bristol-Myers Squibb—grew to their current dimensions, as did the Quakerbridge Mall, which became the catalyst for significant retail development along Route 1.

Despite the transition of Lawrence from a largely rural to a largely developed community, the town has been able to maintain much of its historic charm, as well as significant areas of open space.

Map 1: Lawrence Township



Sources : 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.

A north arrow pointing upwards and a scale bar showing distances of 0, 0.25, 0.5, and 1 mile. The DVRPC logo is located to the right of the scale bar.

Map 2: Aerial Photograph



Sources : 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
dvrpc

Land Cover

Land cover is a description of the landscape on the earth’s surface, such as forest, water, or wetlands. Land use is a description of how people use the land, such as commercial or residential. NJDEP analyzes the land use and land cover of the state based on aerial photography every five years. The last completed analysis is based on aerials from 2012.

Land Cover Classifications

Urban: The Urban or Built-up Land category is characterized by intensive land use where the landscape has been altered by human activities. Although structures are usually present, this category is not restricted to traditional urban areas.

Barren Land: Barren Land is characterized by thin soil, sand or rocks, and a lack of vegetative cover in a non-urban setting. Barren Land is found in nature but also as a result of man’s activities. Extraction mining operations, landfills, and other disposal sites compose the majority of man-altered barren lands.

Source: Land Use Land Cover Classification System, NJDEP Modified Anderson System 2002.

Lawrence’s land cover/land use reflects its natural setting, its agricultural past, and the successive waves of suburban residential development that have occurred since the end of World War II. The largest land cover type found in Lawrence is Urban, which covers approximately 53 percent of the township. This represents a 4 percent increase in Urban or Built-up Land since 2002. The second-highest land cover category is Wetlands, which encompasses 21 percent of the township.

Although Barren Land comprises the smallest portion of Lawrence’s land cover, it experienced the greatest percentage change since 2002, decreasing from 195 acres in 2002 to 22 acres in 2012 (a decrease of 88 percent).

Table 1 shows Lawrence’s land cover grouped into general categories based on NJDEP’s 2012 and 2002 color infrared imagery. The final column

highlights the change in each land use class that occurred over the 10-year period between 2002 and 2012.

Table 1: Lawrence General Land Cover (2012, 2002)

General Land Classes	2012		2002		Change in Acres, 2012–2002
	Area (Acres)	Percentage	Area (Acres)	Percentage	
Agriculture	1,475	10.5%	1,631	11.6%	–156
Barren Land	22	0.2%	195	1.4%	–173
Forest	1,938	13.8%	1,825	13.0%	113
Urban	7,477	53.2%	7,190	51.1%	287
Water	203	1.4%	169	1.2%	34
Wetlands	2,946	21.0%	3,056	21.7%	–110
TOTAL	14,060	100.0%	14,066	100.0%	–6

Source: NJDEP, 2012, 2002

Table 2 breaks down the 2012 general land cover categories into detailed land cover categories.

Table 2: Lawrence Land Use (2012)

Type	Area (Acres)	Percentage
Agricultural wetlands (modified)	159.77	1.1%
Altered lands	12.89	0.1%
Artificial lakes	77.29	0.5%
Athletic fields (schools)	212.85	1.5%
Bridge over water	1.98	0.0%
Cemetery	5.48	0.0%
Commercial/services	1,108.66	7.9%
Coniferous brush/shrubland	12.19	0.1%
Coniferous forest (>50% crown closure)	4.29	0.0%
Coniferous forest (10–50% crown closure)	6.37	0.0%
Cropland and pastureland	1,269.39	9.0%
Deciduous brush/shrubland	74.02	0.5%
Deciduous forest (>50% crown closure)	1,038.70	7.4%
Deciduous forest (10–50% crown closure)	283.35	2.0%
Deciduous scrub/shrub wetlands	66.72	0.5%
Deciduous wooded wetlands	2,211.71	15.7%
Disturbed wetlands (modified)	13.30	0.1%
Former agricultural wetland (becoming shrubby, not built-up)	8.68	0.1%
Herbaceous wetlands	239.04	1.7%
Industrial	128.51	0.9%
Industrial and commercial complexes	7.55	0.1%
Major roadway	207.79	1.5%
Managed wetland in built-up maintained rec area	12.26	0.1%
Managed wetland in maintained lawn greenspace	39.46	0.3%
Military installations	25.71	0.2%
Mixed deciduous/coniferous brush/shrubland	340.92	2.4%
Mixed forest (>50% coniferous with >50% crown closure)	21.10	0.2%
Mixed forest (>50% coniferous with 10–50% crown closure)	11.23	0.1%
Mixed forest (>50% deciduous with >50% crown closure)	14.74	0.1%
Mixed forest (>50% deciduous with 10–50% crown closure)	9.21	0.1%

Type	Area (Acres)	Percentage
Mixed scrub/shrub wetlands (coniferous dom.)	7.77	0.1%
Mixed scrub/shrub wetlands (deciduous dom.)	105.83	0.8%
Mixed transportation corridor overlap area	0.09	0.0%
Mixed urban or built-up land	8.94	0.1%
Mixed wooded wetlands (coniferous dom.)	0.63	0.0%
Mixed wooded wetlands (deciduous dom.)	4.28	0.0%
Natural lakes	9.47	0.1%
Old field (<25% brush covered)	115.22	0.8%
Orchards/vineyards/nurseries/horticultural areas	131.16	0.9%
Other agriculture	74.00	0.5%
Other urban or built-up land	787.41	5.6%
Phragmites dominate interior wetlands	2.15	0.0%
Phragmites dominate old field	0.75	0.0%
Plantation	5.49	0.0%
Railroads	12.94	0.1%
Recreational land	376.40	2.7%
Residential, high-density or multiple dwelling	523.62	3.7%
Residential, rural, single unit	1,379.90	9.8%
Residential, single unit, low density	654.36	4.7%
Residential, single unit, medium density	1,628.10	11.6%
Stormwater basin	158.84	1.1%
Streams and canals	114.15	0.8%
Transitional areas	9.32	0.1%
Transportation/communication/utilities	168.45	1.2%
Upland rights-of-way developed	28.72	0.2%
Upland rights-of-way undeveloped	52.55	0.4%
Wetland rights-of-way	74.26	0.5%
TOTAL	14,059.96	100.0%

Source: NJDEP, 2012

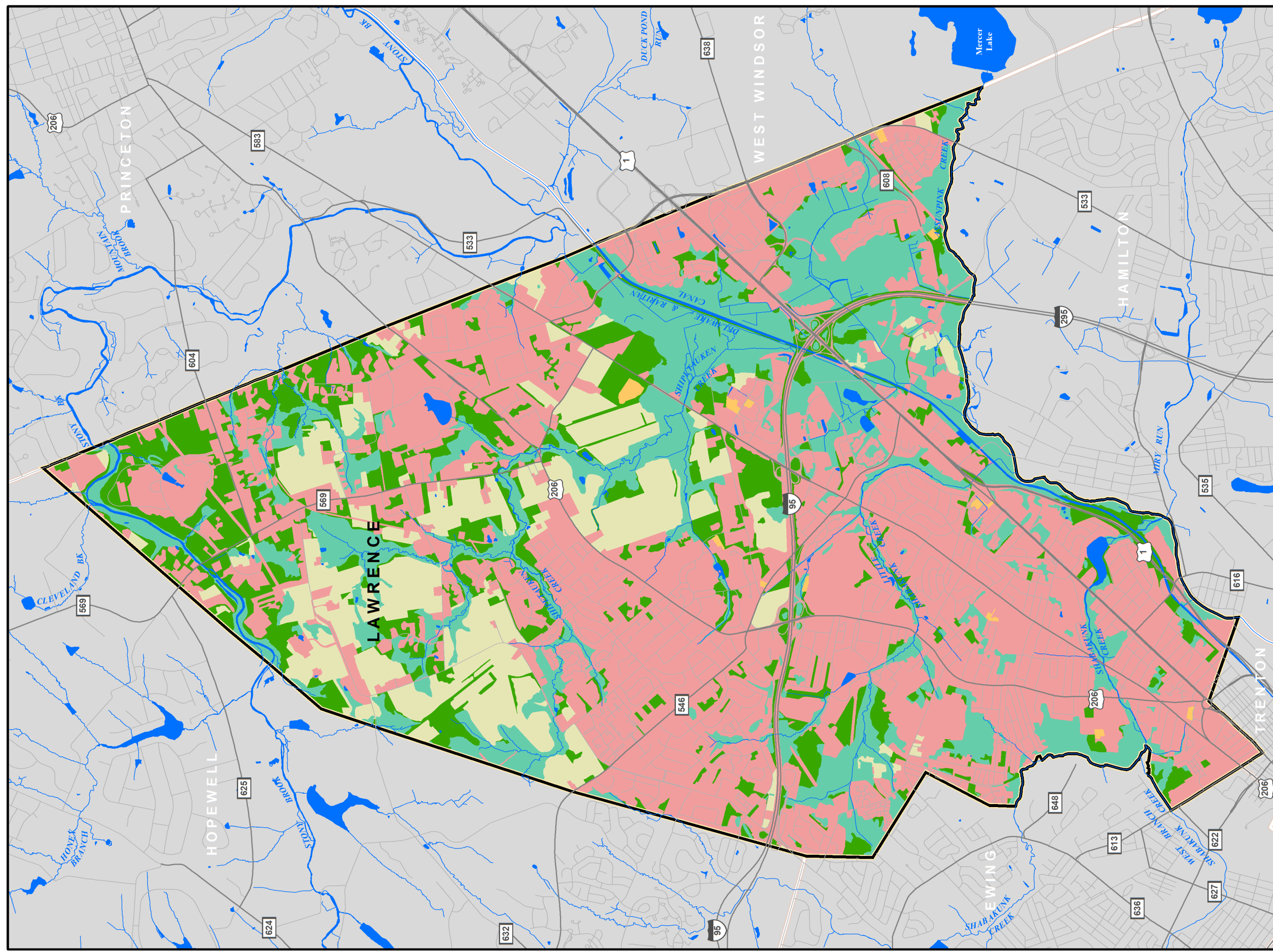
These categories are also depicted on **Map 3: NJDEP Land Cover (2012)**.



Cherry Grove Farm

Source: DVRPC

Map 3: NJDEP Land Cover (2012)



Sources: NJDEP, NJDOT, NRCS, 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.

- Agriculture
- Barren Land
- Forest
- Developed
- Wetlands
- Water

0 0.25 0.5 1 Miles

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Natural Resources

PHYSIOGRAPHY

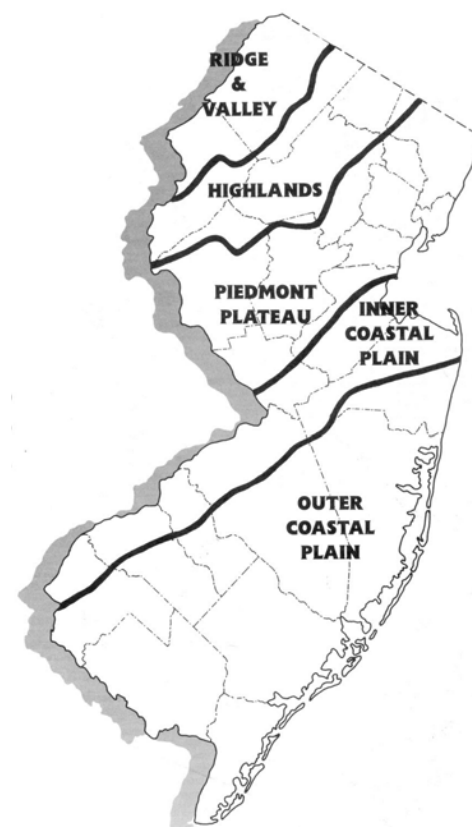
Physiography is the study of a location in relation to its underlying geology. New Jersey is characterized by four physiographic provinces as shown in **Figure 1: The Physiographic Regions of New Jersey**. These provinces include the Ridge and Valley Province, the Highlands Province, the Piedmont Plateau Province, and the Coastal Plain Province. The Coastal Plain Province is further subdivided into the Inner Coastal Plain and the Outer Coastal Plain.

Lawrence spans two physiographic provinces. The northern part of the township lies in the Piedmont Plateau. The Piedmont Plateau is characterized by low, rolling hills and consists of a complex variety of rock formations. 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.

The southern portion of the township is located in the Inner Coastal Plain. The Inner Coastal Plain has relatively flat topography and consists of fertile, unconsolidated sands, silts, and clays.

The dividing line between the two provinces is the fall line, a drop in land level that separates the Piedmont Plateau from the Inner Coastal Plain. This line separates areas with considerable differences in geology, topography, and hydrology. The fall line runs nearly parallel with Route 1, which crosses through the southeastern portion of Lawrence, and has numerous waterfalls marking its course. It is a boundary between older, consolidated rock in the north and younger, less consolidated rock—mostly gravels and sands—in the south.

Figure 1: The Physiographic Regions of New Jersey



Source: NJDEP, NJGS

TOPOGRAPHY AND SURFACE LANDSCAPES

Topography relates to the surface terrain and features of an area. The topography of Lawrence Township is relatively mild, with gentle slopes, flat areas, and occasional steep

slopes. Lawrence contains many wetlands, most of which are located along the Shipetaukin, Assunpink, and Shabakunk creeks and their tributaries. Upland forests are found scattered throughout the township, with the largest sections found to the north, along the Stony Brook, and in the area bounded by Rosedale, Carter, and Lawrence roads. The landscape in the northern part of the township supports gently rolling farmland. The landscape to the south consists of either urban lands, especially near the City of Trenton, or wetlands. The highest elevation in the township is found in the northwest, at 238 feet above sea level. The lowest elevations, which are around 60 feet, are found along the southern creeks. These elevations are also depicted on **Map 4: Elevation**.

Steep Slopes

Steep slopes are fragile environmental features that not only provide scenic views but can also serve a number of environmental benefits, including groundwater recharge. Steep slopes also pose significant development challenges as they are highly susceptible to erosion, land slippage, and subsidence if disturbed.

The Land Use Ordinance of the Township of Lawrence defines steep slopes as those over 20 percent. Development of areas with steep slopes is usually inadvisable as it is likely to result in soil instability, erosion, sedimentation of streams, and increased stormwater runoff and flooding, which can result in degradation of water quality, habitat destruction, and potential damage to property. Erosion on steep slopes is especially prevalent where excessive tree removal has taken place.

Only a small percentage of Lawrence (0.07 percent of the township or 10 acres) has slopes of over 20 percent. The steepest slopes are found primarily along the Stony Brook and its tributaries, and along the Shipetaukin Creek.

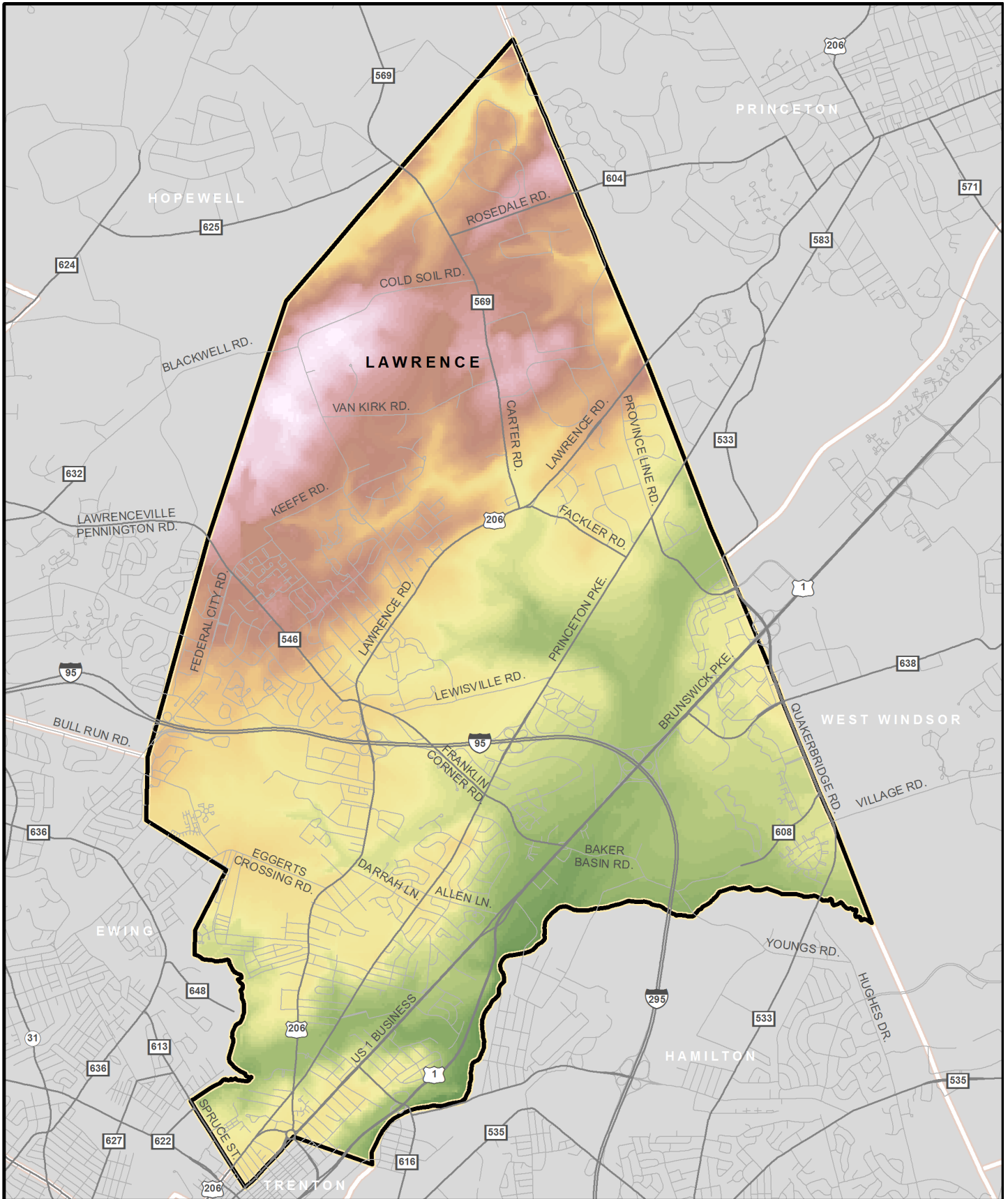
Most of the steep slopes in Lawrence are well vegetated, although farm fields and residential properties may extend to the edge of the plateau. In some locations, development has occurred on the edge of very steep slopes. In these instances, it is important that natural buffers and other stormwater best management practices (BMPs) are used to separate the slope from the development and to prevent runoff from eroding the slope. In 2009, Lawrence amended **§430.J of its Land Use Ordinance** to further protect steep slopes within the township. This amendment narrowed the definition of steep slopes from slopes over 15 percent to slopes over 20 percent but stated that steep slopes shall be protected from avoidable disturbances. Lawrence's steep slopes are depicted on **Map 5: Steep Slopes**.

SOILS

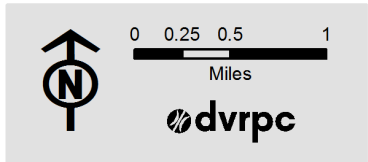
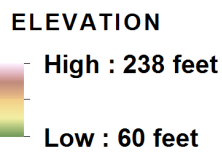
Soil is the foundation for all land uses. A region's soil defines what vegetation is possible, influencing agricultural uses. Soil properties also affect the location of wells and septic facilities, often determining development potential in certain areas. Soil is a natural resource that cannot be replenished on the human time scale.

Data on soil types is derived from surveys conducted by the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS). The Mercer County Rutgers Cooperative Extension Office conducts soil testing for the county. Testing kits are available for purchase, which analyze the fertility level, pH, and other soil properties.

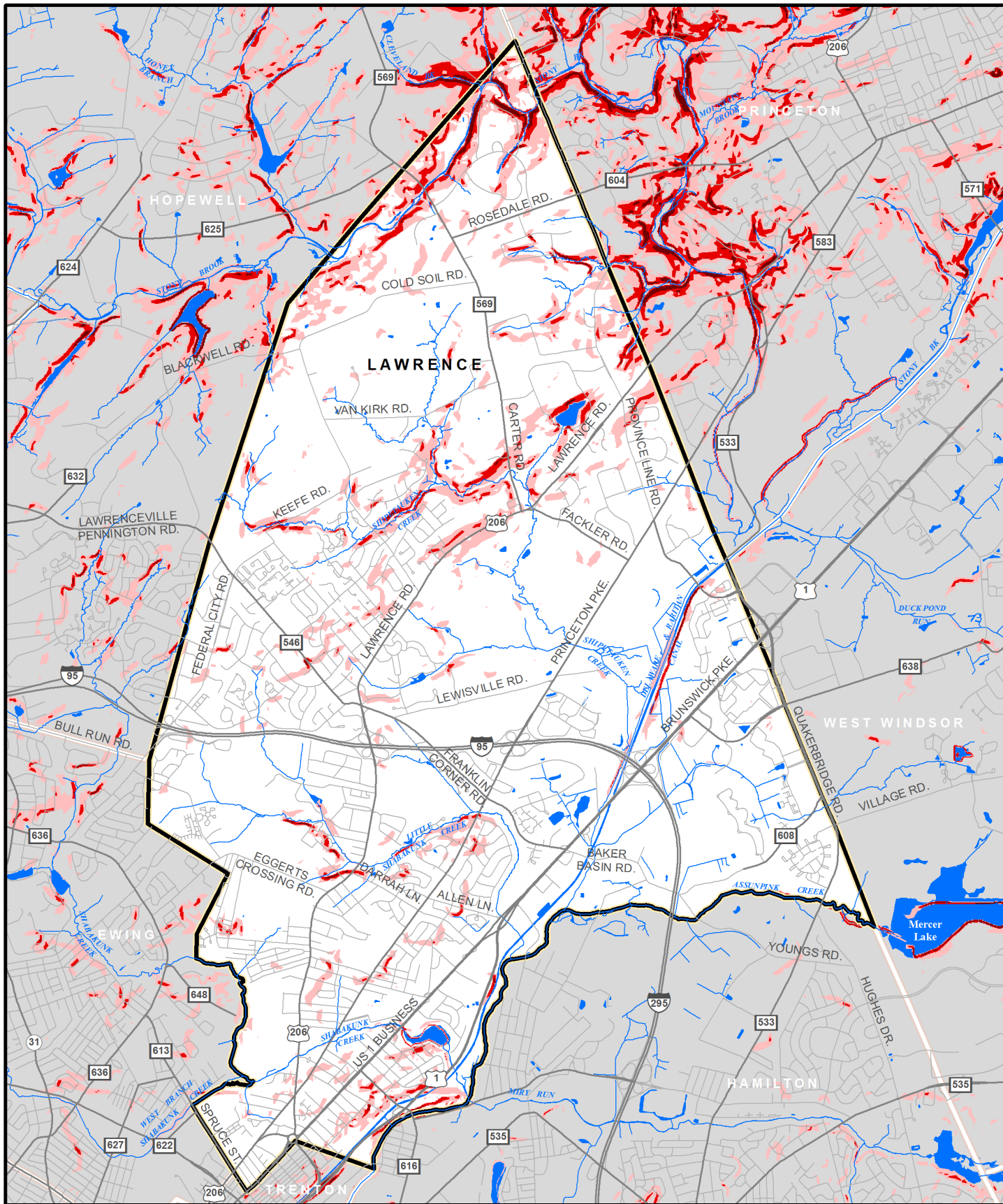
Map 4: Elevation



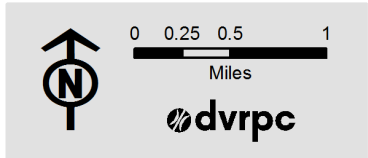
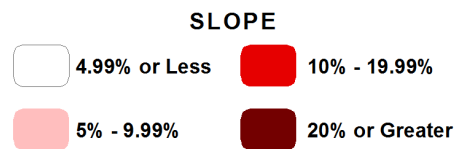
Sources : NJDEP, NJDOT, DVRPC
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.



Map 5: Steep Slopes



Sources : 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.



Common Soils

Bucks: Nearly 17 percent of Lawrence's soils are in the Bucks series. Bucks soils are deep, well-drained soils, located on upland divides and rolling slopes. They are underlain by silt and gravel that lie above bedrock. Their surface runoff and permeability is moderate. Bucks soils have moderate to severe limitations for disposal of sewage from septic tanks. Much of this soil type has been cleared of mixed oaks, maples, yellow poplar, hickory, and ash. Agriculturally, it is used mostly for growing corn, small grains, soybeans, hay, pasture, and, to a small extent, for vegetables, fruits, and nursery plants. Several of the subtypes found in the township are considered Prime Farmland.

Matapeake: Of Lawrence's soils, 9 percent are in the Matapeake series. These soils tend to be very deep and well drained, with slopes ranging from 0 to 10 percent. They have moderate to moderately slow permeability and moderate surface runoff. These soils were formed in a silty mantle and are underlain by sandy and gravelly material. Oaks dominate the native vegetation, and some cutover areas have loblolly, Virginia, or shortleaf pine. Almost all Matapeake soil was once cultivated. Today, commonly grown crops include corn, soybeans, and small grains. The soil is considered Prime Farmland and offers few constraints to development.

Udorthents: make up 6.9 percent of the township's soils. 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.

Sassafras: Over 6 percent of Lawrence is made up of Sassafras soils, which are usually found on gently sloping uplands. These soils are deep, well drained, and moderately coarse in texture. Permeability is moderate to moderately rapid. Slopes can range from nearly level to very steep. These soils can support vegetation consisting of mixed oaks and scattered pines. Sassafras soils are easy to work, have a low natural fertility, and respond to fertilization. These soils present few constraints to development.

Soil Series

Because Lawrence lies in both the Piedmont Province and the Coastal Plain Province, it contains a wide variety of soil series. Soils of the Piedmont Province are predominantly silty, shaley, or stony soils. Thus, the Piedmont region experiences large amounts of surface drainage, flooding, and siltation. Piedmont soils are underlain by bedrock at depths ranging from two to 20 feet. Soils of the Coastal Plain Province, by contrast, range from sand to clay and were formed from materials that were deposited in water. The thickness of their beds ranges from several to hundreds of feet. These formations are typically good aquifers.

The township's soils consist of 33 series types and 79 variations within those series (excluding water), as identified by the NRCS. These are listed in **Table 3: Lawrence Township Soils** and shown on **Map 6: Soils**. Several soil series appear more frequently within Lawrence than others and are briefly described in the box to the left and in the **March 2008 Lawrence ERI**. The most dominant soil type in Lawrence Township is the Bucks soil series, which covers 16.5 percent of the township, followed by the Matapeake soil series, which covers 9.2 percent of the township.

Hydric Soils

Over 22 percent of Lawrence's soils are considered hydric soils, as shown in **Table 3: Lawrence Township Soils**. Hydric soils, as defined by the NRCS, are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic (oxygen-free) conditions below their surfaces. These soils have unique soil properties and are an important element of wetland areas. If a soil is classified as "hydric," land use may be restricted due to the relationship of hydric soils to the definition of wetlands and to laws regarding wetland preservation. More detailed descriptions of Lawrence's wetland areas are found in this section under **Wetlands** and **Agricultural Wetlands** and within the Biological Resources section under **Wetlands**.

Table 3: Lawrence Township Soils

Soil Type	Description	Area (Acres)	% of Lawrence Twp	Hydric?
AugmB	Aura sandy loam, moderately firm, 2 to 5 percent slopes	39.68	0.28%	Yes
AugmC	Aura sandy loam, moderately firm, 5 to 10 percent slopes	26.08	0.19%	Yes
BhnA	Birdsboro silt loam, 0 to 2 percent slopes	100.35	0.71%	No
BhnB	Birdsboro silt loam, 2 to 6 percent slopes	117.12	0.83%	No
BHRSA	Birdsboro sandy subsoil variant soils, 0 to 2 percent slopes	115.05	0.82%	No
BHRSB	Birdsboro sandy subsoil variant soils, 2 to 6 percent slopes	205.03	1.46%	No
BHRSC	Birdsboro sandy subsoil variant soils, 6 to 12 percent slopes	8.04	0.06%	No
BHSGB	Birdsboro gravelly solum variant soils, 0 to 6 percent slopes	187.28	1.33%	No
BoyAt	Bowmansville silt loam, 0 to 2 percent slopes, frequently flooded	311.26	2.21%	Yes
BucA	Bucks silt loam, 0 to 2 percent slopes	259.21	1.84%	No
BucB	Bucks silt loam, 2 to 6 percent slopes	1710.78	12.17%	No
BucB2	Bucks silt loam, 2 to 6 percent slopes, eroded	168.11	1.20%	No
BucC	Bucks silt loam, 6 to 12 percent slopes	50.67	0.36%	No
BucC2	Bucks silt loam, 6 to 12 percent slopes, eroded	125.25	0.89%	No
ChcA	Chalfont silt loam, 0 to 2 percent slopes	3.36	0.02%	Yes
ChcB	Chalfont silt loam, 2 to 6 percent slopes	193.61	1.38%	Yes
ChcB2	Chalfont silt loam, 2 to 6 percent slopes, eroded	33.60	0.24%	No
ChcC2	Chalfont silt loam, 6 to 12 percent slopes, eroded	5.67	0.04%	Yes
DohgB	Downer fine sandy loam, gravelly clay loam substratum, 0 to 5 percent slopes	8.42	0.06%	No
DOZA	Doylestown and Reaville variant silt loams, 0 to 2 percent slopes	361.28	2.57%	Yes
DOZB	Doylestown and Reaville variant silt loams, 2 to 6 percent slopes	249.33	1.77%	Yes
DOZB2	Doylestown and Reaville variant silt loams, 2 to 6 percent slopes, eroded	34.87	0.25%	Yes
DOZC2	Doylestown and Reaville variant silt loams, 6 to 12 percent slopes, eroded	7.66	0.05%	Yes
EkbA	Elkton silt loam, 0 to 2 percent slopes	479.54	3.41%	Yes
EvgB	Evesboro loamy sand, 0 to 5 percent slopes	19.71	0.14%	No
FamA	Fallsington sandy loam, 0 to 2 percent slopes	124.89	0.89%	Yes
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	13.95	0.10%	Yes

Soil Type	Description	Area (Acres)	% of Lawrence Twp	Hydric?
FmhAv	Fluvaquents, 0 to 3 percent slopes, very frequently flooded	315.78	2.25%	Yes
FodB	Fort Mott loamy sand, 0 to 5 percent slopes	76.55	0.54%	No
FodC	Fort Mott loamy sand, 5 to 10 percent slopes	3.48	0.02%	No
GadB	Galestown loamy sand, 0 to 5 percent slopes	56.70	0.40%	No
GASB	Galloway variant soils, 0 to 5 percent slopes	139.16	0.99%	No
GKAWOB	Glassboro and Woodstown sandy loams, 0 to 5 percent slopes	84.17	0.60%	Yes
KkoC	Klinesville channery loam, 6 to 12 percent slopes	74.16	0.53%	No
KkoE	Klinesville channery loam, 18 to 35 percent slopes	40.79	0.29%	No
LbhB	Lansdale sandy loam, 2 to 6 percent slopes	2.39	0.02%	No
LbmCb	Lansdale loam, 0 to 12 percent slopes, very stony	5.81	0.04%	No
LbnC2	Lansdale channery loam, 6 to 12 percent slopes, eroded	10.15	0.07%	No
LemB	Lehigh silt loam, 2 to 6 percent slopes	0.19	0.00%	Yes
LemC2	Lehigh silt loam, 6 to 12 percent slopes, eroded	0.72	0.01%	No
LenB	Lenoir-Keyport silt loams, 0 to 5 percent slopes	90.28	0.64%	Yes
MbaAt	Marsh, freshwater, 0 to 2 percent slopes, frequently flooded	134.80	0.96%	No
MbpA	Matapeake loam, 0 to 2 percent slopes	232.86	1.66%	No
MbpB	Matapeake loam, 2 to 5 percent slopes	983.87	7.00%	No
MbpC2	Matapeake loam, 5 to 10 percent slopes, eroded	70.38	0.50%	No
MBYB	Mattapex and Bertie loams, 0 to 5 percent slopes	625.27	4.45%	Yes
OthA	Othello silt loam, 0 to 2 percent slopes	814.86	5.80%	Yes
PeoB	Penn channery silt loam, 2 to 6 percent slopes	124.39	0.88%	No
PeoC	Penn channery silt loam, 6 to 12 percent slopes	109.06	0.78%	No
PeoD	Penn channery silt loam, 12 to 18 percent slopes	31.88	0.23%	No
PHG	Pits, sand and gravel	50.47	0.36%	No
PmmA	Plummer sandy loam, 0 to 2 percent slopes	157.02	1.12%	Yes
PmmwA	Plummer sandy loam, very wet, 0 to 2 percent slopes	174.47	1.24%	Yes

Soil Type	Description	Area (Acres)	% of Lawrence Twp	Hydric?
PortA	Portsmouth variant silt loam, 0 to 2 percent slopes	437.19	3.11%	Yes
QukB	Quakertown silt loam, 2 to 6 percent slopes	505.05	3.59%	No
QukB2	Quakertown silt loam, 2 to 6 percent slopes, eroded	64.55	0.46%	No
QukC	Quakertown silt loam, 6 to 12 percent slopes	6.28	0.04%	Yes
QukC2	Quakertown silt loam, 6 to 12 percent slopes, eroded	139.88	0.99%	No
QumB	Quakertown channery silt loam, 2 to 6 percent slopes	5.38	0.04%	No
QumC2	Quakertown channery silt loam, 6 to 12 percent slopes, eroded	29.89	0.21%	No
QumD2	Quakertown channery silt loam, 12 to 18 percent slopes, eroded	42.85	0.30%	No
REFA	Readington and Abbottstown silt loams, 0 to 2 percent slopes	406.01	2.89%	Yes
REFB	Readington and Abbottstown silt loams, 2 to 6 percent slopes	559.75	3.98%	Yes
REFB2	Readington and Abbottstown silt loams, 2 to 6 percent slopes, eroded	38.03	0.27%	Yes
REFC2	Readington and Abbottstown silt loams, 6 to 12 percent slopes, eroded	22.35	0.16%	No
RehA	Reaville silt loam, 0 to 2 percent slopes	6.20	0.04%	Yes
RehB	Reaville silt loam, 2 to 6 percent slopes	73.75	0.52%	Yes
RehB2	Reaville silt loam, 2 to 6 percent slopes, eroded	22.21	0.16%	Yes
RehC2	Reaville silt loam, 6 to 12 percent slopes, eroded	14.60	0.10%	No
RorAt	Rowland silt loam, 0 to 2 percent slopes, frequently flooded	298.29	2.12%	Yes
SacA	Sassafras sandy loam, 0 to 2 percent slopes	49.83	0.35%	Yes
SacB	Sassafras sandy loam, 2 to 5 percent slopes	304.10	2.16%	Yes
SacC2	Sassafras sandy loam, 5 to 10 percent slopes, eroded	157.30	1.12%	No
SadB	Sassafras gravelly sandy loam, 2 to 5 percent slopes	381.78	2.72%	Yes
SagC3	Sassafras sandy clay loam, 5 to 10 percent slopes, severely eroded	7.67	0.05%	No
UdbB	Udorthents, bedrock substratum, 0 to 8 percent slopes	17.24	0.12%	Yes
UdcB	Udorthents, clayey substratum, 0 to 8 percent slopes	68.22	0.49%	No

Soil Type	Description	Area (Acres)	% of Lawrence Twp	Hydric?
UdgB	Udorthents, gravelly substratum, 0 to 8 percent slopes	17.91	0.13%	No
UdstB	Udorthents, stratified substratum, 0 to 8 percent slopes	866.82	6.17%	No
WATER	Water	147.40	1.05%	No
TOTAL		14,059.96	100%	

Source: NJDEP, 2012; NRCS, 2015

Soil Limitations

Certain soil characteristics can severely restrict the use of sites for construction and development. **Table 4: 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 development, which are mostly located in the northwestern portion of the township. Septic systems require soils that have a low water table (five feet or more from the surface) and high permeability to allow for proper drainage of wastewater. Soils with high water tables (five feet or less from the surface) create a potential for erosion, wet basements, and low permeability, often allowing wastewater to collect near the surface. Because the suitability of a soil for a septic disposal field is very site specific and relies on many factors, including but not limited to the soil type, there is not an accurate source of soil information regarding this subject. The best way to determine soil suitability for a septic system is to request a site survey by a professional.

Table 4: Soil Limitations for Development

Soil Types	Soil Description	Land Use Implications		
		Building without Basement	Building with Basement	Small Commercial Buildings
AugmB	Aura, Sandy Loam	A	A	A
AugmC	Aura, Sandy Loam	A	A	C
MBYB	Bertie, Loams	B	C	B
BHSGB	Birdsboro, Gravelly Solum	A	A	A
BHRSA	Birdsboro, Sandy Subsoil	B	C	B
BHRSB	Birdsboro, Sandy Subsoil	B	C	B
BHRSC	Birdsboro, Sandy Subsoil	B	C	C
BhnA	Birdsboro, Silt Loam	A	A	A
BhnB	Birdsboro, Silt Loam	A	A	A
BoyAt	Bowmansville, Silt Loam	C	C	C
BucA	Bucks, Silt Loam	C	B	C
BucB	Bucks, Silt Loam	A	B	A
BucB2	Bucks, Silt Loam	A	B	A
BucC	Bucks, Silt Loam	B	B	C
BucC2	Bucks, Silt Loam	B	B	C
ChcA	Chalfont, Silt Loam	C	C	C

Soil Types	Soil Description	Land Use Implications		
		Building without Basement	Building with Basement	Small Commercial Buildings
ChcB	Chalfont, Silt Loam	C	C	C
ChcB2	Chalfont, Silt Loam	C	C	C
ChcC2	Chalfont, Silt Loam	C	C	C
DohgB	Downer, Fine Sandy Loam	A	A	A
DOZA	Doylestown, Variant Silt Loams	C	C	C
DOZB	Doylestown, Variant Silt Loams	C	C	C
DOZB2	Doylestown, Variant Silt Loams	C	C	C
DOZC2	Doylestown, Variant Silt Loams	C	C	C
EkbA	Elkton, Silt Loam	C	C	C
EvgB	Evesboro, Loamy Sand	A	A	A
FamA	Fallsington, Sandy Loam	C	C	C
FmhAt	Fluvaquents, Loamy	C	C	C
FmhAv	Fluvaquents, Very Wet	C	C	C
FodB	Fort Mott, Loamy Sand	A	A	A
FodC	Fort Mott, Loamy Sand	A	A	C
GadB	Galestown, Loamy Sand	A	A	A
GASB	Galloway, Variant Soils	A	C	A
GKAWOB	Glassboro, Sandy Loams	C	C	C
KkoC	Klinesville, Channery Loam	C	C	C
KkoE	Klinesville, Channery Loam	C	C	C
LbnC2	Lansdale, Channery Loam	B	B	C
LbmCb	Lansdale, Loam	A	A	B
LbhB	Lansdale, Sandy Loam	A	A	A
LemB	Lehigh, Silt Loam	C	C	C
LemC2	Lehigh, Silt Loam	C	C	C
LenB	Lenoir and Keyport, Silt Loams	B	C	B
MbaAT	Marsh	N/A	N/A	N/A
MbpA	Matapeake, Loam	A	A	A
MbpB	Matapeake, Loam	A	A	A
MbpC2	Matapeake, Loam	A	A	C
MBYB	Mattapex, Loams	A	C	A
OthA	Othello, Silt Loam	C	C	C
PeoB	Penn, Channery Silt	B	C	B
PeoC	Penn, Channery Silt	B	C	C
PeoD	Penn, Channery Silt	C	C	C
PHG	Pits	N/A	N/A	N/A
PmmA	Plummer, Sandy Loam	C	C	C
PmmwA	Plummer, Sandy Loam	C	C	C
PortA	Portsmouth, Variant Silt Loam	C	C	C
QumB	Quakertown, Channery Silt Loam	A	B	A

Soil Types	Soil Description	Land Use Implications		
		Building without Basement	Building with Basement	Small Commercial Buildings
QumC2	Quakertown, Channery Silt Loam	B	B	C
QumD2	Quakertown, Channery Silt Loam	C	C	C
QukB	Quakertown, Silt Loam	A	B	A
QukB2	Quakertown, Silt Loam	A	B	A
QukC	Quakertown, Silt Loam	B	B	C
QukC2	Quakertown, Silt Loam	B	B	C
REFA	Readington and Abbottstown, Silt Loams: Abbottstown	C	C	C
REFB2	Readington and Abbottstown, Silt Loams: Abbottstown	C	C	C
REFC2	Readington and Abbottstown, Silt Loams: Abbottstown	C	C	C
REFA	Readington and Abbottstown, Silt Loams: Readington	B	C	B
REFB	Readington and Abbottstown, Silt Loams: Readington	B	A	B
REFB	Readington and Abbottstown, Silt Loams: Readington	C	C	C
REFB2	Readington and Abbottstown, Silt Loams: Readington	B	C	B
REFC2	Readington and Abbottstown, Silt Loams: Readington	B	C	C
RehA	Reaville, Silt Loam	B	C	B
RehB	Reaville, Silt Loam	B	C	B
RehB2	Reaville, Silt Loam	B	C	B
RehC	Reaville, Silt Loam	B	C	C
DOZA	Reaville, Variant Silt Loams	B	C	B
DOZB	Reaville, Variant Silt Loams	B	C	B
DOZB2	Reaville, Variant Silt Loams	B	C	B
DOZC2	Reaville, Variant Silt Loams	B	C	C
RorAt	Rowland, Silt Loam	C	C	C
SadB	Sassafrass, Gravelly Sandy Loam	A	A	A
SagC3	Sassafrass, Sandy Clay Loam	A	A	C
SacA	Sassafrass, Sandy Loam	A	A	A
SacB	Sassafrass, Sandy Loam	A	A	A
SacC2	Sassafrass, Sandy Loam	A	A	C
UdbB	Urdothents, Bedrock Substratum	B	C	B
UdcB	Urdothents, Clayey Substratum	C	C	C
UdgB	Urdothents, Gravelly Substratum	A	A	A

Soil Types	Soil Description	Land Use Implications		
		Building without Basement	Building with Basement	Small Commercial Buildings
UdstB	Urdothents, Stratified Substratum	A	A	A
WATER	Water	N/A	N/A	N/A
GKAWOB	Woodstown, Sandy Loams	A	B	A

Source: USDA NRCS, 2013

Key to Land Use Implications	
A = Not Limited	Little or no limitation(s) or easily corrected by use of normal equipment and design techniques.
B = Somewhat Limited	Presence of some limitations that normally can be overcome by careful design and management at somewhat greater cost.
C = Very Limited	Limitations that normally cannot be overcome without exceptional, complex, or costly measures.
N/A = Not Rated	Soil series/type not rated for designated use.

CLIMATE

Climate is a measure of long-term weather patterns and takes into account temperature, precipitation, humidity, atmospheric pressure, wind, and other meteorological variables. Geographically situated midway between the North Pole and the Equator, New Jersey’s climate is extremely variable. The state’s temperate, continental climate is influenced by both hot and cold, and dry and humid airstreams. From May through September, New Jersey is dominated by moist, tropical air that originates in the Gulf of Mexico and is swept in by prevailing winds from the southwest. In winter, winds generally prevail from the northwest, bringing cold, polar air masses from subarctic Canada.

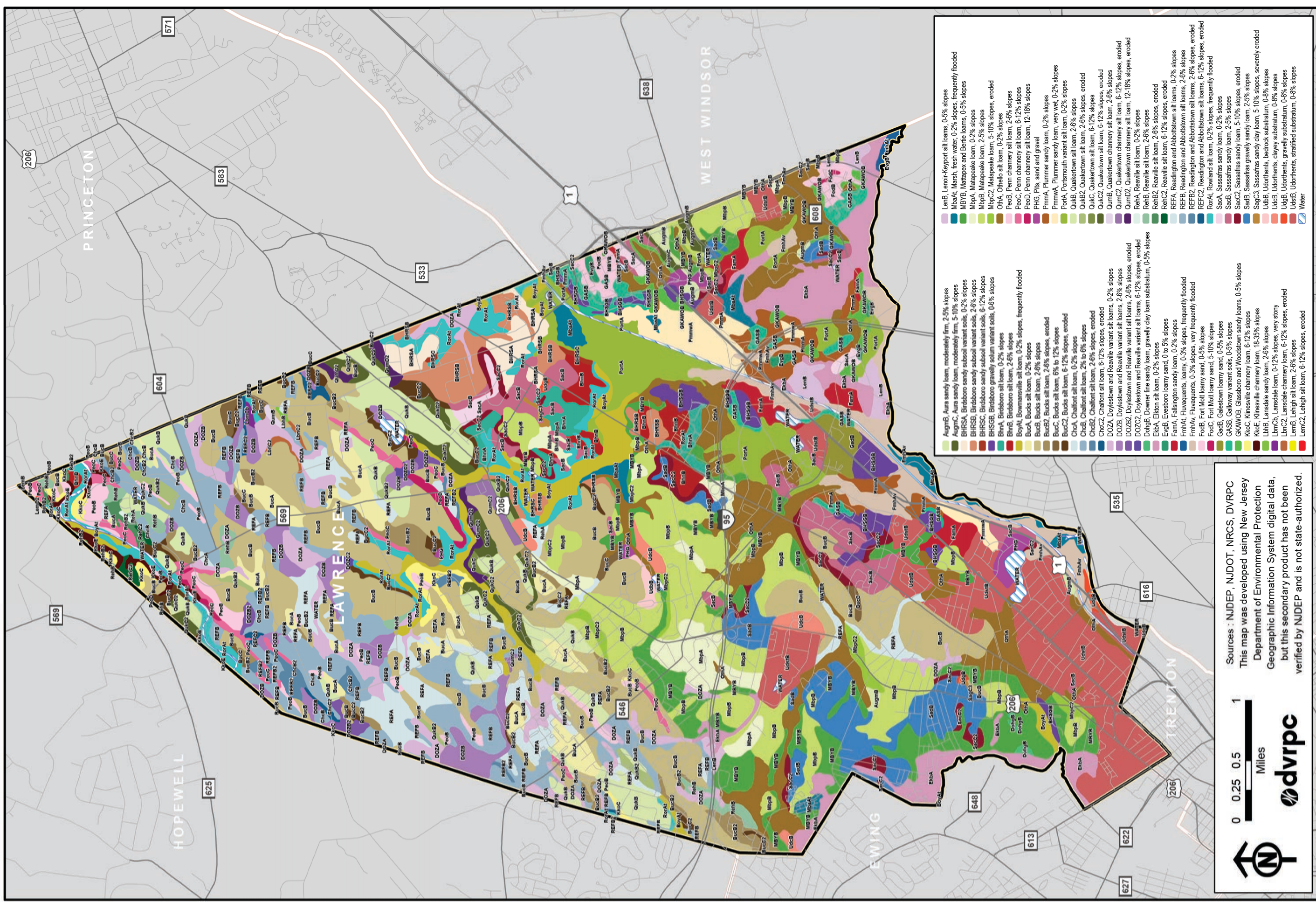
New Jersey is divided into five climate zones: the North, Central, Southwest, Pine Barrens, and Coastal climate zones. Lawrence lies within the Central climate zone, which stretches from New York Harbor to the great bend of the Delaware River near Trenton. This region contains many urban areas, such as Trenton, whose paved surfaces and buildings affect local temperatures by retaining more heat. Known as the “heat island effect,” this causes nighttime temperatures to generally be warmer than surrounding rural areas.

A number of weather and climate observation stations are located near Lawrence. The National Centers for Environmental Information (NCEI), formerly the National Climate Data Center (NCDC), of the National Oceanic and Atmospheric Administration publishes climate data, including monthly summaries from approximately 27 stations in Mercer County on the [NCEI website](#).

Temperature

Based on data recorded from 1995 to 2015 by the State Climatologist station in Hightstown, New Jersey, the mean annual temperature is 53.3°F. As shown in **Figure 2: Monthly Temperature (1995–2015)**, January is the coldest month with a mean temperature of 31.5°F,

Map 6: Soils

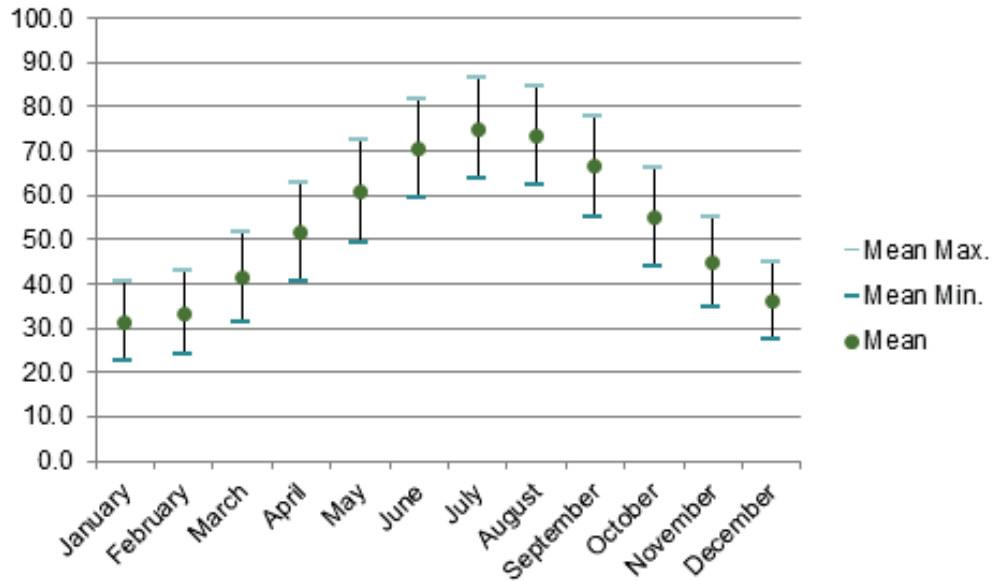


Sources : NJDEP, NJDOT, NRCS, DVRPC
 This map was developed using New Jersey
 Department of Environmental Protection
 Geographic Information System digital data,
 but this secondary product has not been
 verified by NJDEP and is not state-authorized.

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 Miles

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Figure 2: Monthly Temperature (1995–2015)



Source: NCDC

and July is the hottest month with a mean temperature of 75.1°F. In the summer, temperatures in Lawrence rarely exceed 100°F. In the winter, the temperature rarely falls below 10°F for long periods of time. Record temperatures for the region are a high of 102°F and a low of -8°F.

Precipitation

The average monthly precipitation in Lawrence ranges from between two to five inches. Based on data recorded from 1995 to 2015 by the state climatologist station in Hightstown, New Jersey, the area receives the most precipitation in August with an average of 4.78 inches, and the least precipitation in February with an average of 2.49 inches (see **Figure 3: Monthly Precipitation (1995–2015)**). The rainiest month on record was August 2011, when 19.29 inches of precipitation fell. The driest month on record was February 2009, when just 0.60 inches of precipitation fell.

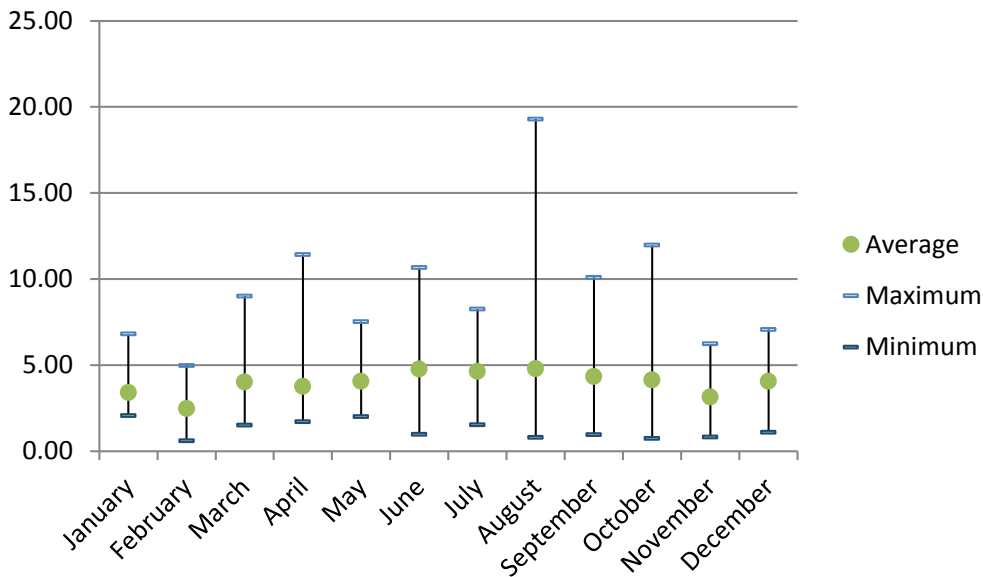
Snowfall

Snowfall typically occurs in New Jersey when moist air from the south converges with cold air from the north. In Lawrence, snowfall may occur from mid-November to early April but is most likely to occur from mid-December to mid-March. Based on data recorded between 2009 and 2014 by the Community Collaborative Rain, Hail, and Snow Network, Lawrence Township experiences an average snowfall of 22.95 inches per year. More recently, during the 2013–2104 winter, Lawrence Township received 60.3 inches of snow, far exceeding the yearly average. The Trenton Mercer Airport recorded a record 76.9 inches of snowfall during the 1995–1996 winter season.

Hazard Events

Severe storm events, including thunderstorms, tropical storms, hurricanes, blizzards, ice storms, hail storms, and tornadoes, all occur in Mercer County. According to the **Mercer**

Figure 3: Monthly Precipitation (1995–2015)



Source: NCDC

County, **New Jersey All-Hazards Pre-Disaster Mitigation Plan** and the Federal Emergency Management Agency (FEMA), Mercer County experienced the following hazard events between 1960 and 2014:

- 97 thunderstorm and high-wind events;
- 17 floods/flash floods;
- 1 drought;
- 9 extreme heat events;
- 6 hail storms;
- 33 winter storms/extreme cold temperature events;
- 29 lightning events;
- 7 hurricanes or tropical storms
- 8 tornadoes; and
- 3 wildfires.

Hurricanes and Tropical Storms

Numerous tropical storms and hurricanes have impacted Lawrence, some of which have been severe. On September 17, 1999, the remnants of Hurricane Floyd caused torrential rains, high winds, flooding, and widespread devastation across New Jersey. Lawrence received over seven inches of rainfall on this date. More recently, on August 27 and 28, 2011, Hurricane Irene brought hurricane-force winds, torrential rainfall, flash flooding, and numerous downed trees and power lines, which resulted in significant power outages and structural damages across the state. The Highstown weather station recorded its highest one-day rainfall total (7.89) on August 28, 2011, as a result of Irene. Lawrence Township also experienced the effects of Hurricane Sandy, which made landfall near Atlantic City, New Jersey on October 29, 2012. As an inland county, Mercer did not bear the brunt of the storm; however, Mercer County still experienced strong wind gusts and heavy rains. Peak wind gusts in Mercer County ranged from 60 to 70 miles per hour, with 1.83 to 2.66 inches of rain falling across the county.

The storm toppled thousands of trees, damaging power lines and buildings. Over 90,000 Mercer County residents lost power as a result of Hurricane Sandy.

Tornadoes

Tornadoes are infrequent, yet the ones that do strike the township have caused significant damage. The most serious tornadoes occurred on September 23, 2003, when atmospheric instability following Hurricane Isabel caused the formation of a series of F1 twisters. The tornadoes caused widespread damage to homes and structures but did not result in any fatalities. The town of Lawrenceville sustained damage from the twisters, largely due to fallen trees.

Winter Storms and Extreme Cold Events

Severe winter weather may include one or more of the following: snowstorms, blizzards, sleet, freezing rain, ice storms, and extreme cold temperatures. The **Mercer County, New Jersey All-Hazards Pre-Disaster Mitigation Plan** found that between 1960 and 2010, there were 32 severe winter weather events within Mercer County that resulted in losses. The most serious of these events were the blizzard of 1996 (total snowfall: four feet) and the winter storm of 2003 (total snowfall: 17 to 25 inches), as both were declared disasters. The entirety of Mercer County, including Lawrence Township, has approximately the same risk of winter storms and extreme cold events; however, different areas can be affected differently due to elevation, terrain, and weather and pressure system conditions. Severe winter weather events can cause serious harm to people and property, and based on past winter weather events, the likelihood of these events continuing in Mercer County and Lawrence is high.

Growing Seasons

According to the USDA, Lawrence lies on the northern edge of Plant Hardiness Zone 7a, where annual minimum temperatures are typically between 0°F and 5°F. Zone 7a covers the southwestern portion of the state and areas along the Atlantic coastline. In Mercer County

Flooding from
Hurricane Irene



Source:
Joseph Crouthamel,
Flickr User

as a whole, the average length of the agricultural growing season is 173 days. The first frost usually occurs in mid-October, and the last frost occurs at the end of April. Temperatures in the winter are usually not low enough to keep the soils frozen for the entire winter season.

Climate Change

Climatologists estimate that from 1880 to 2012, the average global surface temperature rose by 1.5 degrees Fahrenheit and, without additional efforts to constrain emissions, is expected to rise an additional 2 to 9 degrees by 2100. The Office of the New Jersey State Climatologist has recorded temperatures in the state since 1895. The record corroborates this general warming trend, making the impacts of climate change an important issue for New Jersey communities. This trend can be seen when looking at historical temperature readings at the Hightstown, New Jersey station. As mentioned above, the mean annual temperature recorded from 1995 to 2015 by the State Climatologist station in Hightstown, New Jersey was 53.3°F. The mean annual temperature recorded from 1950 to 1970 for the same station was 52.8°F. Even more telling was the finding that mean number of days with maximum temperature greater than or equal 90°F increased from 21.3 days between 1950 and 1970 to 24.5 days between 1995 and 2015.

Estimating the impact of climate change on local weather patterns and precipitation is a complicated process with numerous variables and uncertainties. Generally speaking, climate change is expected to increase average temperatures and precipitation, while at the same time intensifying weather extremes in the Mid-Atlantic region. There will likely be more days over 90 degrees in any given year and more frequent and longer heat waves. Wet periods will become wetter, with more frequent storms and downpours, and dry periods will become drier. Sea level rise will impact coastal communities, including those along the Atlantic coast and the tidal Delaware River.

Such changes in precipitation patterns, along with continued warming, will impact hydrology, agriculture, and the composition of natural vegetation in Lawrence Township. A wetter, warmer climate will likely lead to the infiltration of Lawrence's existing hardwood forests by southern species, such as southern yellow pine. Pests previously unable to survive this far north may increase. More frequent downpours could subject vulnerable areas, both natural and built,



Snow at Mercer Meadows Pole Farm, 2015

Source: DVRPC

Farmland along Cold Soil Road



Source: DVRPC

to increased erosion and downstream sedimentation. But dry periods, when combined with warmer temperatures, will result in drier soil conditions for some parts of the year.

There is an increasing need both to reduce emissions of climate change-causing greenhouse gas emissions and to prepare for those effects of climate change that will occur locally. New Jersey's Global Warming Response Act, enacted in 2007, calls for statewide reduction in greenhouse gas emissions to 1990 levels by 2020 and a reduction to 80 percent below 2006 levels by 2050. New Jersey's 2011 Energy Master Plan pledges to support energy efficiency and backs a renewable energy portfolio standard of 22.5 percent of energy sources from renewable sources by 2021. A draft 2015 update continues to support these goals.

NJDEP is taking steps to help communities prepare for and respond to the expected effects of climate change. The department's Resilient Coastal Communities Initiative, for example, helps communities along tidal waterways identify specific vulnerabilities to future flooding scenarios and develop plans to address these challenges. DVRPC is a partner with NJDEP in this effort.

Initiatives to reduce greenhouse gas emissions and prepare for climate change effects have also been occurring at the regional level. DVRPC carries out a periodic inventory of regional energy uses and greenhouse gas emissions. The inventory, first completed for 2005 and then updated for 2010, allocates emissions to each of the region's nine counties and 352 municipalities. DVRPC has also supported Sustainable Jersey's efforts to help municipalities plan for alternative energy for homes and businesses, understand energy efficiency improvements that could be made in municipal buildings and facilities, and consider alternative fuels for municipal fleets. Finally, DVRPC has worked with the state to help them understand the expected effects of climate change on the state's transportation assets, and is working with municipalities to identify specific community assets vulnerable to future flooding.

AIR QUALITY

Air quality is one of the most difficult environmental resources to measure because its sources are diffuse and regional in nature. Common sources of air pollution include industry, cars,

trucks, buses, fires, and dust. For example, the burning of coal in Ohio, Michigan, and Western Pennsylvania to generate electricity sends pollutants such as sulfur, nitrogen, and particulate matter all the way to the East Coast. Locally produced sources of air pollution include daily roadway traffic and industrial facilities.

Increasing public awareness regarding air pollution led to the passage of a number of state and federal laws, including the original Clean Air Act of 1963 and a much stronger Clean Air Act of 1970 (CAA). In 1990, the CAA was amended and expanded by Congress to include a market approach to reducing air pollution by allowing certain companies to buy and sell emission “allowances,” or “credits.” The 1990 CAA also required transportation projects receiving federal funding to be in conformity with state air quality goals. Additionally, the 1990 CAA revised the way that air toxins are regulated, increasing the number of regulated toxic air pollutants from seven to 187.

In 1970, the U.S. Environmental Protection Agency (EPA) was formed to enforce the CAA. In New Jersey, the EPA allowed NJDEP to enforce the CAA because the state agency developed more stringent air standards and created a State Implementation Plan (see NJAC 7:27). The CAA identified six criteria pollutants (ozone, particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and lead) that are destructive to human health and the built and natural environment (see explanation of **Air Quality Criteria Pollutants** in the box on the right). The EPA sets National Ambient Air Quality Standards (NAAQS) for these pollutants based on human health effects, as well as environmental and property damage.

Between 1970 and 2007, total emissions of the six criteria air pollutants decreased by more than 50 percent. The industrial sector reduced its toxic air emissions by 70 percent during this time period. Stricter emissions standards in the auto industry have made cars 90 percent “cleaner” since 1970. Cars also pollute less because refineries are required to produce cleaner fuels; leaded gasoline was completely banned in 1996.

Air Quality Monitoring

As of 2013, NJDEP's Bureau of Air Monitoring

Air Quality Criteria Pollutants

Ground-level ozone (O₃) is formed when volatile organic compounds (VOC) and nitrogen oxides react with sunlight and heat. It is produced more in the summer months and is the primary constituent of smog. Ground-level ozone is a pulmonary irritant, which, even in low levels, can be dangerous to sensitive populations such as people with asthma or emphysema and the elderly. It can also affect plant growth and is responsible for hundreds of millions of dollars in lost crop production.

Particulate matter (PM), or particle pollution, is made up of dust, ash, smoke, and other small particles formed from the burning or crushing of materials such as wood, rocks, and oil. When ingested, particulate matter can lodge deep in the lungs and can contribute to serious respiratory illnesses such as asthma or lung disease. Particulate matter also creates haze, reduces visibility, and covers buildings in dirty soot.

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon fuel is not burned completely. It is a component of motor vehicle exhaust; therefore, higher levels of CO generally occur in areas with heavy traffic congestion. The highest levels of CO typically occur during the colder months when air pollution becomes trapped near the ground beneath a layer of rising warm air.

Nitrogen oxides (NO_x) are a group of highly reactive gases that contain nitrogen and oxygen in varying amounts. Motor vehicles, electric utilities, and homes and businesses that burn fuels emit nitrogen oxides; they can also be found naturally. Nitrogen oxides are primary components in ground-level ozone (smog), acid precipitation, and other toxic chemicals. Acid precipitation can cause lung ailments in humans, property damage, harm to aquatic life, and other environmental and human health problems.

Sulfur dioxide (SO₂) is released into the atmosphere when fuel containing sulfur, such as coal and oil, is burned, and when gasoline is refined from oil. Sulfur dioxide dissolves in water vapor to form acid precipitation.

Lead (Pb) is a pollutant that was historically released by cars and trucks burning leaded fuel, in addition to its historic use in paint. Today, metal processing plants and trash incinerators are the major source of lead emissions. Lead tends to be a localized air pollutant, found in urban or high-traffic areas, and it is deposited in soil and water, harming fish and wildlife.

maintains a network of 39 ambient air monitoring stations across the state, most of which are clustered in the New York metropolitan area. These stations continually monitor some or all of seven parameters: carbon monoxide, nitrogen oxides, ozone, sulfur dioxide, lead, particulate matter, and meteorological data. In New Jersey, most of the criteria air pollutants are measured using EPA-approved monitoring methods.

A continuous air monitoring station is located at Rider University within Lawrence Township. This station measures the following criteria pollutant and weather data:

- Barometric pressure;
- Relative humidity;
- Solar radiation;
- Temperature;
- Wind speed;
- Wind direction; and
- Ground-level ozone (O₃).

Ground-level Ozone

The amount of ozone has decreased greatly in New Jersey since the 1980s, and one-hour concentrations have not exceeded 0.200 parts per million (ppm) since 1988. For ground-level ozone (O₃), there are two NAAQS: (1) a one-hour concentration of 0.12 ppm, and (2) an eight-hour average concentration of 0.075 ppm. For the national standards, these are the same for both primary and secondary effects. New Jersey, however, has tightened the one-hour concentration standard for secondary effects to 0.08 ppm. The EPA revised the NAAQS for eight-hour averages in 2008 (from 0.08 ppm to 0.075 ppm). In December 2014, the EPA proposed new NAAQS for ground-level ozone that would further tighten the standard, dropping both the primary and secondary eight-hour averages to between 0.065 and 0.07 ppm.

Ozone was monitored at 16 stations throughout the state in 2013, of which 10 operated year round and six operated only during the ozone season (April 1 through October 31). The Rider University station did not exceed the NAAQS one-hour primary standard or the eight-hour standard in 2013, as shown in **Table 5: Ozone One-Hour Data (2013)** and **Table 6: Ozone Eight-Hour Data (2013)** below.

Table 5: Ozone One-Hour Data (2013)

Monitoring Site	1-Hour Max ppm	2nd-Highest 1-Hour Max ppm	4th-Highest 1-Hour Average 2007–2009	# of Days with 1-Hour Averages above 0.12 ppm
Rider University	0.085	0.083	0.101	0

Source: NJDEP, 2013

Table 6: Ozone Eight-Hour Data (2013)

Monitoring Site	Highest Daily Maximum 8-Hour Average for 2013	Avg. of 4th-Highest Daily Maximum 8-Hour Averages 2011–2013	# of Days with 8-Hour Average above 0.075 ppm
Rider University	0.075	0.076	0

Source: NJDEP, 2013

Particulate Matter

As of 2013, 25 sites in New Jersey collected data on particulate matter for particles less than 2.5 microns (PM2.5), 11 of which continuously measure the concentration of fine particles every minute and transmit the data electronically to the New Jersey Bureau of Air Monitoring; 21 sites are designated as Federal Reference Method (FRM) samplers and routinely collect 24-hour samples. The EPA recently revised its NAAQS for fine particulate matter (PM2.5). The national standard for annual PM2.5 is 12.0 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), and the 24-hour average is 35 $\mu\text{g}/\text{m}^3$.

Although there are no PM2.5 stations in Lawrence Township, multiple stations are located close by. An FRM station is located in Trenton, and a continuous monitoring station is located in Ewing. A summary of annual data for 2013 from the Trenton Station can be seen in **Table 7** and for the Ewing Station in **Table 8**. NJDEP publishes regularly updated air quality data on its Air Monitoring website: <http://www.njaqinow.net/>.

Table 7: Summary of Trenton PM2.5 Sampler Data (2013)

Monitoring Site	Number of Samples	Annual Mean Concentration	Highest 24-Hour Concentration	98th %-ile 24-Hour Concentration	2011-2013 24-Hour Design Value (98th %-ile)	2011-2013 Annual Design Value
Trenton	352	9.1	34.4	24.3	24	9.4

Source: NJDEP, 2013

Table 8: Summary of Ewing PM2.5 Sampler Data (2013)

Monitoring Site	Annual Mean Concentration	Highest 24-Hour Concentration	Number of Unhealthy Air Quality Days
Ewing	8.2	26.7	0

Source: NJDEP, 2013

Air Quality Index

The EPA created the Air Quality Index (AQI) to indicate a region's air quality by measuring levels of five of the six criteria pollutants (excluding lead). The AQI is focused on the potential human health hazards experienced by breathing unhealthy air. Scores for the AQI range from 0 to 500 and are divided into six color-coded categories, as shown in **Figure 4: Air Quality**

Figure 4: Air Quality Index

Numerical Air Quality Index (AQI) Rating	Descriptive Rating: Levels of Health Concern	AQI Color Code
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

Source: NJDEP, 2009

Index. The higher the AQI value, the greater the level of air pollution and associated health concerns.

The daily score is based on the highest individual pollutant score reported. For example, if ozone scored 150 and particulate matter scored 100, the daily AQI would be 150—Unhealthy for Sensitive Groups. The index is used to measure overall air quality by counting the number of days per year when the AQI of each region exceeds 100.

New Jersey is subdivided into nine regions that report their respective AQI. Lawrence Township is located in Region 5, which covers Mercer and Burlington counties. The monitoring stations for this region are located in Ewing and at Rider University. The AQI for Region 5 is based on two pollutants: ozone and particulates. In 2013 (the most recent year of annual data), Region 5 reported 317 good days; 47 moderate days; one day that was unhealthy for sensitive groups; and no unhealthy, very unhealthy, or hazardous days.

Point Source of Air Quality Pollution

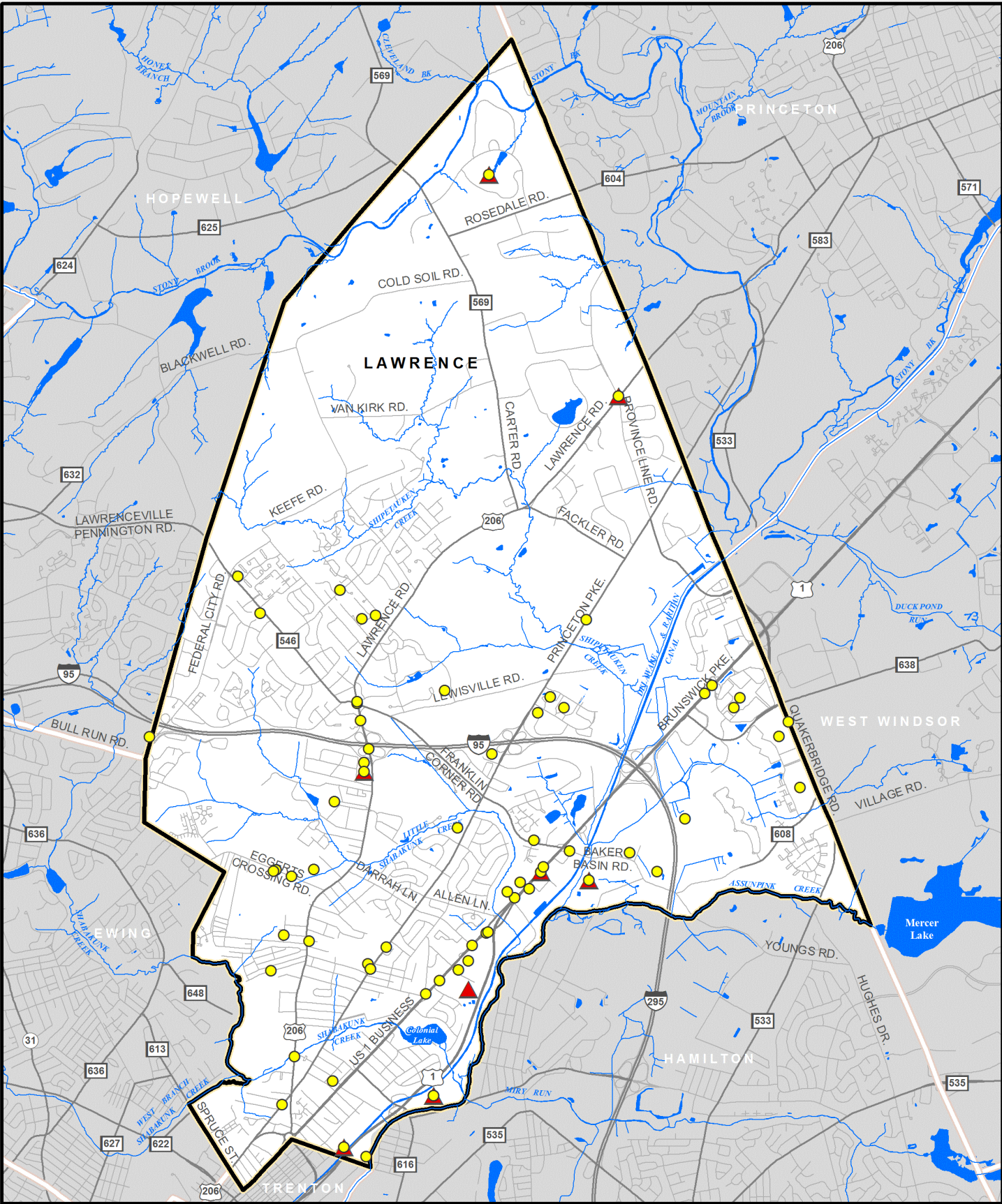
Under the CAA, the EPA limits the amount of other air pollutants and toxins that are emitted by point sources, such as chemical plants, industrial factories, power plants, and steel mills. The NJDEP Air Quality Permitting Program issues permits for stationary sources of air pollution, such as power plants, oil refineries, dry cleaners, food processing centers, and manufacturing plants, and regulates and monitors their emissions. As of September 2015, there were 71 facilities with active air quality permits in Lawrence, listed in **Table 9: Facilities with Active Air Quality Permits**. These are also shown on **Map 7: Point Sources (2015)**. For additional information on specific facilities, please visit the **NJDEP Data Miner**, where you can search for sites by location, name, or ID number (all of which are listed in the table below).

Table 9: Facilities with Active Air Quality Permits

Name	Address	PI Number
1000 Lenox Princeton Pike Corp Ctr	1000 Lenox Dr	61542
993 Lenox Princeton Pike Corp Ctr	993 Lenox Dr	61541
Ace Excavating Inc	30 Black Rd	61080
Agriark	40 Enterprise Ave	61511
Amorphous Silicon Pilot Plant	276 Bakers Basin Rd	60605
Anisam Service Station	135 Lawrenceville Rd	A3793
Antonio's Cleaners	160 Lawrenceville-Pennington Rd	L6059
Britton Concrete Inc	100 Bakers Basin Rd	61010
Britton Recycling Inc	227 Bakers Basin Rd	60997
B-Way Packaging	6 Litho Rd	61023
Cingular Wireless	87 Federal City Rd	61204
Costco Gasoline	4100 Quaker Bridge Rd	A6676
Dick Greenfield Dodge Inc	2700 Brunswick Pk	61127
District Relocation Facility	100 Lenox Dr	61295
Eagle Litho Corp	6 Litho Rd	60619
ETS	660 Rosedale Rd	60092
Eldridge Park School	55 Lawn Park Ave	61033
E R Squibb & Sons Llc	Rt 206 & Province Line Rd	61052

Name	Address	PI Number
Ewing-Lawrence Sewerage Authority (Elsa)	600 Whitehead Rd	60508
Ewing Lawrence Sewerage Auth Wtp	600 Whitehead Rd	60349
Franklin Cleaners	172 Franklin Corner Rd	L9201
Gemstone Cleaners	584 Lawrence Sq Blvd S	L6076
Green Touch Cleaners	2809 Rt 1	L9413
Headwaters Technology Innovation	1501 New York Ave	60021
Jinjin Corp	2495 Brunswick Pk	L6006
John's Truck Stop	3271 U.S. #1	A6233
Joseph Jingoli & Son	100 Lenox Dr	61306
Knapsack Group Llc-Lawrenceville Amoco	1720 Brunswick Pk	A6265
Kwik Fill Usa Inc	360 Lawrenceville Rd	A9784
Lawrence Cleaners	1908 Princeton Ave	L6018
Lawrence Elementary School	40 Craven Ln	61239
Lawrence High School	2525 Princeton Pk	61029
Lawrence Intermediate School	66 Eggert Crossing Rd	61032
Lawrence Lexus	2630 Brunswick Pk	61098
Lawrence Middle School	2455 Princeton Pk	61030
Lawrence Plaza Apartments	2350 Princeton Pk	61149
Lawrence Road Vol Fire Co	1252 Lawrenceville Rd	61444
Lawrence Twp DPW	3701 Princeton Pk	61001
Lawrence Twp DPW	240 Bakers Basin Rd	H8919
Lawrence Twp DPW Garage	240 Bakers Basin Rd	61233
Lawrence Twp Police Dept	2211 Lawrenceville Rd	61235
Lawrence Twp Town Hall	2207 Lawrenceville Rd	61234
Lawrenceville Armory	151 Eggert Crossing Rd	60652
Lawrenceville Fire Co	64 Phillips Ave	61230
Lawrenceville Twp Bd Of Ed	2939 Princeton Pike	61002
Lukoil Of Lawrenceville Service Station	2417 Main St	A6050
Macys Dept Store #65 @ Quakerbridge Mall	400 Quakerbridge Mall	60314
Magic Finish Auto	2002 Princeton Ave	G6035
Morris Hall-St Lawrence Rehab	2381 Lawrenceville Rd	60558
Muller Automotive Dba Lawrence Toyota	2871 Rt 1	61341
NJDMAVA HG	101 Eggert Crossing Rd	61213
NJDOT Lawrence Twp Maintenance Facility	2798 Brunswick Pk	H8733
NJLG UST1 Nj0040 Service Station	2551 Brunswick Ave	A6132
NJLG UST1 Nj0044 Service Station	2890 Brunswick Pk	A6130
Princeton International Press Inc	3175 Princeton Pk	60582
PSE&G Southern Div Lawrenceville Sub Hqtrs	4140 Quakerbridge Rd.	H6041
Q Bridge Cleaning Dba Bridge Cleaners	4110 6 Quaker Bridge Rd	L9255
Quick Chek Food Store #107	303 Brunswick Ave Ext	A9909
Rider University	2083 Lawrenceville Rd	60097
Sears Unit #1734	300 Quakerbridge Mall	60080
Shop Rite Supermarket #500	3373 Brunswick Pk	61320
Slackwood Elementary School	2060 Princeton Pk	61031

Map 7: Point Sources (2015)



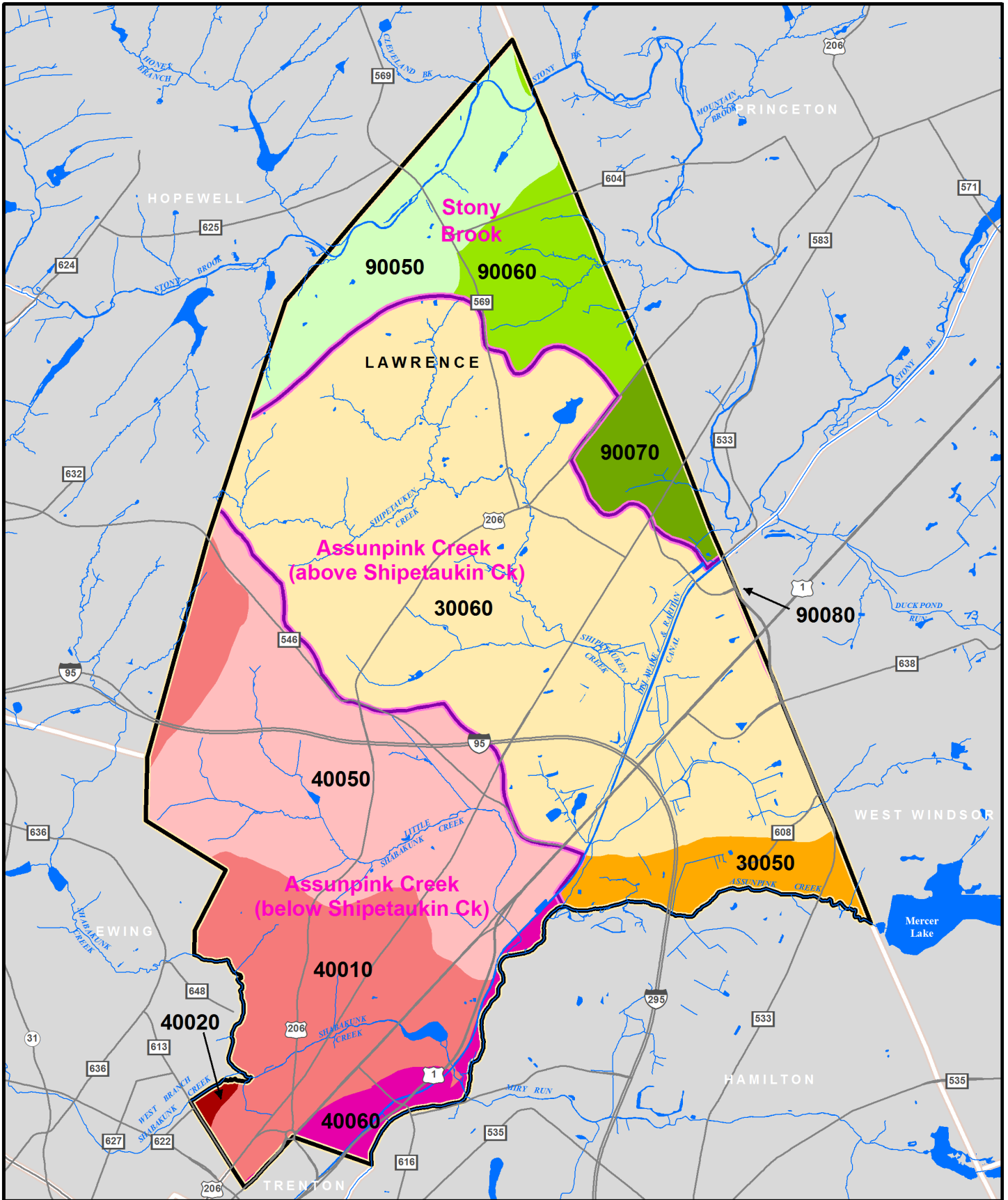
Sources : NJDEP, NJDOT, DVRPC
 This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

- Air Quality Permit Facility
- ▲ New Jersey Pollutant Discharge Elimination System (NJPDES) Permit for Discharge to Surface Water


0 0.25 0.5 1

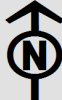

Miles

Map 8: Watersheds



Sources : 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.

 **Watershed (HUC 11)**
Containing Sub-Watershed (HUC 14)

0 0.25 0.5 1
 Miles



Name	Address	PI Number
Slackwood Vol Fire Co	21 Slack Ave	61443
Snow White Cleaners	157 Mercer Mall	L6058
St Anns School	34 Rossa Ave	60881
STS Tire & Auto Ctr	2925 Rt 1	61174
Team Toyota Of Princeton Collision	2865 Rt 1	G9030
The Lawrenceville School	Rt 206 No	61088
USPFO Warehouse	131 Eggerts Crossing Rd	60651
Verizon Wireless	3371 Rt 1	61215
Wawa Food Market #8339	2936 Brunswick Tpke	A6694

Source: NJDEP, 2015

SURFACE WATER RESOURCES

Surface water is water that is present on the land surface, and it includes lakes, ponds, rivers, streams, bogs, wetlands, bays, and oceans. Most of Lawrence Township’s land drains to the Delaware River by way of the Assunpink Creek system. The northern portion of the township drains to the Raritan Bay by way of the Stony Brook system. The Assunpink Creek makes up the southeast border of the township, and Stony Brook is located in the northern tip of the township.

Watersheds

A watershed is all the land and surface water bodies that drain to a particular waterway, such as a river, stream, lake, or wetland, and includes not only the waterbody or waterway itself but also the entire land area that drains to it. The high points in the terrain, such as hills and ridges, define the boundaries of a watershed. Watersheds are natural ecological units, where soil, water, air, plants, and animals interact in a complex relationship, and many factors, including land use, soils, vegetation, and human activity, impact the water quality and ecological value of a watershed.

Each watershed corresponds to a hydrological unit code (HUC), as delineated by the U.S. Geological Survey (USGS). An HUC describes the area of land “upstream from a specific point on the stream—particularly the mouth or outlet—that contributes surface water runoff directly to this outlet point,” otherwise known as the drainage area.¹ An HUC11 watershed (identified by an 11-digit code) contains a number of HUC14 subwatersheds (identified by a 14-digit code). The state of New Jersey has 152 HUC11 watersheds and over 900 HUC14 subwatersheds. Lawrence falls into three HUC11 watersheds: the Stony Brook Watershed, the Assunpink Creek Watershed (above Shipetaukin Creek), and the Assunpink Creek Watershed (below Shipetaukin Creek). There are 10 HUC14 watersheds in Lawrence, listed in **Table 10: Watersheds and Subwatersheds** and shown on **Map 8: Watersheds**.

The Assunpink Creek Watershed covers an area of 91 square miles, 18 of which are located within Lawrence. The Shabakunk Creek Watershed is located within the Assunpink Creek Watershed. The branches of the Shabakunk Creek converge in Lawrence and empty into the 25-mile-long Assunpink Creek. The Assunpink Creek is bordered by forested wetlands and farmland north of the Shabakunk Creek and urban and suburban land in the southwest until

¹ Missouri Watershed Information Network, “Hydrologic Unit Codes – (HUC).”

it drains into the Delaware River. The Stony Brook Watershed covers 55.37 square miles, 3.7 of which are within Lawrence. The watershed is drained by the Stony Brook and joins the Millstone River in Princeton, which then empties into the Raritan Bay and the Atlantic Ocean.

Table 10: Watersheds and Subwatersheds

Watershed Name	Subwatershed Name	Stream Classification	HUC14	Acreage within Lawrence Twp	%
Assunpink Creek (above Shipetaukin Creek)				6,722.27	48%
	Assunpink Creek (Shipetaukin to Trenton Rd)	FW2-NT	30050	528.16	4%
	Shipetaukin Creek	FW2-NT	30060	6,194.11	44%
Assunpink Creek (below Shipetaukin Creek)				4,956.50	35%
	Assunpink Creek (below Shipetaukin Creek)	FW2-NT	40060	328.01	2%
	Little Shabakunk Creek	FW2-NT	40050	2,605.84	19%
	Shabakunk Creek	FW2-NT	40010	1,986.36	14%
	Shabakunk Creek WB	FW2-NT	40020	36.30	0%
Stony Brook				2,381.18	17%
	Duck Pond Run	FW2-TP	90080	2.58	0%
	Stony Brook (Alexander Creek to Rt 206)	FW2-TP	90070	434.01	3%
	Stony Brook (Rt 206 to Province Line Rd)	FW2-TP	90060	784.89	6%
	Stony Brook (Province Line Rd to 74d46m dam)	FW2-TP	90050	1,159.70	8%
TOTAL				14,059.96	100%

Source: NJDEP, 2010

Watershed Management Areas

NJDEP manages water resources on a watershed basis and has divided the state into 20 Watershed Management Areas (WMAs). Each WMA coincides with the hydrologic units as defined and delineated by the USGS. Lawrence Township includes portions of two WMAs: Millstone (10) and the Central Delaware (11). WMA 10 contains a portion of Stony Brook and WMA 11 includes a portion of Assunpink Creek.

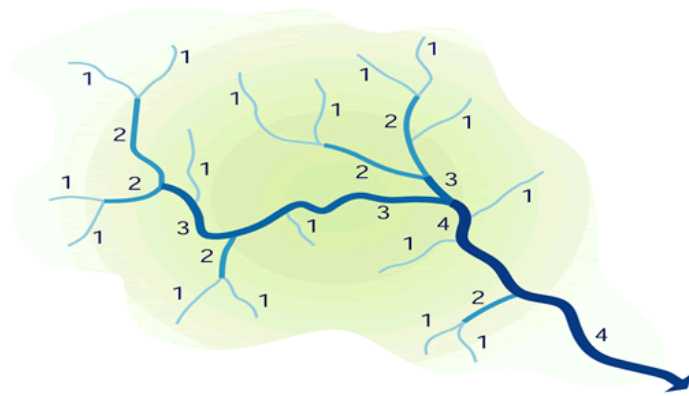
Both of the watershed areas are affected by agriculture and development, especially in the Central Delaware, as development has increased greatly in the past 15 years. Population growth, development, and agriculture stress water resources and impact water quality.

Watershed Associations

Watershed Associations typically advocate for the health of water systems and the environment, as well as protect and restore sensitive habitats, test waterways for pollution, and inspire others to protect their environment.

The Stony Brook-Millstone Watershed Association began in 1949 and became central New

Figure 5: Stream Order



Source: FISRWG

Jersey's first environmental group. Today, the nonprofit organization protects clean water and the environment through a combination of conservation, advocacy, science, and education. The association's ultimate goal is to improve the health and quality of central New Jersey's water and sustain a network of protected habitats for wildlife and people.

Streams

In Lawrence, there are a total of 39.2 stream miles flowing across the land, 25.3 of which are first or second order, or headwater streams. 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). Headwaters are where the stream is "born" and begins to flow. See **Figure 5** for an illustration of stream order.

Headwaters drain only a small area of land, usually around one square mile, and due to their small size, they are highly susceptible to impairment by human activities. Headwaters tend to contain a diversity of aquatic species at the base of the food chain, and the headwaters' condition affects the water quality found downstream. First- and second-order streams are narrow, shallow, and characterized by relatively small base flows, therefore making them subject to greater temperature fluctuations, especially when forested buffers are removed. Furthermore, they are easily over silted by sediment-laden runoff, thus rapidly degrading their water quality. First-order streams in particular are greatly affected by changes in the local water table since they are fed by groundwater sources. **Table 11: Streams** lists the miles of streams of each stream order that flows within Lawrence Township.

Lawrence's primary streams include the Stony Brook, Shabakunk, Little Shabakunk, Assunpink, and Shipetaukin creeks. The Shipetaukin and Shabakunk creeks are monitored by NJDEP for biological life and other parameters to determine water quality. See **Surface Water Quality on page 48** for more information on NJDEP's stream monitoring programs.

Table 11: Streams

Stream Order	Miles
First (smallest)	16.8
Second	8.5
Third	8.6
Fourth	0.2
Fifth	5.1
TOTAL	39.2

Source: NJDEP, 2002

Lakes and Ponds

There are five named waterbodies and several other small, unnamed ponds and water impoundments in Lawrence. The township's named waterbodies include Colonial Lake, Whitehead Mill Pond, Centennial Lake, Toms Lake, and the Lawrenceville School Pond.

Colonial Lake covers 25 acres, and Whitehead Mill Pond covers approximately 12 acres. Colonial Lake, part of Colonial Lake Park, is a publicly owned lake used for passive recreational activities, such as fishing. See **Map 9: Surface Water, Wetlands, Vernal Pools, and Dams**.

The township is currently working on a project to provide for maintenance dredging of Colonial Lake. The proposed dredging area encompasses approximately one acre and is located in the western portion of the lake, in the vicinity of the spillway/weir under Route 1 (Brunswick Pike) associated with the Shabakunk Creek. These proposed activities are necessary as part of ongoing maintenance dredging activities due to sediment accumulation at the mouth of the lake.

Colonial Lake Dam

The Lawrence Colonial Lake Dam, built in 1978, is a class III, low-hazard, earthen berm dam covered in gabion mattresses. During a severe storm incident on March 12–13, 2010, the dam experienced significant damage that had to be repaired on an emergency basis. In September 2010 repairs to the dam were completed and approved by NJDEP. This work included the removal of existing vegetation, repairs to the gabion mattresses, and a reinforcement of the entire gabion mattress surface.

Wetlands

The term *wetland* is applied to areas where water meets the soil surface and supports a particular biological community, serving as natural filters and incubators for many beneficial species. The source of water for a wetland can be surface water, such as an estuary, river, stream, or lake edge, or groundwater, that intersects with a depression in the land surface. Wetlands are classified as either tidal or nontidal. Tidal wetlands can be either saline or freshwater. There are also special wetland categories to denote saturated areas that have



Colonial Lake,
2013

Source:
Famartin,
Wikimedia Commons

been altered by human activities.

To determine what is and what is not a wetland in New Jersey, NJDEP adopted the 1989 **Federal Manual for Identifying and Delineating Jurisdictional Wetlands**. The manual uses three parameters to classify wetlands: (1) hydric soils, (2) wetland hydrology, and (3) hydrophytic vegetation. All three parameters must be met to qualify as a wetland.

New Jersey protects freshwater wetlands under the New Jersey Freshwater Wetlands Protection Act Rules: N.J.A.C. A 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 NJDEP, called a “letter of interpretation” (LOI), can legally determine if there are freshwater wetlands on a property. An LOI verifies the presence, absence, and boundaries of freshwater wetlands and transition areas on a site. Activities permitted to occur within wetlands are very limited and usually require a permit. Additional information on wetlands rules and permits is available through NJDEP.

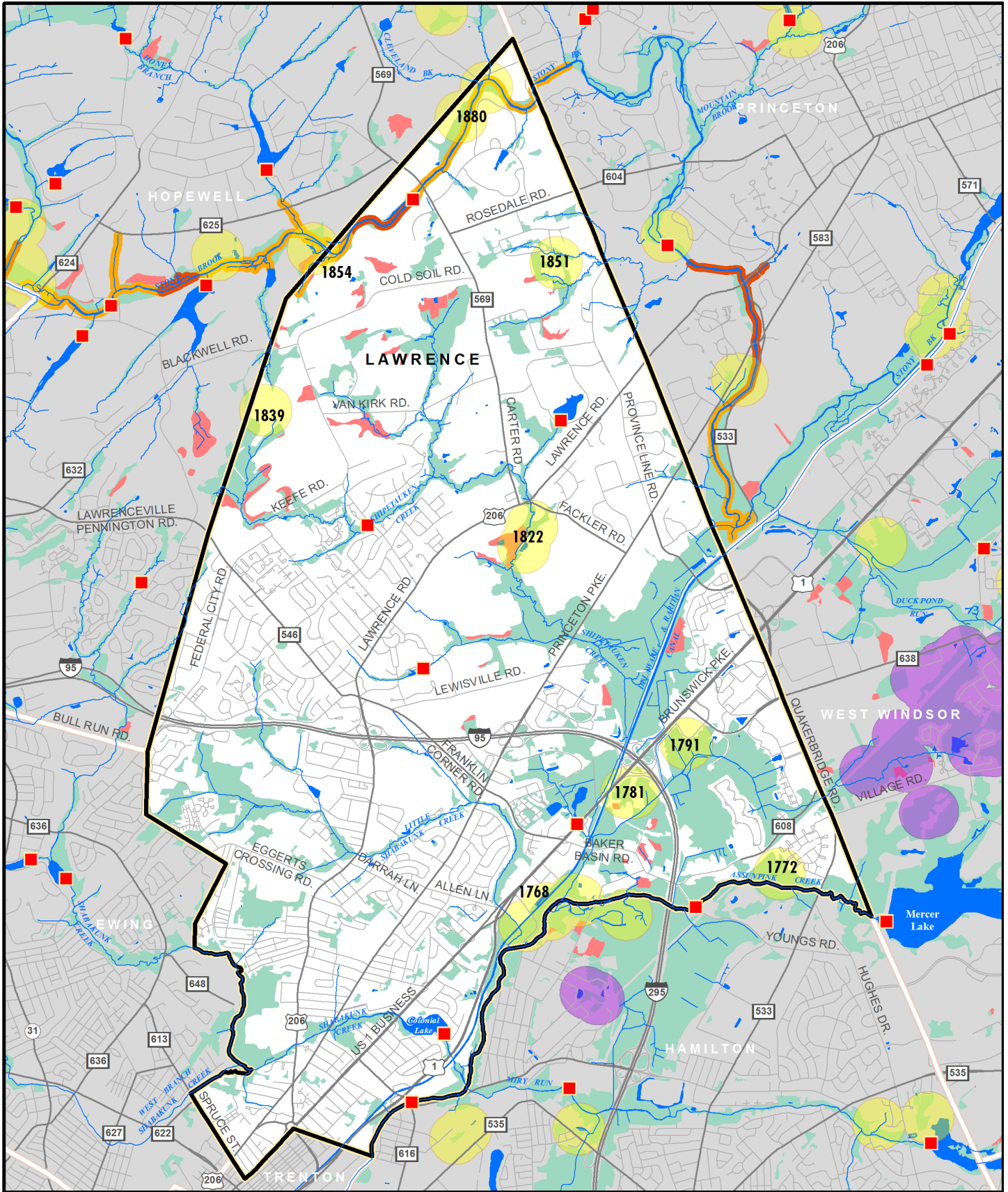
All of Lawrence’s wetlands are freshwater. Wetlands cover 2,946 acres within the township (21 percent of the township), the largest category of which is deciduous wooded wetlands (2,212 acres). The second largest category, herbaceous wetlands, covers 239 acres. In addition to natural wetlands, Lawrence Township also includes 233 acres of modified or disturbed wetlands. Modified wetlands are former wetland areas that have been altered by human activities and no longer support typical wetland vegetation or are not vegetated at all. Lawrence’s modified wetlands fall into the following categories as defined by the Anderson Land Use Classification System: 160 acres of agricultural wetlands, 13 acres of disturbed wetlands, 9 acres of former agricultural wetlands, and 52 acres of wetlands found in maintained green space, recreational areas, or lawns. All categories of wetlands are shown in **Table 12** below and in **Map 9: Surface Water, Wetlands, Vernal Pools, and Dams**.

Table 12: Wetlands

Wetlands	Acerage
Agricultural Wetlands (Modified)	159.77
Deciduous Scrub/Shrub Wetlands	66.72
Deciduous Wooded Wetlands	2,211.71
Disturbed Wetlands (Modified)	13.30
Former Agricultural Wetlands (Becoming Shrubby, Not Built Up)	8.68
Herbaceous Wetlands	239.04
Managed Wetland in Built-up Maintained Rec Area	12.26
Managed Wetland in Maintained Lawn Greenspace	39.46
Mixed Scrub/Shrub Wetlands (Coniferous Dom.)	7.77
Mixed Scrub/Shrub Wetlands (Deciduous Dom.)	105.83
Mixed Wooded Wetlands (Coniferous Dom.)	0.63
Mixed Wooded Wetlands (Deciduous Dom.)	4.28
Phragmites Dominate Interior Wetlands	2.15
Wetland Rights-of-way	74.26
TOTAL	2,945.86

Source: NJDEP, 2012

Map 9: Surface Water, Wetlands, Vernal Pools, and Dams



Sources : 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.

- Dam
- Potential Vernal Habitat Area
- Vernal Habitat Area
- Wetland
- Agricultural Wetland

- FRESHWATER MUSSEL HABITAT**
- Rank 3 - State Threatened
 - Rank 4 - State Endangered

0 0.25 0.5 1

Miles

Selected Wetland Categories

Deciduous Wooded 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. Typical species found in deciduous wooded wetlands in New Jersey include sweetgum, box elder, pin oak, and swamp white oak.

Herbaceous Wetlands are dominated by non-woody plants. In New Jersey, non-*Phragmites* herbaceous wetlands feature vegetation such as Jack-in-the-pulpit, jewelweed, ferns, rice cutgrass, reed canary grass, pond lily, tearthumb, cordgrass, and cattail. Other common herbaceous wetland plants include the common blue violet, dodder, skunk cabbage, marsh marigold, and turk’s cap lily.

Scrub/Shrub Wetlands often make up transitional areas between deciduous wetland and other land cover types. Typical native species in scrub/shrub wetlands in New Jersey include sweet pepperbush, buttonbush, swamp rose, elderberry, arrowwood viburnum, winterberry, and silky dogwood, with swamp azalea making rare appearances. Multiflora rose is the most common invasive exotic shrub in scrub/shrub wetlands.



Phragmites

Source: Michael Hogan

Agricultural Wetlands

The largest type of modified wetlands in Lawrence Township is agricultural wetlands, totaling 160 acres. These “quasi-wetlands” are found scattered as small sites, primarily in the southeastern and northwestern portions of the township. Agricultural wetlands are modified former wetlands currently under cultivation. These areas still exhibit evidence of soil saturation, but they do not support natural wetlands vegetation. See **Map 9: Surface Water, Wetlands, Vernal Pools, and Dams**.

As long as agricultural wetland areas remain in agricultural use, they are exempt from New Jersey’s Freshwater Wetlands Rules N.J.A.C. 7:7A. However, if an agricultural area is removed from agricultural production for more than five years, any wetlands located within that area lose their exempt status. Also, according to N.J.A.C. 7:7A-2.8(b)2, “the exemptions apply only as long as the area is used for the exempted activity.” Therefore, if the area is used for anything other than farming, the exemption no longer applies. Additionally, if hydric soils are present, certain activities on drained farmland may be regulated by the State of New Jersey.

Under the Agricultural Conservation Easement Program (ACEP), the NRCS helps to conserve agricultural lands and wetlands. The ACEP Wetlands Reserve Easement component is a voluntary program that provides technical and financial assistance to private landowners and Indian tribes to restore, protect, and enhance wetlands through the purchase of a wetland reserve easement. Restoring agricultural wetlands requires removing them from agricultural use and restoring them to their natural state. Landowners may apply for enrollment in the Wetlands Reserve Easement program at their local USDA Service Center.

Vernal Pools

Vernal pools are confined depressions, either natural or man-made, which hold water for at least two consecutive months out of the year and are devoid of breeding fish populations. Vernal pools come in

an array of forms: isolated depressions within upland forests, seasonally flooded meadows, floodplain swamps, abandoned gravel pits or quarries, and even derelict swimming pools. However, no matter what the structure or genesis of the pool is, all vernal pools either dry out completely or draw down to very shallow levels unsuitable for sustaining fish. Most commonly, vernal pools appear following snowmelt and during spring rains, then disappear or are dry

during the rest of the year.

Vernal pools are critical sites for certain rare species of frogs and salamanders called obligate breeders. The term *obligate breeder* refers to species that can only reproduce in vernal pools, because the pool's impermanence prevents residence by predators, such as fish, that would consume the eggs and young. Vernal pools also provide habitat for amphibians and reptiles that may breed in them but not exclusively (facultative breeders) or may use the pools at some point in their life cycles.

Vernal pools are so intermittent that their existence 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 obligate amphibian species.

In an effort to boost the effectiveness of the 1987 wetland protection regulations, which allowed the filling of isolated wetlands up to one acre in size (including vernal pools), the NJDFW began the Vernal Pool Survey project in 2001 to identify, map, and certify vernal pools throughout the state. Once a vernal pool is certified, regulations require that a 75-foot buffer be maintained around the pool. NJDEP's Division of Land Use Regulation oversees this designation and restricts development around vernal pools by denying construction permits. To be certified, vernal pools must: (1) occur in a confined basin depression without a permanently flowing outlet; (2) provide documented habitat for obligate or facultative vernal pool herptile species; (3) maintain ponded water for at least two continuous months between March and September of a normal rainfall year; and (4) be free of fish populations throughout the year, or dry up at some time during a normal rainfall year.

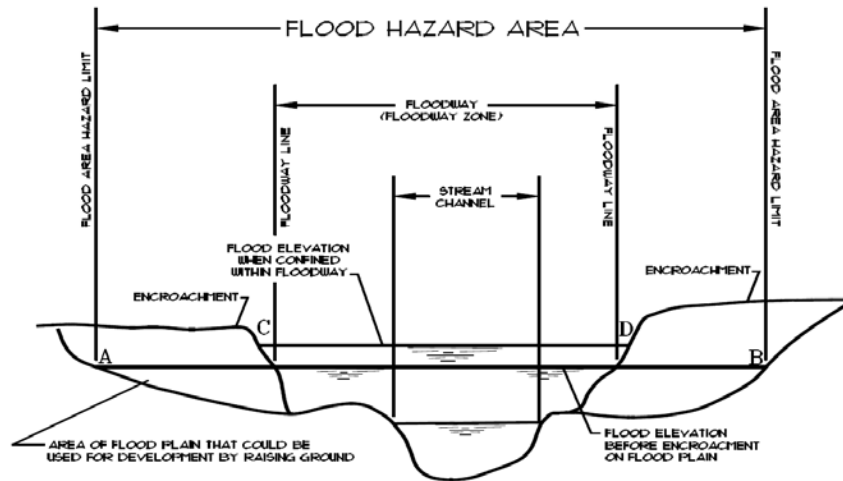
The state has identified nine possible vernal pools in Lawrence, shown in **Map9: Surface Water, Wetlands, Vernal Pools, and Dams** and listed in **Table 13: Vernal Pools**, below. Determining the actual number of pools, and certifying pools, requires investigation in the field. Citizens, local governments, and nonprofit groups can survey pools and submit documentation to NJDEP to have pools certified. NJDFW provides detailed guidance on what documentation is needed. Municipalities can provide additional protection for vernal pools by instituting restrictive zoning or negotiating conservation easements on the land surrounding vernal pools.

Table 13: Vernal Pools

Vernal Pool Habitat ID	Vernal Pool Habitat Type	Acerage
1768	Potential vernal habitat area	124.13
1772	Potential vernal habitat area	54.66
1781	Potential vernal habitat area	80.95
1791	Potential vernal habitat area	69.80
1822	Potential vernal habitat area	107.08
1839	Potential vernal habitat area	60.61
1851	Potential vernal habitat area	69.80
1854	Potential vernal habitat area	15.11
1880	Potential vernal habitat area	101.81
TOTAL		683.95
% of Lawrence Township		5%

Source: NJDEP, 2012

Figure 6: Flood Hazard Area Diagram



Source: *The Land Use Ordinance of the Township of Lawrence*

Floodplains

Areas naturally subject to flooding are called *floodplains*, or flood hazard areas. Floodplains encompass a floodway, which is the portion of a floodplain subject to high velocities of moving water, and the adjacent flood fringe, which helps to hold and carry excess water during overflow of the normal stream channel. The 100-year floodplain is 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 percent chance of occurring in any given year).

Although the terms *flood hazard area* and *100-year floodplain* denote similar concepts, NJDEP defines them in slightly different ways. New Jersey's regulations define the flood hazard area as the area inundated by a flood resulting from the 100-year flood and at least one foot higher than the 100-year floodplain in fluvial (non-coastal) areas. This type of flood is called the "flood hazard area design flood," and it is the flood regulated by NJDEP. See **Figure 6: Flood Hazard Area Diagram** for an illustration of the flood hazard area.

Floodplains require protection in order to prevent loss and injury, especially within the boundaries of the floodway. Equally important is the preservation of the environmentally sensitive aquatic communities that exist in floodplains. These communities are often the first link in the food chain of the aquatic ecosystem. In addition, floodplains 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 keep development out of floodplains will help to preserve the flood-carrying capacity and water quality of streams.

In New Jersey and throughout the country, construction in areas subject to flooding is regulated to protect lives, property, and the environment. New Jersey regulates construction in the flood hazard area under the Flood Hazard Area Control Act, N.J.S.A. 58:16A-50 et seq., and its implementing rules at N.J.A.C. 7:13. NJDEP adopted a new Flood Hazard Control Act in 2007 to streamline the existing regulations and further improve water quality in New Jersey's waters. Additionally, in an attempt to reduce unnecessary regulatory burden, add flexibility, and address implementation issues, NJDEP proposed comprehensive amendments to the Flood Hazard Area Control Act in June 2015.

Lawrence Township's floodplain ordinance protects floodplains with a stream buffer requirement. The ordinance states that no grading can occur and no buildings can be placed within 100 feet of the floodplain of all streams, with only two exceptions: for the installation of necessary stormwater outfall structures and piping, or for up to 500 square feet of encroachment per lot under single and separate ownership.

New Jersey's flood hazard area maps are not available in digital form. Consequently, it

is only possible to approximate the spatial extent of the flood hazard area in Lawrence by using FEMA's 100-year floodplain maps. FEMA issued preliminary Flood Insurance Rate Maps for Mercer County on May 30, 2013, and more recently in limited format on June 15, 2015. For the 2013 update, FEMA performed restudies of approximately 170.89 stream miles, which included the Delaware River within Mercer County, along with 151.96 miles of additional stream reaches. These maps show that 2,348 acres, or almost 17 percent of the township's land area, falls within the 100-year floodplain. In addition, 169 acres (1.2 percent) of the township falls within the 500-year floodplain. Most of Lawrence's floodplain areas are located in the southeastern quadrant of the township along and to the east of the Delaware and Raritan Canal, an area which is also extensively occupied by wetlands. The remaining floodplain areas are found along the Shabakunk, Little Shabakunk, Shipetaukin, and Assunpink creeks, and Stony Brook. See **Map 10: FEMA Floodplains (2015)** and **Table 14: Floodplains**.

Table 14: Floodplains

Floodplain	Area (Acres)	% of Lawrence in Floodplain
100-Year Floodplain	2,348.03	16.70%
500-Year Floodplain	169.06	1.20%
Total Floodplain Area	2,517.08	17.90%

Source: FEMA, 2015

Surface Water Quality

Surface water quality standards are established by federal and state governments to ensure that water is suitable for its intended use. Standards are intended to restore the quality of the nation's waters to provide for the protection and propagation of fish, shellfish, and wildlife and to provide for recreation in and out of the water, wherever attainable.

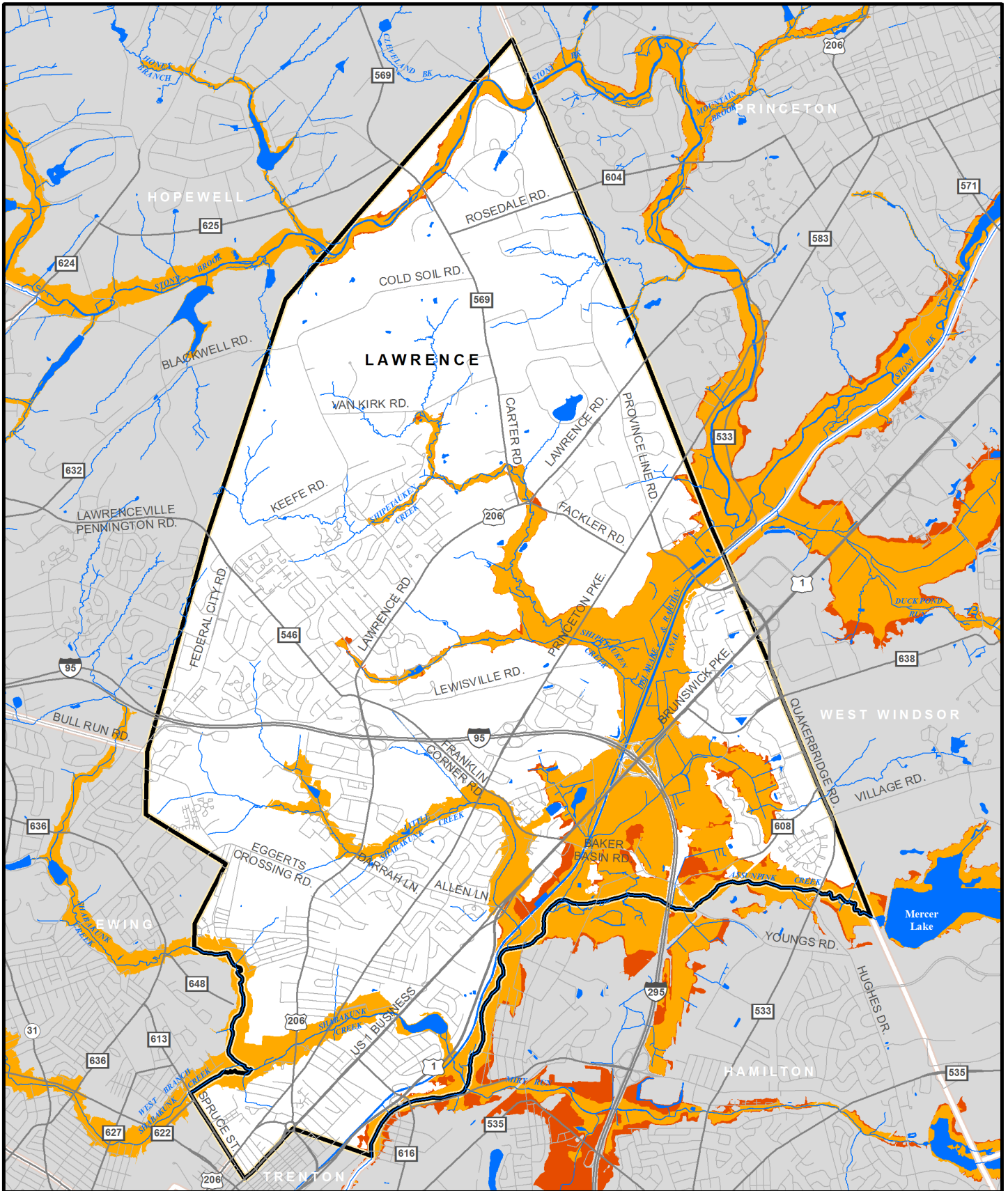
All waterbodies in New Jersey are classified by NJDEP as either freshwater (FW), pinelands water (PL), saline estuarine water (SE), or saline coastal water (SC). FW is further broken down into freshwater that originates and is wholly within federal or state parks, forests, or fish and wildlife lands (FW1) and all other freshwater (FW2). In addition to being classified as FW1 and FW2, freshwater bodies are classified as trout-producing (TP), trout-maintaining (TM), or non-trout waters (NT). 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 Quality Standards N.J.A.C 7:9B-1.12). Each of these classifications may also be subject to different water quality standards.

Of Lawrence's streams, the Shabakunk, Little Shabakunk, Assunpink, and Shipetaukin creeks are all classified as FW2-NT, which means that they are both freshwater and non-trout producing or trout-maintaining waters. The Stony Brook is classified as FW2-TP, meaning that it is a freshwater, trout-producing stream. See **Table 15: Water Quality Classifications of Streams**.

Table 15: Water Quality Classifications of Streams

Streams	Classification
Assunpink Creek	FW2-NT
Little Shabakunk	FW2-NT

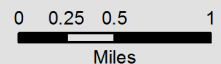
Map 10: FEMA Floodplains (2015)



Sources : 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.

FLOOD ZONE

- 100-Year Floodplain
- 500-Year Floodplain



dvrpc

Streams	Classification
Shabakunk	FW2-NT
Shipetaukin	FW2-NT
Stony Brook	FW2-TP

Source: NJDEP, Surface Water Quality Standards, N.J.A.C. 7:9B

All FW2 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, fishing);
3. Industrial and agricultural water supply;
4. Public potable water supply after conventional filtration and disinfection; and
5. Any other reasonable uses.

The determination of whether or not water quality is sufficient to meet a waterbody’s designated use(s) is based on whether the waterbody is within established limits for certain surface water quality parameters. Some examples of surface water quality parameters include fecal coliform, dissolved oxygen, pH, phosphorous, and toxic substances. NJDEP also evaluates water quality by examining the health of aquatic life in a stream.

New Jersey’s Integrated Water Quality Monitoring and Assessment Report

The Federal Clean Water Act mandates that states submit biennial reports to the EPA that describe the quality of their waters. States must submit two reports: the first is the Water Quality Inventory Report, or 305(b) Report, which documents the status of principal waters in terms of overall water quality and support of designated uses; the second is the 303(d) List, which lists the waterbodies that are not attaining water-quality standards. States must also prioritize the impaired waterbodies on the 303(d) List for Total Maximum Daily Load (TMDL)



Little Shabakunk Creek

Source: DVRPC

and analyze and identify those high-priority waterbodies for which they anticipate establishing TMDLs in the next two years. See the section on **Total Maximum Daily Loads on page 53**.

In 2006, NJDEP began reporting water quality data on a HUC14 subwatershed basis; therefore, the assessments of portions of rivers and streams are reported by the subwatershed they fall within. Subwatersheds (assessment units) are assessed on their attainment of eight different designated uses, although not all uses are applicable to all subwatersheds. The designated uses are as follows:

- Aquatic life (general);
- Aquatic life (trout);
- Recreation;
- Drinking water supply;
- Industrial water supply;
- Agricultural water supply;
- Shellfish harvesting; and
- Fish consumption.

As shown in **Table 16: Water Quality Monitoring and Assessment Report (2014)**, all ten of the subwatersheds that are partially within Lawrence Township are designated as not supporting aquatic life, the most telling parameter of water quality. The Duck Pond Run subwatershed is the only subwatershed that was deemed to fully support water supply uses. See **Map 11: Water Quality (2014)**.

Table 16: Water Quality Monitoring and Assessment Report (2014)

Subwatershed Name	Assessment Unit ID	Aquatic Life - General	Recreation	Water Supply	Fish Consumption
Assunpink Ck (Shipetaukin to Trenton Rd)	02040105230050-01	Not Supporting	Not Supporting	Not Supporting	Not Supporting
Shipetaukin Creek	02040105230060-01	Not Supporting	Not Supporting	Insufficient Data	Insufficient Data
Shabakunk Creek	02040105240010-01	Not Supporting	Not Supporting	Not Supporting	Not Supporting
Shabakunk Creek WB	02040105240020-01	Not Supporting	Not Supporting	Not Supporting	Not Supporting
Little Shabakunk Creek	02040105240050-01	Not Supporting	Not Supporting	Not Supporting	Not Supporting
Assunpink Creek (below Shipetaukin Creek)	02040105240060-01	Not Supporting	Not Supporting	Not Supporting	Not Supporting
Stony Brook (Province Line Rd to 74d46m dam)	02030105090050-01	Not Supporting	Not Supporting	Not Supporting	Not Supporting
Stony Brook (Rt 206 to Province Line Rd)	02030105090060-01	Not Supporting	Not Supporting	Not Supporting	Insufficient Data
Stony Brook (Alexander Creek St to Rt 206)	02030105090070-01	Not Supporting	Not Supporting	Not Supporting	Insufficient Data
Duck Pond Run	02030105090080-01	Not Supporting	Not Supporting	Fully Supporting	Insufficient Data

Source: NJDEP, 2015

Table 17: New Jersey’s 2014 303(d) List of Water Quality Limited Waters lists the non-supporting assessment units and their pollutants in Lawrence Township. If one or more designated uses are assessed as “Not Supporting,” the pollutant(s) causing the non-supporting status is/are identified on the “303(d) List of Water Quality Limited Waters.” When the pollutant causing non-supporting designation is not known, the pollutant is listed as “pollutant unknown.” The ranking (low, medium, high) refers to the priority given a specific assessment unit when determining the schedule for a TMDL. The priority ranking is determined by NJDEP and takes into account the severity of the pollution and the uses of the waters, as well as any additional relevant factors.

Table 17: New Jersey’s 2014 303(d) List of Water Quality Limited Waters

Assessment Unit ID	Assessment Unit Name	Parameter	Ranking
NJ02040105230050-01	Assunpink Creek (Shipetaukin to Trenton Rd)	Arsenic	Low
		Cause Unknown	Low
		Chlordane in Fish Tissue	Low
		Escherichia coli	Medium
		Mercury in Fish Tissue	Low
		PCB in Fish Tissue	Low
NJ02040105230060-01	Shipetaukin Creek	Escherichia coli	Medium
		Oxygen, Dissolved	Medium
NJ02040105240010-01	Shabakunk Creek	Arsenic	Low
		Mercury in Fish Tissue	Low
		Phosphorus	Medium
NJ02040105240020-01	Shabakunk Creek WB	Arsenic	Low
		Pollutant Unknown	Low
		Mercury in Fish Tissue	Low
NJ02040105240050-01	Little Shabakunk Creek	Lead	Low
		Phosphorus	Medium
		Mercury in Fish Tissue	Low
		Arsenic	Low
		Arsenic	Low
NJ02040105240060-01	Assunpink Creek (below Shipetaukin Creek)	Lead	Low
		Phosphorus	Medium
		Mercury in Fish Tissue	Low
NJ02030105090050-01	Stony Brook (Province Line Rd to 74d46m dam)	Arsenic	Low
		Phosphorus	High
NJ02030105090060-01	Stony Brook (Rt 206 to Province Line Rd)	Arsenic	Low
		Phosphorus	High
NJ02030105090070-01	Stony Brook (Alexander Creek to Rt 206)	Arsenic	Low
		Phosphorus	High
NJ02030105090080-01	Duck Pond Run	Pollutant Unknown	Medium

Source: NJDEP, 2014

Common Pollutants

Arsenic is a toxic metalloid formerly used as a component in pesticides and for treating wood. In addition to industrial pollution, waterbodies can accumulate arsenic from natural sources, as some rocks have naturally high levels of the element. Ingesting or breathing arsenic can cause irritation of the lungs and “corns” or “warts” in the skin. High levels of arsenic exposure are fatal. Arsenic accumulates in the tissues of fish and shellfish, although mostly as a component of the less toxic organic compound arsenobetaine. Arsenic contamination primarily affects a waterbody’s attainment level for use as drinking water. See **Historic Pesticides** in the Environmental Issues chapter for additional information on arsenic in Lawrence Township.

Phosphorus exists naturally at low levels within the environment, although excess phosphorus can lead to harmful algae blooms, which can produce “dead zones” where no aquatic life can survive. Typical causes of phosphorus pollution include overfertilization of lawns and agricultural areas; runoff from impervious surfaces such as parking lots, lawns, rooftops, and roadways; discharge from wastewater treatment plants; and overflow from septic systems. Soil erosion is a major contributor of phosphorus to streams, and stream bank erosion occurring during floods can transport high quantities of phosphorus into the water system.

Mercury is found in trace amounts in the human body, although consuming it in large doses can be toxic. The consumption of mercury can affect the immune system, alter genetic and enzyme systems, and damage the nervous system. Mercury bioaccumulates, meaning it accumulates in the body and is not easily broken down. Atmospheric deposition is the main source of mercury in the environment.

In 2014, all of Lawrence’s subwatersheds were identified on the 303(d) list. Among the subwatersheds listed in the 303(d) list, the most common pollutant was arsenic, which was present in eight subwatersheds. Other common pollutants in Lawrence waters include phosphorus, which affects six of Lawrence’s subwatersheds, and mercury, which affects five subwatersheds.

Total Maximum Daily Loads

Section 303(d) of the Clean Water Act requires states, territories, and authorized tribes to establish TMDLs for all impaired waters on the 303(d) list. A TMDL is a calculation of the maximum amount of a pollutant a waterbody can receive without violating water quality standards. A TMDL’s purpose is to initiate a management approach or restoration plan based on identifying the sources of a pollutant and determining the percentage reductions of the pollutant that must be achieved by each source. These sources can be point sources, such as sewage treatment plants, or nonpoint sources, such as runoff from various types of residential, commercial, or agricultural lands. A TMDL goes through four stages; it is “proposed” in a report by NJDEP, “established” when NJDEP finalizes their report, “approved” by EPA Region 2, and “adopted” when NJDEP adopts it as an amendment to a water quality management plan.

As shown in **Table 17**, all three of the Stony Brook subwatersheds located within Lawrence Township were ranked as having a high priority for phosphorus remediation and therefore are listed on the TMDL schedule.

Water Quality Monitoring Networks

New Jersey’s Integrated Report is based on the water quality assessments of a number of different monitoring networks. The Ambient Surface Water

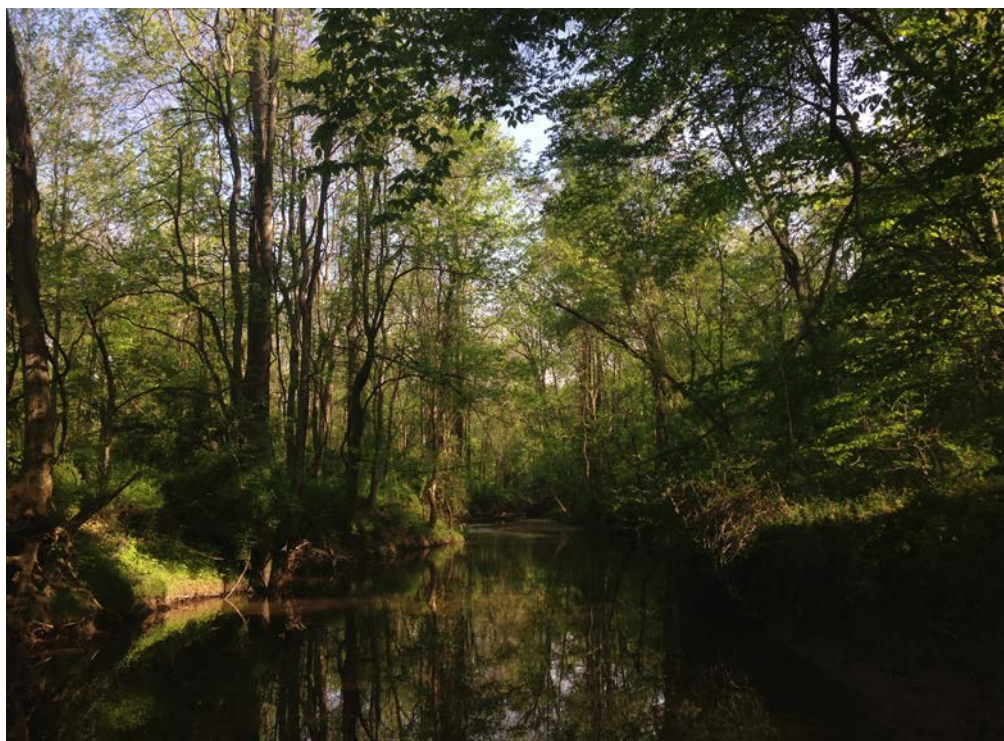
Quality Monitoring Network (ASWQMN) and the Ambient Biological Monitoring Network (AMNET) are the two primary sources of surface water monitoring data. The ASWQMN is a cooperative network between USGS and NJDEP that samples surface water quality at 112 stations throughout the state. These stations monitor stream flow, as well as temperature, dissolved oxygen (DO), pH, carbon dioxide, nitrogen, ammonia, phosphorus, arsenic, and many other parameters. AMNET, administered solely by NJDEP, consists of over 760 non-tidal sampling sites in the state that provide long-term biological data. The program routinely samples and evaluates benthic macroinvertebrate populations at each site as a biological indicator of water quality. Benthic macroinvertebrates are bottom-dwelling aquatic insects, worms, mollusks, and crustaceans that are large enough to be seen by the naked eye.

There are nine AMNET monitoring sites and six ASWQMN stations in or near Lawrence Township, listed below in **Table 18: Stream Monitoring Network Stations**. Beyond the information included in the Integrated Report, additional water quality data gathered from these monitoring stations is available through the USGS and the NJDEP. The stations are shown on **Map 11: Water Quality (2014)**.

Table 18: Stream Monitoring Network Stations

Station Name	Municipality	AMNET Station	ASWQMN Station
UNT to Shipetaukin Creek at Van Kirk Rd	Lawrence	AN0110	
Shipetaukin Creek at Rt 583	Lawrence	AN0111	
Little Shabakunk Creek at Princeton Pk	Lawrence	AN0112	
Shabakunk Creek at Bull Run Rd	Hopewell	AN0113	
Shabakunk Creek at Rt 206	Lawrence	AN0114	
Miry Run Rt 533	Hamilton	AN0115	
Stony Brook Old Mill Rd	Hopewell	AN0392	
Stony Brook Rt 206	Princeton	AN0393	
Duck Pond Run Rt 1	West Windsor	AN0394	
Stony Brook at Princeton	Princeton		1401000
Duck Pond Run in Clarksville	West Windsor		1401200
Assunpink Creek near Clarksville	Hamilton		1463620
Shipetaukin Creek at Lawrence Twp	Lawrence		1463661
Shabakunk Creek at Princeton Pk near Lawrenceville	Lawrence		1463810
Miry Run at Rt 533, Mercerville	Hamilton		1463850

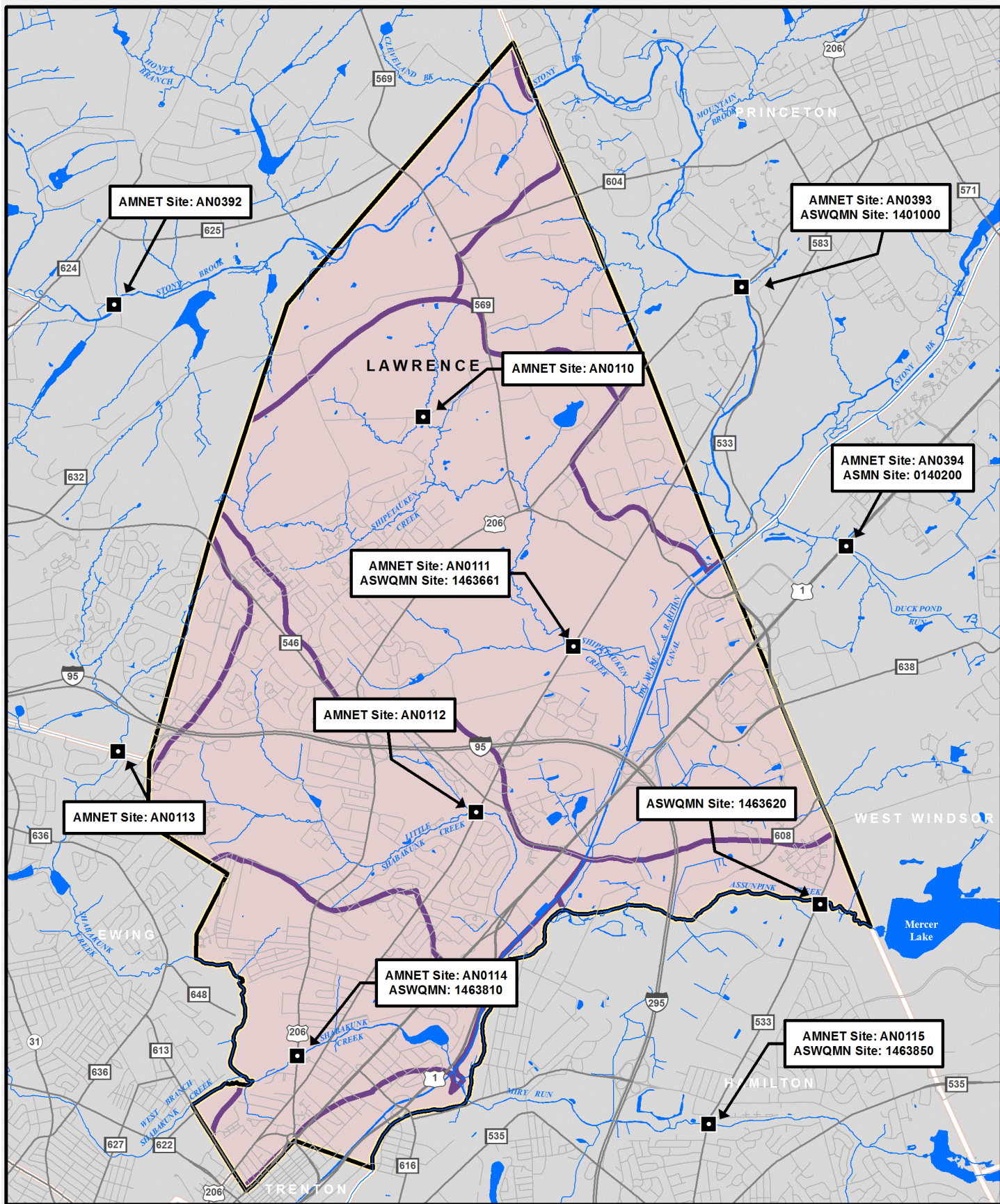
Source: NJDEP, 2015



Shabakunk Creek

Source: Famartin, Wikimedia Commons

Map 11: Water Quality (2014)



Sources : 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.

Monitoring Site
INTEGRATED WATER QUALITY REPORT
 2014, Aquatic Life
 Not Supporting



0 0.25 0.5 1
Miles



Fish Consumption Advisories

Certain fish may contain toxic chemicals, such as polychlorinated biphenyls (PCBs), dioxins, or mercury, which accumulate in water and aquatic life. Chemical contaminants, such as dioxin and PCBs, are classified by the EPA as probable cancer-causing substances in humans. Elevated levels of mercury can pose health risks to the human nervous system. The greatest bioaccumulation of mercury in fish is found in larger fish. 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 has been catching fish at numerous sampling stations throughout the state and testing for contaminant levels and adopting advisories to guide residents on safe consumption practices.

The consumption advisories for fish caught in general freshwater bodies in the state are listed in **Table 19: Fish Consumption Advisories**. Within Lawrence Township, there are additional fish consumption advisories for three additional species of fish in the D&R Canal, which supersede the general advisories.

Table 19: Fish Consumption Advisories

Species	General Population Eat No More Than:	High-risk Individuals Eat No More Than:
General Freshwater Advisories		
Largemouth Bass	One Meal per Week	One Meal per Month
Smallmouth Bass		
Chain Pickerel		
Yellow Bullhead	No Restrictions	One Meal per Week
Brown Bullhead		
Sunfish		
Delaware and Raritan Canal: Entire Length		
Channel Catfish	One Meal per Month	Do Not Eat
American Eel		
Delaware and Raritan Canal at Port Mercer		
Common Carp	One Meal per Year	Do Not Eat

Source: NJDEP, 2013

Other Monitoring

In addition to the various networks used by NJDEP, local groups often assess, monitor, and document water quality. Since 1992, volunteers of the Stony Brook Millstone Watershed Association have performed this task throughout the Millstone Watershed through the StreamWatch program. StreamWatch focuses on measuring the health of local water quality through visual, biological, and chemical observations. StreamWatch data helps the Stony Brook Millstone Watershed Association to assess the impacts of pollution on local streams and determine actions necessary to protect and improve water quality for everyone. However, since StreamWatch data is not analyzed by a certified laboratory, it cannot be added or utilized by NJDEP for the state's Water Quality Monitoring and Assessment Report.

Potential Causes of Water Quality Impairments

Point Sources

Point sources of discharge, 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, which mandated that each state develop water quality standards and regulate the amount of pollution entering waterbodies. The act classified all water pollution into one of two categories: “point source” pollution coming from a single source, such as an industrial pipe; and “nonpoint source” pollution, which comes from many diffuse sources. Although the Federal Clean Water Act only required states to regulate point sources, New Jersey also regulates nonpoint sources through the authority of the NJPDES rules (see **Nonpoint Sources on page 58**).

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 water or groundwater (usually through a subsurface disposal system) must apply for and obtain a permit for discharging. Rather than creating individually tailored permits for every facility, the Division of Water Quality uses scientific standards to create and issue general permits for different categories of dischargers. NJDEP enforces the terms of NJPDES permits by visiting discharging facilities and requiring facilities to periodically conduct water quality, biological and toxicological analyses, and thermal impact and cooling water assessments.

As of November 2015, 44 NJPDES permits for point source discharge were issued to facilities in Lawrence (including 32 5G3 permits for construction activities not shown). They are shown in **Table 20: NJPDES Permits for Point Source Discharges** and on **Map 7: Point Sources (2015)**. For additional information on specific facilities, please visit the **NJDEP Data Miner**, where you can search for sites by location, name, or ID number (all of which are listed in the table below).

Table 20: NJPDES Permits for Point Source Discharges

NJPDES Permit Number	PI Number	Facility Name	Facility Address	Effective Start Date	Expiration Date	Discharge Category Code
NJ0022110	46296	ETS	660 Rosedale Rd	10/1/2013	9/30/2018	A
NJ0024759	46314	Ewing-Lawrence SA WTP	600 Whitehead Rd	3/1/2012	11/30/2014	A
NJ0027618	46935	Bristol-Myers Squibb Co	Rt 206 & Province Line Rd	3/1/2012	2/28/2017	B
NJ0171565	46935	Bristol-Myers Squibb Co	Rt 206 & Province Line Rd	1/1/2015	12/31/2019	L
NJ0213560	448177	AuroHealth	2572 Brunswick Pk	9/1/2013	8/31/2018	L
NJG0032913	46463	Headwaters Technology Innovation	1501 New York Ave	7/1/2015	9/30/2018	CG
NJG0118044	48450	BWAY Packaging	6 Litho Rd	2/1/2013	1/31/2018	5G2
NJG0156183	46314	Ewing-Lawrence SA WTP	600 Whitehead Rd	2/1/2013	1/31/2018	5G2
NJG0171557	52886	Britton Industries Inc.	227 Bakers Basin Rd	9/1/2010	11/30/2014	R7
NJG0198161	46314	Ewing-Lawrence SA WTP	600 Whitehead Rd	1/1/2012	12/31/2016	S4G

NJPDES Permit Number	PI Number	Facility Name	Facility Address	Effective Start Date	Expiration Date	Discharge Category Code
NJG0223603	46296	ETS	660 Rosedale Rd	1/1/2015	12/31/2019	S1G

Source: NJDEP Active Permit List, 2015

Discharge Category Code	Discharge Category Description
A	Sanitary Wastewater: Issued to facilities that discharge primarily domestic sewage from residential and commercial properties.
B	Industrial Wastewater: Issued to facilities that discharge treated and non-treated wastewater derived from, but not limited to, process and non-process wastewater, contact and non-contact cooling water, and stormwater runoff.
L	Significant Indirect User: Some wastewater dischargers do not discharge their wastewater directly into a surface waterbody like a stream or river, and instead discharge into a sanitary sewer system/ sewage treatment plant. These dischargers are known as "indirect users." The wastewater is treated at local agency's treatment plant and usually discharged into a river or stream.
CG	Gen Non-Contact Cooling Water: Authorizes the discharge of non-contact cooling water. Non-contact cooling water is used to cool down various types of industrial and manufacturing equipment without directly coming into contact with facility processes.
R7	Wood Recyclers (GP): Provides an alternative to an individual NJPDES stormwater permit for regulating wood recycling facility operators that are classified as Solid Waste Class B Wood Recyclers.
5G2	Basic Industrial Stormwater (GP): Available to regulated industrial facilities that have eliminated or can eliminate within six months of authorization, all exposure of industrial materials or activities to stormwater discharges (rainfall and snowmelt waters). Exposure may be eliminated by covering the materials or activities or by moving materials or activities indoors.
S4G	Sludge Quality Category 4 (GP): Implement the provisions of the Sludge Quality Assurance Regulations for residual quality and quantity monitoring for Domestic Treatment Works and industrial and public water treatment systems with permitted flow > 5.0 million gallons per day (MGD).
S1G	Sludge Quality Category 1 (GP): Implement the provisions of the Sludge Quality Assurance Regulations for residual quality and quantity monitoring for Domestic Treatment Works and industrial and public water treatment systems with permitted flow between 0.02 and 0.099 MGD.

Nonpoint Sources

Nonpoint sources of discharge, or stormwater runoff, have the largest effect on the water quality and channel health of streams in Lawrence Township. According to the EPA, about half the pollution in New Jersey's surface water comes from nonpoint sources. Development dramatically increases nonpoint source pollution by increasing the volume of water and the level of pollutants in the runoff. Increased runoff causes erosion and sediment buildup in streams, carries nutrients from fertilizers, and washes toxins, bacterial contamination, road salt, motor oils, and litter into the stream.

The sources of polluted stormwater runoff are also the most difficult to identify and remediate because they are diffuse, widespread, and cumulative. Most nonpoint source pollution in Lawrence Township is derived from stormwater runoff from impervious surfaces such as streets and highways, parking lots, commercial/industrial areas, and residential sites (with and without detention basins). Nonpoint source pollution is also derived from agricultural fields

that lack adequate vegetative buffers. The waterways in Lawrence are affected by stormwater runoff from within the township and from upstream municipalities.

Since the adoption of the Federal Clean Water Act and the implementation of NJPDES permits in subsequent years, water pollution from point sources has decreased dramatically. However, as development has continued to spread throughout New Jersey, nonpoint source pollution has increased substantially. NJDEP's new Stormwater Management Rules focus on reducing and controlling nonpoint sources of water pollution.

The Municipal Stormwater Regulation Program was developed in response to the EPA's Phase II rules published in December 1999. NJDEP issued two sets of stormwater rules on February 2, 2004. The first set is the Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program rules (N.J.A.C. 7:14A), which are intended to address pollutants associated with existing stormwater runoff. The Phase II rules specifically govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems (MS4s). The program established four NJPDES general permits: the Tier A Municipal Stormwater General Permit (Tier A Permit for large municipalities), the Tier B Municipal Stormwater General Permit (Tier B Permit for rural municipalities), the Public Complex Stormwater General Permit (Public Complex Permit), and the Highway Agency Stormwater General Permit (Highway Permit). Public complexes include certain large public colleges, prisons, hospital complexes, and military bases. Highway agencies include county, state, interstate, or federal government agencies that operate highways and other thoroughfares.

As a Tier A municipality, Lawrence was required to obtain a NJPDES general permit for the stormwater system and its discharges within its borders, which are considered to be owned and "operated" by the municipality. The general permit addresses stormwater quality issues related to new development, redevelopment, and existing development by requiring regulated entities to implement Statewide Basic Requirements (SBRs), listed in the callout on **page 60**. Addressing SBR #4, Lawrence Township voluntarily installed floatable control bars on stormwater catch basins around the township. There are no NJPDES permits for public complexes or highway agencies in Lawrence Township. The one NJPDES permit for nonpoint source pollution is listed in **Table 21: NJPDES Permit for Nonpoint Source Pollution**.

Table 21: NJPDES Permit for Nonpoint Source Pollution

NJPDES Permit Number	PI Number	Facility Name	Facility Address	Effective Start Date	Expiration Date	Discharge Category Description
NJG0149560	203072	Lawrence Twp	2207 Lawrenceville Rd	3/1/2009	2/28/2014	Tier A Municipal Stormwater General Permit

Source: NJDEP Active Permit List, 2015

The second set of rules, known as the Stormwater Management rules (N.J.A.C. 7:8), describe the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development.

As of November 2015, NJDEP was in the process of updating the Municipal Stormwater Regulation Program. In October 2014, NJDEP Division of Waste Quality staff provided multiple outreach sessions to discuss the status of ongoing activities, including changes to the

Stormwater Management Statewide Basic Requirements: Tier A Municipalities

1. Control post-construction stormwater management in new development and redevelopment through:
 - Adoption of a stormwater management plan in accordance with N.J.A.C. 7:8.;
 - Adoption and implementation of a stormwater control ordinance in accordance with N.J.A.C. 7:8. (This ordinance requires retention on site of 100 percent of preconstruction recharge, and use of low-impact design in stormwater facilities, among other features.);
 - Ensuring compliance with Residential Site Improvement Standards for stormwater management. (The RSIS has been revised to incorporate the low-impact design and other requirements of the stormwater control ordinance.);
 - Ensuring long-term operation and maintenance of BMPs on municipal property; and
 - Requiring that new storm drain inlets meet new design standards.
2. Conduct local public education:
 - Distribute educational information (about stormwater requirements, nonpoint source pollution, and stewardship) annually to residents and businesses and conduct a yearly “event” (such as a booth with these messages at a community day).
 - Have all municipal storm drain inlets labeled with some type of “don’t dump” message.
 - Distribute information annually regarding fertilizer/pesticide application, storage, disposal, and landscaping alternatives and regarding proper identification, handling, and disposal of wastes, including pet waste and litter.
 - Adopt specific ordinances to control waste disposal and other nonpoint sources.
3. Control improper disposal of waste through improved yard waste collection and through adoption of ordinances (pet waste, litter, improper dumping, and wildlife feeding).
4. Control solids and floatables through increased street sweeping, retrofitting storm drain inlets during road repairs, and instituting programs for stormwater facility management, for roadside erosion control, and for outfall pipe scouring/erosion.
5. Improve maintenance yard operations, specifically for de-icing material storage, fueling operations, vehicle maintenance, and housekeeping operations.
6. Increase employee training for all of the above.

Tier A Stormwater Annual Report and Audit Program, as well as the MS4 Tier A renewal permit.

In February 2004, the Stony Brook Millstone Watershed Association released ***Taking the Next Step: Lawrence Township Municipal Assessment***, which identified issues in Lawrence that may hinder the preservation of natural resources and made a number of recommendations to assist the township in achieving its goals. The document noted that the “Township’s Master Plan states as a Conservation of Natural Features goal to create a regional stormwater management plan with adjacent municipalities.”² Although Lawrence currently does not have a comprehensive stormwater management plan, *Taking the Next Step* recommended that the township “Create and adopt a stormwater management plan that includes an ordinance, BMPs, implementation, and enforcement.”³

² Stony Brook Millstone Watershed Association, *Taking the Next Step: Lawrence Township Municipal Assessment* (February 2004).

³ Ibid.

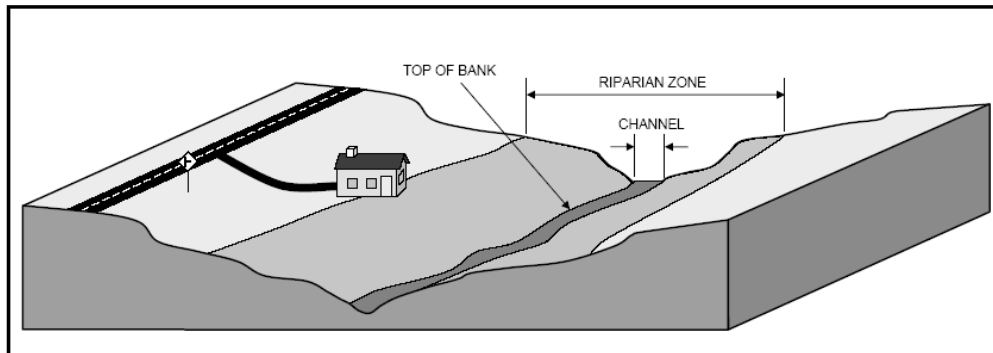
Additionally, **The Green Buildings and Environmental Sustainability Element of the Master Plan**, which was adopted by the Lawrence Township Planning Board on May 3, 2010, includes a number of goals and objectives that seek to reduce nonpoint source pollution and improve water resources throughout the township, including:

- Goal B: Improve how runoff is managed and treated throughout the township in order to improve water quality, increase groundwater recharge, and improve runoff management and treatment throughout the township.
- Goal C: Increase vegetated riparian buffers around surface waters in the township to reduce nonpoint source pollution.⁴

Stream Buffers

The stream buffer, or riparian zone, 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. The riparian zone is composed of the channel and land within 50, 150, or 300 feet of the channel. 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—a greenway—for wildlife to move between larger forested habitat areas. Residents can utilize these greenways for recreation with the addition of trails, bikeways, and access points to water for fishing and canoe/kayak launching. A depiction of the riparian zone is shown in **Figure 7: Parts of a Riparian Zone**.

Figure 7: Parts of a Riparian Zone



Source: NJDEP

The importance of a healthy, intact buffer zone has been well documented scientifically over the past 25 years, especially for headwater streams. There is less agreement and much continuing research on the appropriate minimum width of a buffer. In addition to development

restrictions in the floodplain (discussed in the **Floodplains** section), a 300-foot buffer is required by the Stormwater Management (NJAC 7:8) and the Flood Hazard Control Act rules at NJAC 7:13 for certain activities proposed adjacent to Category One (C1) streams or their upstream tributaries in the same subwatershed. NJDEP defines C1 waterbodies as those that meet the standards of Exceptional Ecological Significance, Exceptional Fisheries Resource(s), and Exceptional Water Supply Significance. See **New Jersey Surface Water Quality Standards Antidegradation Designations** for additional clarification.

Category Two (C2) waterbodies, defined as those not designated as Outstanding National

⁴ Lawrence Township, New Jersey, *The Green Buildings and Environmental Sustainability Element of the Master Plan*, prepared by Clarke Caton Hintz (May 3, 2010).

Resource Waters or C1, also need protection. In 2009, Lawrence Township amended its Land Use Ordinance to include a more comprehensive stream buffer ordinance. See **Lawrence Stream Buffer Ordinance** for additional details. In addition to establishing stream buffer protections through their land use ordinances, municipalities may also acquire riparian buffer areas as part of a recreational park, open space, or greenway plan.

Additionally, in the *Protecting Our Streams* resource paper, the Association of New Jersey Environmental Commissions notes that “Environmental commissions can encourage the preservation of existing vegetation and replanting of native vegetation along bare stream banks as important steps to preserve and improve stream quality.”⁵ Use of native vegetation in landscaping minimizes the need for pesticide and fertilizer use and requires less frequent watering and mowing. This recommendation is in line with Lawrence’s **The Green Buildings and Environmental Sustainability Element of the Master Plan**, specifically Goal C (noted above) and Goal D: Encourage the use of sustainable landscaping in the township.

Impervious Coverage

As noted in earlier sections, the volume of stormwater runoff that is carried to a stream 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 percent or more within a subwatershed are directly linked to increased stormwater runoff, enlargement of stream channels, increased stream bank erosion, lower dry weather flows, higher stream temperatures, lower water quality, and declines in aquatic wildlife diversity. When impervious cover reaches 25 percent to 30 percent within a subwatershed, streams can become severely degraded. See **Map 12: Impervious Surfaces (2011)**.

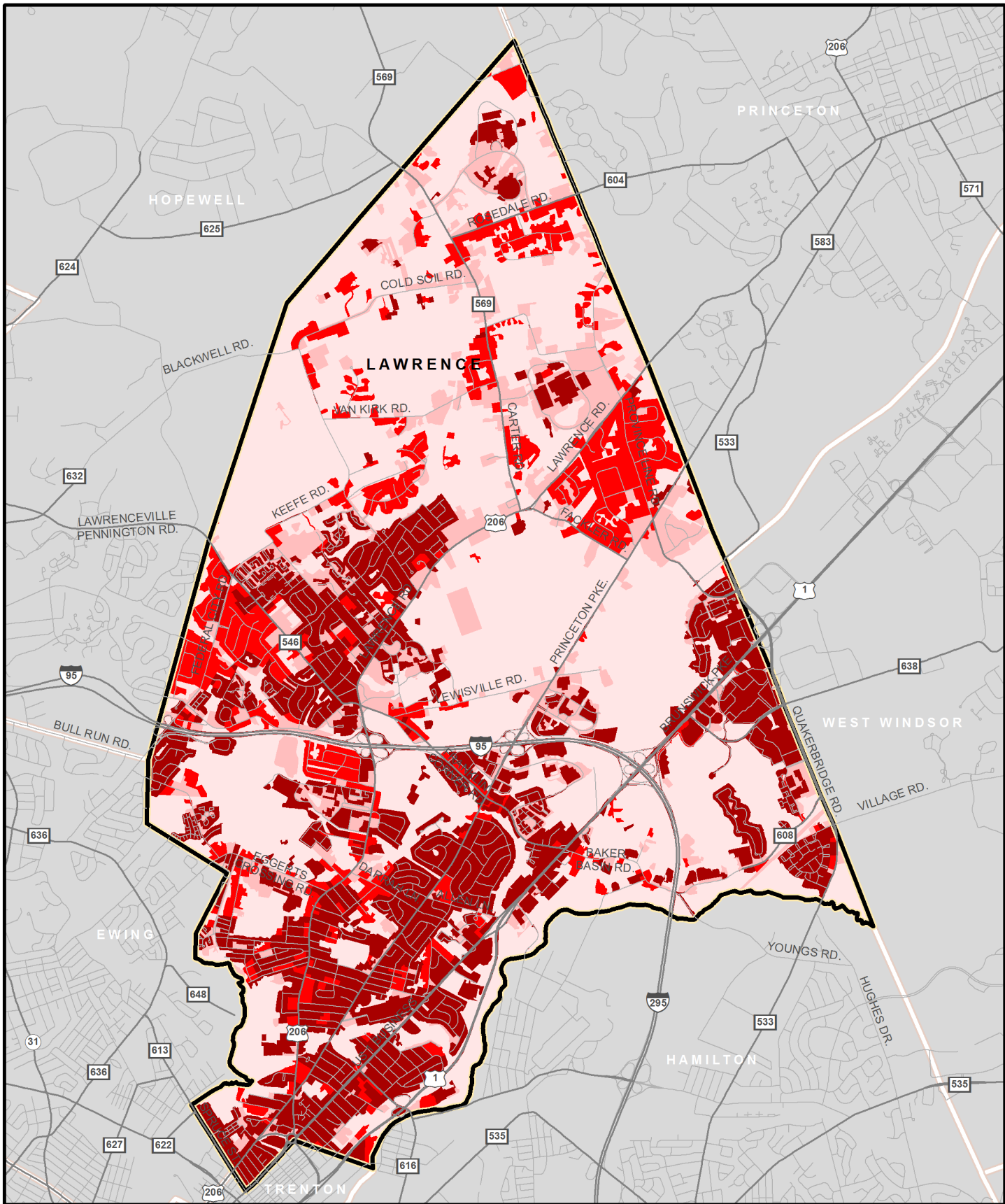
Table 22: Acreage of Impervious Surface in Lawrence Township

HUC14	Subwatershed Name	Total Acres in Subwatershed	Acres of Impervious Surface	Percent Impervious Surface
02030105090050	Stony Brook (Province Line Rd to 74d46m dam)	6,272.09	301.26	4.80%
02030105090060	Stony Brook (Rt 206 to Province Line Rd)	5,153.95	520.69	10.10%
02030105090070	Stony Brook (Alexander Creek to Rt 206)	2,671.01	259.11	9.70%
02030105090080	Duck Pond Run	3,668.52	681.51	18.58%
02040105230050	Assunpink Creek (Shipetaukin to Trenton Rd)	6,181.80	642.95	10.40%
02040105230060	Shipetaukin Creek	6,905.70	1,003.33	14.53%
02040105240010	Shabakunk Creek	5,400.61	1,422.17	26.33%
02040105240020	Shabakunk Creek WB	3,078.89	1,173.50	38.11%
02040105240050	Little Shabakunk Creek	2,785.77	701.84	25.19%
02040105240060	Assunpink Creek (below Shipetaukin Creek)	3,051.18	1,389.55	45.54%

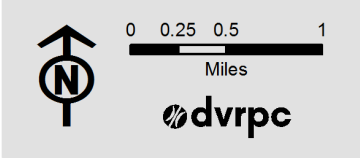
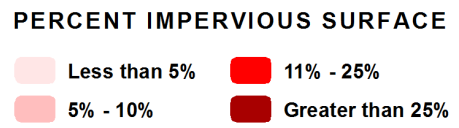
Source: NJDEP, 2011

⁵ Association of New Jersey Environmental Commissions, *Protecting Our Streams* (Mendham, NJ, 2009).

Map 12: Impervious Surfaces (2011)



Sources : 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.



Due to the increasing amount of development within Lawrence, impervious cover is a major issue within certain areas of the township. This is especially true along Route 1 and Princeton Pike, and in the Quakerbridge Mall area, where impervious coverage is very high. Eight of Lawrence's 10 subwatersheds exceed the 10 percent threshold for impairment, and the southwestern corner of the township (comprising most of the Shabakunk Creek and Assunpink subwatersheds) exceeds 25 percent cover. The least developed watershed, draining into the Stony Brook, reaches only 4.8 percent cover, while the most developed, along Lawrence's border with Trenton, exceeds 45 percent cover. See **Table 22: Acreage of Impervious Surface in Lawrence Township**. Note that the percentage of impervious surface by subwatershed applies to the entire subwatershed, not just the area within Lawrence.

GROUNDWATER

Aquifers and Geological Formations

Principal aquifers in New Jersey are classified into two groups: Coastal Plain aquifers south of the Fall Line, and non-Coastal Plain aquifers north of the Fall Line. Lawrence Township is crossed by the Fall Line, which is the boundary between the Piedmont Plateau and the Atlantic Coastal Plain physiographic provinces. The two provinces contain different types of geologic outcrops, which affect groundwater supplies and recharge. Permeability of Piedmont Plateau soils is generally slow or moderate, and runoff is more rapid. Coastal Plain soils are generally sandy or gravelly and permeability is moderate to rapid.

About two-thirds of the township lies 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 river basins in Pennsylvania. The geology of the Newark Basin is composed of four sedimentary rock formations, three igneous rock formations, and diabase intrusives. The deposits form low ridges and valleys in the region that trend from northeast to southwest. The predominate aquifers within the basin are called, collectively, the Newark Group. They consist of the Passaic Formation, the Stockton Formation, and the Lockatong Formation. Together,

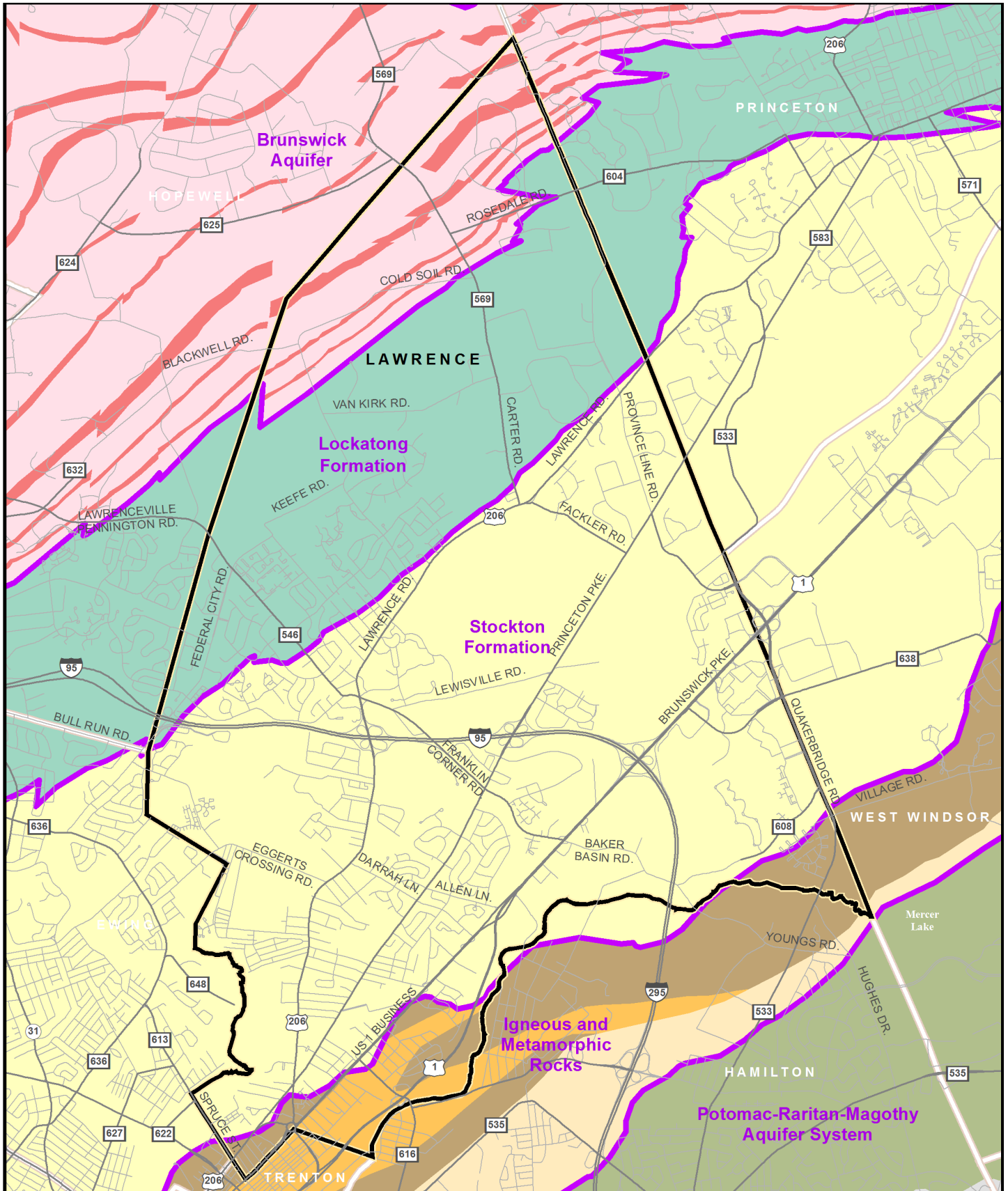
Newark Group Formations

The Stockton Formation extends as a thin belt from Mercer County northward to Rockland County, New York. In Lawrence, it underlies 8,545 acres (61 percent of the township). It is composed of very old sediments, which are highly erodible. The bottom half of the formation is composed of mostly fluvial deposits containing medium-to-coarse-grained sandstones, siltstone, 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 soils associated with this formation also are the best in the township for agricultural uses, septic filter fields, and water retention.










The Lockatong Formation lies between the Stockton and Passaic formations and is composed of less erodible rocks, such as gray and black shale and siltstone, as well as subordinate purple and red mudstone. The rock has both low permeability and porosity, and the fractures are widely spaced and tight, allowing little infiltration. Of the three formations, it is the poorest for storing water and is one of the lowest-yielding aquifers in New Jersey. Soils associated with this formation are generally poorly drained and have a high water table. In Lawrence, the Lockatong Formation underlies 3,463 acres (25 percent of the township) in the northern part of the township.


The Passaic Formation underlies the smallest portion of Lawrence, only 1,327 acres (9 percent of the township). The Passaic Formation is the second-best water-bearing geologic formation in the township. The zone of water-storing joints and fractures in the Passaic Formation is estimated to be 200 to 600 feet thick. It has an extensive system of rock fractures, which enable it to store and move groundwater. The Passaic Formation is composed mostly of red mudstone, as well as subordinate gray, purple, and black mudstone. The formation also is composed of sandstone and conglomerate containing glauberite and gypsum.

Map 13: Aquifers and Bedrock Geology




Sources : 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.

-  Bedrock Aquifer
- Geologic Outcrops**
-  Gabbro
-  Gneiss Granofels and Migmatite
-  Lockatong Formation
-  Passaic Formation
-  Passaic Formation Gray Bed
-  Potomac Formation
-  Stockton Formation
-  Wissahickon Formation



0 0.25 0.5 1

Miles



these three bedrock aquifers provide 95 percent of the Newark Basin's water. The Lockatong Formation and the Stockton Formation make up the majority of Lawrence's geology. See **Map 13: Aquifers and Bedrock Geology**.

Water from bedrock aquifers is drawn from joints and fractures, or networks of fractures, in the rock. The number and size of these joints and fractures decrease with increasing depth below the ground surface. Shallow parts of bedrock aquifers are generally unconfined, meaning they are not bounded by confining layers made of less 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 surface. Sixty-five percent of all water is drawn from within 200 feet of the land surface, and 85 percent of all water is drawn from within 300 feet of the land surface. Below 500 feet, there are fewer and smaller fractures in the rock, thus storing less groundwater.

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 susceptible to local contamination. The groundwater is generally hard, containing more minerals than are found in surface water.

In addition to these major formations, igneous and metamorphic rock formations underlying small portions of Lawrence include the Gabbro and Wissahickon formations, as well as Gneiss Granofels and Migmatite. These bed outcrop formations occur only in the southern tips of the township.

Groundwater Recharge

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

The New Jersey Geological Survey (NJGS) 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. NJDEP has used this methodology to map the groundwater recharge potential of land areas throughout the state. Recharge is equivalent to the amount of precipitation per year that could reach the water table in an area with a particular combination of soils and land use. It is expressed as inches per year.

It should be noted that the NJGS methodology is limited. The NJGS has stated that this method only evaluates groundwater recharge potential, not aquifer recharge, and should be considered accordingly. Groundwater recharge potential is not the same as aquifer recharge, which the NJGS has defined as the recharge rate for those geological formations that yield economically significant quantities of water to wells.

In Lawrence, lands with recharge rates between 13 and 16 inches per year, the highest in the township, are found in scattered patches, with the largest areas found in the northern part of the township and near the Stony Brook and Shipetaukin Creeks. See **Map 14: Groundwater Recharge**. Often, areas with high recharge rates are located in the Coastal Plain province or along the border between the Coastal Plain and the Piedmont provinces, where the recharge

Stony Brook near
Route 569



Source:
DVRPC

of groundwater is high because the area is underlain by permeable, alluvial sediments. Some of these highly permeable soil series in Lawrence include Sassafras, Birdsboro, Evesboro, and Galestown soils.

In general, on high recharge lands, large amounts of paving and high impervious cover will have 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 two to four acres are often needed for proper nitrate dilution from septic systems in areas having 10 or more inches per year of groundwater recharge.

In addition, about 40 percent of the township’s land experiences zero inches of groundwater recharge, primarily due to development and urbanization. Most of this land is located in the southern part of the township. See **Table 23** for more information on groundwater recharge in Lawrence Township.

Table 23: Groundwater Recharge in Lawrence

Inches per Year	Acres	Percentage of Lawrence
0–1	5,630.61	40.0%
2–10	2,920.05	20.8%
11–12	3,688.95	26.2%
13–16	1,820.35	13.0%
Total	14,059.96	100.0%

Source: NJDEP, 2004

While the surest way to protect groundwater recharge is to leave land undeveloped, there are ways in which urbanized areas can preserve ground and stormwater standards. BMPs, such as tree trenches, bioswales, rain gardens, rain barrels, and porous pavement can be used

with great success to capture, treat, and infiltrate precipitation in developed areas from all but the most significant storm events. Also referred to as green infrastructure, these techniques are utilized in more developed communities to manage stormwater and protect drinking water supplies. **The Green Building and Sustainability Element of the Master Plan** encourages residents and business owners to implement smaller BMPs such as rain gardens on their properties to help infiltrate runoff and recharge groundwater.

Over the last few decades, groundwater levels in the majority of observation wells located in Mercer County have decreased slightly. The level of groundwater is measured by its depth below the surface, so a higher depth indicates a lower level of groundwater. As the water level reading increases, the groundwater level decreases, meaning the depth at which one would find water is increasing below the land surface. With increased water level depth, wells must be drilled deeper to reach sizable and usable quantities of water. As seen in **Table 24**, the water level has decreased in seven of the eight wells, indicated by an increased depth below the surface. Only one well saw an increase in the water level; however, its last day of observation was July 31, 2003. Out of the eight wells, only one exists in Lawrence Township: the Cranston Farms 15 Observation well, located at 2739-2761 Main Street. This well taps the Stockton Formation aquifer, which, as noted in the sidebar, is one of the most productive aquifers in the region.

Table 24: USGS Groundwater Observation Wells

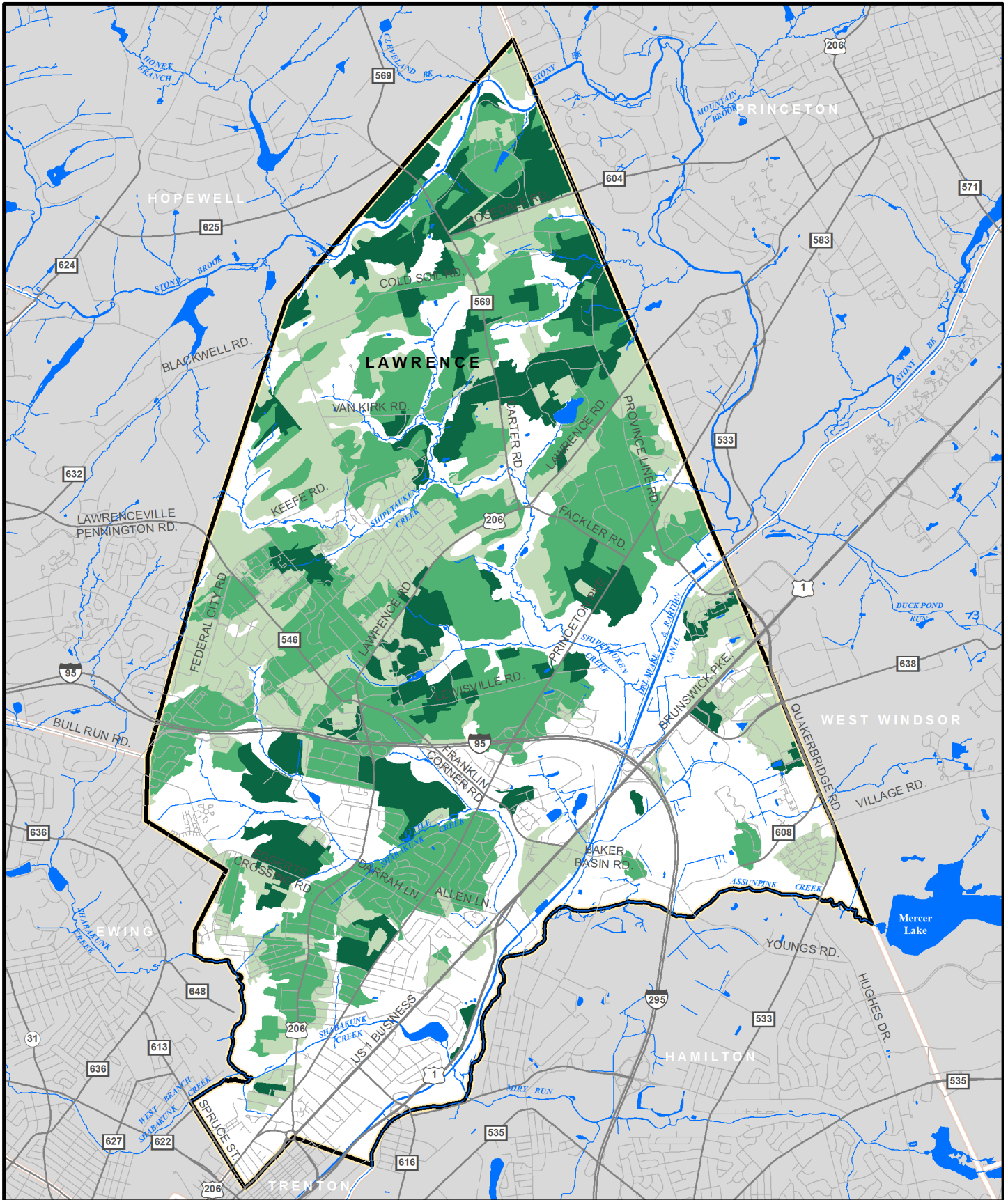
Site Name	Township	Depth of Well (ft)	Depth of Hole (ft)	Date of First Observation	Water Level (ft from surface)	Date of Last Observation	Water level (ft from surface)	Local Aquifer
Civil Defense Obs	Ewing	300	-	4/21/2001	15.6	9/17/2015	17.69	Lokatong
MW-59Br	Ewing	80	80	6/13/2000	9.59	7/31/2003	8.87	Lokatong
MW-54Br Core2 Obs	Ewing	200	200	4/24/2001	11.95	9/30/2005	14.34	Lokatong
Wash Crossing Pk 14 Obs	Hopewell	225	225	4/11/1992	65.49	9/17/2015	69.37	Passaic
Bristol-Myers 100 Obs	Hopewell	300	300	12/6/1986	14.45	10/15/2015	16.87	Passaic
Honey Br 10 Obs	Hopewell	150	150	10/1/1972	27.02	3/5/1995	27.38	Passaic
Carter Rd Obs	Hopewell	99	-	2/25/1987	11.62	9/10/2015	14.00	Passaic
Cranston Farms 15 Obs	Lawrence	200	200	3/2/1990	28.1	11/10/2015	31.9	Stockton

Source: USGS, 2015

Drinking Water Supply

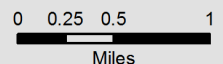
Lawrence Township receives its drinking water from four water-supply systems: Aqua New Jersey (formerly the Lawrenceville Water Company), the Lawrenceville School, the New Jersey American Water Company–Raritan, and the Trenton Water Works. The majority of Lawrence Township receives its drinking water from the New Jersey American Water Company (which obtains its water from a number of sources, including 129 wells and seven surface water intakes along the Delaware and Raritan Canal and in the Stockton Formation) or the Trenton Water Works (which obtains its water from the Delaware River).

Map 14: Groundwater Recharge



Sources : NJDEP, NJGS, 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.

INCHES PER YEAR



Miles



As required by state and federal regulations, the drinking water quality of all utilities are regularly monitored for a variety of chemical and biological parameters. Monitored chemical contaminants include inorganics; radionuclides; and synthetic organic chemicals, including volatile organic chemicals, pesticides, herbicides, and disinfection by-products. Biological contaminants that are monitored include coliform and Legionella bacteria, as well as parasites such as Giardia and Cryptosporidium. Other factors tested include turbidity (or cloudiness). Lead and copper are also tested at a sample number of household taps. Drinking water utilities are required to notify their customers if the levels of any monitored chemicals exceed the regulated standards.

Drinking water supplies are rated for their susceptibility to contamination by different parameters. This rating reflects the potential for contamination, not the existence of contamination. People with immunodeficiency may be more vulnerable to contamination in drinking water than the general population. Like all surface water sources in the state, the New Jersey American Water Company and the Trenton Water Works are highly susceptible to contamination by pathogens, nutrients, inorganics, and disinfection by-product precursors. The New Jersey American Water Company surface water sources are also highly susceptible to pesticide contamination. As noted above, the New Jersey American Water Company, Aqua New Jersey, and the Lawrenceville School also draw their water from wells, which vary greatly in their susceptibility to the seven contaminants.

In addition to the water utilities, there are a number of public and private water supply wells, as well as farmland irrigation systems that draw on groundwater. The **March 2008 Environmental Resource Inventory for Lawrence Township** noted that there were seven public community and seven public non-community water supply wells (a well that has at least 15 service connections used by year-round residents) in Lawrence; however, due to the sensitive nature of public community water supply wells, NJDEP no longer provides this data to the public.

There are 157 permits for private wells in Lawrence Township, 131 of which are listed as active. The 2002 Private Well Testing Act (PWTA) requires state-certified laboratory water testing in order to sell a residential property. It also requires landlords to test the private well water supplied to their tenants and provide their tenants with a written copy of the results. The data generated by these tests are provided to both the homeowners and the NJDEP Bureau of Safe Drinking Water. NJDEP uses the data to assess the quality of the water from private wells throughout the state. PWTA testing data gathered for wells located in Lawrence Township from September 2002 to April 2014 is summarized in **Table 25: PWTA Data**.

If the tests detect parameters in excess of the maximum contaminant level, the laboratory must

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) was passed by the U.S. Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The Act was amended in 1986 and 1996 to increase protections, monitoring requirements, enforcement, and reporting standards. Private drinking water wells, however, are exempt from the Act.

The SDWA authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water. In New Jersey, NJDEP assumes responsibility for enforcing the SDWA.

The SDWA requires public water suppliers to provide their customers with an annual Consumer Confidence Report. The report provides information on the source of the water supply, the level of any regulated contaminants detected in the water, the health effects of contaminants detected above federal health-based standards, and the water system's compliance with other drinking water regulations.

notify various parties depending on the parameter, including the homeowner, public health authority, and NJDEP. The PWTA does not require homeowners to treat private well water if an exceedence is identified. However, local health authorities may require the installation of treatment equipment, as well as notify surrounding homeowners and businesses.

Table 25: PWTA Data

Parameter	Percentage of Wells that Exceeded a Maximum Contaminant Level	Number of Wells Tested Under PWTA
Nitrate	0.5%	206
Arsenic	14.6%	206
Iron	21.4%	206
Manganese	27.2%	206
Gross Alpha	1.7%	180
VOC	1.5%	206
Fecal coliform or E. coli	2.4%	206
pH	28.2%	206

Source: NJDEP, 2015

Wellhead Protection Areas

Preventing contamination in areas where aquifers intersect the land surface is extremely important in order to maintain a safe drinking-water supply. As part of its 1991 Well Head Protection Program Plan, NJDEP delineated Well Head Protection Areas (WHPAs) around all community wells. A WHPA is the area from which a well draws its water within a specified time frame (tiers). Pollutants spilled directly on or near the wellhead will enter the water source within that timeframe. 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 BMPs to protect groundwater, land use planning, and education to promote public awareness of groundwater resources.

Once WHPAs are delineated, potential pollution sources may be managed by landowners 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 within those zones.

The radius of the WHPA depends on a number of factors related to the well and the underlying hydrogeology. The thicker and more porous the aquifer and the slower the pumping rate of the well, the smaller the radius of the WHPA is. The WHPAs in Lawrence Township are shown on **Map 15: Wellhead Protection Areas.**

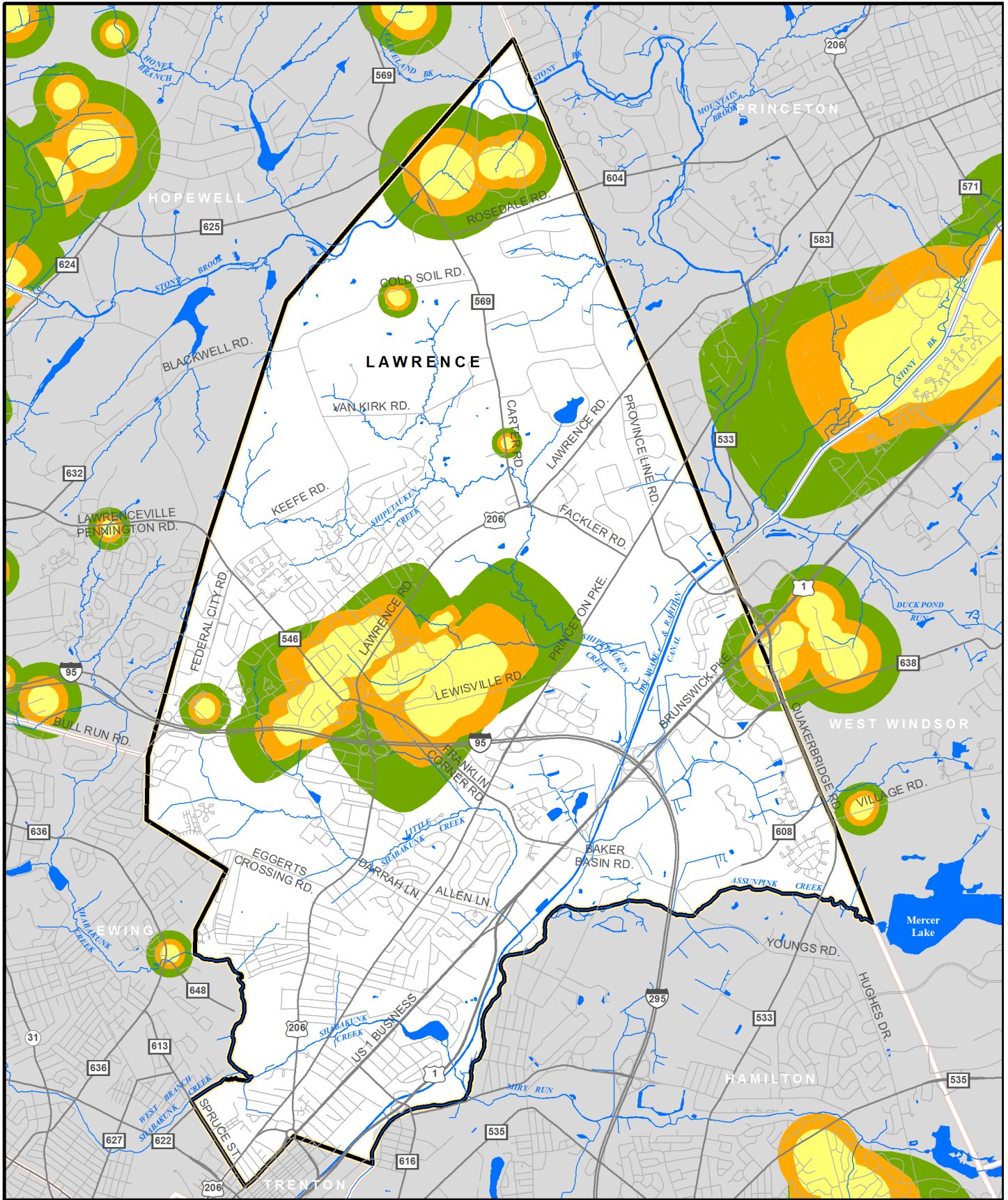
Delineating a WHPA

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 = 12 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 to undertake specific remedies, and 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.


Map 15: Wellhead Protection Areas



Sources : 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.


TIME OF TRAVEL

- 2 Year
- 5 Year
- 12 Year



0 0.25 0.5 1

Miles



Biological Resources

When a community protects wildlife and habitat, it is also protecting biodiversity, which is important for the health and productivity of the ecosystem and its inhabitants, including humans. Biodiversity refers to the variety of genetic material within a species population, the variety of species (plants, animals, microorganisms) within a community, and the variety of natural communities within a given region. 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 of which are 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.

Despite being over 50 percent developed, Lawrence Township still contains numerous types of habitats, all of which are important for maintaining biodiversity. Wetlands, the most abundant type of natural vegetation in Lawrence, are found throughout the township with higher concentrations in its southeastern portion. Particularly abundant among these are deciduous wooded wetlands and herbaceous wetlands. Upland forests, which were once the most abundant type of natural habitat in Lawrence, are scattered throughout the township where land is dry and undeveloped. The following sections identify and describe in more detail the plant and animal communities that inhabit these ecosystems within Lawrence.

NATURAL VEGETATION

Drexel Woods



Source:
Famartin,
Wikimedia Commons

A region's vegetation is dependent on many factors, the most important of which are climate and soils. The region has a cool, temperate climate with rainfall averaging 3.97 inches per month (see the **Climate** section for a detailed description of Lawrence's variable climate). Most of Lawrence's soils are generally well-drained soils, supporting a diversity of trees and some crops. Lawrence's poorly drained soils exhibit ponding and hydric characteristics that sustain wetland plants. See **Soils on page 14** for a detailed description of Lawrence's soils.

Lawrence's natural vegetation types, along with human-influenced types of land cover, have been tabulated and mapped by NJDEP's 2012 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 System, created by the USGS. See **Table 26: Natural Vegetation** and **Map 16: Natural Vegetation** for additional details on Lawrence's natural vegetation.

Table 26: Natural Vegetation

Type of Vegetation	Acres	Percentage of Total Land Area
Brush/Shrubland	86.21	0.6%
Brush/Shrubland–Old field	456.90	3.2%
Upland Forest–Coniferous	16.15	0.1%
Upland Forest–Deciduous	1,322.06	9.4%
Upland Forest–Mixed (Coniferous Dominated)	32.33	0.2%
Upland Forest–Mixed (Deciduous Dominated)	23.95	0.2%
Water	202.89	1.4%
Wetlands–Herbaceous	239.04	1.7%
Wetlands–Modified	159.77	1.1%
Wetlands–Phragmites Dominated	2.15	0.0%
Wetlands–Scrub/Shrub	189.00	1.3%
Wetlands–Wooded - Deciduous	2,211.71	15.7%
Wetlands–Wooded Mixed (Coniferous Dominated)	0.63	0.0%
Wetlands–Wooded Mixed (Deciduous Dominated)	4.28	0.0%
Wetlands–Modified	139.28	1.0%
Total Natural Vegetation	5,086.35	36.2%
Non-natural vegetation (urban, agriculture, barren land, etc.)	8,973.61	63.8%
Total Lawrence Land	14,059.96	100.0%

Source: NJDEP, 2012

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. New Jersey's wetlands are located around numerous interior stream systems and along coastal rivers and bays. NJDEP, which employs USGS guidelines, classifies wetlands with naturally occurring vegetation into two major categories: (1) *tidal wetlands*, which are wetlands associated with tidal portions of the Delaware River system and waterways draining into the Atlantic Ocean; and (2) *interior wetlands*, which are wetlands found in non-tidal lowlands associated with waterways and isolated wetlands surrounded by uplands. NJDEP also identifies *modified wetlands*, which

Flowering dogwood



Source:
Michael Hogan

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.

Almost all of Lawrence's wetlands are found in association with the major streams and their tributaries, and, being inland, there are no tidal wetlands. Interior wetlands provide high-

quality animal and plant habitat and purify the township's surface and ground water. Lawrence has three major types of interior wetlands: (1) wooded wetlands dominated by deciduous trees, which occupy about 2,212 acres; (2) scrub/shrub wetlands, which are closely associated with wooded wetlands and occupy roughly 180 acres; and (3) herbaceous wetlands, which occur along lake edges, in open floodplains, and in former agricultural fields and occupy 239 acres of Lawrence's land area. See **Wetlands on page 42, Map 9: Surface Water, Wetlands, Vernal Pools, and Dams on page 44, and Map 16: Natural Vegetation** for more information.

Upland Forests

Upland areas are those locations without water at or near the soil surface. Most of Lawrence's original upland forests have been cleared and converted to farms or residential or commercial development. Today's upland forests are second or third growth and tend to be located near stream corridors, on steep slopes, or on less desirable soils. Approximately 1,394 acres, or 10 percent of Lawrence's land area, is upland forest. Upland forest is found throughout the township, although it is more common in the northern half of the township. See **Map 16: Natural Vegetation**. The vast majority of Lawrence's upland forest is composed of deciduous forest (1,322 acres). Some of this upland forest has been preserved by the creation of parks, such as Drexel Woods, Tiffany Woods, and Carson Road Woods. The composition of Lawrence's upland deciduous forests is largely one of mixed oaks—black, red, pin, and white oaks—joined by other hardwoods, such as ash, birch, maple, beech, hickory, locust, poplar, and sweetgum. The understory is dominated by flowering dogwood, black cherry, ironwood, and sassafras. Vines, such as wild grapes, Virginia creeper, Japanese honeysuckle, poison ivy, greenbriar, and Asiatic bittersweet are common. Winterberry, holly, elderberry, spicebush, arrowwood viburnum, swamp azalea, honeysuckle, sweet pepperbush, and black haw are common shrubs in moister locations.

Grasslands and Agricultural Lands

Grasslands are considered to be one of the most endangered ecosystems globally. They are threatened by human development, new agricultural technology, grazing, desertification, soil erosion, and invasive species. Grasslands are important because they provide habitat for specialized species such as grassland birds and shade-intolerant herbaceous plants. Many species of increasingly rare grassland birds require large contiguous patches of grasslands for successful breeding and roosting.

NJDEP defines grassland habitat as brushland, shrubland, or old fields that were cleared or disturbed at one time and then abandoned. Following abandonment, old fields are overgrown by perennial herbs and grasses. These pioneer plants remain the dominant species for three to 20 years' time. Later, woody plants 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. To be sustained, grasslands must be mowed every one or two years. Grasslands are also highly susceptible to invasive species.

In Lawrence, 543 acres, or 4 percent of the land cover, is classified as brushland, shrubland, or old fields. Much of Lawrence's grassland can be found in the Pole Farm District of Mercer Meadows. Upon acquiring the Pole Farm District in 1998, Mercer County allowed the land to revert back to natural fields and forest from its previous use as farmland. In 2012, Mercer County, in partnership with the Friends of Hopewell Valley Open Space and the U.S. Fish and Wildlife Service, undertook a 435-acre habitat restoration project to improve Mercer Meadows' grasslands for native wildlife by removing trees and invasive plant species and seeding the area with native grasses and wildflowers. The Washington Crossing Audubon Society documented over 100 bird species, including the bobolink and eastern meadowlark—both rare grassland birds—at the Pole Farm District of Mercer Meadows. See **Animal Communities on page 79** and **Appendix D** for more information.

In addition to brushland and old fields, active agricultural cropland and pastureland is considered suitable "grassland" habitat for wildlife. Agricultural cropland and pastureland covers 1,475 acres, or 10 percent of the township's total land area.

Rare Plant Species

According to the Natural Heritage Database, a list of documented sightings of threatened and endangered species, there are four rare plant species that have been observed in Lawrence Township. However, as seen below in **Table 27**, many of these plant species do not have recorded observations from recent years. For a more complete list of plant species found in Lawrence, see **Appendix B - Appendix E**, which records which plant species that have been observed in Drexel Woods, Carson Road Woods Park, Mercer Meadows' Pole Farm, and Shipetaukin Woods.

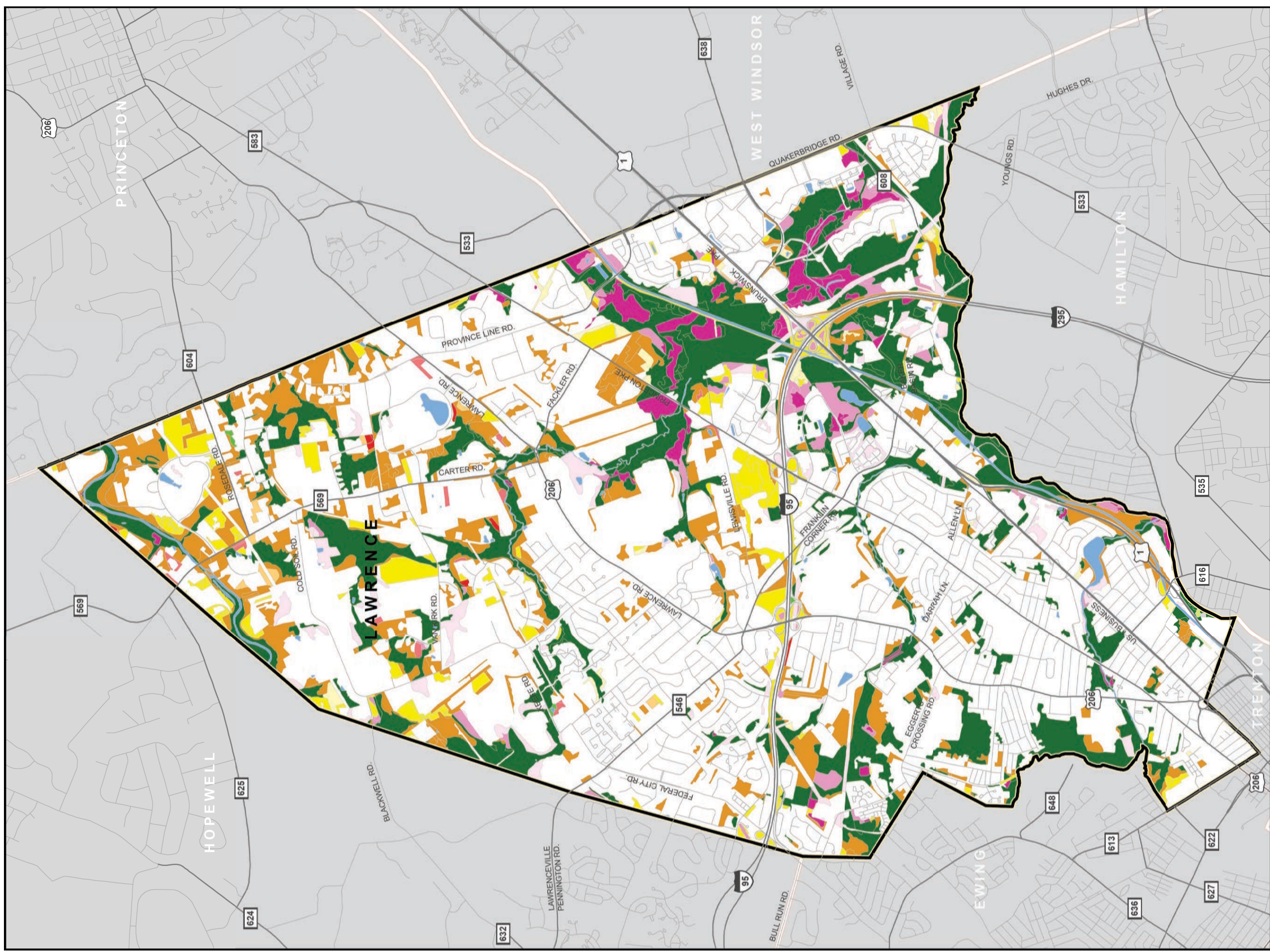
Table 27: Rare Plant Species

Common Name	Scientific Name	State Status	State Rank	Last Observed
Yellow Giant-hyssop	Agastache nepetoides	--	S2	8/18/2011
Willdenow's Sedge	Carex willdenowii var. willdenowii	--	S2	5/21/2007
Lowland Fragile Fern	Cystopteris protrusa	--	S2	4/24/2012
Purple Meadow-parsnip	Thaspium trifoliatum var. trifoliatum	--	S3	5/21/2007
Brown Sedge	Carex buxbaumii	--	S3	5/28/1904
Cloud Sedge	Carex haydenii	Endangered	S1	5/28/1904

Source: NJDEP, New Jersey Natural Heritage Program, 2015

State Rank	
S1	Critically Imperiled in New Jersey (>5 occurrences)

Map 16: Natural Vegetation



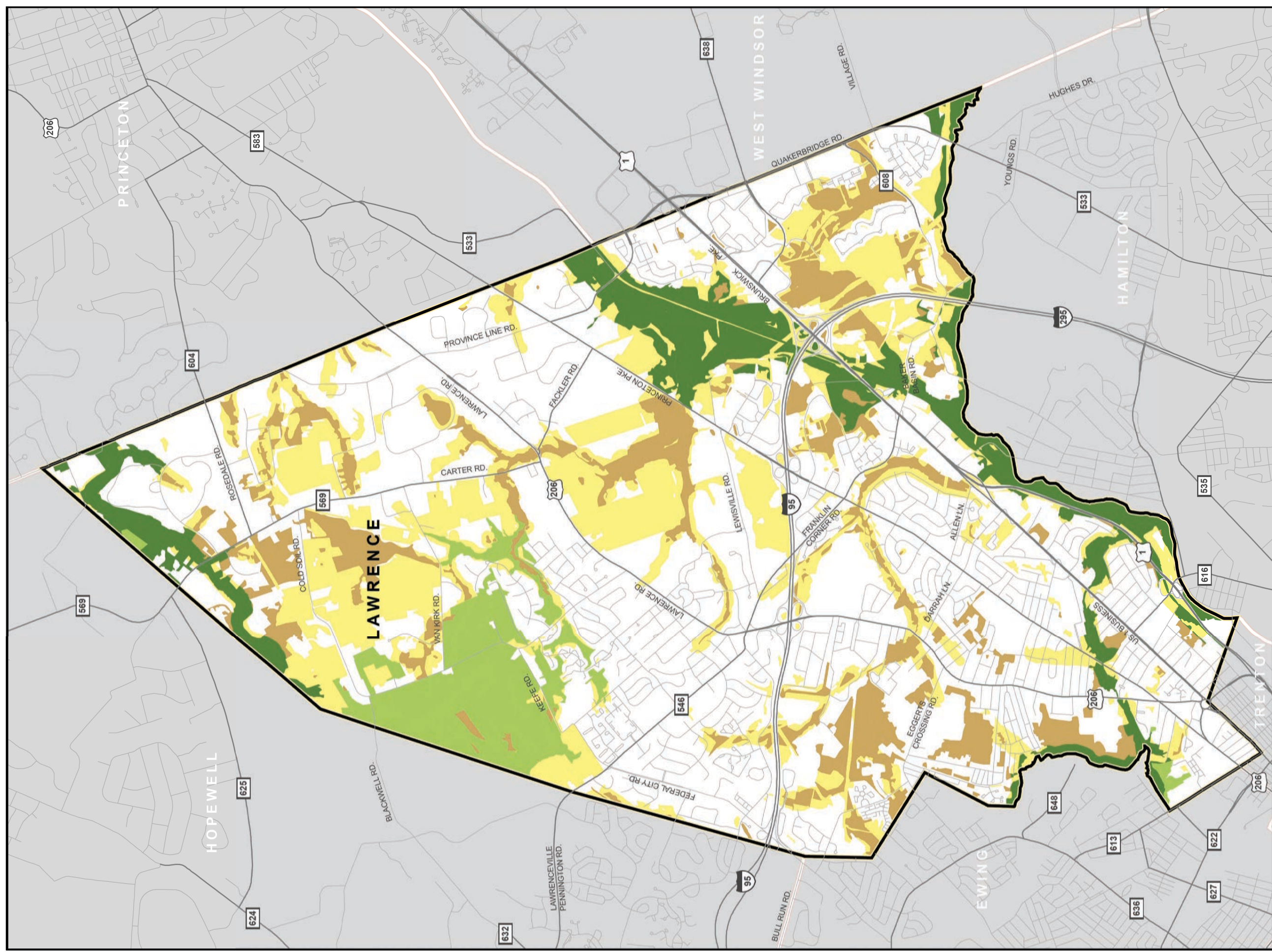
Sources : NJDEP, NJDOT, DVRPC
 This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

- VEGETATION**
- Brush/Shrubland
 - Brush/Shrubland - Oldfield
 - Lake or Stream
 - Upland Forest - Coniferous
 - Upland Forest - Mixed (Conif. dom.)
 - Upland Forest - Deciduous
 - Upland Forest - Mixed (Decid. dom.)
 - Wetlands - Modified
 - Wetlands - Scrub/Shrub
 - Wetlands - Herbaceous
 - Wetlands - Wooded - Decid.
 - Wetlands - Wooded Mixed
 - Wetlands - Phragmites dom.
 - All Other Land Cover

0 0.25 0.5 1
 Miles

dvrpc

Map 17: Landscape Project Habitat Priorities



Sources : 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.

- TYPE OF CONSERVATION PRIORITY**
- Rank 1 - Habitat Specific Requirements
 - Rank 2 - Special Concern
 - Rank 3 - State Threatened
 - Rank 4 - State Endangered
 - Rank 5 - Federal Listed

0 0.25 0.5 1
 Miles

State Rank	
S2	Imperiled in New Jersey (6–20 occurrences)
S3	Rare in state (21–100 occurrences)
S4	Apparently secure in state

LANDSCAPE PROJECT PRIORITY HABITATS

Started in 1994 by the NJDFW’s Endangered and Nongame Species Program, the Landscape Project was created to protect biological diversity by maintaining and enhancing imperiled wildlife species and important habitats in New Jersey. It identifies species-specific habitat in the state based on a combination of two factors: (1) land use/land cover patches specific for each species, and (2) species occurrence records from the Biotics database. The resulting species-specific habitat patches are classified according to a scale of five ranks based on the status of each species detailed in **Table 28** and **Table 29 on page 84**.

Map 17: Landscape Project Habitat Priorities illustrates the Landscape Project habitats identified in Lawrence Township. Within Lawrence, important habitats for rare species are predominantly located within and along the banks of the Delaware and Raritan Canal and Stony Brook. Additionally, areas identified as Rank 1, 2, and 3 species habitats are located in the northwestern and central portions of the township and generally align with areas that are identified as agricultural uses. It is important to preserve both suitable and critical habitats in order to maintain the diversity of species that still exist in the township and to improve the likelihood of survival for endangered and threatened species.

Table 28: Landscape Project Priority Habitats

Habitat	Rank	Acres
Habitat Specific Requirements	1	2,703.41
Special Concern	2	1,397.52
State Threatened	3	729.58
State Endangered	4	1,128.36
Total		5,958.88

Source: NJDEP, 2012

ANIMAL COMMUNITIES

Although no comprehensive inventory of the different animal species within Lawrence Township exists, there are records of sightings, biological studies of range, environmental impact assessments, and evaluations of endangered and threatened status. Using federal, state, scientific, and nonprofit sources, it is possible to identify and describe known and possible animals of Lawrence. A list of animal and plant species found in the 184-acre Carson Road Woods, which is located in the northern part of Lawrence, is provided in **Appendix C**. This biological inventory was conducted by the Washington Crossing Audubon Society in 2003. Additionally, a list of animal and plant species found on the Pole Farm Property (Mercer County Park Northwest) is included in **Appendix D**. This biological survey was also conducted by the Washington Crossing Audubon Society. Both lists generally apply to Lawrence as a whole.

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. Invertebrates consist of insects (beetles, butterflies, moths, dragonflies, ants, termites, bees, wasps, flies, 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 freshwater stream bottoms. These communities consist largely of the juvenile stages of many insects, such as dragonflies and mayflies, as well as mollusks, crustaceans, and worms. Monitoring for diverse assemblages of macroinvertebrates reveals the effect of pollutants over a long period of time. The NJDEP AMNET surveys streams for macroinvertebrate communities, which indicate certain levels of water quality, as discussed in the **Surface Water Quality** section of this document.

There are 10 invertebrate species listed as endangered and 14 invertebrate species listed as threatened in the State of New Jersey (See **Appendix F: State Endangered and Threatened Species**). According to the Natural Heritage Database, three of these threatened or endangered invertebrate species still exist in Lawrence's waters (See **Appendix G**).

Vertebrates

With approximately 450 different species of vertebrate wildlife in New Jersey, vertebrates are less numerous than invertebrates, but their larger size makes them much more visible and, therefore, better studied and recorded. Mammals and reptiles are fairly well documented. Birds that nest in the township are known, but migrants that depend on Lawrence's 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. The NJDFW lists 89 species of mammals in New Jersey, of which only nine are listed as endangered, and none are listed as threatened. Six of the threatened species are whales, and, of the three land-based species, only one of these, the bobcat, is found in Lawrence Township. Some common mammals found in Lawrence include cottontail rabbits, eastern gray squirrels, skunks, little brown bats, white-tailed deer, opossums, and raccoons.

Deer Management in New Jersey

White-tailed deer are one of the most prevalent and easily recognized wildlife species in New Jersey. While many residents prize the presence of mammalian life, deer can often be perceived as nuisances as a result of negative interactions with humans, particularly in more densely developed areas. According to the USDA, 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 affected. Additionally, deer can devastate the under-story of forests through overgrazing, destroying the growth of seedlings and young trees. Finally, as most motorists are well aware, collisions between deer and automobiles frequently result in

serious damage.

To minimize human–deer conflicts, NJDFW designated 61 deer management zones throughout the state. Portions of Lawrence Township are located in deer management zones 12 and 14. Each zone treats its deer as individual populations with their own management objectives. The New Jersey Agricultural Experiment Station recommends both lethal and non-lethal 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 sharp shooting, and employ traps and euthanasia to reduce deer numbers. Alternatively, communities and private landowners can choose to apply more costly, non-lethal 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.

While current deer problems should be addressed, it is important to note that conflicts between deer and human populations will continue to increase 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.

Birds

There are over 440 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, but also the New Jersey Atlantic coast and the Delaware Bay are major parts of the Eastern Flyway (established migratory air route) in North America.

Common birds in Lawrence are ducks, woodpeckers, geese, swallows, jays, robins, wrens, sparrows, and some hawks. The threatened grasshopper sparrow and bobolink have been sighted in the township, as has the Cooper’s hawk. See **Appendix B - Appendix E** for a list of birds observed in parks throughout Lawrence.

Barred owl



Source: ThinkStock

Important Bird Areas

The Important Bird Area (IBA) Program began as an international initiative for saving bird and wildlife habitat. The Audubon Society, which manages the IBA program in North America, has identified more than 2,600 IBAs, covering more than 380 million acres in the United States. The state IBA programs have succeeded in protecting tens of thousands of acres of bird habitat and raised public awareness about habitat protection. In New Jersey, the



Grasshopper
sparrow

Source:
ThinkStock

New Jersey Audubon Society, in cooperation with the New Jersey Endangered and Nongame Species Program and the National Audubon Society, runs the Important Bird and Birding Area program. This program identifies not only Important Bird Areas, but also areas important for bird watching.

In New Jersey, for a site to qualify as an IBA, it must meet at least one of four primary criteria, including the presence of species of conservation concern, the presence of “regional responsibility species,” the capacity to hold “significant congregations” of one or more bird species, and the presence of exceptionally high numbers of birds during migration relative to the surrounding areas.

Lawrence is home to a portion of one IBA, the Pole Farm IBA. Bisected by the Lawrence–Hopewell township boundary, the Pole Farm IBA is bounded by Blackwell Road to the north, Cold Soil Road to the east, Keefe Road to the south, Federal City Road to the west, and Lawrenceville-Pennington Road to the southwest. It is approximately 800 acres and is owned by the Mercer County Park Commission. The habitat of this IBA consists of mostly non-tidal wetlands and fallow fields. In addition, there is some shrubland and deciduous forest on the parcel. The Pole Farm IBA is a wintering home for the Northern Harrier, a New Jersey species of Special Concern. Regional Responsibility species, such as the Northern Flicker, Chimney Swift, Wood Thrush, and Eastern Towhee, can also be found on the property.

Resident Canada Goose Populations

The state of New Jersey now has a “resident” Canada goose population of over 80,000 birds that no longer migrate to more southern locales. This population may double in size in the next five to 10 years. While geese are a pleasant 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, polluting surface waters and 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 potentially injure humans.

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

Threatened and Endangered Wildlife Species

The Cooper's Hawk (*Accipiter cooperii*) is a member of the Accipiter family and is especially adapted to fly through dense cover chasing prey. In New Jersey, Cooper's hawks breed in wooded wetlands. 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, which create a closed canopy. On average, a hawk will place his or her nest more than one-third of a mile away from the nearest human inhabitant. The hawk was listed as endangered in 1974 and downgraded to threatened in 1999 and special concern in 2012. The loss of large, contiguous forests remains a threat to this species and warrants the continued protection of Cooper's hawk nesting habitats.

The Barred Owl (*Strix varia*) inhabits contiguous old-growth wetland forests. The owls use cavities in large trees for their nests. In northern New Jersey, barred owls live in mixed deciduous wetland or riparian forests. They avoid sites near residential, agricultural, industrial, or commercial areas. They prefer lowlands and avoid rocky hillsides. Barred owls were once abundant in the deep-wood swamps of New Jersey, but they diminished in numbers as they were shot by hunters and as habitat was reduced beginning in the 1940s through the cutting of old-growth forests and the filling of wetlands. In 1979 it was listed as a threatened species in New Jersey.

The Bobcat (*Felis reflexus*) is a member of the Felidae family. Bobcats can occupy a variety of habitats, ranging from forests to mixed agricultural areas to rural areas outside of cities. They generally occupy habitats with rocks or dense cover, which provide protection from weather and predators, as well as resting places. In New Jersey, bobcats typically occupy areas of contiguous forest or fragmented forests interspersed with agricultural areas. In the 1800s, many New Jersey forests were cleared, leading to a decline in the number of bobcats. By the 1970s, the animal was believed to have been extirpated from the state. In 1977, the New Jersey Division of Fish, Game, and Shellfisheries (now the NJDFW) started a bobcat restoration project, releasing bobcats from Maine into northern New Jersey. While bobcat numbers today are steady, the animal is still listed as a state endangered species.

community level. Like all waterfowl, Canada geese are protected by the Migratory Bird Treaty Act. Therefore, a management program may require the USDA's approval. 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 them with decoys.

Reptiles and Amphibians

There are eight endangered and three threatened reptile species in New Jersey, including seven different turtle species and four snake species. Amphibians of some types, such as bullfrogs, are abundant. Other species are rare because they depend on vernal pools, as was discussed in the **Vernal Pools** section of this document (page 45). There are three endangered and three threatened amphibian species in New Jersey, including four salamander and two frog species. In Lawrence Township, the eastern box turtle, wood turtle, spotted turtle, and Fowler's toad—all threatened or species of special concern—have been sighted in the last several years. The eastern box turtle and the wood turtle are classified as species of special concern and state threatened, respectively.

Fish

New Jersey's waters are home to 85 species of freshwater fish, as well as 336 species of marine finfish. The NJDFW, 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, Lawrence's freshwater streams may contain the following fish: redbreasted sunfish, blue gill sunfish, white sucker, chain pickerel, pumpkinseed, eastern mudminnow, common shiner, largemouth bass, tessellated darter, and the American eel.

Endangered Vertebrates

According to the Natural Heritage Database, a list of documented sightings of threatened and endangered species, a number of rare wildlife species have been sighted in Lawrence. Two reptile and one mammal

species are included in the Natural Heritage Database for Lawrence Township and are listed

in **Table 29: Rare Animal Species** below. Brief descriptions of several of these species and their preferred habitat can be found in the box on **page 83**. Additionally, three state endangered species (the bald eagle, the vesper sparrow, and the bobcat), as well as six state threatened species, have been found in Lawrence. See **Appendix F** for a list of endangered and threatened species in New Jersey.

Table 29: Rare Animal Species

Common Name	Scientific Name	Rank	State Status	State Rank
American Kestrel	<i>Falco sparverius</i>	3	Threatened	S2B,S2N
Bald Eagle	<i>Haliaeetus leucocephalus</i>	4	Endangered	S1B,S2N
Barred Owl	<i>Strix varia</i>	3	Threatened	S2B,S2N
Bobcat	<i>Lynx rufus</i>	4	Endangered	S1
Bobolink	<i>Dolichonyx oryzivorus</i>	3	Threatened	S2B,S3N
Brown Thrasher	<i>Toxostoma rufum</i>	2	Special Concern	S3B,S4N
Cooper's Hawk	<i>Accipiter cooperii</i>	2	Special Concern	S3B,S4N
Eastern Box Turtle	<i>Terrapene carolina carolina</i>	2	Special Concern	S3
Eastern Meadowlark	<i>Sturnella magna</i>	2	Special Concern	S3B,S3N
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	3	Threatened	S2B,S3N
Great Blue Heron	<i>Ardea herodias</i>	2	Special Concern	S3B,S4N
Long-eared Owl	<i>Asio otus</i>	3	Threatened	S2B,S2N
Northern Harrier	<i>Circus cyaneus</i>	2	Special Concern	S1B,S3N
Vesper Sparrow	<i>Pooecetes gramineus</i>	4	Endangered	S1B,S3N
Wood Turtle	<i>Glyptemys insculpta</i>	3	Threatened	S2

Source: NJDEP Natural Heritage Database, 2015

Rank	Description
	<i>Species-specific habitat patches that:</i>
1	Meet habitat-specific suitability requirements, such as minimum size or core area criteria for endangered, threatened, or special concern wildlife species, but that do not intersect with any confirmed occurrences of such species.
2	Contain one or more occurrences of species considered to be species of special concern.
3	Contain one or more occurrences of state threatened species.
4	Contain one or more occurrences of state endangered species.
5	Contain one or more occurrences of wildlife listed as endangered and threatened pursuant to the Federal Endangered Species Act of 1973.

State Rank	
S1	Critically imperiled in New Jersey (>5 occurrences)
S2	Imperiled in New Jersey (6–20 occurrences)
S3	Rare in state (21–100 occurrences)

State Rank	
S4	Apparently secure in state
S5	Demonstrably secure in state
B	Refers to the breeding population of the element in the state
N	Refers to the nonbreeding population of the element in the state
NA	Data not available

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 exemplary natural communities within the state that are critically important habitat for rare species. Preserving these areas is a top priority for efforts to conserve biological diversity in New Jersey. There are 343 NHP sites in the state of New Jersey, none of which are located in Lawrence Township. NHP designations are based on the records of the Natural Heritage Database. Information on particular sites may also be provided by the Nature Conservancy or by the NJDEP Endangered and Nongame Species Program, and especially through the latter agency’s Landscape Project.

The Natural Heritage Database also lists for Lawrence several species of threatened and endangered plants and animals, or rare natural communities that have been found in parts of the township. Only one of the rare plants present in Lawrence—the cloud sedge—has state endangered status. The Natural Heritage Database’s individual records of animals have been incorporated into the Landscape Project, but plant listings are not a basis for 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

Loveless Nature Preserve



Source: DVRPC

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 the protection of threatened and endangered species.

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

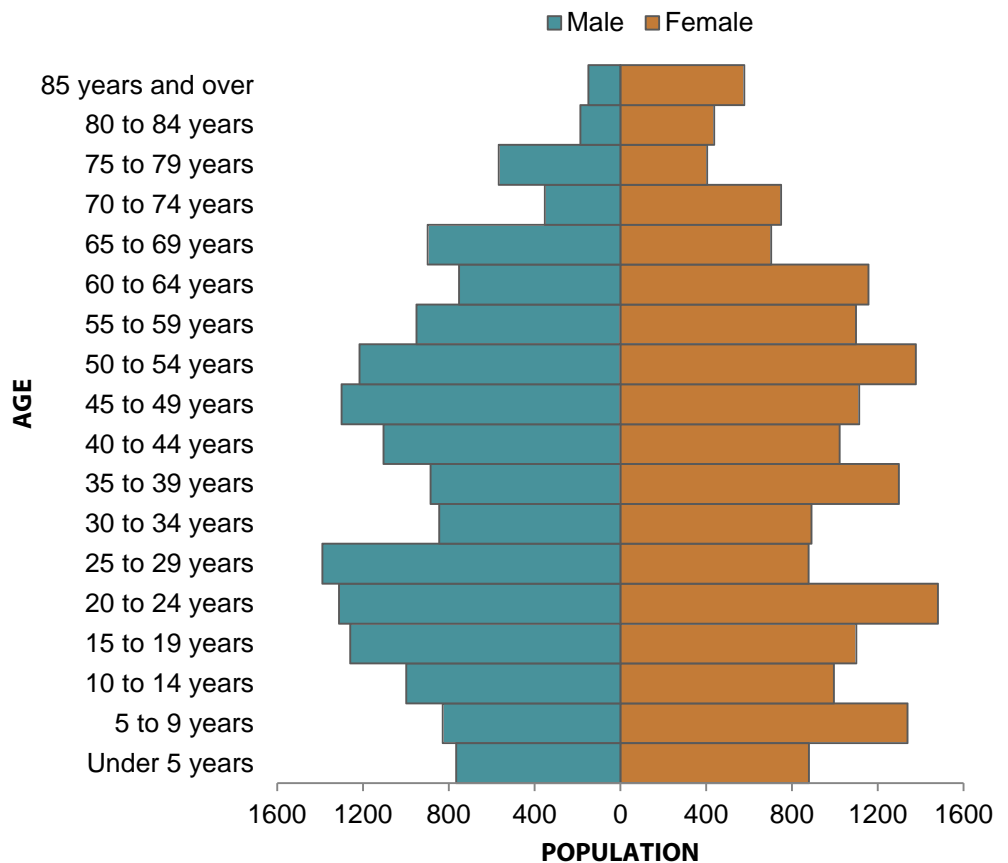
The Built Environment

DEMOGRAPHICS

According to the 2014 5-Year American Community Survey (ACS), approximately 33,252 people live in Lawrence Township. This represents a slight decrease from Lawrence’s 2010 population of 33,472, but a 14 percent increase from Lawrence’s 2000 population of 29,159. DVRPC projects only a small increase (3.4 percent) of 1,116 additional residents by the year 2040.

According to the 2014 5-Year ACS, 8,164 residents, or 25 percent of Lawrence’s total population, are under the age of 20. This is an increase of 14 percent from 2000. This age group represents those residents who are most physically active in the community and most likely to use public recreational facilities. **Figure 8** shows that much of Lawrence’s population lies in the economically active age range (from 20 to 60 years of age), providing a strong tax base and workforce for the township.

Figure 8: Age Pyramid for Lawrence Township (2014)



Source: U.S. Census Bureau, 2010–2014 American Community Survey 5-Year Estimates

The population of Lawrence Township is somewhat diverse, with approximately 11 percent of residents identifying as Black and 15 percent identifying as Asian (see **Table 30: Lawrence Township Population by Race**).

Table 30: Lawrence Township Population by Race

Race	Population	Percentage
White	22,987	69%
Black or African American	3,753	11%
American Indian and Alaska Native	11	0%
Asian	4,968	15%
Native Hawaiian and Other Pacific Islander	0	0%
Some other race	824	2%
Two or more races:	709	2%
Total:	33,252	100%

Source: U.S. Census Bureau, 2010–2014 American Community Survey 5-Year Estimates

There were a total of 12,994 housing units in Lawrence Township in 2014, a 16 percent increase from the 2000 total of 11,180 units. In 2014, 96 percent (12,410 housing units) were occupied, and 4 percent (584 units) were vacant.

Although almost half of Lawrence’s population lives in single-family detached homes (47 percent), approximately 23 percent of Lawrence residents live in apartment buildings with 10 or more units.

TRANSPORTATION

Lawrence has a strategic location in the Mid-Atlantic region. It is only 54 miles from New York City and 33 miles from Philadelphia. Commuters in Lawrence benefit from the Amtrak line that connects New York City with Philadelphia and bisects the township. This train line is part of the Northeast Corridor route that connects Washington, DC to Boston.

The modern roadway transportation corridors that serve Lawrence have fostered much of its past and current growth. The township is accessible by four major roads: Routes 95, 295, 206, and 1. Interstate 95 and Interstate 295 form a semi-circle through Lawrence and intersect with Route 1 and Route 206, which run north–south, bisecting the township.

County roads within the township include Routes 546 (Lawrenceville-Pennington Road/Franklin Corner Road), 583 (Princeton Pike), 604 (Rosedale Road), 533 (Quakerbridge Road), and 569 (Carter Road), as well as Lawrence Station, Whitehead, and Grovers Mill roads and the Brunswick Extension. These routes provide access and connections within the township and county and reflect the township’s land use and distribution of historic centers of activity. Smaller roads in the township are a mixture of old rural lanes and newer subdivision thoroughfares.

Lawrence experiences heavy congestion during rush hours. Most of this congestion is concentrated along Business Route 1 (Brunswick Pike) and Route 206. The township has plans to redevelop the Business Route 1 corridor to calm traffic and make it more pedestrian friendly. Lawrence designated this stretch of Business Route 1 a Redevelopment Area and

drafted a Redevelopment Plan. The plan recommends various traffic-calming measures by converting the highway into a boulevard and constructing a landscaped median in the center. Officials hope that these measures will also encourage the development of local businesses in the area. Lawrence recently began the redevelopment of Business Route 1 and expects construction to be completed in 2018.

In 2010, the New Jersey Department of Transportation released the **Route 1 Regional Growth Strategy**, which provides an integrated development and transportation vision that focuses development in mixed-use centers served by a robust multimodal transportation network. The study area included 15 municipalities along the Route 1 corridor between Trenton and New Brunswick. The strategy identified over 40 locations for potential mixed-use centers, including seven of varying sizes in Lawrence Township. Implementing the land use and transportation vision will require the coordinated efforts of many municipalities, county agencies, state departments, and business leaders.

In 2006, New Jersey Transit completed an alternatives analysis that studied the feasibility of providing a Bus-Rapid Transit (BRT) system along the Route 1 corridor. A BRT system is a public transportation system that uses existing infrastructure and scheduling improvements to provide a higher quality of bus service. The New Jersey Transit alternatives analysis estimated that the implementation of a BRT system along Route 1 could reduce weekday auto person trips by 11,000 to 12,000 trips, significantly reducing the number of vehicles on a congested roadway. New Jersey Transit is now investigating a phased implementation of the BRT system.

HISTORIC RESOURCES

Lawrence hosts 10 places on the National and State Registers of Historic Places, including six historic houses, three historic districts, and one National Historic Landmark. The historic districts contain dozens of individual structures, sites, and buildings, many of which, though not all, are historic. In addition to the National and State Register sites, Lawrence Township has designated other significant sites and structures as “local historic landmarks.” Many of these sites are eligible for listing on the State and National Registers of Historic Places. They are described in detail in the Lawrence Township Master Plan. See **Map 18: Historical and Cultural Resources** and **Table 31: Sites Listed on the National and State Registers of Historic Places and Locally Designated Landmarks**. The Lawrence Township Historic Preservation Advisory Committee also maintains an official township Historic Property Listing, identifying specific properties, sites, and structures that have historic importance at the local level. This list (see **Appendix I**) identifies over 100 historic properties in addition to those already listed on the National and State Registers and the local historic landmark list.

Lawrence is rich with historic structures and buildings. The Village of Lawrenceville contains many of the original homes of the early settlers of the area. Many of these buildings are located within the Lawrenceville Main Street Historic District, which was listed on the National and State Registers of Historic Places in 1972. The historic district encompasses the two-mile stretch of Main Street (Route 206) between Franklin Corner Road and the area slightly north of Fackler Road. It was one of the first registered historic districts in New Jersey. The Main Street Historic District includes over 50 buildings, a nineteenth-century commercial strip, and an area of the Lawrenceville School known as “the Circle.” The Circle contains six dormitories, a chapel, and an administration building, all designed by the architectural firm Peabody and Stearns of Boston. Frederick Law Olmsted, one of the designers of Central Park in New York

City, prepared the Circle's landscape plan. The Circle is designated as a National Historic Landmark, the highest designation by the federal government and reserved for only a small number of nationally significant historic properties in the nation.

The old Maidenhead Church (now known as the Presbyterian Church of Lawrenceville) was originally built in 1764 and is one of the oldest Presbyterian churches in New Jersey. Situated in the Lawrenceville Main Street Historic District, the church was enlarged in both 1833 and 1853. The Presbyterian Church's cemetery still exists, as do two other cemeteries in the village: the Upper Cemetery and the Princessville Cemetery. Veterans from several wars are buried in both the Upper and Princessville cemeteries.

The Main Street Historic District is also part of the King's Highway Historic District, which was listed on the New Jersey and National Registers in 2001. This road was originally a narrow Indian path, but eventually was widened and became the main colonial road between New York and Philadelphia, as well as an early postal route across the state. The King's Highway Historic District begins at the eastern end of the intersection of Route 206 and Franklin Corner Road in Lawrence and extends to the eastern end of the intersection of Route 27 and Raymond Road in Franklin Township in Somerset County.

There are various mechanisms to enhance historic preservation from the federal to the local level. At the federal level, placing sites and districts on the National Register of Historic Places affords them added consideration in 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.

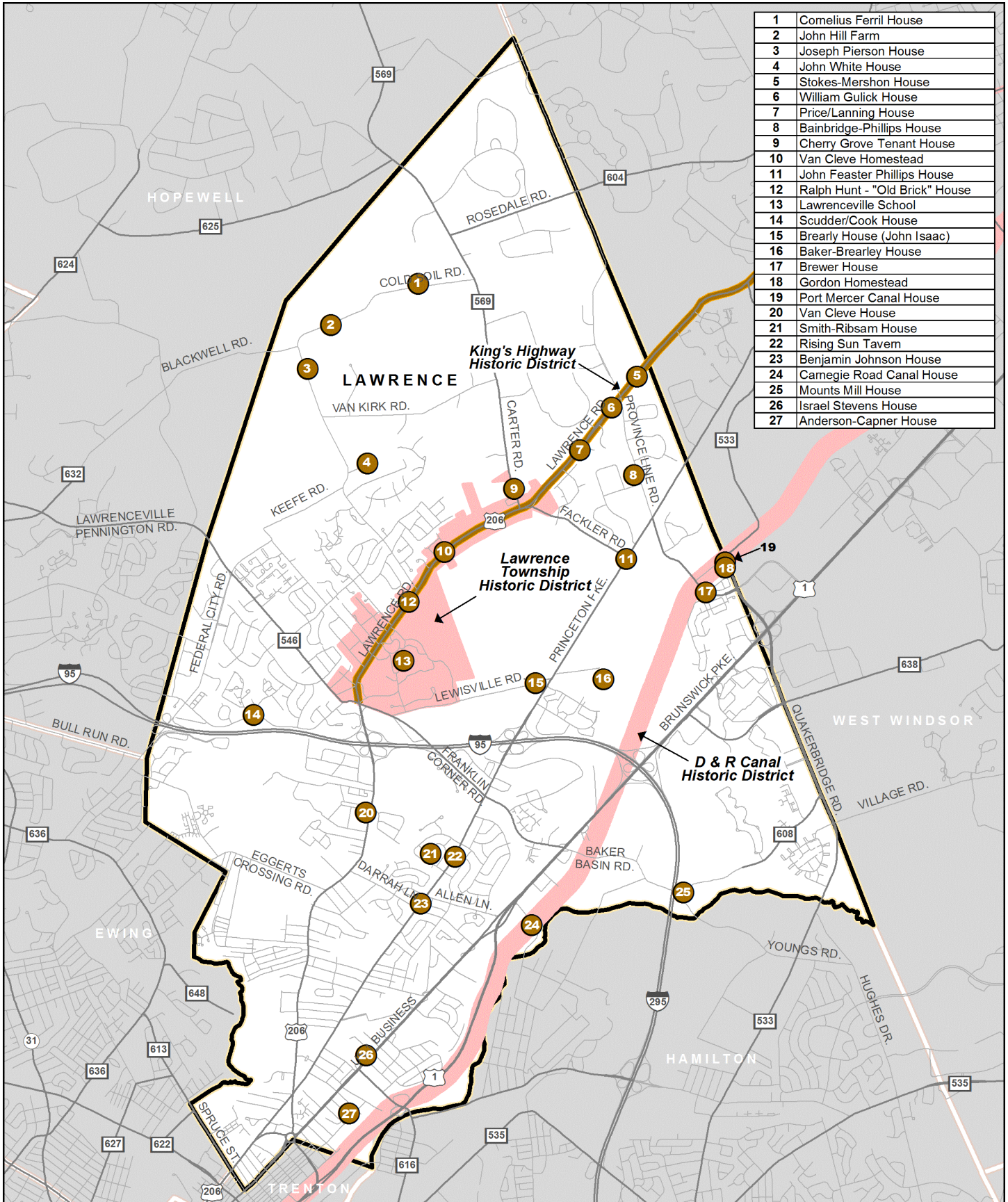
New Jersey municipalities are permitted to identify, designate, and regulate their own historic resources through the adoption of historic preservation ordinances (which are recognized as zoning laws under the New Jersey Municipal Land Use law). Local historic districts can be created by municipalities to preserve significant historic sites by regulating the erection, alteration, restoration, and demolition of buildings within the historic district. Historical committees, such as the Lawrence Township Historic Preservation Advisory Committee, are government bodies that oversee historic preservation planning and decision making in



Presbyterian Church of Lawrenceville

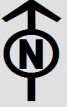

Source:
Jerrye & Roy Klotz,
MD, Wikimedia
Commons

Map 18: Historical and Cultural Resources



1	Cornelius Ferril House
2	John Hill Farm
3	Joseph Pierson House
4	John White House
5	Stokes-Mershon House
6	William Gulick House
7	Price/Lanning House
8	Bainbridge-Phillips House
9	Cherry Grove Tenant House
10	Van Cleve Homestead
11	John Feaster Phillips House
12	Ralph Hunt - "Old Brick" House
13	Lawrenceville School
14	Scudder/Cook House
15	Brearily House (John Isaac)
16	Baker-Brearley House
17	Brewer House
18	Gordon Homestead
19	Port Mercer Canal House
20	Van Cleve House
21	Smith-Ribsam House
22	Rising Sun Tavern
23	Benjamin Johnson House
24	Carnegie Road Canal House
25	Mounts Mill House
26	Israel Stevens House
27	Anderson-Capner House

Sources : NJHPO, NJDEP, NJDOT, DVRPC
Lawrence Township
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



their communities, and the establishment of these committees is typically the first step in implementing local preservation efforts.

The Lawrence Township Historic Preservation Advisory Committee is responsible for protection of historic structures within the township and education about them. The Committee meets monthly or on an as-needed basis to review applications for exterior modification to any building or structures within the Main Street historic district and to all buildings designated as landmarks throughout the township. The Committee also advises the state of New Jersey and Mercer County on projects within Lawrence that impact historical structures.

The Lawrence Historical Society, by contrast, is a nonprofit organization dedicated to preserving and protecting the township's historical structures, such as the 1830 Port Mercer Canal House and the 1761 Brearley House, a Georgian Quaker farmhouse, which the Society leases from Lawrence Township to serve as its headquarters. The Lawrence Historical Society holds tours, holiday events, and educational programs at these two sites.

In 2009, Lawrence Township published *A Guide to Lawrenceville's Historic Landmarks* to highlight the township's many historical homes and resources. The book, which is available for purchase at the township office, lead readers on tours of all of the designated historic sites in Lawrence Township, focusing on Main Street, the Lawrenceville School, and several other neighborhoods throughout the township.

The National Park Service and the New Jersey State Historic Preservation Office jointly administer the Certified Local Governments (CLG) program, which provides technical assistance and funding for community-based preservation efforts. To participate, municipalities must maintain a historic preservation commission, survey local historic properties, provide opportunities for public participation in preservation activities, and develop and enforce local preservation laws. Lawrence Township is a CLG and therefore is eligible to draw from an exclusive pool of matching federal and state funds for program implementation or rehabilitation work.

There are also federal incentives for individuals, organizations, or firms that own historic



Brearley House

Source: Lawrence Hopewell Trail Corporation

properties and are interested in historic preservation. Interested parties can take advantage of the Rehabilitation Investment Tax Credit, a federal tax incentive to encourage the preservation and reuse of older income-producing properties, including offices, apartment buildings, and retail stores.

Table 31: Sites Listed on the National and State Registers of Historic Places and Locally Designated Landmarks

Name	Location	Designation
Anderson-Capner House	700 Trumbull Ave	National and State
Baker-Breareley House	Meadow Road and Princeton Pike	National and State
Bainbridge-Phillips House	4419 Province Line Road	Local Landmark
Brewer House	634 Rosedale Road	Local Landmark
Brearily House (John Isaac)	2 Lewisville Road	Local Landmark
Carnegie Road Canal House	Near Carnegie Road Bridge	Local Landmark
Cherry Grove Tenant House	17 Carter Road	Local Landmark
Delaware and Raritan Canal Historic District	Entire Canal bed and all land 100 yards to either side of the center line	National and State
Cornelius Ferril House	335 Cold Soil Road	Local Landmark
Gordon Homestead	4240 Province Line Road	Local Landmark
William Gulick House	3641 Lawrenceville-Princeton Road	Local Landmark
John Hill Farm	265 Cold Soil Road	Local Landmark
Ralph Hunt—"Old Brick" House	2750 Main Street	Local Landmark
Benjamin Johnston House	2685 Princeton Pike	Local Landmark
King's Highway Historic District	US Route 206 and NJ Route 27, between Lawrenceville and Kingston	National and State
Lawrence Township Historic District	US Route 206 between Pennington-Lawrenceville Road and Carter Road	National and State
Lawrenceville School	Main Street	National Historic Landmark
Mounts Mill House	301 Lawrence Station Road	Local Landmark
John Feaster Phillips House	3850 Princeton Pike	Local Landmark
Joseph Pierson House	210 Cold Soil Road	Local Landmark
Port Mercer Canal House	4274 Province Line Road	National and State
Price/Lanning House	3461 Lawrenceville-Princeton Road	Local Landmark
Rising Sun Tavern	2861 Princeton Pike	Local Landmark
Scudder/Cook House	96 Denow Road	Local Landmark
Israel Stevens House	2167 Brunswick Ave	National and State
Smith-Ribsam House	45 Pine Knoll Drive	National and State
Stokes-Mershon House	3801 Lawrenceville-Princeton Road	Local Landmark
Van Cleve Homestead	2942 Main Street	Local Landmark
Van Cleve House	2083 Lawrence Road (Rider University)	Local Landmark
John White House	100 Cold Soil Road	National and State

Sources: *New Jersey Historic Preservation Office, Lawrence Township Master Plan (1995), Lawrence Historical Society*

TOWNSHIP UTILITIES AND SERVICES

Drinking Water

Four different water companies, plus many private wells, provide drinking water for Lawrence Township residents. Residences south of Route 95/295 are supplied with public drinking water by the Trenton Water Works. This area extends north to the town hall along Route 206 and along Interstate 95 to Federal City Road. Aqua New Jersey (formerly the Lawrenceville Water Company) services residences between Interstate 95, Federal City Road, Keefe Road, and one-half mile north of Cold Soil Road. The area north of Keefe Road and Meadow Road and one-half mile north of Cold Soil Road is serviced by the New Jersey American Water Company (formerly the Elizabethtown Water Company). Many properties within these areas may also have individual private wells. Additionally, the Lawrenceville School manages its own drinking water utility. More information about Lawrence's drinking water can be found under **Drinking Water Supply on page 68**.

Sewer

Sewerage service for the majority of township residents is provided through the Ewing-Lawrence Sewerage Authority (ELSA), which operates a treatment plant located at 600 Whitehead Road in Lawrenceville and discharges into the Assunpink Creek. The area that ELSA services includes about two-thirds of Lawrence. Bristol-Myers Squibb Co., ETS, and the Chapin School each operate minor facilities in Lawrence that are regulated through the New Jersey Pollutant Discharge Elimination System. The remainder of the township is served by individual subsurface sewage disposal systems (i.e., residential septic systems). See Existing Wastewater Facilities and Service Area Map in **Appendix J**. Extensions of the sewer-service area within the township must be approved by the Township Council, and they must be consistent with the Utility Element of the Master Plan and the Mercer County Water Quality Management Plan and 201 Sewer Service Plans.

Trash/Recycling

In Lawrence, trash is picked up every week, and recycling is picked up curbside every other Monday. Recycling service is provided by the county through the Mercer County Improvement Authority. Materials recycled include glass, plastic, aluminum, newspapers, cardboard, and paper. The township also collects brush and yard waste once a month.

In 2015, Lawrence began an optional curbside organic waste pick-up program that allows residents to compost organic waste items such as food scraps, paper towels, coffee grounds, pizza boxes, and egg shells at a cost of 17 dollars per month. Many residents enrolled in the pilot program.

Education

The Lawrence public school system serves over 4,000 students. The township has four elementary schools for children pre-K to grade 3: Ben Franklin, Elridge Park, Lawrenceville, and Slackwood elementary schools. The Lawrence Intermediate School educates children in grades 4 through 6. In addition, the township has one middle school (Lawrence Middle School) and one high school (Lawrence High School).

In addition to public schools, Lawrence is home to the Lawrenceville School, a 700-acre private college preparatory high school founded on Main Street in 1810 as the Maidenhead Academy.

Central Park



Source: DVRPC

The school was founded by Isaac VanArsdale Brown in the front parlor of his home, and it gradually expanded through the years. John Cleve Brown donated a large sum of money to the school in 1875, enabling the school to construct nine additional buildings, which are listed on the national, state, and local historic registers. Today, the school has over 800 boarding and day students from 30 states and 40 countries/territories.

There are two parochial schools in Lawrence: St. Ann's Elementary School and Notre Dame High School. Two other coeducational independent private day schools are the Princeton Junior School for children pre-K through grade 5 and the Chapin School for children pre-K through grade 8.

Rider University also makes its home in the southwestern part of Lawrence. With roots dating back to 1865, Rider is a private, coeducational university located on a 280-acre campus. Almost 5,000 full-time undergraduate and graduate students attend Rider. Rider consists of four academic colleges—the College of Business Administration; the College of Liberal Arts, Education, and Sciences; the College of Continuing Studies; and Westminster Choir College (located in Princeton Borough)—that offer 67 undergraduate and 35 graduate degree programs. The university is accredited by the Middle States Commission on Higher Education and holds specialized accreditation with the Association to Advance Collegiate Schools of Business, the National Council for the Accreditation of Teacher Education, the National Association of Schools of Music, the Council for Accreditation of Counseling and Related Education Programs, and the National Accreditation of School Psychologists.

Parks, Open Space, and Recreation

Lawrence Township is home to a widespread park system that provides a variety of active and passive recreational opportunities for area residents. Active recreation opportunities in the township include activities such as soccer, baseball, volleyball, tennis, and basketball. In addition to sports fields and courts, Lawrence contains a number of playgrounds and trails. Passive recreation encompasses most other park activities, including walking, fishing, bird watching, bike riding, and picnicking. Typically, these activities take place in natural settings. In total, Lawrence Township contains almost 2,145 acres of publicly owned recreation and

open space, over 490 acres of preserved farmland, and 1,218 acres of privately owned open space. See **Map 19: Existing Open Space**, **Map 20: Trails and Parks**, and **Appendix K**. The National Recreation and Parks Association recommends 6.25 to 10.5 acres of green space per 1,000 persons, and Lawrence far exceeds this standard. With a total of approximately 3,856 acres of protected green space and a population of 33,252, Lawrence has an average of 116 acres per 1,000 persons.

Parks

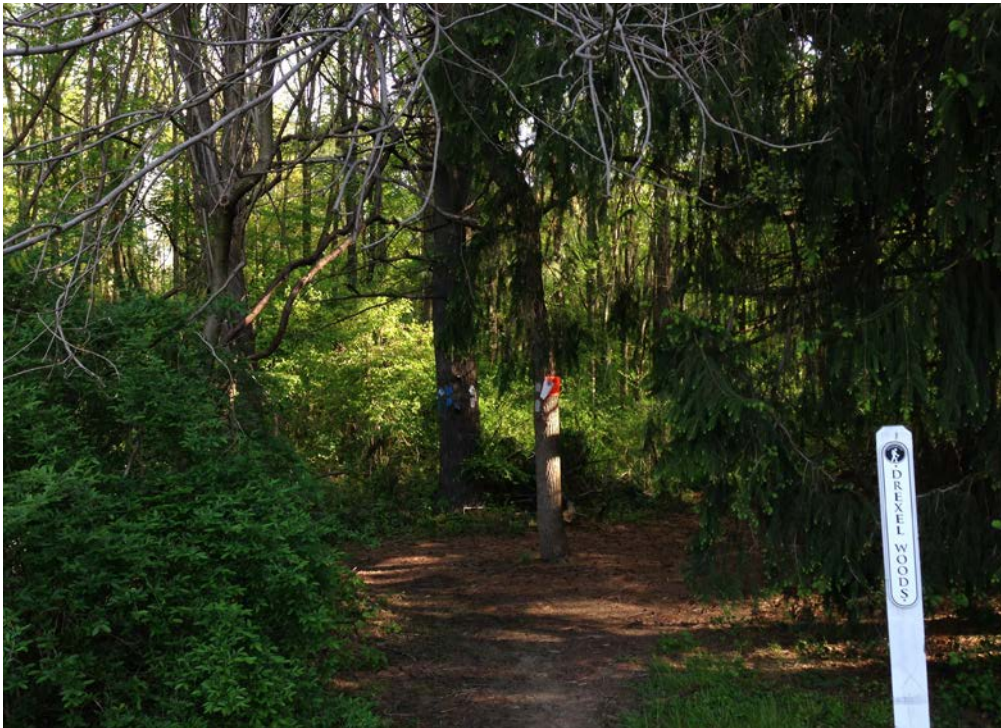
Lawrence provides a wide variety of recreational opportunities at its township parks, which include: Carson Road Woods, Central Park, Colonial Lake Park, Drexel Woods, Eldridge Park, Gilpin Park, Hamnett Park, Lawrence Veterans Park, Shipetaukin Woods, Stonicker Park, and Village Park. Of these, the largest and most widely used is the 107-acre Central Park located off Eggert Crossing Road. It contains four soccer fields, four baseball diamonds, one football field, three lighted tennis courts, lacrosse fields, and five basketball courts. Two other parks, Veterans Park (20 acres) and Village Park (60 acres), provide tennis courts, jogging paths, playground equipment, sports fields, picnic areas, and a dog park.

Colonial Lake Park

Colonial Lake Park, located just off of Brunswick Avenue, attracts many fishermen because its 25-acre lake is stocked annually by the NJDFW. The park also offers tennis courts, playground equipment, and a jogging path. The township recently undertook a number of improvements to Colonial Lake Park, including installing new landscaping, repaving the trail, and dredging the lake.

Drexel Woods

In 1996, Lawrence Township, with the help of a Green Acres Grant, bought the 45-acre Drexel Woods property. The land is forested and is used for passive recreation. Drexel Woods also



Trailhead at
Drexel Woods

Source:
Famartin,
Wikimedia Commons

Mercer Meadows, Maidenhead Trail



Source: DVRPC

contains the Lawrence Nature Center, a center for outdoor education and passive recreation. The center is operated by the township's Recreation Department, which works with the Friends of Lawrence Nature Center to host numerous nature programs, including bird walks, community bonfires, bat hikes, and Earth Day festivities. Additionally, Drexel Woods has a network of trails, two of which have been blazed to mark a one-mile loop. **Appendix B** lists many of the plant and bird species spotted in Drexel Woods.

Carson Road Woods

In 2001, Lawrence Township purchased 183 acres of farmland and forestland located between Carson Road and Belleview Terrace for \$8.4 million. This land, which became Carson Road Woods, is dedicated to passive recreation. The park has 4.4 miles of trails that lead visitors around farm fields, through a rare beech forest, and along streams and meadows. Carson Road Woods is also home to many species of birds, mammal, and reptiles, as well as over 200 plant and tree varieties. Today, the Friends of Carson Road Woods, an incorporated 501(c)(3), helps to maintain the marked trails, organize nature hikes, and conduct guided tours. See **Appendix C** for a list of many of the plant and animal species of Carson Road Woods.

Maidenhead Meadows

In 2015, Lawrence Township created its largest municipal park—Maidenhead Meadows Park—combining eight parcels that had been acquired over a period of 27 years. The 345 acre park stretches from I-95 to Providence Line Road and from the historic Princeton Pike to the Delaware and Raritan Canal State Park. The push for the Maidenhead Meadows Park was spearheaded by the Lawrence Township Trails, Open Space, and Stewardship Advisory Committee. Maidenhead Meadows is home to the Princessville Cemetery, the 1761 Brearley House, and various trails, including a causeway trail connecting the Brearley House to the Delaware and Raritan Canal, and segments of the Lawrence Hopewell Trail.

Mercer Meadows

In 2010, Mercer County created Mercer Meadows by merging four separate parks: Rosedale Park, the Mercer County Equestrian Center, Mercer County Park Northwest (the "Pole Farm"), and Curlis Woods. This 1,600 acre park consists of five distinct districts—Farm History,



Green Acres Sign
at the Loveless
Nature Preserve

Source: DVRPC

Rosedale Park, Ecological, Equestrian, and the Pole Farm—each with unique historical and natural aspects and diverse recreational opportunities. The land making up the Pole Farm District and much of the Farm History District (formerly known as Mercer County Park Northwest) was originally farmland before it was purchased by American Telephone and Telegraph (AT&T) in 1928. Between 1929 and 1975, the Pole Farm contained hundreds to thousands of telephone poles with antennas that AT&T used to transmit phone calls across the Atlantic Ocean. In 1995, the company sold the land to Mercer County to use as parkland. To prepare for the creation of a new county park, the Washington County Audubon Society conducted a biological survey of the property in 1999. The results are found in **Appendix D**. Today, most of the property consists of open meadows, wetlands, forest, and shrubland. Miles of trails, including 4.2 miles of the Lawrence-Hopewell Trail, run through Mercer Meadows. Also see **Grasslands and Agricultural Lands on page 75** for more information on Mercer Meadows.

Mercer County Park

Lawrence Township residents also have convenient access to Mercer County Park, which is located on the southeastern border of Lawrence. This park is composed of more than 2,500 acres and includes a small portion of Lawrence, West Windsor, and Hamilton townships. The park contains facilities for active and passive recreation, including a dozen softball fields, 18 basketball half-courts, an outdoor tennis center, a boat marina, an ice skating center, picnic areas, and seven soccer fields.

Open Space and Greenways

In addition to its parks, Lawrence Township is home to a number of open space and greenway resources. As Lawrence becomes more and more developed, it is important that the township, county, and state all work to obtain open space for passive recreation, farmland preservation, and greenways.

The two main groups that work to acquire and protect open space and farmland and establish greenways within Lawrence are the Lawrence Township Trails, Open Space, and Stewardship Advisory Committee, and the Lawrence Township Conservation Foundation. The Lawrence

Township Trails, Open Space, and Stewardship Advisory Committee serves as official advisory body to the town council. The Lawrence Township Conservation Foundation is an independent nonprofit organization. Together, these groups play an important role in identifying, acquiring, and protecting open space. They educate township residents and farmers about the importance of open space and work with county and state organizations to identify and acquire parcels.

One important state program that has played a significant role in providing funding to acquire open space is the New Jersey Green Acres Program. Created in 1961, the New Jersey Green Acres Program aims to partner with townships and counties to acquire and preserve open space in New Jersey. The program's goal is to create a system of interconnected open spaces to protect and enhance the natural environment of New Jersey for historic, scenic, and recreational purposes and for public enjoyment. Since 1961, over \$1.5 billion has been used to acquire over 615,000 acres of land and develop over 1,100 parks. Although funding for the Green Acres program has been variable, voters have repeatedly approved bond measures to fund open space preservation. More recently, in 2014, New Jersey voters approved the New Jersey Open Space Preservation Funding Amendment, which provided a more permanent funding source by dedicating 6 percent of corporate business tax revenues to open space, farmland, and historic preservation for the next 30 years.

In 1989, Mercer County established a dedicated tax for open space, which provides funds for the acquisition of county-wide regional open space and for the operation of the Mercer County Open Space Assistance Program. The tax rate was increased twice, most recently in 2004 to three cents per hundred dollars of assessed property value.

Lawrence Township also enacted a local open space tax to further support the acquisition and preservation of open space. In 1999, voters approved an open space tax of one cent per hundred dollars of assessed property value. In 2003, the tax was increased to three cents per hundred dollars of assessed property value. This tax generated approximately \$1.37 million in 2014 for open space preservation.

In 2000, Lawrence prepared an Open Space and Recreation Plan for the township. It

Mercer Meadows



Source: DVRPC

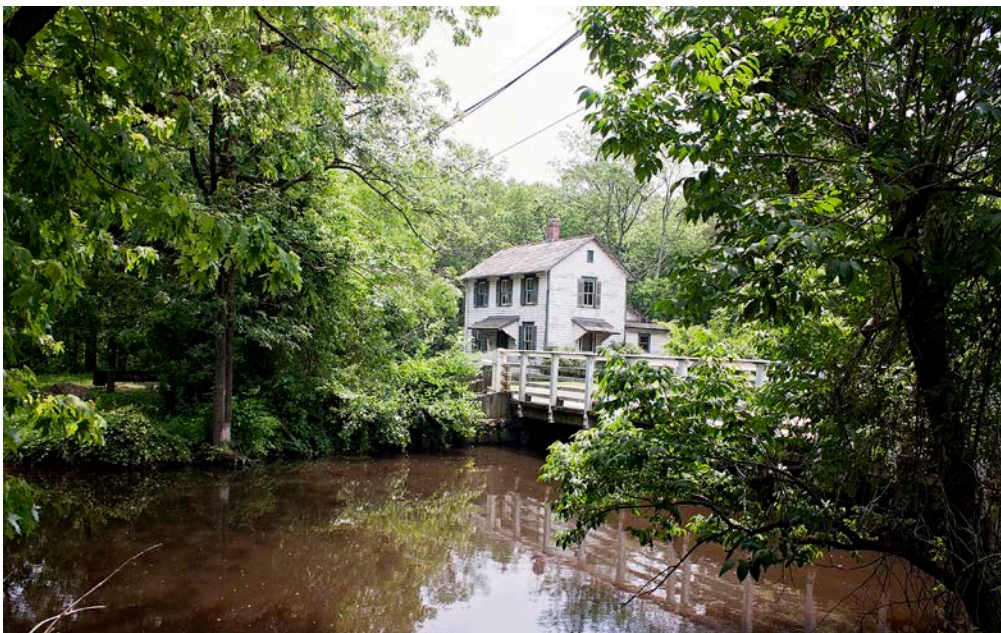
identified a total of 3,084 acres of preserved open space in the township. Since then, approximately 800 additional acres of open space have been preserved for a total of 3,856 acres. Of this, 1,028 acres are township-owned parkland and open space subject to Green Acres regulation, 123 acres are township-owned open space not subject to Green Acres regulation, 994 acres are other government-owned open lands, 1,218 acres are privately owned open space, and 493 acres are preserved farmland in the Farmland Preservation Program. In total, the 3,856 acres account for approximately 27 percent of the township's total acreage.

Further acquisition of open space is important throughout the township. In the more rural northern portion, there is pressure from developers to convert open land into residential subdivisions. The southern portion of the township, by contrast, is more densely developed with homes and businesses that contribute runoff to streams, increasing flooding problems. Here, there is a need to preserve land along streams in order to protect and restore vegetated riparian buffers.

Delaware and Raritan Canal

One of the most important greenways in Lawrence is the Delaware and Raritan (D & R) Canal, which runs through approximately 5.3 miles of the southeastern portion of the township. This canal was built between 1830 and 1834 to fill in a missing link in the intercoastal waterway that extended from Massachusetts to Georgia. The canal was primarily used to transport coal from the anthracite coal fields in eastern Pennsylvania to New York City. Over the years, the canal's importance for transportation gradually waned with the growth of railroads. After the canal's closure in the 1930s, some portions were filled in to accommodate the state's expanding highway system. By the 1970s, the canal was heavily used for recreation, and citizen activists rallied to save the canal from total destruction. In 1973, the canal and its remaining structures were entered into the National Register of Historic Places, and in 1974, the state established the Delaware and Raritan Canal State Park. In 1992, the park's trail system was designated a National Recreation Trail.

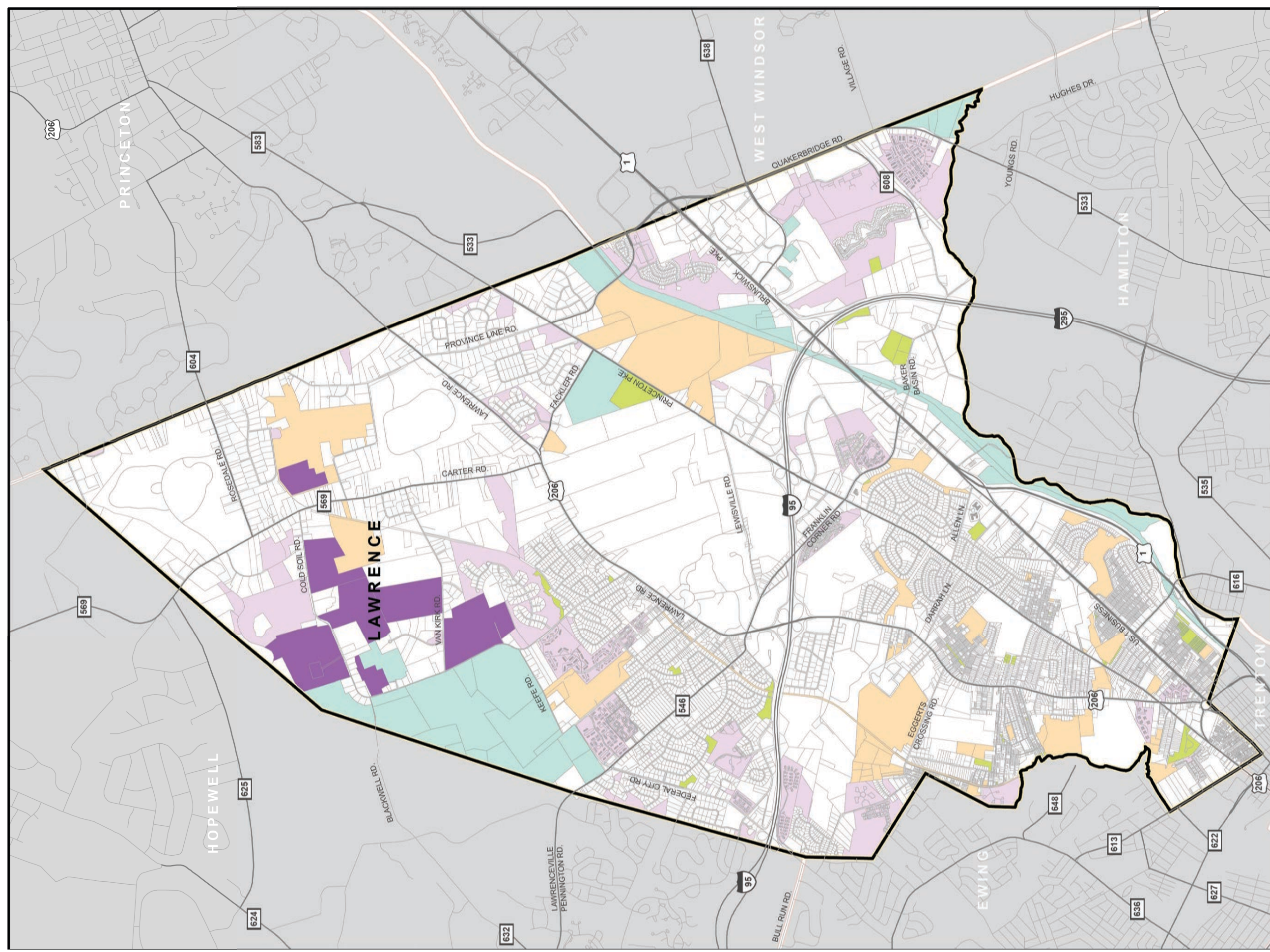
Today, the D & R Canal State Park is 70 miles long, including the 22-mile feeder canal portion,



D & R Canal at Carnegie Road

Source: DVRPC

Map 19: Existing Open Space

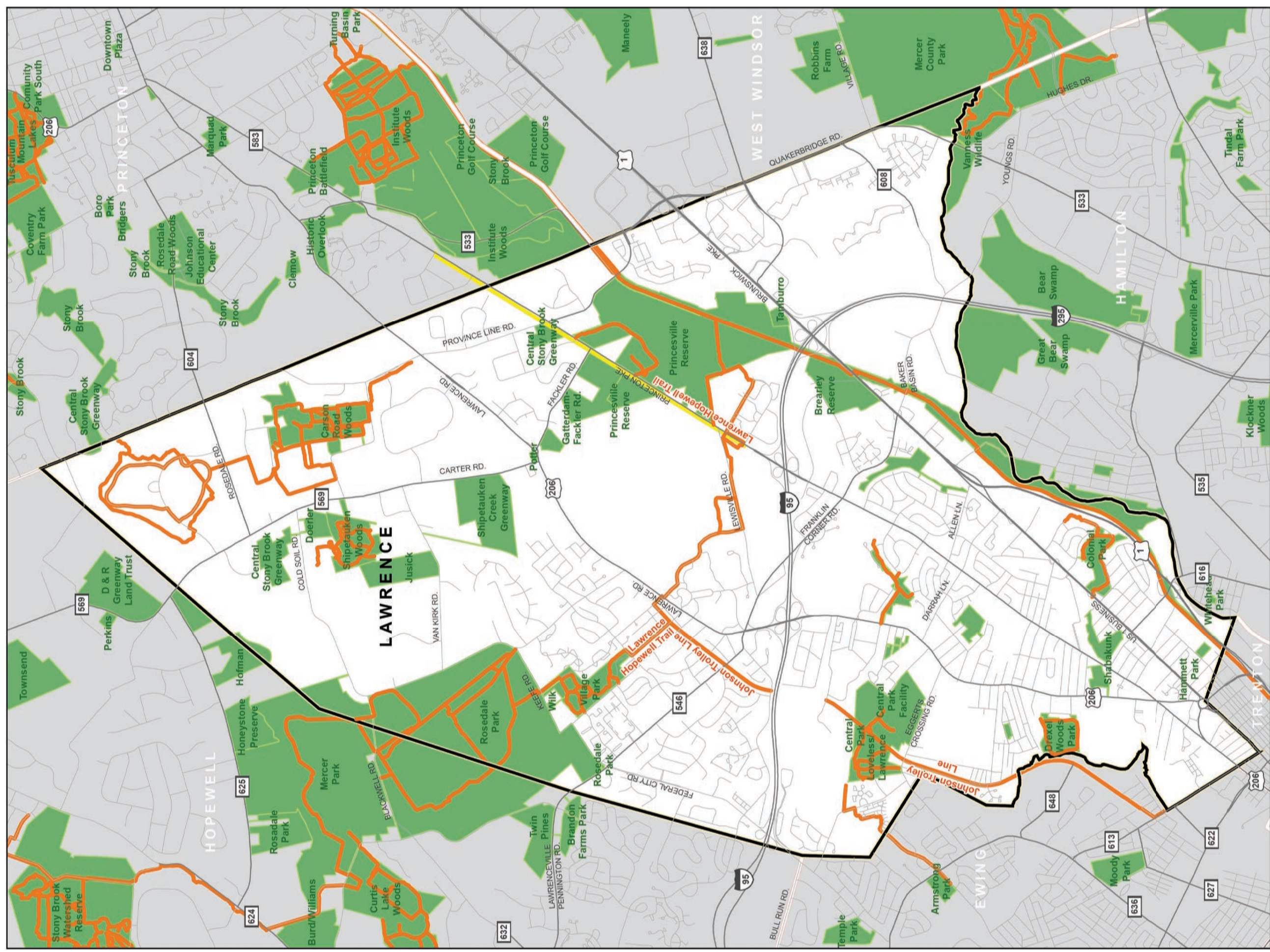


Sources : NJDEP, NJDOT, DVRPC,
Lawrence Township
This map was developed using New Jersey
Department of Environmental Protection
Geographic Information System digital data,
but this secondary product has not been
verified by NJDEP and is not state-authorized.

- Farmland Preservation Program
- Government Owned Open Space
- Privately Owned Open Space
- Public Land Not Subject to Green Acres
- Public Land Subject to Green Acres

0 0.25 0.5 1
Miles

Map 20: Trails and Parks

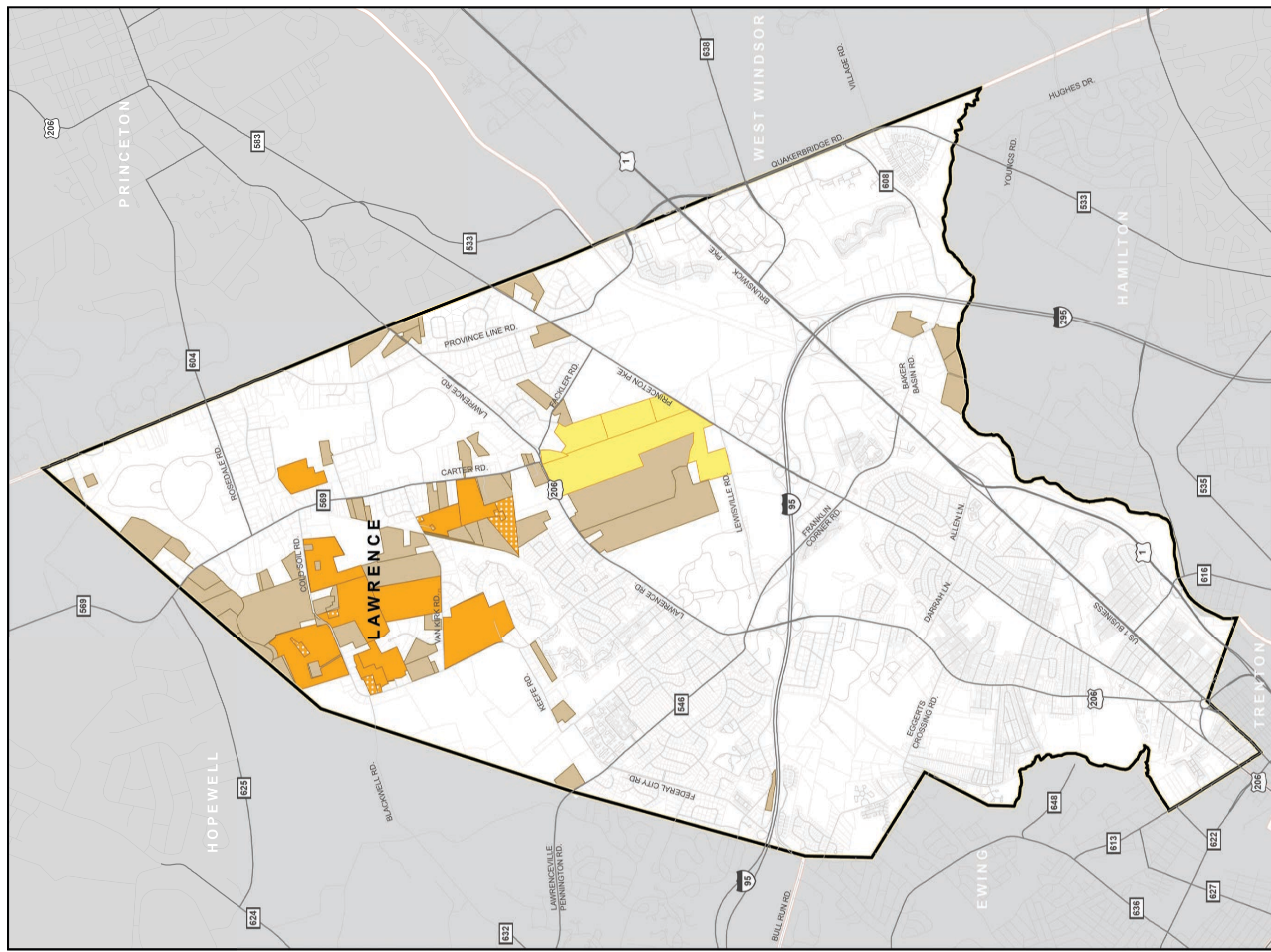


Sources : NJDEP, NJDOT, DVRPC, Lawrence Township
 This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

- Existing Trail
- On-Road Bike Facility
- Park


0 0.25 0.5 1 Miles


Map 21: Farmland




Sources : NJDEP, NJDOT, DVRPC, NJDA SADC, Lawrence Township
 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.

- Farmland
- Preserved Farmland
- 8 Year Program
- Preserved
- Unpreserved Exception Area on Preserved

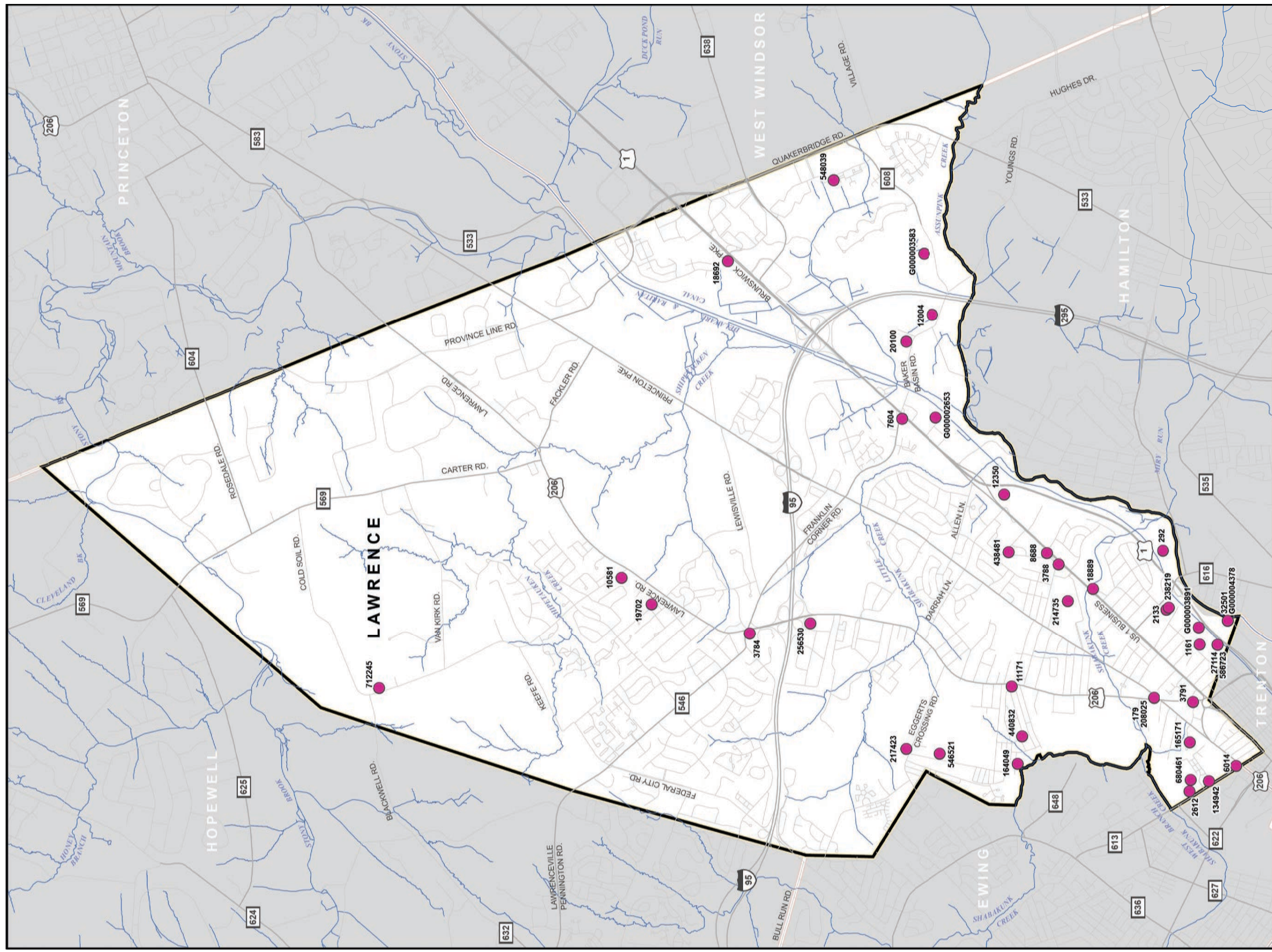




 0 0.25 0.5 1 Miles



Map 22: Known Contaminated Sites



Sources: 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.

North arrow pointing up.

Scale bar: 0, 0.25, 0.5, 1 Miles.

dvrpc logo.

which parallels the Delaware River from above Frenchtown south to Bordentown, 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 off-road multiuse trail that will eventually extend from Maine to Florida. Fish, including bass, sunfish, catfish, pickerel, and perch, occupy the canal's water year-round. 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, including one in Lawrence at the foot of Cherry Tree Lane. 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 Delaware and Raritan Canal is a source of public water for agriculture, industry, and homes. About 75 million gallons of water are pumped from the canal daily for these purposes. See **Map 20: Trails and Parks** for the location of the D & R Canal in Lawrence.

Farmland

Farmland is also an important open space resource for Lawrence, providing acres of wildlife habitat and groundwater recharge, preserving scenic vistas, producing a supply of fresh food, supporting the local economy, and serving as a link to the township's agricultural past. According to the **County of Mercer Comprehensive Farmland Preservation Plan**, most of the county's agriculturally assessed lands are located in Hopewell Township and the northern half of Lawrence Township, as well as the southern municipalities of West Windsor, Washington, and East Windsor Township. See **Table 32: Acres of Assessed Farmland** below for a listing of agriculturally assessed lands in Lawrence Township in 2014 and 2006 and **Map 21: Farmland** for locations of farms in Lawrence Township. Although the total acres of land in agricultural use decreased during this period, the percentage of cropland harvested increased by 14 percent.

Table 32: Acres of Assessed Farmland

	2014	2006	Change
Cropland Harvested	769	674	95
Cropland Pastured	37	136	-99
Permanent Pasture	360	546	-186
Non-Appurt Woodland	151	148	3
Appurtenant Woodland	418	382	36
Equine Acres	-	37	-37
Renewable Energy	30	-	30
Total for Ag Use	1,765	1,923	-158

Farmland preservation helps to ensure that these resources remain in agricultural production, guaranteeing a future food supply and maintaining a way of life for generations. Preserved farmland also helps to limit urban sprawl and protect the township's water and soil resources. In Lawrence, 10 farms totaling 493 acres have been permanently preserved. Most of these farms are located along Carson, Cold Soil, or Van Kirk roads. Farmland preservation has generally been made possible through the state's farmland preservation program or with county funds.

Trails

Lawrence Township contains over 35 miles of off-road trails, which not only provide many

recreational opportunities but also help to support alternative modes of transportation and create a more liveable community.

A number of organizations work to develop, maintain, and program trails throughout the township. The Friends of the Lawrence Greenway is a nonprofit organization that advocates for a walkable and bikeable community in Lawrence Township. The Lawrence Hopewell Trail Corporation is another nonprofit organization that works to develop and maintain the Lawrence Hopewell Trail.

Lawrence Hopewell Trail

Since 2001, Lawrence Township, along with many public and private-sector partners, have worked to develop the Lawrence Hopewell Trail. When completed, this 20-mile trail will connect Lawrence and Hopewell townships and will loop through private property, parkland, business parks, and school campuses. As of May 2015, over 75 percent of the trail had been completed. Local, state, federal, and private funds have helped to finance the development of this \$8 million trail. Both the Bristol-Myers Squibb Company and ETS, which have campuses in the township, were early supporters and significant partners. See **Map 20: Trails and Parks**.

Johnson Trolley Line

The Johnson Trolley line is another important part of Lawrence's off-road, multiuse trail system. The township constructed the trail on the bed of the Johnson Trolley Line, which shuttled passengers from Princeton to Trenton between 1901 and 1940. The tracks were then used to haul freight until the early 1970s, when I-95 was built, bisecting the trolley line and the township. Later, the trolley line route was converted into two trails: Johnson Trolley Line North and Johnson Trolley Line South. The northern segment runs about one mile from Gordon Avenue in Lawrenceville to Denow Road, directly north of I-95. The southern section of the trail consists of a 2.4-mile paved trail that runs from the Rider University campus, immediately south of I-95 to Spruce Street in Ewing Township. In 2013, Lawrence Township, with funding from DVRPC, contracted Parsons Brinckerhoff to conduct a feasibility study to evaluate



Johnson Trolley Line trail

Source: DVRPC

Lawrence
Hopewell
Trail between
Princeton Pike
Corporate Center
and Brearley
House



Source: Lawrence-
Hopewell Trail
Corporation

alternatives for connecting the two sections of the Johnson Trolley Line. The study offered four design options, ranging from \$1.2 million for non-structural solutions to \$8.1 million to construct a pedestrian bridge over I-95.

Other trails in Lawrence Township include:

- Shipetaukin Woods Trails and Terhune Orchards Farm Trail;
- Trails in Mercer Meadows, including the Maidenhead Trail and the Twin Pines Trail;
- Trails in Armory Woods;
- Trails in Tiffany Woods;
- Trails in Carson Road Woods;
- The one-third mile Brearley-Great Meadow Trail, which was built by the township in 1998; it begins at the Brearley House, crosses the Shipetaukin Creek, and connects to the D & R Canal towpath;
- The circular, two mile Laurie Chauncey Nature Path (on the ETS campus), which curves along the Stony Brook through deciduous forest until it reaches the gas pipeline, where it enters a meadow; the trail consists of many bridges over intermittent streams and offers beautiful views to trail goers;
- Trails in Central Park;
- Trails in Drexel Woods;
- Trails in Colonial Lake Park;
- Trails in Village Park;
- Trails in Loveless Nature Preserve; and
- Trails in Turtleback Park.

To encourage residents to take advantage of these resources, Lawrence Township published the **Lawrence Township Trail Guide in 2009**. This booklet features 12 different trails, with

maps, parking information, and a brief description for each trail. Additionally, the East Coast Greenway, which passes through Lawrence as part of the D & R Canal, updated its guide to the **East Coast Greenway in New Jersey** in 2013. The **Lawrence Hopewell Trail website** also includes links to additional trail resources, including maps of area trails.

Environmental Issues

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 those on the National Priorities List (NPL), commonly known as Superfund sites. These are eligible for federal cleanup funds. Other sites are handled by state or individual programs or through private funds.

As of January 2016, there were 41 active known contaminated sites within Lawrence Township, listed in **Table 33: Known Contaminated Sites** and **Map 22: Known Contaminated Sites**. These are active sites with confirmed contamination of the soil, groundwater, and/or surface water. Active sites are those sites having one or more active cases with any number of pending and closed cases. Among the known contaminated sites in Lawrence Township are gas stations, industrial sites, auto businesses, municipal facilities, and private residences. Addresses of private residences have been removed from the list for confidentiality.

There are 12 Superfund or potential Superfund sites in Mercer County, one of which—Headwaters Technology Innovation (also known as Hydrocarbon Technologies Inc.)—is located in Lawrence Township. None of the sites in Mercer County are on the NPL. Sites not currently listed on the NPL are not eligible for Superfund Trust funds for site remediation. This information was retrieved using the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). CERCLIS is the national database and management system that the EPA uses to track activities at hazardous waste sites considered for cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act, also known as Superfund.

Table 33: Known Contaminated Sites

Name	Address	Site ID	PI Number
1052 Spruce St	1052 Spruce St	148810	680461
19 Petroleum	1601 Princeton Ave	43528	6014
ALS	135 Lawrenceville Rd	6368	3791
Avalon Run	Avalon Way	436108	548039
Bobs Auto Service	15 Cold Soil Rd	6372	10581
Brown's Paving	260 Eggert Crossing Rd	165502	217423
BWAY MFG Inc	6 Litho Rd	6376	G000002653
Chronar Corporation (Former)	330 Lawrence Station Rd	66186	G000003583
Crown Enterprises	320 Bakers Basin Rd	45105	12004

Name	Address	Site ID	PI Number
Ewing-Lawrence Sewerage Authority	600 Whitehead Rd	14539	292
Express Gas	360 Lawrence Rd	158070	208025
Former Automotive Dealership	1060 Spruce St	6359	2612
Hub City Distributors	649 Whitehead Rd	42169	2133
Hyrocabon Research Incorporated	1501 New York Ave	6353	27114
Johns Truck Stop LP	3271 Brunswick Pk	6381	18692
Lawrence Industrial Park	40 Enterprise Ave	57375	32501
Lawrence Road Servicenter	1175 Lawrenceville Rd	6371	11171
Lawrence Shopping Ctr	2495 Brunswick Pk	6345	214735
Lawrence Twp Maint Yard	2798 Brunswick Pk	47153	12350
Lawrence Twp Public Works	1461 Ohio Ave	41874	1161
Lawrence Twp Public Works	240 Bakers Basin Rd	52722	20100
Lawrenceville Amoco	360 Lawrence Rd	158070	179
Lawrenceville Exxon NJ 0040	2501 Brunswick Pk	6386	8688
Lawrenceville Fuel Co.	20 Gordon Ave	6374	19702
Lawrenceville Shell	2961 Brunswick Pk	6380	7604
Lukoil #57325	2515 Brunswick Pk	6387	3788
Lukoil of Lawrenceville	2417 Main St	6366	3784
Materials Electronic Products Corp	990 Spruce St	6362	134942
Project Freedom-Lawrenceville	Princeton Ave	125123	165171
Riggins Trucking MVA	Rt 1 & Whitehead Rd	182008	238219
RS-Strauss	Brunswick Pk Mm 55	43983	8102
Saturn Chemical Inc. (Former)	1600 New York Ave	66210	G000003891
Thiokol Chemical Corporation	40 Enterprise Ave	66234	G000004378
Transco Gas Pipeline Hydrocarbon Technologies	1501 New York Ave	6353	586723
Vacant Building	1900 Brunswick Pk	52258	18889

Source: NJDEP, 2016

In addition to the 41 active sites, there are two pending sites with confirmed contamination in the township, listed in **Table 34: Pending Known Contaminated Sites**. There are also 268 closed contaminated sites with remediated contamination, listed in **Appendix L: Closed Known Contaminated Sites**.

Table 34: Pending Known Contaminated Sites

Name	Address	Site ID	PI Number
Lawrence Station Rd	Lawrence Station Rd	73853	G000036225
United Parcel Service	Bakers Basin Rd	45427	1545

Source: NJDEP, 2016

Pit Stop Service Center

The Lawrence Road Service Center, formerly known as the Pit Stop Service Center, was a gasoline and service station that recently completed a multi year site remediation process.

Between 1997 and 1998, NJDEP received three notifications of discharges that occurred at the Lawrence Road Service Center. NJDEP ordered the Service Center to stop selling gasoline at that time; however, the Service Center continued to operate as an automobile repair facility at the site until 2003.

In early 2003, a number of Lawrence residents near the Service Center complained of odors in the drinking water. In response, Lawrence Township sampled 13 residential drinking water wells near the Service Center. Methyl-t-butyl ether (MTBE), a gasoline additive, was detected in the water samples collected from five of the residential properties. Although those five properties were then connected to the municipal water supply, the remaining eight homes continued to utilize potable wells.

In October 2003, the Service Center owner declared bankruptcy. Two years later, Lawrence Road LLC acquired the Service Center site, removing seven underground storage tanks (USTs) and 2,000 tons of petroleum-impacted soils. The USTs were believed to have been the source of the groundwater contamination.

In 2009, NJDEP hired The Louis Berger Group to conduct a remedial investigation (RI) to determine the extent of the groundwater and soil contamination. The RI included on-site soil investigations with soil samples taken from 25 borings across the Service Center site, groundwater monitoring through well installation and repair, and surface water and sediment investigations. The RI found that gasoline-related contaminants were present around the former UST extraction areas, under the building footprint, and within the shallow groundwater zone on-site. Off-site investigations also revealed the continued presence of MTBE in exceedence of groundwater quality standards. The Louis Berger Group submitted the Final Remediation Investigation Report to the township on September 11, 2014. The report included their findings, as well as a number of remedial alternatives. The site is now listed on the NJDEP Closed Known Contaminated Sites list (see **Appendix L**).

Underground Storage Tanks

There are a number of businesses in Lawrence with USTs commonly used to store fuel oil, or in the case of service stations, gasoline or diesel fuel. Storage tanks installed prior to 1998 may have outdated leak control and corrosion prevention measures and must be continually monitored for emissions. Corrosion and leakage of USTs can become a serious threat to the groundwater and soil surrounding them. These sites are monitored under a program called the Bureau of Underground Storage Tanks. Sites are registered, receive permits, and are monitored for leaks at regular intervals. As of June 2012, there were 14 active and compliant sites in Lawrence Township with regulated USTs that contained hazardous substances, pursuant to N.J.A.C. 7:14B et seq. They are listed in **Table 35: Underground Storage Tanks in Lawrence Township**. If there is a known release to soil and/or groundwater, a site will also be listed in **Table 33: Known Contaminated Sites**. There may also be private residences in Lawrence Township with USTs, used primarily to hold home heating oil. As these tanks age and rust, they often begin to leak, which becomes a serious threat to the groundwater below them. Those private residences are not publicly listed by NJDEP unless they pose a human health hazard.

Table 35: Underground Storage Tanks in Lawrence Township

Facility Number	Facility Name	Street Address
6014	19 Petroleum	1601 Princeton Ave
7349	2890 Brunswick Pike NJ 0044	2890 Brunswick Pk
3791	ALS	135 Lawrenceville Rd
2562	ETS	660 Rosedale Rd
208025	Express Gas	360 Lawrence Rd
30873	Lawrenceville Amoco	1720 Brunswick Ave
7604	Lawrenceville Shell	2961 Brunswick Pk
3788	Lukoil #57325	2515 Brunswick Pk
3784	Lukoil Of Lawrenceville	2417 Main St
4193	PSE&G Southern Division, Lawrenceville	4140 Quakerbridge Rd
298837	Quick Chek Corporation #107	303 Brunswick Extention Cir
1162	Slackwood Fire Company	21 Slack Ave
4177	Trenton District Gas T & D	665 Whitehead Rd
G000004019	Wawa Food Market #8339	2936 Brunswick Pk

Source: NJDEP, 2012

Groundwater Contamination

There are 12 sites within Lawrence that have documented groundwater contamination from various sources. These sites are restricted by a Classification Exception Area (CEA) designation, which is a geographically defined area within which the local groundwater resources are known to be contaminated because the water quality does not meet drinking water and groundwater quality standards for specific contaminants. 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 areas 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, 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. See **Table 36: Classification Exception Areas**.

Table 36: Classification Exception Areas

PI Number	Name	Address	Start Date
000179	Lawrenceville Amoco	360 Lawrenceville Rd	11/25/2014
000292	Ewing-Lawrence Sewerage Authority	600 Whitehead Rd	10/28/1998
002133	Hub City Distributors	649 Whitehead Rd	7/2/1999

PI Number	Name	Address	Start Date
003784	Lukoil of Lawrenceville	2417 Main St	4/17/2014
003791	ALS	135 Lawrenceville Rd	6/30/2003
007604	Lawrenceville Shell	2961 Brunswick Pk	5/17/2005
008688	Lawrenceville Exxon NJ 0040	2551 Brunswick Ave	8/1/2005
010581	Bobs Auto Service	15 Cold Soil Rd	7/6/2015
011171	Lawrence Road Service Center	1175 Lawrence Rd	5/18/2015
027114	Hydrocarbon Research Inc.	1501 New York Ave	6/8/2001
G000001956	Trenton Fibre Drum Co., Inc.	1545 New York Ave	1/6/2015
G000002653	BWAY MFG Inc.	6 Litho Rd	5/13/2009

Source: NJDEP, 2015

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 build-up of radon-contaminated air (internal alpha particle exposure hazard) 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 for alpha particles in the air within a home. Fortunately, radon testing is inexpensive. All radon test results conducted in the state are reported to NJDEP by certified companies, which perform the tests or manufacture the test kits. This data is used to classify municipalities into a three-tier system, which identifies the potential for homes with indoor radiation problems.

NJDEP classifies municipalities into three categories—high (Tier 1), moderate (Tier 2), or low (Tier 3)—as to the risk of having high radon levels. Lawrence is listed as a Tier 1 municipality with high potential of having high radon levels in homes.

The criteria for a Tier 1 municipality designation is that of at least 25 homes tested, 25 percent or more have radon concentrations greater than or equal to 4.0 picocuries per liter in air. This is the level at which homeowners should take immediate action. If radon levels are high in a home, NJDEP suggests that the homeowner 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 by installing a radon extraction system and/or frequently ventilating indoor air.

NJDEP maintains www.njradon.org as an information source for concerned citizens. Free information packets are available upon request. All companies conducting radon testing and mitigations are certified by NJDEP and listed on their web site. The Lawrence Township Health Department also has free literature regarding radon testing and remediation, as well as radon testing kits for available for a small fee, at the Lawrence Township municipal building.

OTHER ENVIRONMENTAL CONCERNS

Historic Landfills

Lawrence is home to one former landfill, the Wenczel Tile Landfill. Landfills pose a number of potential environmental issues, including groundwater contamination and harmful air emissions. Current EPA landfill regulations (Subtitle D) mandate at least 30 years of post-closure care and monitoring to ensure that the landfill's leachate is properly removed and treated so that it does not leak into its surroundings and contaminate the surrounding soil and groundwater. Leachate is water that has passed through a landfill, both from the decomposition of material in the landfill and as a result of precipitation passing through the waste. Leachate is most likely to enter the environment either due to a faulty liner system or via the "bathtub effect," in which liquid accumulates in the landfill and spills out from the top of the containment system. While current landfill regulations have greatly decreased the probability of landfill failure within the 30-year post-closure window, it is likely that these systems will remain in danger of leaking and contaminating the outside environment well into the future, beyond the mandated post-closure period.

The other major issue related to conventional landfills is the production of landfill gas, which is formed from the anaerobic decomposition of material within the landfill by bacteria. Landfill gas is composed of roughly 50 percent methane, along with carbon dioxide, volatile organic compounds such as benzene, and other contaminants. Landfill gas is an environmental hazard for several reasons, including an increased risk of landfill fires and noxious odors. Additionally, landfill gas is a major contributor to increased levels of greenhouse gases in the atmosphere, as methane is 40 times more potent a greenhouse gas than carbon dioxide. While the EPA mandates collection of landfill gas, which is often burned to produce electricity, no system is able to collect all of the landfill gas produced, leading to "fugitive" emissions.

The Wenczel Tile Landfill, located on Lawrence Station Road, was a five-acre industrial landfill that accepted non-hazardous waste materials resulting from manufacturing, industrial, and research development processes and operations. The landfill ceased operations in 1988.

Toxic Releases

According to the EPA annual Toxics Release Inventory, the B-Way Manufacturing facility on Litho Road ranks high in the release of toxic chemicals to the environment in New Jersey. In 2014, B-Way released approximately 5,126 pounds of toxic chemicals into the air. Chemicals released include trimethylbenzene, certain glycol ethers, ethylbenzene, methyl isobutyl ketone, n-butyl alcohol, naphthalene, and xylene. The Bristol-Myers Squibb facility located on Province Line Road in Lawrenceville is also listed in the EPA's Toxics Release Inventory. The 2014 report listed this facility as releasing 1,149 pounds of ammonia into the environment.

Historic Pesticides

New Jersey is one of the first states in the nation to address issues relating to toxic pesticide residuals, such as dichloro-diphenyl-trichloroethane (better known as DDT), arsenic, and lead, which remain in the soil from past agricultural operations. In 1996, NJDEP convened a task force to study the extent of the historic pesticide problem in New Jersey and to develop strategies for protecting human health. The task force's findings were issued in an April 1999 report. While the task force examined 18 agricultural sites throughout New Jersey (none in Mercer County), it is estimated that 5 percent of the state's land area is impacted by residues from agricultural pesticides. The primary human health concern of residual contamination

is the ingestion of contaminated soil. Therefore, small children who may ingest soil are at the greatest health risk. This issue may affect residents of homes and subdivisions built on former cropland and orchards. Homeowners can take precautions, such as maintaining grass coverage and washing hands and toys after playing in exposed soil. Some developers may be willing to address this problem by testing and removing the existing topsoil and bringing in clean topsoil before construction commences.

ENVIRONMENTAL PROTECTION

The resources documented in this environmental resource inventory—natural resources, water resources, and biological resources—as well as historic and cultural resources, are key contributors to the character and quality of the Lawrence community. Documentation of these resources provides a foundation for their care, protection, and enhancement for the benefit of current and future Lawrence residents. Accomplishing this task will require further planning and policy making. Fortunately, local officials and community residents have a wide variety of tools at their disposal for this purpose, including municipal land use tools, natural resource protection ordinances, and land preservation techniques.

Lawrence Township has a number of municipal ordinances designed to protect natural resources. **§430.J** of the Lawrence, New Jersey Land Use Ordinance, which regulates development in areas adjacent to streams or in areas of steep slopes, and discussed in **Stream Buffers on page 61** and **Steep Slopes on page 14**, is one way in which Lawrence Township protects its natural resources for the benefit of the environment and the health and safety of its residents. Some environmental laws or programs include the New Jersey Freshwater Wetlands Protection Act (see **Wetlands on page 42**), the Clean Water Act (see **Surface Water Quality on page 48**), the New Jersey Pollutant Discharge Elimination System program (see **Point Sources on page 57**), and the NJDEP Air Quality

Feeding the goats
at Cherry Grove
Farm



Source: DVRPC

Permitting Program (see **Point Source of Air Quality Pollution on page 35**).

Other important municipal ordinances that Lawrence Township has are the **Tree Removal and Tree Cutting Ordinance** (§541 of the Land Use Ordinance) and **Soil Erosion and Sediment Control** (§537 of the Land Use Ordinance). The Tree Removal and Tree Cutting Ordinance protects Lawrence's tree canopy by controlling and regulating excessive removal, cutting, and destruction of trees. This ordinance also recognizes the value of trees for improving water quality, air quality, and aquifer recharge. The Soil Erosion and Sediment Control section of the Land Use Ordinance is intended to prevent flooding, protect exposed soils to protect people and property, and control damage from soil excavation, relocation, removal, or disturbance.

Perhaps more important than municipal ordinances are the organizations and residents who enforce these protections and work to educate residents of Lawrence on the need for and benefits of environmental resource preservation and restoration. The role of the Lawrence Township ERSGAC is to advise the local governments and explore opportunities for addressing environmental problems. Environmental commissions such as the one in Lawrence may work on a variety of issues, including open space preservation, smart growth, wetlands and water resource protection, green infrastructure, recycling and litter, environmental cleanups, wildlife habitat, energy efficiency and conservation, and transportation. Members inform elected officials and the public, serve on committees, research issues, develop educational programs, and advocate for sound environmental policies. In addition to the ERSGAC, other organizations such as **Sustainable Lawrence** and the **Mercer County Sustainability Coalition** work to encourage the people and institutions of Lawrence and Mercer County to adopt sustainable practices. **Sustainable Jersey**, a nonprofit organization that provides tools, trainings, and financial incentives to support communities as they pursue sustainability programs, certified Lawrence Township as a bronze community in 2014. Combined, all of these tools can help to protect and enhance Lawrence Township's many environmental resources.

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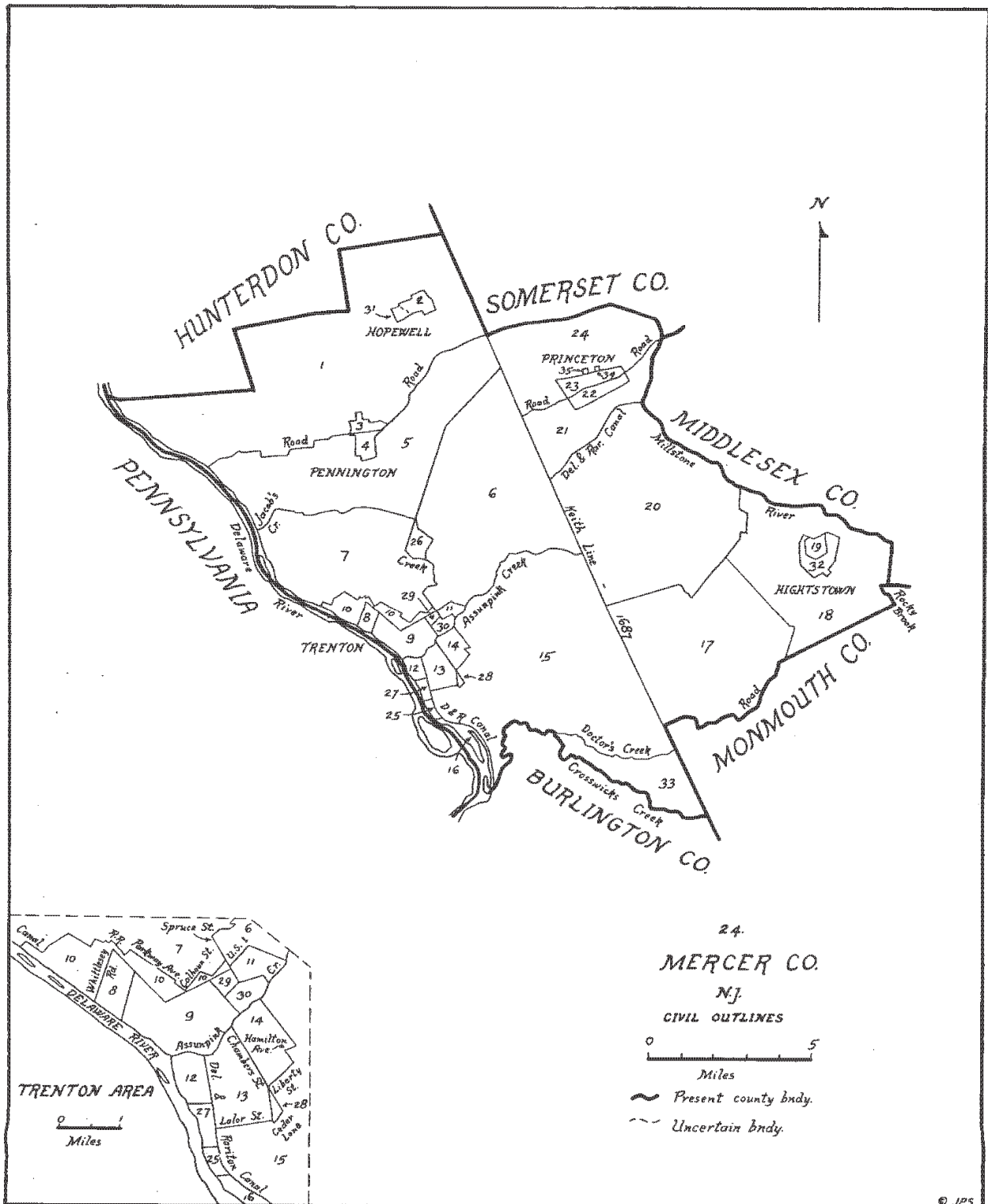
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Mercer County Civil Outlines



Source: John Snyder, New Jersey Bureau of Geology and Topography, 1969

APPENDIX B

Plants and Birds of Drexel Woods

Plants
garlic mustard
onion grass
Jack-in-the-pulpit
thistle
spring beauty
lily-of-the-valley
dog-toothed-violet
jewelweed
tree clubmoss
Wild Lily of the Valley
grape-hyacinth
daffodil
star-of-bethlehem
mayapple
dwarf cinquefoil
small-flowered crowfoot
goldenrod
common chickweed
skunk-cabbage
common dandelion
periwinkle
violets
yellow violet
poverty grass
fern
moss
agave
Japanese barberry
gray dogwood
dogwood
Morrow's bush honeysuckle
rhododendron
azalea
multiflora rose
arrowwood
Norway maple
box elder
red maple

Birds
American crow
American goldfinch
American redstart
American robin
bald eagle*
belted kingfisher
black-capped chickadee
black and white warbler
blue jay
blue-gray gnatcatcher
brown creeper
brown thrasher
brown-headed cowbird
Canada goose
catbird
common grackle
common yellowthroat
Cooper's hawk
dark-eyed junco
downy woodpecker
Eastern towhee
European starling
great crested flycatcher
great egret*
great horned owl
house sparrow
house wren
dark-eyed junco
mallard
mourning dove
northern cardinal
northern common flicker
northern oriole
ovenbird
prairie warbler
red-bellied woodpecker
red-shouldered hawk
red-tailed hawk

Plants

tree-of-heaven
American hornbeam
shagbark hickory
possible persimmon
Russian olive
winged euonymous
American beech
white ash
American holly
eastern red cedar
spicebush
sweet gum
tulip poplar
eastern hop-hornbeam
Norway spruce
eastern white pine
sycamore
black cherry
choke cherry
white oak
black oak
pin oak
red oak
sassafras
Eastern hemlock
slippery elm
Japanese maple
magnolia tree
douglas fir
Asiatic bittersweet
running strawberry-bush
Japanese honeysuckle
Virginia creeper
poison ivy
raspberry
blackberry
greenbrier
grape
frost grape
ivy

Birds

rock dove (pigeon)
scarlet tanager
tufted titmouse
turkey vulture
white-breasted nuthatch
white-throated sparrow
wild turkey
wood thrush
yellow warbler
yellow-rumped warbler

Source: Lawrence Nature Center, Drexel Woods Trail Map and History of Plants and Birds

* flyover

Plants and Animals of Carson Road Woods Park

Birds

Common Name	Scientific name	Family
Canada goose	<i>Branta canadensis</i>	Anatidae
mallard duck	<i>Anas platyrhynchos</i>	Anatidae
black vulture	<i>Coragyps atratus</i>	Cathartidae
turkey vulture	<i>Cathartes aura</i>	Cathartidae
osprey	<i>Pandion haliaetus</i>	Accipitridae
bald eagle	<i>Haliaeetus leucocephalus</i>	Accipitridae
northern harrier	<i>Circus cyaneus</i>	Accipitridae
sharp-shinned hawk	<i>Accipiter striatus</i>	Accipitridae
Cooper's hawk	<i>Accipiter cooperii</i>	Accipitridae
red-tailed hawk	<i>Buteo jamaicensis</i>	Accipitridae
wild turkey	<i>Meleagris gallopavo</i>	Phasianidae
killdeer	<i>Charadrius vociferus</i>	Charadriidae
American woodcock	<i>Scolopax minor</i>	Scolopacidae
ring-billed gull	<i>Larus delawarensis</i>	Laridae
mourning dove	<i>Zenaida macroura</i>	Columbidae
eastern screech owl	<i>Otus asio</i>	Strigidae
great horned owl	<i>Bubo virginianus</i>	Strigidae
chimney swift	<i>Chaetura pelagica</i>	Apodidae
red-bellied woodpecker	<i>Melanerpes carolinus</i>	Picidae
yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	Picidae
downy woodpecker	<i>Picoides pubescens</i>	Picidae
hairy woodpecker	<i>Picoides villosus</i>	Picidae
northern flicker	<i>Colaptes auratus</i>	Picidae
pileated woodpecker	<i>Dryocopus pileatus</i>	Picidae
eastern wood-pewee	<i>Contopus virens</i>	Tyrannidae
eastern phoebe	<i>Sayornis phoebe</i>	Tyrannidae
great crested flycatcher	<i>Myiarchus crinitus</i>	Tyrannidae
eastern kingbird	<i>Tyrannus tyrannus</i>	Tyrannidae
tree swallow	<i>Tachycineta bicolor</i>	Hirundinidae
barn swallow	<i>Hirundo rustica</i>	Hirundinidae
blue jay	<i>Cyanocitta cristata</i>	Corvidae
American crow	<i>Corvus brachyrhynchos</i>	Corvidae
fish crow	<i>Corvus ossifragus</i>	Corvidae
Carolina chickadee	<i>Poecile carolinensis</i>	Paridae
tufted titmouse	<i>Baeolophus bicolor</i>	Paridae
white-breasted nuthatch	<i>Sitta carolinensis</i>	Sittidae
brown creeper	<i>Certhia americana</i>	Certhiidae

Common Name	Scientific name	Family
Carolina wren	<i>Thryothorus ludovicianus</i>	Troglodytidae
house wren	<i>Troglodytes aedon</i>	Troglodytidae
winter wren	<i>Troglodytes troglodytes</i>	Troglodytidae
ruby-crowned kinglet	<i>Regulus calendula</i>	Regulidae
blue-gray gnatcatcher	<i>Poliophtila caerulea</i>	Sylviidae
eastern bluebird	<i>Sialia sialis</i>	Turdidae
hermit thrush	<i>Catharus guttatus</i>	Turdidae
wood thrush	<i>Hylocichla mustelina</i>	Turdidae
American robin	<i>Turdus migratorius</i>	Turdidae
gray catbird	<i>Dumetella carolinensis</i>	Mimidae
northern mockingbird	<i>Mimus polyglottos</i>	Mimidae
brown thrasher	<i>Toxostoma rufum</i>	Mimidae
cedar waxwing	<i>Bombycilla cedrorum</i>	Bombycillidae
European starling	<i>Sturnus vulgaris</i>	Sturnidae
white-eyed vireo	<i>Vireo griseus</i>	Vireonidae
red-eyed vireo	<i>Vireo olivaceus</i>	Vireonidae
blue-winged warbler	<i>Vermivora pinus</i>	Parulidae
Nashville warbler	<i>Vermivora ruficapilla</i>	Parulidae
yellow warbler	<i>Dendroica petechia</i>	Parulidae
magnolia warbler	<i>Dendroica magnolia</i>	Parulidae
yellow-rumped warbler	<i>Dendroica coronata</i>	Parulidae
prairie warbler	<i>Dendroica discolor</i>	Parulidae
palm warbler	<i>Dendroica palmarum</i>	Parulidae
blackpoll warbler	<i>Dendroica striata</i>	Parulidae
black-and-white warbler	<i>Mniotilta varia</i>	Parulidae
ovenbird	<i>Seiurus aurocapillus</i>	Parulidae
common yellowthroat	<i>Geothlypis trichas</i>	Parulidae
Wilson's warbler	<i>Wilsonia pusilla</i>	Parulidae
scarlet tanager	<i>Piranga olivacea</i>	Thraupidae
northern cardinal	<i>Cardinalis cardinalis</i>	Cardinalidae
rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	Cardinalidae
indigo bunting	<i>Passerina cyanea</i>	Cardinalidae
eastern towhee	<i>Pipilo erythrophthalmus</i>	Emberizidae
American tree sparrow	<i>Spizella arborea</i>	Emberizidae
field sparrow	<i>Spizella pusilla</i>	Emberizidae
savannah sparrow	<i>Passerculus sandwichensis</i>	Emberizidae
song sparrow	<i>Melospiza melodia</i>	Emberizidae
swamp sparrow	<i>Melospiza georgiana</i>	Emberizidae
white-throated sparrow	<i>Zonotrichia albicollis</i>	Emberizidae
dark-eyed junco	<i>Junco hyemalis</i>	Emberizidae
red-winged blackbird	<i>Agelaius phoeniceus</i>	Icteridae
common grackle	<i>Quiscalus quiscula</i>	Icteridae
brown-headed cowbird	<i>Molothrus ater</i>	Icteridae
orchard oriole	<i>Icterus spurius</i>	Icteridae

Common Name	Scientific name	Family
Baltimore oriole	<i>Icterus galbula</i>	Icteridae
purple finch	<i>Carpodacus purpureus</i>	Fringillidae
house finch	<i>Carpodacus mexicanus</i>	Fringillidae
American goldfinch	<i>Carduelis tristis</i>	Fringillidae
house sparrow	<i>Passer domesticus</i>	Passeridae

Amphibians

Common Name	Scientific Name	Family
northern spring peeper	<i>Pseudacris crucifer</i>	Hylidae
green frog	<i>Rana clamitans</i>	Ranidae
pickerel frog	<i>Rana palustris</i>	Ranidae
northern two-lined salamander	<i>Eurycea b. bislineata</i>	Plethodontidae
redback salamander	<i>Plethodon cinereus</i>	Plethodontidae

Reptiles

Common Name	Scientific Name	Family
eastern milk snake	<i>Lampropeltis t. triangulum</i>	Colubridae
eastern garter snake	<i>Thamnophis s. sirtalis</i>	Colubridae
eastern box turtle	<i>Terrapene carolina</i>	Emydidae

Mammals

Common Name	Scientific Name	Family
white-tailed deer	<i>Odocoileus virginianus</i>	Cervidae
coyote	<i>Canis latrans</i>	Canidae
red fox	<i>Vulpes vulpes</i>	Canidae
house cat	<i>Felis catus</i>	Felidae
Virginia opossum	<i>Didelphis virginiana</i>	Didelphidae
northern short-tailed shrew	<i>Blarina brevicauda</i>	Soricidae
mole	Family <i>Talpidae</i>	Talpidae
eastern cottontail	<i>Sylvilagus floridanus</i>	Leporidae
white-footed mouse	<i>Peromyscus leucopus</i>	Muridae
gray squirrel	<i>Sciurus carolinensis</i>	Sciuridae

Butterflies and Moths

Common Name	Scientific Name	Family
black swallowtail	<i>Papilio polyxenes</i>	Papilionidae
eastern tiger swallowtail	<i>Papilio glaucus</i>	Papilionidae
spicebush swallowtail	<i>Papilio troilus</i>	Papilionidae
cabbage white	<i>Pieris rapae</i>	Pieridae
clouded sulphur	<i>Colias philodice</i>	Pieridae
orange sulphur	<i>Colias eurytheme</i>	Pieridae
blue azure	<i>Celastrina ladon</i>	Lycaenidae

Common Name	Scientific Name	Family
summer azure	<i>Celestrina neglecta</i>	Lycaenidae
eastern tailed blue	<i>Everes comyntas</i>	Lycaenidae
spring azure	<i>Celastrina argiolus</i>	Lycaenidae
great spangled fritillary	<i>Speyeria cybele</i>	Nymphalidae
pearl crescent	<i>Phyciodes tharos</i>	Nymphalidae
question mark	<i>Polygonia interrogationis</i>	Nymphalidae
eastern comma	<i>Polygonia comma</i>	Nymphalidae
mourning cloak	<i>Nymphalis antiopa</i>	Nymphalidae
American painted lady	<i>Vanessa virginiensis</i>	Nymphalidae
painted lady	<i>Vanessa cardui</i>	Nymphalidae
red admiral	<i>Vanessa atalanta</i>	Nymphalidae
buckeye	<i>Junonia coenia</i>	Nymphalidae
red-spotted purple	<i>Limenitis arthemis</i>	Nymphalidae
little wood satyr	<i>Megisto cymela</i>	Nymphalidae
common wood nymph	<i>Cercyonis pegala</i>	Nymphalidae
monarch	<i>Danaus plexippus</i>	Nymphalidae
Delaware skipper	<i>Anatrytone logan</i>	Hesperiidae
silver-spotted skipper	<i>Epargyreus clarus</i>	Hesperiidae
Juvenal's dusky wing	<i>Erynnis juvenalis</i>	Hesperiidae
swarthy skipper	<i>Nastra lherminier</i>	Hesperiidae
least skipper	<i>Ancyloxypha numitor</i>	Hesperiidae
Peck's skipper	<i>Polites coras</i>	Hesperiidae
little glassywing	<i>Pompeius verna</i>	Hesperiidae
sachem	<i>Atalopedes campestris</i>	Hesperiidae
dun skipper	<i>Euphyes vestris</i>	Hesperiidae
spicebush silkmoth	<i>Callosamia promethea</i>	Saturniidae:

Dragonflies and Damselflies

Common Name	Scientific Name	Family
common green darner	<i>Anax junius</i>	Aeshnidae
black-shouldered spinyleg	<i>Dromogomphus spinosus</i>	Gomphidae
dot-tailed whiteface	<i>Leucorrhinia intacta</i>	Libellulidae
widow skimmer	<i>Libellula luctuosa</i>	Skimmers
twelve-spotted skimmer	<i>Libellula pulchella</i>	Skimmers
painted skimmer	<i>Libellula semifasciata</i>	Skimmers
common whitetail	<i>Libellula lydia</i>	Skimmers
eastern amberwing	<i>Perithemis tenera</i>	Skimmers
meadowhawk	<i>Sympetrum sp.</i>	Skimmers
black saddlebags	<i>Tramea lacerata</i>	Skimmers
black-winged damselfly	<i>Calopteryx maculata</i>	Calopterygidae

Miscellaneous Insects and Spiders

Common Name	Scientific Name	Family
soldier beetle	<i>Family cantharidae</i>	Cantharidae
ladybird beetle	<i>Family coccinellidae</i>	Coccinellidae
Mydas fly	<i>Family mydadae</i>	Mydadae
water strider	<i>Gerris remigis</i>	Gerridae
small milkweed bug	<i>Lygaeus kalmii</i>	Lygaeidae
spittlebug	<i>Family cercopidae</i>	Cercopidae
honey bee	<i>Apis mellifera</i>	Apidae
bumblebee	<i>Bombus sp.</i>	Apidae
bald-faced hornet	<i>Dolichovespula maculata</i>	Vespidae
hornet	<i>Family vespidae</i>	Vespidae
meadow grasshopper type	<i>Family tettiganiidae</i>	Tettiganiidae
grasshopper (green short-horned)	<i>Family acrididae</i>	Acrididae
locusts	<i>Family acrididae</i>	Acrididae
cricket	<i>Family gryllidae</i>	Gryllidae
European mantis	<i>Mantis religiosa</i>	Mantidae
Chinese mantis	<i>Tenodera aridifolia</i>	Mantidae
praying mantis	<i>Family mantidae</i>	Mantidae
eastern wood tick	<i>Dermacentor sp.</i>	Ixodidae
orb weaver spider	<i>Araneus sp.</i>	Araneidae
garden spider	<i>Araneus diadematus</i>	Araneidae
sheet web spiders	<i>Family linyphiidae</i>	Linyphiidae
wolf spider	<i>Lycosa sp.</i>	Lycosidae
fishing spider	<i>Dolomedes sp.</i>	Pisauridae
eastern daddy-long-legs	<i>Leiobunum sp.</i>	Phalangidae

Trees

Common Name	Scientific Name	Family
eastern red cedar	<i>Juniperus virginiana var virginiana</i>	Cupressaceae
European larch	<i>Larix decidua</i>	Pinaceae
Norway spruce	<i>Picea abies</i>	Pinaceae
blue spruce	<i>Family Pinaceae</i>	Pinaceae
eastern white pine	<i>Pinus strobus</i>	Pinaceae
douglas fir	<i>Pseudotsuga menziesii</i>	Pinaceae
American holly	<i>Ilex opaca var opaca</i>	Aquifoliaceae
flowering dogwood	<i>Cornus florida</i>	Cornaceae
dogwood	<i>Cornus sp.</i>	Cornaceae
black gum	<i>Nyssa sylvatica var sylvatica</i>	Nyssaceae
honey-locust	<i>Gleditsia triacanthos</i>	Fabaceae
gray birch	<i>Betula populifolia</i>	Betulaceae
birch	<i>Betula sp.</i>	Betulaceae
American hornbeam	<i>Carpinus caroliniana var virginiana</i>	Betulaceae
white oak	<i>Quercus alba</i>	Fagaceae

Common Name	Scientific Name	Family
swamp white oak	<i>Quercus bicolor</i>	Fagaceae
pin oak	<i>Quercus palustris</i>	Fagaceae
red oak	<i>Quercus rubra var rubra</i>	Fagaceae
black oak	<i>Quercus velutina</i>	Fagaceae
American beech	<i>Fagus grandifolia</i>	Fagaceae
sweet gum	<i>Liquidambar styraciflua</i>	Hamamelidaceae
bitter-nut hickory	<i>Carya cordiformis</i>	Juglandaceae
shagbark hickory	<i>Carya ovata</i>	Juglandaceae
black walnut	<i>Juglans nigra</i>	Juglandaceae
sassafras	<i>Sassafras albidum</i>	Lauraceae
tulip poplar	<i>Liriodendron tulipifera</i>	Magnoliaceae
sweet cherry	<i>Prunus avium</i>	Rosaceae
black cherry	<i>Prunus serotina var serotina</i>	Rosaceae
cherry	<i>Prunus sp.</i>	Rosaceae
crabapple	<i>Pyrus sp.</i>	Rosaceae
eastern cottonwood	<i>Populus deltoides var deltoides</i>	Salicaceae
aspen or cottonwood	<i>Populus sp.</i>	Salicaceae
willow	<i>Salix sp.</i>	Salicaceae
box elder	<i>Acer negundo var negundo</i>	Aceraceae
Norway maple	<i>Acer platanoides</i>	Aceraceae
red maple	<i>Acer rubrum</i>	Aceraceae
silver maple	<i>Acer saccharinum</i>	Aceraceae
white ash	<i>Fraxinus americana</i>	Oleaceae
green ash	<i>Fraxinus pennsylvanica</i>	Oleaceae
ash	<i>Fraxinus sp.</i>	Oleaceae
princess tree	<i>Paulownia tomentosa</i>	Scrophulariaceae
American elm	<i>Ulmus americana</i>	Ulmaceae
slippery elm	<i>Ulmus rubra</i>	Ulmaceae
elm	<i>Ulmus sp.</i>	Ulmaceae

Shrubs

Common Name	Scientific Name	Family
winterberry	<i>Ilex verticillata var verticillata</i>	Aquifoliaceae
holly	<i>Ilex sp.</i>	Aquifoliaceae
Japanese barberry	<i>Berberis thunbergii</i>	Berberidaceae
barberry	<i>Berberis sp.</i>	Berberidaceae
Japanese honeysuckle	<i>Lonicera japonica</i>	Caprifoliaceae
amur honeysuckle	<i>Lonicera maackii</i>	Caprifoliaceae
Morrow's bush honeysuckle	<i>Lonicera morrowii</i>	Caprifoliaceae
twinsisters	<i>Lonicera tatarica</i>	Caprifoliaceae
honeysuckle	Family caprifoliaceae	Caprifoliaceae
common elderberry	<i>Sambucus canadensis var canadensis</i>	Caprifoliaceae
viburnum	<i>Viburnum sp.</i>	Caprifoliaceae
arrowwood	<i>Viburnum dentatum</i>	Caprifoliaceae

Common Name	Scientific Name	Family
blackhaw	<i>Viburnum prunifolium</i>	Caprifoliaceae
Russian olive	<i>Elaeagnus angustifolia</i>	Elaeagnaceae
autumn olive	<i>Elaeagnus umbellata var parvifolia</i>	Elaeagnaceae
spicebush	<i>Lindera benzoin</i>	Lauraceae
bayberry	Family myricaceae	Myricaceae
oriental hedge; oriental privet	<i>Ligustrum sp.</i>	Oleaceae
Asiatic privet	<i>Ligustrum sp.</i>	Oleaceae
privet	<i>Ligustrum sp.</i>	Oleaceae
red chokeberry	<i>Aronia arbutifolia</i>	Rosaceae
multiflora rose	<i>Rosa multiflora</i>	Rosaceae
Virginia rose	<i>Rosa virginiana var virginiana</i>	Rosaceae
blackberry	<i>Rubus orarius</i>	Rosaceae
raspberry	<i>Rubus sp.</i>	Rosaceae
wineberry	<i>Rubus phoenicolasius</i>	Rosaceae
winged euonymus	<i>Euonymus sp.</i>	Celastraceae
poison ivy	<i>Toxicodendron radicans</i>	Anacardiaceae
staghorn sumac	<i>Rhus hirta</i>	Anacardiaceae

Vines

Common Name	Scientific Name	Family
Virginia creeper	<i>Parthenocissus quinquefolia</i>	Vitaceae
frost grape	<i>Vitis vulpina</i>	Vitaceae
grape	<i>Vitis sp.</i>	Vitaceae
Asiatic bittersweet	<i>Celastrus orbiculata</i>	Celastraceae
bittersweet	<i>Celastrus sp.</i>	Celastraceae
common greenbrier	<i>Smilax rotundifolia</i>	Smilacaceae
greenbrier	<i>Smilax sp.</i>	Smilacaceae

Ferns

Common Name	Scientific Name	Family
northern lady-fern	<i>Athyrium filix-femina var angustum</i>	Dryopteridaceae
sensitive fern	<i>Onoclea sensibilis</i>	Dryopteridaceae
Christmas fern	<i>Polystichum acrostichoides var acrostichoides</i>	Dryopteridaceae
hayscented fern	<i>Dennstaedtia punctiloba</i>	Polypodiaceae
rock polypody	<i>Polypodium virginianum</i>	Polypodiaceae
New York fern	<i>Thelypteris noveboracensis</i>	Thelypteridaceae
Marsh fern	<i>Thelypteris palustris var pubescens</i>	Thelypteridaceae

Grasses and Rushes

Common Name	Scientific Name	Family
yellow-fruit sedge	<i>Carex annectens var xanthocarpa</i>	Cyperaceae
connecting sedge	<i>Carex annectens var annectens</i>	Cyperaceae

Common Name	Scientific Name	Family
Bailey's sedge	<i>Carex baileyi</i>	Cyperaceae
bladder sedge	<i>Carex intumescens</i>	Cyperaceae
sallow sedge	<i>Carex lurida</i>	Cyperaceae
Pennsylvania sedge	<i>Carex pennsylvanica</i>	Cyperaceae
pointed broom sedge	<i>Carex scoparia var scoparia</i>	Cyperaceae
wide-spreading sedge	<i>Carex squarrosa</i>	Cyperaceae
an awl-fruit sedge	<i>Carex stipata</i>	Cyperaceae
tussock sedge	<i>Carex stricta</i>	Cyperaceae
fox sedge	<i>Carex vulpinoidea var vulpinoidea</i>	Cyperaceae
dark-green bulrush	<i>Scirpus atrovirens</i>	Cyperaceae
woolgrass	<i>Scirpus cyperinus</i>	Cyperaceae
bentgrass	<i>Agrostis sp.</i>	Poaceae
rough bentgrass	<i>Agrostis scabra</i>	Poaceae
broom-sedge	<i>Andropogon virginicus var virginicus</i>	Poaceae
Andropogon sp.	<i>Andropogon sp.</i>	Poaceae
sweet vernal grass	<i>Anthoxanthum odoratum ssp odoratum</i>	Poaceae
meadow brome	<i>Bromus commutatus</i>	Poaceae
smooth brome	<i>Bromus inermis ssp inermis</i>	Poaceae
Japanese brome	<i>Bromus japonicus</i>	Poaceae
sweet wood-reed	<i>Cinna arundinacea</i>	Poaceae
orchard grass	<i>Dactylis glomerata ssp glomerata</i>	Poaceae
poverty wild oat grass	<i>Danthonia spicata</i>	Poaceae
nodding wild rye	<i>Elymus canadensis</i>	Poaceae
tumble grass	<i>Eragrostis spectabilis</i>	Poaceae
white-hair panic grass	<i>Panicum villosissimum var villosissimum</i>	Poaceae
Panicum sp.	<i>Panicum sp.</i>	Poaceae
tall fescue	<i>Festuca arundinacea</i>	Poaceae
nerved manna grass	<i>Glyceria striata</i>	Poaceae
perennial rye grass	<i>Lolium perenne var perenne</i>	Poaceae
Japanese stilt grass	<i>Microstegium vimineum</i>	Poaceae
switch grass	<i>Panicum virgatum var virgatum</i>	Poaceae
reed canary grass	<i>Phalaris arundinacea</i>	Poaceae
meadow timothy	<i>Phleum pratense</i>	Poaceae
phragmites	<i>Phragmites sp.</i>	Poaceae
Kentucky blue grass	<i>Poa pratensis ssp pratensis</i>	Poaceae
old-pasture spear grass	<i>Poa saltuensis</i>	Poaceae
cultivated rye	<i>Secale cereale</i>	Poaceae
yellow foxtail	<i>Pennisetum glaucum</i>	Poaceae
foxtail	<i>Setaria sp.</i>	Poaceae
Indian grass	<i>Sorghastrum nutans</i>	Poaceae
intermediate quack grass	<i>Thinopyrum intermedium</i>	Poaceae
quack grass	<i>Agropyrum repens</i>	Poaceae
Canadian rush	<i>Juncus canadensis</i>	Juncaceae

Common Name	Scientific Name	Family
soft rush	<i>Juncus effusus</i>	Juncaceae
poverty rush	<i>Juncus tenuis</i>	Juncaceae
rush	<i>Juncus sp.</i>	Juncaceae

Herbaceous Plants

Common Name	Scientific Name	Family
wild carrot	<i>Daucus carota</i>	Apiaceae
yarrow	<i>Achillea millefolium</i>	Asteraceae
ragweed	<i>Ambrosia artemisiifolia</i>	Asteraceae
common burdock	<i>Arctium minus</i>	Asteraceae
mugwort	<i>Artemisia vulgaris</i>	Asteraceae
calico aster	<i>Aster lateriflorus var lateriflorus</i>	Asteraceae
New England aster	<i>Aster novae-angliae</i>	Asteraceae
panicked aster	<i>Aster simplex</i>	Asteraceae
aster	Family asteraceae	Asteraceae
tickseed sunflower	<i>Bidens coronata</i>	Asteraceae
chicory	<i>Cichorium intybus</i>	Asteraceae
Canadian thistle	<i>Cirsium arvense</i>	Asteraceae
bull thistle	<i>Cirsium vulgare</i>	Asteraceae
thistle	Family asteraceae	Asteraceae
daisy fleabane	<i>Erigeron strigosus var strigosus</i>	Asteraceae
common fleabane	<i>Erigeron sp.</i>	Asteraceae
boneset	<i>Eupatorium perfoliatum</i>	Asteraceae
Eupatorium sp.	<i>Eupatorium sp.</i>	Asteraceae
grass-leaved goldenrod	<i>Euthamia graminifolia</i>	Asteraceae
a quickweed	<i>Galinsoga sp.</i>	Asteraceae
sweet everlasting	<i>Gnaphalium obtusifolium</i>	Asteraceae
panicked hawkweed	<i>Hieracium paniculatum</i>	Asteraceae
a hawkweed	<i>Hieracium pratense</i>	Asteraceae
ox-eye daisy	<i>Leucanthemum vulgare</i>	Asteraceae
golden ragwort	<i>Senecio aureus</i>	Asteraceae
Canadian goldenrod	<i>Solidago canadensis var canadensis</i>	Asteraceae
goldenrod	<i>Solidago sp.</i>	Asteraceae
lance-leaved goldenrod	<i>Solidago graminifolia</i>	Asteraceae
early goldenrod	<i>Solidago juncea</i>	Asteraceae
rough-stemmed goldenrod	<i>Solidago rugosa</i>	Asteraceae
common dandelion	<i>Taraxacum officinale ssp officinale</i>	Asteraceae
New York ironweed	<i>Vernonia noveboracensis</i>	Asteraceae
cockleburr	<i>Xanthium sp.</i>	Asteraceae
white snakeroot	<i>Eupatorium rugosum</i>	Asteraceae
jewelweed	<i>Impatiens sp.</i>	Balsaminaceae
mayapple	<i>Podophyllum peltatum</i>	Berberidaceae
garlic mustard	<i>Alliaria officinalis</i>	Brassicaceae
yellow rocket	<i>Barbarea vulgaris</i>	Brassicaceae

Common Name	Scientific Name	Family
quaker bittercress	<i>Cardamine pensylvanica</i>	Brassicaceae
cuckoo flower	<i>Cardamine pratensis var pratensis</i>	Brassicaceae
bulbous bittercress	<i>Cardamine bulbosa</i>	Brassicaceae
wild pepperwort	<i>Lepidium virginicum var virginicum</i>	Brassicaceae
cress	Family brassicaceae	Brassicaceae
indian-tobacco	<i>Lobelia inflata</i>	Campanulaceae
lobelia	<i>Lobelia sp.</i>	Campanulaceae
common mouse-ear chickweed	<i>Cerastium fontanum ssp vulgare</i>	Caryophyllaceae
St. Johnswort	<i>Hypericum perforatum</i>	Clusiaceae
violet bush-clover	<i>Lespedeza violacea</i>	Fabaceae
slender bush-clover	<i>Lespedeza virginica</i>	Fabaceae
yellow hop clover	<i>Trifolium agrarium</i>	Fabaceae
red clover	<i>Trifolium pratense</i>	Fabaceae
white clover	<i>Trifolium repens</i>	Fabaceae
centaury	<i>Centaurium umbellatum</i>	Gentianaceae
wild geranium	<i>Geranium maculatum</i>	Gentianaceae
spreading dogbane	<i>Apocynum androsaemifolium</i>	Apocynaceae
indian-hemp	<i>Apocynum cannabinum var cannabinum</i>	Apocynaceae
dogbane	<i>Apocynum sp.</i>	Apocynaceae
white milkweed	<i>Asclepias variegata</i>	Asclepiadaceae
milkweed	<i>Asclepias sp.</i>	Asclepiadaceae
American pennyroyal	<i>Hedeoma pulegioides</i>	Lamiaceae
catnip	<i>Nepeta cataria</i>	Lamiaceae
self-heal	<i>Prunella vulgaris</i>	Lamiaceae
mountain mint	<i>Pycnanthemum muticum</i>	Lamiaceae
blue vervain	<i>Verbena hastata var hastata</i>	Verbenaceae
vervain	<i>Verbena sp.</i>	Verbenaceae
enchanter's-nightshade	<i>Circaea lutetiana var canadensis</i>	Onagraceae
purple-leaved willow-herb	<i>Epilobium coloratum</i>	Onagraceae
seedbox	<i>Ludwigia alternifolia</i>	Onagraceae
ludwigia	<i>Ludwigia sp.</i>	Onagraceae
common evening-primrose	<i>Oenothera biennis</i>	Onagraceae
evening primrose	<i>Oenothera villosa</i>	Onagraceae
primrose	<i>Oenothera sp.</i>	Onagraceae
beechdrops	<i>Epifagus virginiana</i>	Orobanchaceae
water-pepper	<i>Polygonum hydropiper</i>	Polygonaceae
lady's-thumb	<i>Polygonum persicaria</i>	Polygonaceae
sheep sorrel	<i>Rumex acetosella</i>	Polygonaceae
dock	Family Polygonaceae	Polygonaceae
bitter dock	<i>Rumex obtusifolius</i>	Polygonaceae
Virginia knotweed	<i>Tovara virginiana</i>	Polygonaceae
pokeweed	<i>Phytolacca americana var americana</i>	Phytolaccaceae
spring beauty	<i>Claytonia virginica var virginica</i>	Portulacaceae

Common Name	Scientific Name	Family
plantain	<i>Plantago major</i>	Plantaginaceae
scarlet pimpernel	<i>Anagallis arvensis var arvensis</i>	Primulaceae
wind-flower	<i>Anemone quinquefolia var quinquefolia</i>	Ranunculaceae
kidney-leaf buttercup	<i>Ranunculus abortivus</i>	Ranunculaceae
goldencups	<i>Ranunculus bulbosus</i>	Ranunculaceae
small-flowered agrimony	<i>Agrimonia parviflora</i>	Rosaceae
agrimony	<i>Agrimonia sp.</i>	Rosaceae
indian-strawberry	<i>Duchesnea indica</i>	Rosaceae
strawberry	<i>Fragaria sp.</i>	Rosaceae
white avens	<i>Geum canadense var canadense</i>	Rosaceae
rough cinquefoil	<i>Potentilla norvegica ssp monspeliensis</i>	Rosaceae
common cinquefoil	<i>Potentilla simplex</i>	Rosaceae
American golden-saxifrage	<i>Chrysosplenium americanum</i>	Saxifragaceae
partridge-berry	<i>Mitchella repens</i>	Rubiaceae
purple gerardia	<i>Gerardia purpurea</i>	Scrophulariaceae
butter-and-eggs	<i>Linaria vulgaris</i>	Scrophulariaceae
foxglove beardtongue	<i>Penstemon digitalis</i>	Scrophulariaceae
beardtongue	<i>Penstemon sp.</i>	Scrophulariaceae
common mullein	<i>Verbascum thapsus</i>	Scrophulariaceae
mullein	<i>Verbascum sp.</i>	Scrophulariaceae
thyme-leaf speedwell	<i>Veronica serpyllifolia var serpyllifolia</i>	Scrophulariaceae
ground-cherry	<i>Physalis sp.</i>	Solanaceae
horse nettle	<i>Solanum carolinense var carolinense</i>	Solanaceae
common morning-glory	<i>Ipomoea purpurea</i>	Convolvulaceae
ivy-leaf morning-glory	<i>Ipomoea hederacea</i>	Convolvulaceae
Canadian clearweed	<i>Pilea pumila</i>	Urticaceae
common blue violet	<i>Viola papilionacea</i>	Violaceae
jack-in-the-pulpit	<i>Arisaema triphyllum ssp triphyllum</i>	Araceae
skunk-cabbage	<i>Symplocarpus foetidus</i>	Araceae
strict blue-eyed grass	<i>Sisyrinchium montanum</i>	Iridaceae
star-of-bethlehem	<i>Ornithogalum umbellatum</i>	Liliaceae
false Solomon's seal	<i>Smilacina racemosa</i>	Liliaceae
onion grass	<i>Allium sp.</i>	Liliaceae
broad-leaf cattail	<i>Typha latifolia</i>	Typhaceae
cattail	<i>Typha sp.</i>	Typhaceae
horsetail	<i>Equisetum sp.</i>	Equisetaceae

Source: Carson Road Woods Biological Inventory, Washington Crossing Audubon Society, March 2003

Plants and Animals of Mercer Meadows' Pole Farm

Ferns

Common Name	Scientific Name	Family
northern lady fern	<i>Athyrium filix-femina</i>	Aspleniaceae
Christmas fern	<i>Polystichum acrostichoides</i>	Aspleniaceae
tree clubmoss	<i>Lycopodium obscurum</i>	Lycopodiaceae
cut-leaved grape fern	<i>Botrychium dissectum</i>	Ophioglossaceae
hayscented fern	<i>Dennstaedtia punctilobula</i>	Polypodiaceae
sensitive fern	<i>Onoclea sensibilis</i>	Polypodiaceae
New York fern	<i>Thelypteris noveboracensis</i>	Polypodiaceae

Herbs

Common Name	Scientific Name	Family
indian hemp	<i>Apocynum cannabinum</i>	Apocynaceae
skunk cabbage	<i>Symplocarpus foetidus</i>	Araceae
swamp milkweed	<i>Asclepias incarnata</i>	Asclepiadaceae
purple milkweed	<i>Asclepias purpurascens</i>	Asclepiadaceae
common milkweed	<i>Asclepias syrica</i>	Asclepiadaceae
jewelweed	<i>Impatiens capensis</i>	Asclepiadaceae
terrestrial water starwort	<i>Callitriche terrestris</i>	Callitrichaceae
wild bergamot	<i>Monarda fistulosa</i>	Caprifoliaceae
purple bergamot	<i>Monarda media</i>	Caprifoliaceae
Deptford pink	<i>Dianthus armeria</i>	Caryophyllaceae
evening lychnis, white campion	<i>Lychnis alba</i>	Caryophyllaceae
yarrow	<i>Achillea millefolium</i>	Compositae
ragweed, common	<i>Ambrosia artemisiifolia</i>	Compositae
mugwort	<i>Artemisia vulgaris</i>	Compositae
many-flowered aster	<i>Aster ericoides</i>	Compositae
New England aster	<i>Aster novae angliae</i>	Compositae
health aster	<i>Aster pilosus</i>	Compositae
small white aster	<i>Aster vimineus</i>	Compositae
tickseed sunflower	<i>Bidens coronata</i>	Compositae
beggar ticks	<i>Bidens polylepis</i>	Compositae
spotted knapweed	<i>Centaurea maculosa</i>	Compositae
ox-eye daisy	<i>Chrysanthemum leucanthemum</i>	Compositae
chicory	<i>Cichorium intybus</i>	Compositae
Canada thistle	<i>Cirsium arvense</i>	Compositae
field thistle	<i>Cirsium discolor</i>	Compositae
bull thistle	<i>Cirsium vulgare</i>	Compositae

Common Name	Scientific Name	Family
horseweed	<i>Conyza canadensis</i>	Compositae
fleabane, common and daisy	<i>Erigeron sp.</i>	Compositae
spotted joe-pye weed	<i>Eupatorium maculatum</i>	Compositae
boneset	<i>Eupatorium perforliatum</i>	Compositae
joe-pye weed	<i>Eupatorium purpureum</i>	Compositae
grass-leaved goldenrod	<i>Euthamia graminifolia</i>	Compositae
sneezeweed	<i>Helenium autumnale</i>	Compositae
tall sunflower	<i>Helianthus giganteus</i>	Compositae
Jerusalem artichoke	<i>Helianthus tuberosus</i>	Compositae
wild lettuce	<i>Lactuca canadensis</i>	Compositae
black-eyed susan	<i>Rudbeckia hirta</i>	Compositae
tall goldenrod	<i>Solidago altissima</i>	Compositae
Canada goldenrod	<i>Solidago canadensis</i>	Compositae
late goldenrod	<i>Solidago gigantea</i>	Compositae
lance-leaved goldenrod	<i>Solidago graminifolia</i>	Compositae
early goldenrod	<i>Solidago juncea</i>	Compositae
gray goldenrod	<i>Solidago nemoralis</i>	Compositae
rough-stemmed goldenrod	<i>Solidago rugosa</i>	Compositae
oyster plant	<i>Tragopogon porrifolius</i>	Compositae
New York ironweed	<i>Vernonia noveboracensis</i>	Compositae
clotbur/cocklebur	<i>Xanthium strumarium</i>	Compositae
field mustard	<i>Brassica rapa</i>	Cruciferae
dry oak woodland sedge	<i>Carex pennsylvanica</i>	Cyperaceae
sedge	<i>Carex spp. (several spp.)</i>	Cyperaceae
woolgrass	<i>Scirpus cyperinus</i>	Cyperaceae
Georgia bulrush	<i>Scirpus georgianus</i>	Cyperaceae
closed or bottle gentian	<i>Gentiana clausa</i>	Gentianaceae
redtop (bentgrass)	<i>Agrostis alba</i>	Graminaceae
ticklegass	<i>Agrostis hyemalis</i>	Graminaceae
bushy beard-grass	<i>Andropogon glomeratus</i>	Graminaceae
little bluestem (broom beardgrass)	<i>Andropogon scoparius</i>	Graminaceae
broomsedge	<i>Andropogon virginicus</i>	Graminaceae
orchard grass	<i>Dactylis glomerata</i>	Graminaceae
smooth crab brass	<i>Digitalis ischamaemum</i>	Graminaceae
barnyard grass	<i>Echinochloa crusgalli</i>	Graminaceae
spikerush	<i>Elechris olivacea</i>	Graminaceae
wild rye	<i>Elymus virginicus</i>	Graminaceae
tussock sedge	<i>Karex stricta</i>	Graminaceae
fall panicum	<i>Panicum dicotomiflorum</i>	Graminaceae
switch grass	<i>Panicum virgatum</i>	Graminaceae
reed canary grass	<i>Phalaris arundinacea</i>	Graminaceae
common reed grass	<i>Phragmites communis</i>	Graminaceae
little blue stem	<i>Schizachyrium scoparium</i>	Graminaceae
green bulrush	<i>Scirpus atrovirers</i>	Graminaceae

Common Name	Scientific Name	Family
nodding foxtail grass	<i>Setaria faberi</i>	Graminaceae
yellow foxtail grass	<i>Setaria glauca</i>	Graminaceae
bristly foxtail	<i>Setaria sp.</i>	Graminaceae
indian grass	<i>Sorghastrum nutans</i>	Graminaceae
grease grass/purple top	<i>Tridens flava</i>	Graminaceae
common St. Johnswort	<i>Hypericum perforatum</i>	Guttiferae
soft rush	<i>Juncus effusus</i>	Juncaceae
secund rush	<i>Juncus secundus</i>	Juncaceae
cut-leaved water-horehound	<i>Lycopus americanus</i>	Labiatae
stalked bugleweed	<i>Lycopus rubellus</i>	Labiatae
self-heal	<i>Prunella vulgaris</i>	Labiatae
narrow-leaved mountain mint	<i>Pycnanthemum tenuifolium</i>	Labiatae
mountain mint	<i>Pycnanthemum muticum</i>	Labiatae
hairy skullcap	<i>Scutellaria ellipica</i>	Labiatae
tick trefoil	<i>Desmodium sp.</i>	Leguminosae
round-headed bush clover	<i>Lespedeza capitata</i>	Leguminosae
white sweet clover	<i>Melilotus alba</i>	Leguminosae
trailing wild bean	<i>Strophostyles helvola</i>	Leguminosae
yellow hope clover	<i>Trifolium agarium</i>	Leguminosae
red clover	<i>Trifolium pratense</i>	Leguminosae
white clover	<i>Trifolium repens</i>	Leguminosae
asparagus	<i>Asparagus officinalis</i>	Lilaceae
turks-cap lilly	<i>Lilium superbum</i>	Liliaceae
false solomon's seal	<i>Smilacina racemosa</i>	Lilaceae
purple loosestrife	<i>Lythrum salicaria</i>	Lythraceae
velvetleaf	<i>Abutilon theophrasti</i>	Malvaceae
Viginia meadow beauty	<i>Rhexia virginica</i>	Melastomataceae
purple-leaved willow-herb	<i>Epilobium coloratum</i>	Onagraceae
water purslane	<i>Ludwigia palustris</i>	Onagraceae
evening primrose	<i>Oenothera biennis</i>	Onagraceae
sundrops	<i>Oenothera fruticosa</i>	Onagraceae
nodding ladies' tresses	<i>Spiranthes cernua</i>	Orchidaceae
yellow wood sorrel	<i>Oxalis stricta</i>	Oxalidaceae
pokeweed	<i>Phytolacca americana</i>	Phytolaccaaceae
English pliantain	<i>Plantago lanceolata</i>	Plantaginaceae
pliantain	<i>Plantago major</i>	Plantaginaceae
deer tongue grass	<i>Dicanthelium spp.</i>	Poaceae
Japanese stilt grass	<i>Microstegium vimineum</i>	Poaceae
halberd-leaved tearthumb	<i>Polygonum arifolium</i>	Polygonaceae
cespitose knotweed	<i>Polygonum cespitosum</i>	Polygonaceae
lady's thumb	<i>Polygonum persicaria</i>	Polygonaceae
water smartweed	<i>Polygonum punctatum</i>	Polygonaceae
arrow-leaved tearthumb	<i>Polygonum sagittatum</i>	Polygonaceae
curled cock	<i>Rumex crispus</i>	Polygonaceae

Common Name	Scientific Name	Family
Virginia knotweed	<i>Tovara virginiana</i>	Polygonaceae
striped wintergreen	<i>Chimaphila maculata</i>	Pyrola
goatsbeard	<i>Aruncus dioicus</i>	Rosaceae
white avens	<i>Genum canadense</i>	Rosaceae
common cinquefoil	<i>Potentilla simplex</i>	Rosaceae
potentilla	<i>Potentilla sp.</i>	Rosaceae
steepleshub	<i>Spitea tomentosa</i>	Rosaceae
bedstraw	<i>Galium sp.</i>	Rubiaceae
clayton's bedstraw	<i>Galium tinctorium</i>	Rubiaceae
partridge berry	<i>Mitchella repens</i>	Rubiaceae
purple gerardia	<i>Gerardia purpurea</i>	Scrophulariaceae
winged monkeyflower	<i>Mimulus alatus</i>	Scrophulariaceae
hairy beardtongue	<i>Penstemon hirsutus</i>	Scrophulariaceae
moth mullein	<i>Verbascum blattaria</i>	Scrophulariaceae
common mullien	<i>Verbascum thapsus</i>	Scrophulariaceae
horse nettle	<i>Solanum caolinense</i>	Solanaceae
black nightshade	<i>Solanum nigrum</i>	Solanaceae
cattail	<i>Typha latifolia</i>	Typhaceae
Queen Anne's lace	<i>Daucus carota</i>	Umbelliferae
blue vervain	<i>Verbena hastata</i>	Verbenaceae

Shrubs

Common Name	Scientific Name	Family
smooth sumac	<i>Rhus Glabra</i>	Anacardiaceae
deciduous leaved holly	<i>Ilex decidua</i>	Aquifoliaceae
winterberry	<i>Ilex verticillata</i>	Aquifoliaceae
Japanese barberry	<i>Berberis thunbergii</i>	Berberidaceae
common elderberry	<i>Sambucus canadensis</i>	Caprifoliaceae
maple-leafed viburnum	<i>Viburnum acerfolium</i>	Caprifoliaceae
arrowwood	<i>Viburnum dentatum</i>	Caprifoliaceae
nannyberry	<i>Viburnum lentago</i>	Caprifoliaceae
black haw	<i>Viburnum prunifolium</i>	Caprifoliaceae
winged Euonymus	<i>Euonumus sp.</i>	Celastraceae
silky dogwood	<i>Cornus amomum</i>	Cornaceae
panicled dogwood	<i>Cornus racemosa</i>	Cornaceae
red-osier dogwood	<i>Cornus sericea</i>	Cornaceae
black huckleberry	<i>Gaylussacia bacatta</i>	Ericaceae
maleberry	<i>Lyonia ligustrina</i>	Ericaceae
highbush blueberry	<i>Vaccinium corymbosum</i>	Ericaceae
spicebush	<i>Lindera benzoin</i>	Lauraceae
bayberry (northern)	<i>Myrica pennsylvanica</i>	Myricaceae
autumn olive	<i>Elaegnus umbellata</i>	Oleaceae
shadbush	<i>Amerlanchier arborea</i>	Rosaceae
hawthorn	<i>Crategus sp.</i>	Rosaceae

Common Name	Scientific Name	Family
red chokeberry	<i>Pyrus arbutifolia</i>	Rosaceae
American crabapple	<i>Pyrus coronaria</i>	Rosaceae
crabapple	<i>Pyrus sp.</i>	Rosaceae
multiflora rose	<i>Rosa multiflora</i>	Rosaceae
swamp rose	<i>Rosa palustris</i>	Swamp Rose
Virginia rose	<i>Rosa virginiana</i>	Rosaceae
common blackberry	<i>Rubus allegheniensis</i>	Rosaceae
dewberry	<i>Rubus flagellaris</i>	Rosaceae
blackberry	<i>Rubus</i>	Rosaceae

Trees

Common Name	Scientific Name	Family
Norway maple	<i>Acer platanoides</i>	Aceraceae
red maple	<i>Acer rubrum</i>	Aceraceae
winged sumac	<i>Rhus copallina</i>	Anacardiaceae
staghorn sumac	<i>Rhus typhina</i>	Anacardiaceae
river birch	<i>Betula nigra</i>	Betulaceae
grey birch	<i>Betula populifolia</i>	Betulaceae
honey locust	<i>Gleditsia triacanthos</i>	Caesalpiniaceae
flowering dogwood	<i>Cornus florida</i>	Cornaceae
eastern red cedar	<i>Juniperus virginiana</i>	Cupressaceae
persimmon	<i>Diospyros virginiana</i>	Ebenaceae
black locust	<i>Robinia pseudoacacia</i>	Fabaceae
American beech	<i>Fagus grandifolia</i>	Fagaceae
white oak	<i>Quercus alba</i>	Fagaceae
swamp white oak	<i>Quercus bicolor</i>	Fagaceae
scarlet oak	<i>Quercus coccinea</i>	Fagaceae
pin oak	<i>Quercus palustris</i>	Fagaceae
black oak	<i>Quercus velutina</i>	Fagaceae
sweet gum	<i>Liquidambar styraciflua</i>	Hamamelidaceae
shagbark hickory	<i>Carya ovata</i>	Juglandaceae
mockernut hickory	<i>Carya tomentosa</i>	Juglandaceae
sassafras	<i>Sassafras albidum</i>	Laueaceae
tulip poplar	<i>Liriodendron tulipifera</i>	Magnoliaceae
white ash	<i>Fraxinum americana</i>	Oleaceae
green ash	<i>Fraxinus pennsylvanica</i>	Oleaceae
plane tree	<i>Platanus sp.</i>	Platanaceae
common buckthorn	<i>Rhamnus cathartica</i>	Rhamnaceae
princess tree	<i>Paulownia tomentosa</i>	Rhamnaceae
apple	<i>Malus sp.</i>	Rosaceae
black cherry	<i>Prunus serotina</i>	Rosaceae
big-toothed aspen	<i>Populus grandidentata</i>	Salicaceae
poplar, small toothed	<i>Populus sp.</i>	Salicaceae
weeping willow	<i>Salix babylonica</i>	Salicaceae

Common Name	Scientific Name	Family
black willow	<i>Salix nigra</i>	Salicaceae
willow	<i>Salix sp.</i>	Salicaceae
American elm	<i>Ulmus americana</i>	Ulmaceae
slippery elm	<i>Ulmus rubra</i>	Ulmaceae

Vines

Common Name	Scientific Name	Family
poison Ivy	<i>Toxicodendron radicans</i>	Anacardiaceae
Japanese honeysuckle	<i>Lonicera japonica</i>	Caprifoliaceae
morrow's honeysuckle	<i>Lonicera morrowii</i>	Caprifoliaceae
asiatic bittersweet	<i>Celastrus orbiculatus</i>	Celastraceae
ivy-leaved morning glory	<i>Ipomoea heteracea (I.nil)</i>	Convolvulaceae
small white morning glory	<i>Ipomoea lacunosa</i>	Convolvulaceae
common morning glory	<i>Ipomoea purpurea</i>	Convolvulaceae
common greenbrier	<i>Smilax rotundifolia</i>	Liliaceae
Virginia creeper	<i>Parthenocissus quinquefolia</i>	Vitaceae
grape	<i>Vitis sp.</i>	Vitaceae
fox grape	<i>Vitus labrusca</i>	Vitaceae

Algae

Common Name	Scientific Name	Family
stonewort (Green Alga)	<i>Nitella sp.</i>	Anacardiaceae

Fungi

Common Name	Scientific Name	Family
fly agaric	<i>Amanita muscaria</i>	Amanitaceae
webcap	<i>Cortinarius sp.</i>	Cortinariaceae
pinkgill	<i>Entoloma sp.</i>	Entolomataceae
waxycap	<i>Hygrophorus sp.</i>	Hygrophoraceae
puffball	<i>Bovista pila</i>	Lycoperdacea
vase puffball	<i>Calvatia cyathiformis</i>	Lycoperdacea
aastern stinkhorn	<i>Phallus ravenelii</i>	Phallaceae
turkeytail	<i>Coriolus versicolor</i>	Polyporaceae
coincap	<i>Collybia sp.</i>	Tricholomataceae
amethyst tallowgill	<i>Laccaria amethystina</i>	Tricholomataceae
deceiver	<i>Laccaria lacata</i>	Tricholomataceae

Birds

Common Name	Scientific Name	Family
great blue heron	<i>Ardea herodias</i>	Ardeidae
snow goose	<i>Chen caerulescens</i>	Anatidae
Canada goose	<i>Branta canadensis</i>	Anatidae

Common Name	Scientific Name	Family
mute swan	<i>Cygnus olor</i>	Anatidae
wood duck	<i>Aix sponsa</i>	Anatidae
black vulture	<i>Coragyps atratus</i>	Cathartidae
turkey vulture	<i>Cathartes aura</i>	Cathartidae
osprey	<i>Pandion haliaetus</i>	Accipitridae
northern harrier	<i>Circus cyaneus</i>	Accipitridae
sharp-shinned hawk	<i>Accipiter striatus</i>	Accipitridae
cooper's hawk	<i>Accipiter cooperii</i>	Accipitridae
broad-winged hawk	<i>Buteo platypterus</i>	Accipitridae
red-tailed hawk	<i>Buteo jamaicensis</i>	Accipitridae
rough-legged hawk	<i>Buteo lagopus</i>	Accipitridae
American kestrel	<i>Falco sparverius</i>	Falconidae
peregrine falcon	<i>Falco peregrinus</i>	Falconidae
ring-necked pheasant	<i>Phasianus colchicus</i>	Phasianidae
northern bobwhite	<i>Colinus virginianus</i>	Phasianidae
wild turkey	<i>Meleagris gallopavo</i>	Meleagrididae
Virginia rail	<i>Rallus limicola</i>	Rallidae
killdeer	<i>Charadrius vociferus</i>	Charadriidae
ring-billed gull	<i>Larus delawarensis</i>	Laridae
herring gull	<i>Larus argentatus</i>	Laridae
rock dove	<i>Columba livia</i>	Columbidae
mourning dove	<i>Zenaida macroura</i>	Columbidae
black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	Cuculidae
eastern screech-owl	<i>Otus asio</i>	Strigidae
great horned owl	<i>Bubo virginianus</i>	Strigidae
common nighthawk	<i>Chordeiles minor</i>	Caprimulgidae
chimney swift	<i>Chaetura pelagica</i>	Apodidae
ruby-throated hummingbird	<i>Archilochus colubris</i>	Trochilidae
red-bellied woodpecker	<i>Melanerpes carolinus</i>	Picidae
downy woodpecker	<i>Picoides pubescens</i>	Picidae
hairy woodpecker	<i>Picoides villosus</i>	Picidae
northern flicker	<i>Colaptes auratus</i>	Picidae
eastern wood-pewee	<i>Contopus virens</i>	Tyrannidae
willow flycatcher	<i>Empidonax traillii</i>	Tyrannidae
eastern phoebe	<i>Sayornis phoebe</i>	Tyrannidae
great crested flycatcher	<i>Myiarchus crinitus</i>	Tyrannidae
eastern kingbird	<i>Tyrannus tyrannus</i>	Tyrannidae
northern shrike	<i>Lanius excubitor</i>	Laniidae
white-eyed vireo	<i>Vireo griseus</i>	Vireonidae
yellow-throated vireo	<i>Vireo-throated Vireo</i>	Vireonidae
red-eyed vireo	<i>Vireo olivaceus</i>	Vireonidae
blue jay	<i>Cyanocitta cristata</i>	Corvidae
American crow	<i>Corvus brachyrhynchos</i>	Corvidae
fish crow	<i>Corvus ossifragus</i>	Corvidae

Common Name	Scientific Name	Family
purple martin	<i>Progne subis</i>	Hirundinidae
tree swallow	<i>Tachycineta bicolor</i>	Hirundinidae
barn swallow	<i>Hirundo rustica</i>	Hirundinidae
carolina chickadee	<i>Parus carolinensis</i>	Paridae
black-capped chickadee	<i>Parus atricapillus</i>	Paridae
tufted titmouse	<i>Parus bicolor</i>	Paridae
red-breasted nuthatch	<i>Sitta canadensis</i>	Sittidae
white-breasted nuthatch	<i>Sitta carolinensis</i>	Sittidae
Carolina wren	<i>Thryothorus ludovicianus</i>	Troglodytidae
house wren	<i>Troglodytes aedon</i>	Troglodytidae
golden-crowned kinglet	<i>Regulus satrapa</i>	Sylviidae
blue-gray gnatcatcher	<i>Polioptila caerulea</i>	Sylviidae
eastern bluebird	<i>Sialia sialis</i>	Turdidae
veery	<i>Catharus fuscescens</i>	Turdidae
wood thrush	<i>Hylocichla mustelina</i>	Turdidae
American robin	<i>Turdus migratorius</i>	Turdidae
European starling	<i>Sturnus vulgaris</i>	Sturnidae
gray catbird	<i>Dumetella carolinensis</i>	Mimidae
northern mockingbird	<i>Mimus polyglottos</i>	Mimidae
brown thrasher	<i>Toxostoma rufum</i>	Mimidae
cedar waxwing	<i>Bombycilla cedrorum</i>	Bombycillidae
blue winged warbler	<i>Vermivora pinus</i>	Parulidae
yellow warbler	<i>Dendroica petechia</i>	Parulidae
chestnut-sided warbler	<i>Dendroica pennsylvanica</i>	Parulidae
magnolia warbler	<i>Dendroica magnolia</i>	Parulidae
yellow-rumped warbler	<i>Dendroica coronata</i>	Parulidae
palm warbler	<i>Dendroica palmarum</i>	Parulidae
blackpoll warbler	<i>Dendroica striata</i>	Parulidae
black-and-white warbler	<i>Mniotilta varia</i>	Parulidae
American redstart	<i>Setophaga ruticilla</i>	Parulidae
ovenbird	<i>Seiurus aurocapillus</i>	Parulidae
common yellowthroat	<i>Geothlypis trichas</i>	Parulidae
Wilson's warbler	<i>Wilsonia pusilla</i>	Parulidae
scarlet tanager	<i>Piranga olivacea</i>	Thraupidae
rufous-sided towhee	<i>Pipilo erthrophthalmus</i>	Fringillidae
chipping sparrow	<i>Spizella passerina</i>	Fringillidae
field sparrow	<i>Spizella pusilla</i>	Fringillidae
savannah sparrow	<i>Passerculus sandwichensis</i>	Fringillidae
grasshopper sparrow	<i>Ammodramus savannarum</i>	Fringillidae
song sparrow	<i>Melospiza melodia</i>	Fringillidae
swamp sparrow	<i>Melospiza georgiana</i>	Fringillidae
white-throated sparrow	<i>Zonotrichia albicollis</i>	Fringillidae
dark-eyed junco	<i>Junco hyemalis</i>	Fringillidae
northern cardinal	<i>Cardinalis cardinalis</i>	Fringillidae

Common Name	Scientific Name	Family
rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	Fringillidae
indigo bunting	<i>Passerina cyanea</i>	Fringillidae
purple finch	<i>Carpodacus purpureus</i>	Fringillidae
house finch	<i>Carpodacus mexicanus</i>	Fringillidae
American goldfinch	<i>Carduelis tristis</i>	Fringillidae
bobolink	<i>Dolichonyx oryzivorus</i>	Icteridae
red-winged blackbird	<i>Agelaius phoeniceus</i>	Icteridae
eastern meadowlark	<i>Sturnella magna</i>	Icteridae
common grackle	<i>Quiscalus quiscula</i>	Icteridae
brown-headed cowbird	<i>Molothrus ater</i>	Icteridae
orchard oriole	<i>Icterus spurius</i>	Icteridae
northern oriole	<i>Icterus galbula</i>	Icteridae
house sparrow	<i>Passer domesticus</i>	Ploceidae

Vertebrates (Excluding Birds)

Common Name	Scientific Name	Family
bluegill sunfish	<i>Lepomis macrochirus</i>	Centarchidae
northern spring peeper	<i>Pseudacris crucifer</i>	Hylidae
bullfrog	<i>Rana catesbeiana</i>	Ranidae
green frog	<i>Rana clamitans melanota</i>	Ranidae
pickerel frog	<i>Rana palustris</i>	Ranidae
northern two-lined salamander	<i>Eurycea b. bislineata</i>	Plethodontidae
redback salamander	<i>Plethodon cinereus</i>	Plethodontidae
eastern garter snake	<i>Thamnophis s. sirtalis</i>	Colubridae
eastern milk snake	<i>Lampropeltis t. triangulum</i>	Colubridae
northern black racer	<i>Coluber c. constrictor</i>	Colubridae
common snapping turtle	<i>Chelydra s. serpentina</i>	Chelydridae
eastern box turtle	<i>Tarrapene c. carolina</i>	Emydidae
eastern painted turtle	<i>Chrysemys p. picta</i>	Emydidae
spotted turtle	<i>Clemmys guttata</i>	Emydidae
wood turtle	<i>Clemmys insculpta</i>	Emydidae
eastern cottontail rabbit	<i>Sylvilagus floridanus</i>	Leporidae
gray squirrel	<i>Sciurus carolinensis</i>	Sciuridae
groundhog	<i>Marmota monax</i>	Sciuridae
meadow vole	<i>Microtus pennsylvanicus</i>	Cricetidae
white-footed mouse	<i>Peromyscus leucopus</i>	Cricetidae
raccoon	<i>Procyon lotor</i>	Procyonidae
coyote	<i>Canis latrans</i>	Canidae
red fox	<i>Vulpes fulva</i>	Canidae
house cat	<i>Felis catus</i>	Felidae
white-tail deer	<i>Odocoileus virginianus</i>	Cervidae
bat	<i>Chiroptera</i>	Vespertilionidae
northern short-tailed shrew	<i>Blarina brevicauda</i>	Soricidae
eastern mole	<i>Scalopus aquaticus</i>	Talpidae

Moths

Common Name	Scientific Name	Family
hummingbird clearwing	<i>Hemaris thysbe</i>	Sphingidae
luna moth	<i>Actius luna</i>	Saturniidae
long-winged dagger moth	<i>Acronicta longa</i>	Noctuidae
epsilon dart	<i>Agrotis epsilon</i>	Noctuidae
copper underwing	<i>Amphipyra pyramidiodes</i>	Noctuidae
green cutworm moth	<i>Anicla infecta</i>	Noctuidae
velvetbean caterpillar moth	<i>Anticarsia gemmatalis</i>	Noctuidae
clover looper moth (female)	<i>Caenurgina crassiuscula</i>	Noctuidae
forage looper moth	<i>Caenurgina erechtea</i>	Noctuidae
girlfriend underwing	<i>Catocala amica</i>	Noctuidae
gaceful underwing	<i>Catocala gracilis</i>	Noctuidae
woody underwing	<i>Catocala grynea</i>	Noctuidae
the little wife	<i>Catocala muliercula</i>	Noctuidae
the bride	<i>Catocala neogama</i>	Noctuidae
residua underwing	<i>Catocala residua</i>	Noctuidae
ultronia underwing	<i>Catocala ultronia</i>	Noctuidae
snowy dart	<i>Euagrotis illapsa</i>	Noctuidae
common idia	<i>Idia aemula</i>	Noctuidae
American idia	<i>Idia americalis</i>	Noctuidae
glossy black idia	<i>Idia lubricalis</i>	Noctuidae
ursula wainscot	<i>Leucania ursula</i>	Noctuidae
roadside sawfly	<i>Metaxaglaea viatica</i>	Noctuidae
maple looper moth	<i>Parallelia bistriaris</i>	Noctuidae
armyworm moth	<i>Pseudaletia unipuncta</i>	Noctuidae
the herald	<i>Scoliopteryx libatrix</i>	Noctuidae
variable sawfly	<i>Sericaglaea signata</i>	Noctuidae
yellow-striped armyworm moth	<i>Spodoptera ornithogalli</i>	Noctuidae
fall armyworm moth	<i>Spodoptera frugiperda</i>	Noctuidae
lesser or greater black letter dart	<i>Xestia adela</i> or <i>X. dolosa</i>	Noctuidae
paal-banded dart	<i>Xestia badinodis</i>	Noctuidae
horrid underwing (horrid zale)	<i>Zale horrida</i>	Noctuidae
lunate zale	<i>Zale lunata</i>	Noctuidae
brown-shaded gray	<i>Anacamptodes defectaria</i>	Geometridae
grape leafroller moth	<i>Desmia funeralis</i>	Pyralidae

Butterflies

Common Name	Scientific Name	Family
eastern black swallowtail	<i>Papilio polyxenes</i>	Papilionidae
eastern tiger Swallowtail	<i>Pterourus glaucus</i>	Papilionidae
spicebush swallowtail	<i>Pterourus troilus</i>	Papilionidae
cabbage white	<i>Artogeia rapae</i>	Pieridae
clouded sulfur	<i>Colias philodice</i>	Pieridae

Common Name	Scientific Name	Family
orange sulfur	<i>Colias eurytheme</i>	Pieridae
spring azure	<i>Celestrina ladon</i>	Lycaenidae
summer azure	<i>Celestrina neglecta</i>	Lycaenidae
eastern tailed blue	<i>Everes comyntas</i>	Lycaenidae
buckeye	<i>Junonia coenia</i>	Nymphalidae
mourning cloak	<i>Nymphalis antiopa</i>	Nymphalidae
pearl crescent	<i>Phyciodes tharos</i>	Nymphalidae
question mark	<i>Polygonia interrogationis</i>	Nymphalidae
great spangled fritillary	<i>Speyeria cybele</i>	Nymphalidae
American painted lady	<i>Vanessa virginiensis</i>	Nymphalidae
red admiral	<i>Vanessa atalanta</i>	Nymphalidae
red-spotted purple	<i>Basilarchia astyanax</i>	Nymphalidae
viceroys	<i>Basilarchia archippus</i>	Nymphalidae
common wood nymph	<i>Cercyonis pegala</i>	Satyridae
little wood satyr	<i>Megisto cymela</i>	Satyridae
monarch	<i>Danaus plexippus</i>	Danaiidae
silver-spotted skipper	<i>Epargyreus clarus</i>	Hesperiidae
juvenal's duskywing	<i>Erynnis juvenalis</i>	Hesperiidae
least skipper	<i>Ancyloxypha numitor</i>	Hesperiidae
dun skipper	<i>Euphyes ruricola</i>	Hesperiidae
peck's skipper	<i>Polites peckius</i>	Hesperiidae
little glassy-wing	<i>Pompeius verna</i>	Hesperiidae
European skipper	<i>Thymelicus lineola</i>	Hesperiidae

Insects

Common Name	Scientific Name	Family
six-spotted green tiger beetle	<i>Cicindela sexgutta</i>	Cicindelidae
black-winged damselfly	<i>Calopteryx maculata</i>	Calopterygidae
white-tail dragonfly	<i>Plathemis lydia</i>	Libellulidae
skimmer species	<i>Varies</i>	Libellulidae
praying mantis	<i>Mantis religiosa</i>	Mantidae

Source: Adapted from Biological Survey of the "Pole Farm," The Washington Crossing Audubon Society, January 1999.

Plants and Animals of Shipetauken Woods

Birds

Common Name	Scientific Name
Canada goose	<i>Branta canadensis</i>
Mallard	<i>Anas platyrhynchos</i>
Turkey Vulture	<i>Cathartes aura</i>
Red tailed hawk	<i>Buteo jamaicensis</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Bobwhite	<i>Colinus virginianus</i>
Ring billed gull	<i>Larus delawarensis</i>
Mourning dove	<i>Zenaida macroura</i>
Northern flicker	<i>Colaptes auratus</i>
Red-bellied woodpecker	<i>Centurus carolinus</i>
Downy woodpecker	<i>Picoides pubescens</i>
Hairy woodpecker	<i>Picoides villosus</i>
Eastern wood pewee	<i>Contopus virens</i>
Acadian flycatcher	<i>Empidonax virescens</i>
Barn swallow	<i>Hirundo rustica</i>
Blue jay	<i>Cyanocitta cristata</i>
American crow	<i>Corvus brachyrhynchos</i>
Carolina chickadee	<i>Parus carolinensis</i>
Tufted titmouse	<i>Parus bicolor</i>
White-breasted nuthatch	<i>Sitta carolinensis</i>
House wren	<i>Troglodytes aedon</i>
Carolina wren	<i>Thryothorus ludovicianus</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>
Eastern bluebird	<i>Sialia sialis</i>
American robin	<i>Turdus migratorius</i>
Swainson's thrush	<i>Catharus ustulatus</i>
Wood thrush	<i>Hylocichla mustelina</i>
Nothern mockingbird	<i>Mimus polyglottos</i>
European starling	<i>Sturnus vulgaris</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Prairie warbler	<i>Dendroica discolor</i>
Black and white warbler	<i>Mniotilta varia</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Northern parula	<i>Parula americana</i>
Black-throated green warbler	<i>Dendroica virens</i>

Common Name	Scientific Name
Black-throated blue warbler	<i>Dendroica caerulescens</i>
Yellow warbler	<i>Dendroica petechia</i>
Yellow-rumped warbler	<i>Dendroica coronata</i>
Palm warbler	<i>Dendroica palmarum</i>
American redstart	<i>Setophaga ruticilla</i>
Scarlet tanager	<i>Piranga olivacea</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Eastern towhee	<i>Pipilo erythrophthalmus</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>
Song sparrow	<i>Melospiza melodia</i>
Chipping sparrow	<i>Spizella passerina</i>
Field sparrow	<i>Spizella pusilla</i>
Swamp sparrow	<i>Melospiza georgiana</i>
American tree sparrow	<i>Spizella arborea</i>
Northern oriole	<i>Icterus galbula</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Common grackle	<i>Quiscalus quiscula</i>
Brown-headed cowbird	<i>Molothrus ater</i>
American goldfinch	<i>Carduelis tristis</i>
Dark-eyed junco	<i>Junco hyemalis</i>

Trees

Common Name	Scientific Name	Habitat
Black locust	<i>Robinia pseudoacacia</i>	Forest edges and Field
Sweet gum	<i>Liquidambar styraciflua</i>	Field and Forest edge
American elm	<i>Ulmus americana</i>	Field and Forest edge
Red mulberry	<i>Morus rubra</i>	Field and Forest edge
Black cherry	<i>Prunus serotina</i>	Forest edge
Sassafras	<i>Sassafras albidum</i>	Forest edge
Autumn olive	<i>Elaeagnus umbellata</i>	Field
Witch hazel	<i>Hamamelis virginiana</i>	Forest
American beech	<i>Fagus grandifolia</i>	Forest
Bitternut hickory	<i>Carya cordiformis</i>	Forest
Black walnut	<i>Juglans nigra</i>	Forest edges
Umbrella magnolia	<i>Magnolia tripetala</i>	Forest
Flowering dogwood	<i>Cornus florida</i>	Forest
Fringe tree	<i>Chionanthus virginicus</i>	Forest
Hawthorn	<i>Crataegus sp.</i>	Forest
Ironwood	<i>Carpinus caroliniana</i>	Forest
Persimmon	<i>Diospyros virginiana</i>	Forest
Pignut hickory	<i>Carya glabra</i>	Forest
Pin oak	<i>Quercus palustris</i>	Forest
Eastern red cedar	<i>Juniperus virginiana</i>	Field
Red maple	<i>Acer rubrum</i>	Forest

Common Name	Scientific Name	Habitat
Red oak	<i>Quercus rubra</i>	Forest
Slippery elm	<i>Ulmus rubra</i>	Forest
Shagbark hickory	<i>Carya ovata</i>	Forest
Sugar maple	<i>Acer saccharum</i>	Forest
Tulip poplar	<i>Liriodendron tulipifera</i>	Forest
White ash	<i>Fraxinus americana</i>	Forest
White oak	<i>Quercus alba</i>	Forest
Catalpa	<i>Catalpa bignonioides</i>	Forest edge
Green ash	<i>Fraxinus pennsylvanica</i>	Forest
American beech	<i>Fagus grandifolia</i>	Forest

Shrubs and Vines

Common Name	Scientific Name	Habitat
Japanese honeysuckle	<i>Lonicera japonica</i>	Forest Edge
Pennsylvania blackberry	<i>Rubus pennsylvanica</i>	Forest Edge
Multiflora rose	<i>Rosa multiflora</i>	Forest edge, Field, and Forest
Virginia creeper	<i>Parthenocissus quinquefolia</i>	Forest edge and Forest
Staghorn sumac	<i>Rhus typhina</i>	Forest edge
Poison ivy	<i>Toxicodendron radicans</i>	Forest edge and Forest
Fox grape	<i>Vitis labrusca</i>	Forest edge
Amur honeysuckle	<i>Lonicera maackii</i>	Forest edge
Wineberry	<i>Rubus phoenicolasius</i>	Forest
Asiatic bittersweet	<i>Celastrus orbiculatus</i>	Forest
Spicebush	<i>Lindera benzoin</i>	Forest
Common greenberier	<i>Smilax rotundifolia</i>	Forest
Pinxter azalea	<i>Rhododendron canescens</i>	Forest
Japanese barberry	<i>Berberis thunbergii</i>	Forest
Maple-leaf viburnam	<i>Viburnum acerifolium</i>	Forest
Winged euonymus	<i>Euonymus alatus</i>	Forest
Northern arrowwood	<i>Viburnum recognitum</i>	Forest
Ibota privet	<i>Ligustrum obtusifolium</i>	Forest
Chokeberry	<i>Aronia sp.</i>	Forest
Elderberry	<i>Sambucus canadensis</i>	Forest

Herbs

Common Name	Scientific Name	Habitat
Mugwort	<i>Artemisia vulgares</i>	Field
Wintercress	<i>Barbarea vulgaris</i>	Field
Dandelion	<i>Taraxacum officinale</i>	Field
Common plantain	<i>Plantago major</i>	Field
Goldenrod	<i>Solidago sp.</i>	Field
Garlic mustard	<i>Alliaria officinalis</i>	Field and Forest
Yarrow	<i>Achillea millefolium</i>	Field

Common Name	Scientific Name	Habitat
Reed canary grass	<i>Phalaris arundinaceae</i>	Field
Common milkweed	<i>Asclepias syriaca</i>	Field
Sweet vernal grass	<i>Anthoxanthum odoratum</i>	Field
Little bluestem	<i>Schizachyrium scoparium</i>	Field
Curly dock	<i>Rumex crispus</i>	Field
Early buttercup	<i>Ranunculus fascicularis</i>	Field
Common blue violet	<i>Viola papilionacea</i>	Field and Forest
Indian strawberry	<i>Duchesnea indica</i>	Field
Indian hemp	<i>Apocynum cannabinum</i>	Field
Spotted touch-me-not	<i>Impatiens capensis</i>	Forest
Sensitive fern	<i>Onoclea sensibilis</i>	Forest
Jack-in-the-pulpit	<i>Arisaema atrorubens</i>	Forest
Mayapple	<i>Podophyllum peltatum</i>	Forest
Ladie's thumb	<i>Polygonum persicaria</i>	Forest
Spring beauty	<i>Claytonia virginica</i>	Forest
Spring cress	<i>Cardamine bulbosa</i>	Forest
Canada mayflower	<i>Maianthemum canadense</i>	Forest
Smooth Solomon's seal	<i>Polygonatum biflorum</i>	Forest
Skunk cabbage	<i>Symplocarpus foetidus</i>	Forest
Tussock sedge	<i>Carex stricta</i>	Forest
Trout lily	<i>Erythronium americanum</i>	Forest
Japanese stiltgrass	<i>Microstegium vimineum</i>	Forest
Wood reedgrass	<i>Cinna arundinacea</i>	Forest
Rough bedstraw	<i>Gallium asprellum</i>	Forest
Trout lily	<i>Erythronium umbilicatum</i>	Forest
Gill-over-the-ground	<i>Glechema hederacea</i>	Field
Rough avens	<i>Geum laciniatum</i>	Field
Orchard grass	<i>Dactylis glomerata</i>	Field
Fescue	<i>Festuca sp.</i>	Field
Lady fern	<i>Athyrium Filix-femina</i>	Forest
White clover	<i>Trifolium repens</i>	Field
Deptford pink	<i>Dianthus armeria</i>	Field
Oxeye daisy	<i>Chrysanthemum leucanthemum</i>	Field
Black medick	<i>Medicago lupulina</i>	Field
Carolina cranesbill	<i>Geranium carolinianum</i>	Field
White snakeroot	<i>Eupatorium rugosum</i>	Forest
Mild water pepper	<i>Polygonum hydropiper</i>	Forest
Halberd-leaved tearthumb	<i>Polygonum arifolium</i>	Forest
Honewort	<i>Cryptotaenia canadensis</i>	Forest
Bamboo	<i>Bambusa/Phyllostachys/Pseudosasa sp.</i>	Field

Source: Lawrence Township, August 2007

State Endangered and Threatened Species

Birds

Endangered		Threatened	
Common Name	Scientific Name	Common Name	Scientific Name
American Bittern	<i>Botaurus lentiginos</i>	bobolink	<i>Dolichonyx oryzivorus</i> BR
bald eagle	<i>Haliaeetus leucocephalus</i> BR **	bald eagle	<i>Haliaeetus leucocephalus</i> NB **
peregrine falcon	<i>Falco peregrinus</i>	Cooper's hawk	<i>Accipiter cooperii</i>
northern goshawk	<i>Accipiter gentilis</i> BR	red-shouldered hawk	<i>Buteo lineatus</i> NB
pie-billed grebe	<i>Podilymbus podiceps</i> **	black-crowned night-heron	<i>Nycticorax nycticorax</i> BR
northern harrier	<i>Circus cyaneus</i> BR	yellow-crowned night-heron	<i>Nyctanassa violaceus</i>
red-shouldered hawk	<i>Buteo lineatus</i> BR	red knot	<i>Calidris canutus</i> BR
short-eared owl	<i>Asio flammeus</i> BR	osprey	<i>Pandion haliaetus</i> BR
piping plover	<i>Charadrius melodus</i> **	barred owl	<i>Strix varia</i>
upland sandpiper	<i>Batramia longicauda</i>	long-eared owl	<i>Asio otus</i>
loggerhead shrike	<i>Lanius ludovicianus</i>	black rail	<i>Laterallus jamaicensis</i>
black skimmer	<i>Rynchops niger</i> BR	black skimmer	<i>Rynchops niger</i> NB
Henslow's sparrow	<i>Ammodramus henslowii</i>	grasshopper sparrow	<i>Ammodramus savannarum</i> BR
vesper sparrow	<i>Pooecetes gramineus</i> BR	Savannah sparrow	<i>Passerculus sandwichensis</i> BR
least tern	<i>Sterna antillarum</i>	vesper sparrow	<i>Pooecetes gramineus</i> NB
roseate tern	<i>Sterna dougallii</i> **	red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
sedge wren	<i>Cistothorus platensis</i>		

Reptiles

Endangered		Threatened	
Common Name	Scientific Name	Common Name	Scientific Name
timber rattlesnake	<i>Crotalus h. horridus</i>	northern pine snake	<i>Pituophis m. melanoleucus</i>
corn snake	<i>Elaphe g. guttata</i>	Atlantic green turtle **	<i>Chelonia mydas</i> **
queen snake	<i>Regina septemvittata</i>	wood turtle	<i>Glyptemys insculpta</i>
bog turtle**	<i>Glyptemys muhlenbergii</i> **		
Atlantic Hawksbill**	<i>Eretmochelys imbricata</i> **		
Atlantic Leatherback**	<i>Dermochelys coriacea</i> **		
Atlantic Loggerhead**	<i>Caretta caretta</i> **		
Atlantic Ridley**	<i>Lepidochelys kempi</i> **		

Amphibians

Endangered		Threatened	
Common Name	Scientific Name	Common Name	Scientific Name
blue-spotted salamander	<i>Ambystoma laterale</i>	eastern mud salamander	<i>Pseudotriton montanus</i>
eastern tiger salamander	<i>Ambystoma tigrinum</i>	long-tailed salamander	<i>Eurycea longicauda</i>
southern gray treefrog	<i>Hyla chrysocelis</i>	pine barrens treefrog	<i>Hyla andersonii</i>

Invertebrates

Endangered		Threatened	
Common Name	Scientific Name	Common Name	Scientific Name
American burying beetle**	<i>Nicrophorus americanus**</i>	robust baskettail (dragonfly)	<i>Epitheca spinosa</i>
northeastern beach tiger beetle**	<i>Cincindela d. dorsalis**</i>	banner clubtail (dragonfly)	<i>Gomphus apomyius</i>
bronze copper	<i>Lycaena hyllus</i>	harpoon clubtail (dragonfly)	<i>Gomphus desertus</i>
brook floater (mussel)	<i>Alasmidonta varicosa</i>	frosted elfin (butterfly)	<i>Callophrys irus</i>
green floater (mussel)	<i>Lasmigona subviridis</i>	Kennedy's emerald (dragonfly)	<i>Somatochlora kennedyi</i>
gray petaltail (dragonfly)	<i>Tachopteryx thoreyi</i>	triangle floater (mussel)	<i>Alasmidonta undulata</i>
Mitchell's satyr (butterfly)**	<i>Neonympha m. mitchellii**</i>	silver-bordered fritillary (butterfly)	<i>Bolaria selene myrina</i>
arogos skipper (butterfly)	<i>Atrytone arogos arogos</i>	superb jewelwing (dragonfly)	<i>Calopteryx amata</i>
Appalachian grizzled skipper (butterfly)	<i>Pyrgus wyandot</i>	eastern lampmussel (mussel)	<i>Lampsilis radiata</i>
dwarf wedgemussel**	<i>Alasmidonta heterodon**</i>	yellow lampmussel (mussel)	<i>Lampsilis cariosa</i>
		tidewater mucket (mussel)	<i>Leptodea ochracea</i>
		eastern pondmussel (mussel)	<i>Ligumia nasuta</i>
		brook snaketail, (dragonfly)	<i>Ophiogomphus asperses</i>
		checkered white (butterfly)	<i>Pontia protodice</i>

Mammals

Endangered	
Common Name	Scientific Name
Indiana bat**	<i>Myotis sodalis**</i>
Bobcat	<i>Lynx rufus</i>
North Atlantic right whale**	<i>Eubalaena glacialis**</i>
blue whale**	<i>Balaenoptera musculus**</i>
fin whale**	<i>Balaenoptera physalus**</i>
humpback whale**	<i>Megaptera novaeangliae**</i>
sei whale**	<i>Balaenoptera borealis**</i>
sperm whale**	<i>Physeter macrocephalus**</i>
Allegheny woodrat	<i>Neotoma magister</i>

Fish

Endangered	
Common Name	Scientific Name
Atlantic sturgeon**	<i>Acipenser oxyrinchus oxyrinchus**</i>
shortnose sturgeon**	<i>Acipenser brevirostrum**</i>

Source: NJDEP, Division of Fish and Wildlife

**Federally endangered or threatened.

BR = Breeding population only; NB = non-breeding population only.

Rare Wildlife Species from Natural Heritage Database

Birds

Common Name	Scientific Name	Rank	State Protection Status	State Rank
American Kestrel	<i>Falco sparverius</i>	3	State Threatened	S2B,S2N
Bald Eagle	<i>Haliaeetus leucocephalus</i>	4	State Endangered	S1B,S2N
Barred Owl	<i>Strix varia</i>	3	State Threatened	S2B,S2N
Bobolink	<i>Dolichonyx oryzivorus</i>	3	State Threatened	S2B,S3N
Brown Thrasher	<i>Toxostoma rufum</i>	2	Special Concern	S3B,S4N
Cooper's Hawk	<i>Accipiter cooperii</i>	2	Special Concern	S3B,S4N
Eastern Meadowlark	<i>Sturnella magna</i>	2	Special Concern	S3B,S3N
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	3	State Threatened	S2B,S3N
Great Blue Heron	<i>Ardea herodias</i>	2	Special Concern	S3B,S4N
Long-eared Owl	<i>Asio otus</i>	3	State Threatened	S2B,S2N
Northern Harrier	<i>Circus cyaneus</i>	2	Special Concern	S1B,S3N
Vesper Sparrow	<i>Pooecetes gramineus</i>	4	State Endangered	S1B,S3N

Invertebrates

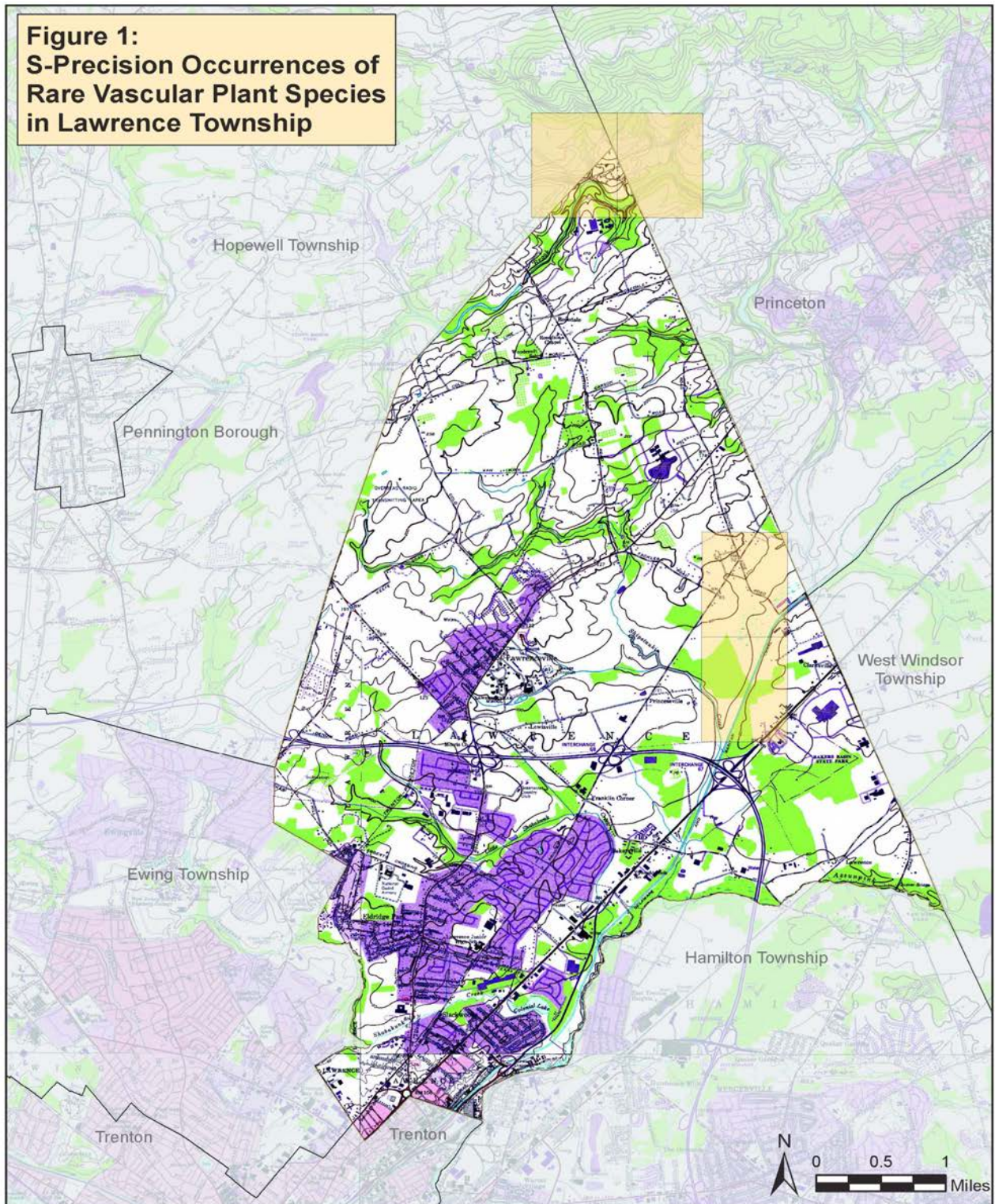
Common Name	Scientific Name	Rank	State Protection Status	State Rank	Last Observed
Brook Floater	<i>Alasmidonta varicosa</i>	4	State Endangered	S1	1992
Creeper	<i>Strophitus undulatus</i>	2	Special Concern	S3	2007
Eastern Pondmussel	<i>Ligumia nasuta</i>	3	State Threatened	S2	2007
Triangel Floater	<i>Alasmidonta undulata</i>	3	State Threatened	S2	1995

Source: NJDEP Natural Heritage Database, 2015

Rank	Description
	<i>Species-specific habitat patches that:</i>
1	Meet habitat-specific suitability requirements such as minimum size or core area criteria for endangered, threatened, or special concern wildlife species, but that do not intersect with any confirmed occurrences of such species.
2	Contain one or more occurrences of species considered to be species of special concern.
3	Contain one or more occurrences of state threatened species.
4	Contain one or more occurrences of state endangered species.
5	Contain one or more occurrences of wildlife listed as endangered and threatened pursuant to the Federal Endangered Species Act of 1973.

State Rank	
S1	Critically imperiled in New Jersey (>5 occurrences)
S2	Imperiled in New Jersey (6–20 occurrences)
S3	Rare in state (21–100 occurrences)
S4	Apparently secure in state
S5	Demonstrably secure in state
B	Refers to the breeding population of the element in the state
N	Refers to the nonbreeding population of the element in the state
NA	Data not available

Occurrences of Rare Vascular Plant Species



Source: NJDEP, 2015

Lawrence Township Historic Property Listings

Property Number	Property Location	Owner Address	Owner City/State	Zip	Owner
700	Trumbull Ave	700 Trumbull Ave	Lawrenceville, NJ	08648	Saretzky, Kathlinda & Gary D
18	Carnegie Rd	John Fitch Plaza	Trenton, NJ	08625	Dept of Environmental Protection
2167	Brunswick Ave	2167 Brunswick Ave	Lawrenceville, NJ	08648	O'Neal, Billy Joe Jr & Lauren
2083	Lawrence Rd	2083 Lawrence Rd	Lawrenceville, NJ	08648	Rider University
45	Pine Knoll Dr	45 Pine Knoll Rd	Lawrenceville, NJ	08648	Cloran, Michael E & Elyse M
2685	Princeton Pk	2685 Princeton Pk	Lawrenceville, NJ	08648	Nichols, J Randall
2681	Princeton Pk	2681 Princeton Pk	Lawrenceville, NJ	08648	Hutchison, John & Sheryl
301	Lawrence Stn Rd	301 Lawrence Station Rd	Lawrenceville, NJ	08648	Halcak, Carl
96	Denow Rd	96 Denow Rd	Lawrenceville, NJ	08648	Applegate, Robert Ux
100	Meadow Rd	2207 Lawrenceville Rd	Lawrenceville, NJ	08648	Township of Lawrence
3850	Princeton Pk	17 Elm St	Morristown, NJ	07960	Enterprise Holde Co
2467	Main St	2467 Main St	Lawrenceville, NJ	08648	Nictakis, Peter E Ux
2459	Main St	2459 Main St	Lawrenceville, NJ	08648	Tilton, Judith Ann & Emma H Tilton
2453	Main St	2453 Main St	Lawrenceville, NJ	08648	Hill, William C III
2449	Main St	49 Moran Ave	Princeton, NJ	08540	Somers, Elizabeth D
2431	Main St	620 Liberty Ave 19th Fl	Pittsburgh, PA	15222	Mdltc Bk C/O Pnc Rlty Sv P2ptpp03-4
1	Monroe Ave	1 Monroe Ave	Lawrenceville, NJ	08648	Naggar, J A & M K Klingenberg
2525	Main St	2525 Main St	Lawrenceville, NJ	08648	Pallotti, Michael & Darlene
2515	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2505	Main St	2505 Main St	Lawrenceville, NJ	08648	Brandt, Daniel J W & Jennifer H
2499	Main St	2499 Main St	Lawrenceville, NJ	08648	Hullfish, William R Ux
2489	Main St	2489 Main St	Lawrenceville, NJ	08648	Flanagan, Patricia C/O April
2475	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees Of Lawrenceville School
2565	Main St	2565 Main St	Lawrenceville, NJ	08648	Baker, Thomas & Carole
2557	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2549	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2535	Main St	2535 Main St	Lawrenceville, NJ	08648	Ultan, Susan D

Property Number	Property Location	Owner Address	Owner City/State	Zip	Owner
2571	Main St	2571 Main St	Lawrenceville, NJ	08648	Longhi, Gloria I
2611	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2581	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2579	Main St	2579 Main St	Lawrenceville, NJ	08648	Willis, Edward David & Ann C
2617	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2635	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2651	Main St	64 River Dr	Titusville, NJ	08560	Hinkle, Herbert D & Patricia A
2647	Main St	35 Nursery Rd	Titusville, NJ	08560	Vitella, Joseph A
2641	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2641	Main St	C/O A Wilson Hogate Hall	Lawrenceville, NJ	08648	Lawr Sq So Master Assoc, Lawr School
2627	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2621	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2673	Main St	226 Landis Ave - Acct Pyb	Vineland, NJ	08360	1st St Prop #41 Llc- Sun Nat'l Bank
2667	Main St	974 Lawrenceville Rd	Princeton, NJ	08540	Bearsnout Llc Co Chambers Walk Cafe
2665	Main St	31 Fresh Ponds Rd	East Brunswick, NJ	08816	Bailey, Lawrence etals
2663	Main St	31 Fresh Ponds Rd	East Brunswick, NJ	08816	Bailey, Lawrence etals
2659/ 2661	Main St	10 Benjamin Trail	Pennington, NJ	08534	Vitella, Joseph & Anthony
NO #	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2942	Main St	2942 Main St Rd 6	Lawrenceville, NJ	08648	Cranstoun, Winnifred
3020	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	The Lawrenceville School
3030	Lawrenceville Rd	3030 Lawrenceville Rd	Lawrenceville, NJ	08648	Dix, R M Jr & Xuan
3070	Lawr-Prin Rd	3070 Lawr-Prin Rd	Lawrenceville, NJ	08648	Thomas, Maria Isabel
3090	Lawr-Prin Rd	3090 Lawrenceville Rd	Lawrenceville, NJ	08648	Hoffmann, Agnes C
3200	Main St	974 Lawr-Princeton Rd	Princeton, NJ	08540	Cherry Grove Farm LLC
NO #	Lawr-Prin Rd	974 Lawr-Princeton Rd	Princeton, NJ	08540	Cherry Grove Farm LLC
2688	Main St	2688 Main St	Lawrenceville, NJ	08648	Lawrenceville Presbyterian Church
2	Lewisville Rd	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School

Property Number	Property Location	Owner Address	Owner City/State	Zip	Owner
2858	Main St	Box 6196	Lawrenceville, NJ	08648	Hill, Harry R Jr Et Ux
2868	Main St	2868 Main St	Lawrenceville, NJ	08648	Huston, John J Jr & Harriet
2898	Main St	2898 Main St	Lawrenceville, NJ	08648	Coffee, Dorothy
2805	Main St	2805 Main St	Lawrenceville, NJ	08648	Battle, Carolyn A
2801	Main St	108 Cypress Ct	Hammonton, NJ	08037	Kiss-Gross, Charitas
2797	Main St	14 Stratton Ct	Flemington, NJ	08822	Lloyd, Harry J
2793	Main St	2789 Main St	Lawrenceville, NJ	08648	Woolsey, H G Ux
2789	Main St	2789 Main St	Lawrenceville, NJ	08648	Heim, Charles G & Deborah J
2785	Main St	2785 Main St	Lawrenceville, NJ	08648	Maple, John U Et Ux
2779	Main St	P.O. Box 6126	Lawrenceville, NJ	08648	Trustees of Lawrenceville School
2775	Main St	2775 Main St	Lawrenceville, NJ	08648	Mc Call, David B Jr & Abigail S
2761	Main St	480 Wash-Cross Penn Rd	Titusville, NJ	08560	Brophy, Martin & Sandra
2739	Main St	2739 Main St	Lawrenceville, NJ	08648	Voliva, Richard L Jr & Marilyn M
2737	Main St	2737 Main St	Lawrenceville, NJ	08648	Allen, Raymond D Ux
2735	Main St	20 Bayard Ln	Princeton, NJ	08540	Peacock Inn Associates Inc
2727	Main St	2727 Main St	Lawrenceville, NJ	08648	Hassett, William A & Afton L
2721	Main St	2721 Main St	Lawrenceville, NJ	08648	Seitchik, Peter & Joan W
2719	Main St	2719 Main St	Lawrenceville, NJ	08648	Mott, Paul B Jr Ux
2711	Main St	2711 Main St	Lawrenceville, NJ	08648	Keuffel, Elizabeth R (Trust)
2705	Main St	2705 Main St	Lawrenceville, NJ	08648	Stack P.O.le, William Et Ux
2695	Main St	69 Farrand Rd	Princeton, NJ	08540	Huckel, Kirk D Et Ux
2691	Main St	7 Northfield Ct	Lawrenceville, NJ	08648	Hunt, Jonathan A & Mary E
2687	Main St	Box 6466	Lawrenceville, NJ	08648	Guldalian, Jack Etux
2685	Main St	35 Craven Ln	Lawrenceville, NJ	08648	Hullfish Real Estate Co , LLC
2681/ 2683	Main St	35 Craven Ln	Lawrenceville, NJ	08648	Hullfish Real Estate Co , LLC
100	Cold Soil Rd	P.O. Box 6494	Lawrenceville, NJ	08648	Seymour, Paul & Shelley & Prin U
2	Concord Ave	2 Concord Ave	Lawrenceville, NJ	08648	Tata, Suresh S & Nivedita S
12	Grandview Ave	12 Grandview Ave	Lawrenceville, NJ	08648	Frazee, Elizabeth L & T Mcnulty Iii
2	Edgewood Ave	2 Edgewood Ave	Lawrenceville, NJ	08648	Kerney, J Regan
3001	Lawr-Prin Rd	55 Green Ave	Lawrenceville, NJ	08648	Lawrenceville Cemetery - J Campbell
3011	Lawr-Prin Rd	3011 Lawrenceville Rd	Lawrenceville, NJ	08648	Morrison Richard & Willard Michelle
3031	Lawr-Prin Rd	3031 Lawr-Prin Rd	Lawrenceville, NJ	08648	Boisson, Jean B & Catrina L
3051	Lawrenceville Rd	3051 Lawrenceville Rd	Lawrenceville, NJ	08648	Perez, Francisco J

Property Number	Property Location	Owner Address	Owner City/State	Zip	Owner
3071	Lawr-Prin Rd	3071 Lawr-Prin Rd	Lawrenceville, NJ	08648	Crane, David Ux - Orchard Hill
3069	Lawrenceville Rd	3069 Lawrenceville Rd	Lawrenceville, NJ	08648	Jones, Jeanne M
3091	Lawr-Prin Rd	P.O. Box 7408	Princeton, NJ	08543	De Ravel D'esclaP.O.n, Rysia
17	Carter Rd	974 Lawrenceville Rd	Princeton, NJ	08540	The Hamill Family LP
1	Carter Rd	1 Carter Rd	Princeton, NJ	08540	Baus, Robert D & Maureen O'Malley
1	Shadowstone Ln	1 Shadowstone Ln	Lawrenceville, NJ	08648	Taylor, Frances X & Nancy
2837	Main St	2837 Main St	Lawrenceville, NJ	08648	Trainer, Robert W & S Victoria
2895	Main St	2895 Lawrenceville Rd	Lawrenceville, NJ	08648	Fichtner, Aaron R & Ciociola, Heather
2897	Main St	2897 Main St	Lawrenceville, NJ	08648	Caiazza, Cathianne
2909	Main St	2909 Main St	Lawrenceville, NJ	08648	Adamsky, Gregory P & Susanne M
2913	Main St	2913 Main St	Lawrenceville, NJ	08648	Chenoweth, Katharine A
2915	Main St	P.O. Box 6978	Lawrenceville, NJ	08648	Sallee, Eric Ux
2923	Main St	2923 Main St	Lawrenceville, NJ	08648	Mumby, Robert J
2931	Main St	2931 Main St	Lawrenceville, NJ	08648	Skovron, Mary Lou
2945	Main St	1 Concord Ave	Lawrenceville, NJ	08648	Chiardia, Ida Marie
3301	Lawr-Prin Rd	500 East 83rd St	New York, NY	10028	Pressel, Michael G & Janet
3271	Lawr-Prin Rd	3271 Lawr-Prin Rd	Princeton, NJ	08540	Johnston, Michael G Et Ux
3231	Lawr-Prin Rd	1327 Canal Rd	Princeton, NJ	08540	Delaware & Raritan Greenway
3641	Lawr-Prin Rd	411 Hackensack Ave 7th Fl	Hackensack, NJ	07601	L'ville Rlty Co - Straus Capital Gr
3461	Lawrenceville Rd	3461 Lawrenceville Rd	Princeton, NJ	08540	Waaben, Sigurd G Ux
3270	Lawr-Prin Rd	3270 Lawr-Prin Road	Princeton, NJ	08540	J R F Lawrence Inc
4419	Province Line Rd	4416 Province Line Rd	Princeton, NJ	08540	Dougherty, Patricia Paine
335	Cold Soil Rd	335 Cold Soil Rd	Princeton, NJ	08540	Sargent, Douglas Ux
265	Cold Soil Rd	P.O. Box 9269	Trenton, NJ	08650	Di Donato, E B -Mallard Prop Mgt Grp
210	Cold Soil Rd	210 Cold Soil Rd	Princeton, NJ	08540	Hautau, Janet M
3801	Lawr-Prin Rd	3801 Lawr-Prin Rd	Princeton, NJ	08540	Stokes, Marie Louise Et Vir
634	Rosedale Rd	634 Rosedale Rd	Princeton, NJ	08540	Lasley, Janet & Marc Brahaney
NO #	Meadow Rd	2207 Lawrenceville Rd	Lawrenceville, NJ	08648	Township of Lawrence

Source: Lawrence Township

Existing Wastewater Facilities and Service Area



NJDEP Required Notes:

Development in areas zoned as wetlands, flood prone areas, designated river areas, or other environmentally sensitive areas may be subject to special regulation under Federal or State statutes or rules. Interested persons should check with the Department of Environmental Protection for the latest information. Deposition of environmental features is for general information purposes only, and shall not be construed to define the legal geographic jurisdiction of such facilities or rules.

All existing, new, or expanded industrial pretreatment facilities requiring Significant Indirect user (SIIU) permits and/or Treatment works Approvals that are located within the designated sewer service area, are deemed to be considered.

Individual subsurface sewage disposal systems (ISSDS) for individual residences can only be constructed in designated sewer service areas if legally enforceable guarantees are provided, before such construction. The use of such systems will be discontinued when the designated sewer service becomes available. This applies to ISSDS that receive effluent from the designated sewer service under the Ready Improvement Sewerage and Facilities Act (R.I.S.F.A. 18-11-23) or individual Treatment Works Approval or New Sewer Facility Construction System Permit under N.J.A.C. 7:14A. It also applies to ISSDS which require only local approval. Compliance with the construction requirements has been demonstrated through adoption of local ordinances which require abandonment of the septic and connection to the sewer system once it becomes available. See Appendix F of County Ordinance.

Locations of future pump stations, major interceptors, and trunk sewers are being provided for general information only and will not appear on the final map for any future construction permit or permit reviews unless the pump station, major interceptor or trunk sewer is part of a State or locally funded project.

Pre-existing grant conditions and requirements from Federal and State grants or loans for sewerage facilities which provide for protection of sewer service to environmentally sensitive areas, are unaffected by changes of the WWP and compliance is required. Please see respective grant Chapters for the existence of any applicable environmentally sensitive areas in which Federal 2010 grant limitations prohibit the extension of sewer service.

Pursuant to N.J.A.C. 7:15, Riparian zones are 300 feet from top of bank (or centerline of a 100 foot wide stream where no bank is approved) for waters designated as Category One and all upstream tributaries within the same HUC 14, 150 feet for waters designated Trout Production and all upstream waters, 150 feet for water designated Trout Maintenance and all upstream waters within one lease mile measured along the length of the regulated water, 150 feet for any segments of water flowing through an area that contains designated habitat for a threatened or endangered species of plant or animal, which is tributary dependent on the surface water body for its survival, and all streams within one lease mile tributary within one lease mile as measured along the length of the surface water body, 150 feet for waters that are through non-point source, and 150 feet for all waters not designated as C1, trout waters, critically water dependent Threatened and/or Endangered Species Habitat, or associated with acid rock.

Surface waters that are designated Category One are listed in the Surface Water Quality Standards at N.J.A.C. 7:15B. The Department's "Surface Water Quality Standards" GIS data layer was utilized to determine these waters. The applicable 300 foot buffer has been applied to these waters and overlaid with the proposed sewer service areas. Waters with buffers have not been graphically removed from the sewer service area but are not proposed for sewer service. Jurisdictional determinations by the Department will be utilized to determine the extent of the sewer service area on individual lots.

Further compliance with the riparian zone standard has been demonstrated by the adoption of local ordinances in compliance with all or part of the Flood Hazard Control Act Rules (N.J.A.C. 7:15) and Water Quality Management Rules (N.J.A.C. 7:15B). See Appendix F of the County Summary.

DSW		
NJPDES	Facility Name	Permitted Flow (MGD)
NJ002768	BRETELAVERS SOURCE CO	0.14
NJ002479	EWING LAWRENCE SEWERAGE AUTH	16
NJ002210	ETS	0.06

DGW		
NJPDES	Facility Name	Permitted Flow (MGD)
NJ0023035	THE CHAPIN SCHOOL	no data

Lawrence Township
Map 2M. Existing Wastewater Facilities and Service Area
 June 2012 Revised February 5, 2013 August 26, 2013, October 3, 2013
 Mercer County

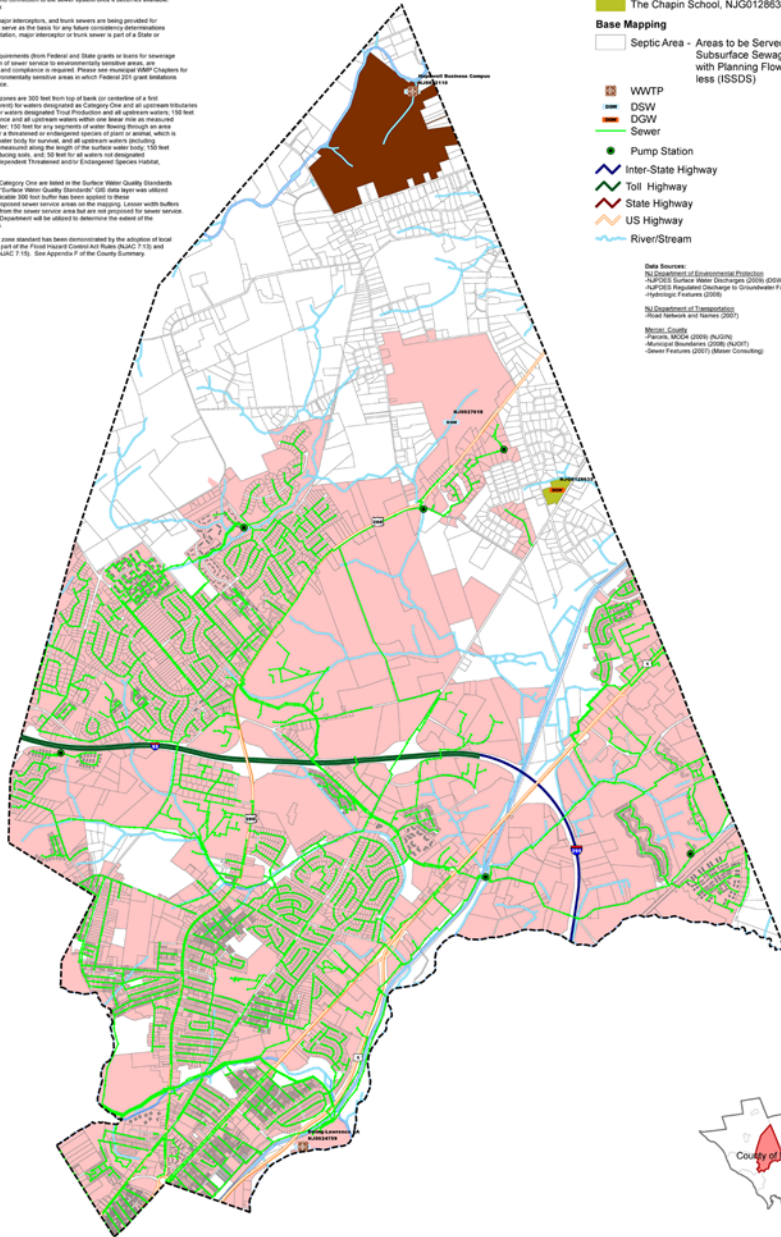
Existing Parcel Served by Sewer

- Facility Name, NJPDES
 - Ewing Lawrence Sewerage Authority, NJ0024759
 - Educational Testing Service, NJ0022110
 - The Chapin School, NJG0128635

Base Mapping

- Septic Area - Areas to be Served by Individual Subsurface Sewage Disposal Systems with Planning Flows 2000 GPD or less (ISSDS)
- WWTP
- DSW
- DGW
- Sewer
- Pump Station
- Inter-State Highway
- Toll Highway
- State Highway
- US Highway
- River/Stream

Data Sources:
 NJ Department of Environmental Protection
 -NJPDES Surface Water Discharge (2006) (DSW/WWTP)
 -NJPDES Regulated Discharge to Groundwater Facility (2007) (DGW)
 -Hazardous Features (2008)
 NJ Department of Transportation
 -State Routes and Turners (2007)
 Mercer County
 -Parcels, MCOA (2005) (PJUN)
 -Municipal Boundaries (2008) (MUNOT)
 -Sewer Features (2007) (Sewer Consulting)



Lawrence Township Open Space Listings

Farmland Preservation

OWNER	LOCATION	TYPE OF ACQUISITION	AREA
Chmiel	Cold Soil Rd	County Easement Purchase	12.57
Chmiel	Cold Soil Rd	County Easement Purchase	29.40
Bruce DiDonato	Cold Soil Rd	County Easement Purchase	83.56
Frank Lee and Penelope Hendrickson	Cold Soil Rd	County Easement Purchase	95.57
D and E Johnson	Van Kirk Rd	County Easement Purchase	65.34
Gary and Pam Mount	Cold Soil Rd	County Easement Purchase	52.36
Gary and Pam Mount	Van Kirk Rd	County Planning Incentive Grant	24.62
Princeton Research Lands	Cold Soil Rd	County Easement Purchase	65.66
Samuel M. Hamill, Jr.	Carter Rd	County Planning Incentive Grant	33.53
Township of Lawrence (GGR)	Carson Rd	County Fee	30.20
Subtotal			492.80

Government Owned Open Space

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
7	504	5	D & R Canal	NJDEP	D & R Canal	10.76
7	504	4	D & R Canal	Tax Agt Penn RR CO	D & R Canal	0.84
7	7101	1	D & R Canal	NJDEP	D & R Canal	1.07
7	7101	2	D & R Canal	NJDEP	D & R Canal	32.45
7	5201.1	5.01	D & R Canal	NJDEP	D & R Canal	4.76
7	5201	7	D & R Canal	NJDEP	D & R Canal	2.43
7	5201	6	D & R Canal	NJDEP	D & R Canal	6.17
7	5201	8	D & R Canal	NJDEP	D & R Canal	20.81
7	5201	1	D & R Canal	NJDEP	D & R Canal	8.43
7	5201	5.02	D & R Canal	NJDEP	D & R Canal	38.51
7	3901	5	D & R Canal	NJDEP	D & R Canal	8.17
7	3601	9	D & R Canal	NJDEP	D & R Canal	26.96
7	3601	21.02	D & R Canal	NJDEP	D & R Canal	1.34
7	3601	8	D & R Canal	NJDEP	D & R Canal	16.47
7	4001	42	D & R Canal	NJDEP	D & R Canal	2.12
7	4001	40	D & R Canal	NJDEP	D & R Canal	1.19
7	4001	28	D & R Canal	NJDEP	D & R Canal	8.46
7	4001	27	D & R Canal	NJDEP	D & R Canal	1.33

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
7	1202	5	D & R Canal	NJDEP	D & R Canal	45.77
7	1203	5	D & R Canal	NJDEP	D & R Canal	9.90
7	1202	1	D & R Canal	NJDEP	D & R Canal	36.95
7	1202	7	D & R Canal	NJDEP	D & R Canal	0.39
75	4201	30.03		NJDOT	Office Rd	2.28
76	4201	30.04		NJDOT	Grovers Mill Rd	5.00
77	4201	33.02		NJDOT	Grovers Mill Rd	5.46
78	4301	4	Mercer County Park	Mercer County	Quakerbridge Rd	13.14
78	4301	3	Mercer County Park	Mercer County	Quakerbridge Rd	20.63
78	4301	2	Mercer County Park	Mercer County	Quakerbridge Rd	5.93
78	4301	1	Mercer County Park	Mercer County	Quakerbridge Rd	11.66
96	5801	24	Gatterdam Park	Mercer County	Fackler Rd	76.44
101	6101	11	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	57.26
101	6101	12	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	6.99
101	6101	13	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	5.69
101	6101	14	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	22.30
101	6101	15	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	45.49
101	6101	1	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	10.38
101	6101	2	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	119.60
101	6101	3	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	13.89
101	6101	4	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	94.12
101	6101	6	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	5.97
101	6101	5	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	76.46
101	6101	8	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	17.13
101	6101	7	Mercer County NW Park	Mercer County	Cold Soil/Keefe Rd	17.84
122	7201	28	Mercer County Park	Mercer County	Blackwell Rd	46.06
127	7301	32		Mercer County	Jochris Dr	29.36
Subtotal						994.36

Privately Owned Open Space

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
1	302	31		Society Hill	Wittenborn Dr	9.01
9	801	41		Tiffany Woods	Seth Ct	1.17
10	902	2		Meadow Woods	U. S. Route 206	12.72
31	2101	40	Easement	Lawrence Township	U. S. Route 1	0.22
33	2207	12		QB Land Assoc.	Johnson Rd	0.30
35	2301	28		L'ville Housing Assoc.	Johnson Ave	25.52
47	2601	27	Lawrenceville Point	Lawrenceville Point HOA	Bunker Hill Rd	52.82
50	2701	26		First Property	Ketterer Ct	3.33

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
50	2701	26		First Property	Ketterer Ct	1.25
51	2701	32		Stewards Crossing	Ckside Ct	23.05
52	2701	41		Twin Meadows	Anthony Ln	0.82
53	2701	62		Federal Hill	Anthony Ln	12.72
54	2701	83		Federal Point	Federal Point Blvd	32.05
59	3004	1	Easement	Arora	Princeton Pk	1.44
61	3014	98		Woodmont	Morton Ct	7.40
61	3014	67		Woodmont	Morton Ct	1.24
61	3014	2		Woodmont	Morton Ct	1.29
61	3014	1		Woodmont	Morton Ct	2.73
65	3901	2	Easement	Lawrence Township	Princess Rd	5.73
66	3904	1		Gatherings OS	Princess Rd	1.60
66	3903	13		Gatherings OS	Princess Rd	13.10
66	3905	1		Gatherings OS	Princess Rd	1.00
66	3901	13		Gatherings OS	Princess Rd	21.65
67	3902	1		Eagles Chase	Eagles Chase Dr	16.34
70	4103	12		LS.V. -1 & II	Assunpink Ck	37.39
70	4104	15		LS.V. -1 & II	Mendrey Ct	27.51
70	4104	1		LS.V. -1 & II	Kite Ct	30.25
71	4201	10.01.1		Liberty Green	Lawrence Sta. Rd	77.66
72	4201	10		Avalon Run	Town Run	19.03
72	4201	11		Avaton Run	Avalon Way	69.68
72	4201	10.02.1		Avalon Run	Town Run	28.74
74	4201	28	Easement	PSE&G	U. S. Route 1	35.78
79	4403	9		Klockner Farms	Spring Beauty Dr	0.79
79	4404	9		Klockner Farms	Klockner Ct	4.79
83	5101	18	Easement	Princeton Pk Park	Lenox Dr	2.87
83	5101	18	Easement	Princeton Pk Park	Lenox Dr	5.18
83	5101	18	Easement	Princeton Pk Park	Lenox Dr	4.09
84	5201	1		Yorkshire Village	Port Mercer Rd	7.59
84	5202	2		Yorkshire village	Port Mercer Rd	3.88
84	5202	1		Yorkshire Village	Port Mercer Rd	2.71
84	5202	3		Yorkshire Village	Port Mercer Rd	6.40
84	5201	1		Yorkshire Village	Port Mercer Rd	6.34
84	5202	49		Yorkshire Village	Canal View Dr	5.87
84	5202	1		Yorkshire Village	Canal View Dr	65.40
84	5202	42		Yorkshire Village	Canal View Dr	3.02
85	5301	25		Ridings	Coach Dr	15.40
86	5301	9		Lawr. Crossing	Dayna Ct	1.43
86	5301	9		Lawr. Crossing	Dayna Ct	2.34
87	5401	111		Sturwood Hamlet	Denow Rd	16.16
87	5401	109		Sturwood Hamlet	Wexford Dr	22.87

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
88	5401	119		Denow Associates	Schindler Ct	7.08
89	5401	120.01.2		Evans	Federal City Rd	1.18
90	5401	125		Logan Square	Eric Ct	0.57
93	5710	3		Stonerise	Gordon Ave	0.61
93	5710	1		Stonerise	Gordon Ave	1.25
93	5703	1		Stonerise	Gordon Ave	3.57
93	6301	82		Stonerise	Gordon Ave	0.95
93	6301	81		Stonerise	Gordon Ave	0.57
93	6301	78		Stonerise	Gordon Ave	0.19
93	6301	76		Stonerise	Gordon Ave	0.27
98	5901	6		Oakwood	Tamar Ct	0.35
99	6005	235		The Village	Yeger Dr	5.45
99	6005	239		The Village	Carver Pl	10.12
100	6006	1		Larken Assoc.	Yeger Dr	18.24
100	6007	2		Larken Assoc.	Yeger Dr	16.68
102	6201	6		Society Hill	Gordon Ave	32.46
102	6201	24		Society Hill	Gordon Ave	4.65
102	6201	25		Society Hill	Gordon Ave	10.76
102	6201	23		Society Hill	Gordon Ave	14.60
104	6201	7		Lawrencewood	Dix Ln	3.57
104	6201	7		Lawrencewood	Dix Ln	1.08
105	6401	12		Kingsbrook	Ashleigh Dr	64.88
105	6401	99		Kingsbrook	Cold Soil Rd	22.65
108	6501	119		Feldco	Bergen St	1.62
109	6501	120	Easement	Mills	Van Kirk Rd	2.05
110	6501	122	Easement	Hamill	Carter Rd	33.57
111	6703	1		Province Hill	Fackler Rd	5.80
111	6701	49		Province Hill	Fackler Rd	12.22
112	6703	2.01.2		Princeton Junior School	Fackler Rd	0.89
113	6801	1		Foxcroft	Foxcroft Dr	1.05
114	6901	5	Easement	Walson Farm	Princeton Pk	10.71
115	6901	17		Foxcroft	Bannister Dr	3.31
116	7001	3		Squires Runne	Buckingham Dr	17.74
117	7001	41		Holly Ridge	Tomlyn Dr	1.87
118	7001	5.01.1	Easement	Chapin School	Princeton Pk	0.67
119	7201	11		D&R Greenway Inc.	Poe Rd	10.99
119	7701	17		D&R Greenway Inc.	Poe Rd	16.90
119	7701	16		D&R Greenway Inc.	Poe Rd	6.22
120	7201	17	Easement	Transco	Cold Soil Rd	90.28
123	7201	31	Easement	S. T. Peterson	Carter Rd	3.81
123	7201	31	Easement	S. T. Peterson	Carter Rd	7.36
123	7201	31	Easement	S. T. Peterson	Carter Rd	2.14

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
126	7301	13		Toftrees	Toftrees Ct	4.06
131	7501	13	Easement	Rosedale Acres	Vista Dr	2.67
134	7601	10	Easement	Jasna Polana Golf	Province Line Rd	5.64
135	7802	1		D&R Greenway Inc.	Province Line Rd	3.26
Subtotal						1,218.23

Public Land Not Subject to Green Acres

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
2	501	39	Public Works Landfill	Lawrence Township	Ohio Ave	0.15
2	501	41	Public Works Landfill	Lawrence Township	Ohio Ave	0.50
2	501	19	Public Works Landfill	Lawrence Township	Ohio Ave	0.07
2	501	18	Public Works Landfill	Lawrence Township	Ohio Ave	0.06
2	501	17	Public Works Landfill	Lawrence Township	Ohio Ave	0.06
2	501	16	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	15	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	14	Public Works Landfill	Lawrence Township	Ohio Ave	0.07
2	501	13	Public Works Landfill	Lawrence Township	Ohio Ave	0.09
2	501	12	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	11	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	20	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	21	Public Works Landfill	Lawrence Township	Ohio Ave	0.06
2	501	22	Public Works Landfill	Lawrence Township	Ohio Ave	0.06
2	501	23	Public Works Landfill	Lawrence Township	Ohio Ave	0.07
2	501	24	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	25	Public Works Landfill	Lawrence Township	Ohio Ave	0.07
2	501	26	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	27	Public Works Landfill	Lawrence Township	Ohio Ave	0.07
2	501	28	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	29	Public Works Landfill	Lawrence Township	Ohio Ave	0.07
2	501	30	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	31	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	32	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	33	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	34	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	35	Public Works Landfill	Lawrence Township	Ohio Ave	0.07
2	501	36	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	37	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	38	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	10	Public Works Landfill	Lawrence Township	Ohio Ave	0.07
2	501	9	Public Works Landfill	Lawrence Township	Ohio Ave	0.08

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
2	501	8	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	7	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	6	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	5	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	4	Public Works Landfill	Lawrence Township	Ohio Ave	0.07
2	501	3	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	2	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
2	501	1	Public Works Landfill	Lawrence Township	Ohio Ave	0.08
4	502	19	Nash Park	Lawrence Township	Ohio Ave	3.82
4	502	38	Nash Park	Lawrence Township	Ohio Ave	0.28
4	502	18	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	17	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	16	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	15	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	14	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	13	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	12	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	11	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	10	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	9	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	8	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	7	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	6	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	5	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	4	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	3	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	20	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	21	Nash Park	Lawrence Township	Ohio Ave	0.11
4	502	22	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	23	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	24	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	25	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	26	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	27	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	28	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	29	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	30	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	31	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	32	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	33	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	34	Nash Park	Lawrence Township	Ohio Ave	0.08
4	502	35	Nash Park	Lawrence Township	Ohio Ave	0.09

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
4	502	36	Nash Park	Lawrence Township	Ohio Ave	0.09
4	502	37	Nash Park	Lawrence Township	Ohio Ave	0.09
5	503	26		Lawrence Township	Valley Forge Ave	0.12
5	503	16		Lawrence Township	Valley Forge Ave	0.08
5	503	18		Lawrence Township	Valley Forge Ave	0.07
5	503	17		Lawrence Township	Valley Forge Ave	0.07
5	503	15		Lawrence Township	Valley Forge Ave	0.42
5	503	19		Lawrence Township	Valley Forge Ave	0.12
5	503	20		Lawrence Township	Valley Forge Ave	0.12
5	503	21		Lawrence Township	Valley Forge Ave	0.12
5	503	22		Lawrence Township	Valley Forge Ave	0.11
5	503	23		Lawrence Township	Valley Forge Ave	0.11
5	503	24		Lawrence Township	Valley Forge Ave	0.12
5	503	25		Lawrence Township	Valley Forge Ave	0.11
6	504	2		Lawrence Township	Cherry Tree Ln	1.10
8	801	1	Project Freedom	Lawrence Township	U.S. Route 206	13.46
15	1301	42		Lawrence Township	Lawn Park Ave	0.33
16	1304	7		Lawrence Township	Lawn Park Ave	0.20
17	1306	36		Lawrence Township	Lawn Park Ave	0.04
17	1306	37		Lawrence Township	Lawn Park Ave	0.05
19	1314	4		Lawrence Township	Arcadia Ave	0.18
20	1316	78		Lawrence Township	Northbrook Ave	0.15
24	1502	28		Lawrence Township	Graf Ave	1502
24	1502	27		Lawrence Township	Graf Ave	0.05
24	1502	26		Lawrence Township	Graf Ave	0.51
25	1502	37		Lawrence Township	Princeton Pk	0.27
25	1502	36		Lawrence Township	Princeton Pk	0.21
26	1506	27		Lawrence Township	Lake Dr	0.09
26	1506	26		Lawrence Township	Lake Dr	0.07
26	1506	25		Lawrence Township	Lake Dr	0.09
29	2002	41		Lawrence Township	Harding Ave	0.06
37	2309	16		Lawrence Township	Johnson Ave	0.05
37	2309	15		Lawrence Township	Johnson Ave	0.03
37	2309	14		Lawrence Township	Johnson Ave	0.04
38	2312	98	OS-Drift Homes	Lawrence Township	Drift Ave	3.19
41	2324	3		Lawrence Township	Locust Ave	0.06
41	2324	2		Lawrence Township	Locust Ave	0.06
41	2324	1		Lawrence Township	Locust Ave	0.05
42	2326	15		Lawrence Township	Johnson Ave	0.05
42	2326	16		Lawrence Township	Johnson Ave	0.04
43	2401	15		Lawrence Township	Marlboro Rd	0.32
43	2401	14		Lawrence Township	Marlboro Rd	0.26

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
43	2401	13		Lawrence Township	Marlboro Rd	0.26
43	2401	12		Lawrence Township	Marlboro Rd	0.16
45	2403	11		Lawrence Township	Pilla & Marlboro Ave	0.25
45	2403	10		Lawrence Township	Pilla & Marlboro Ave	0.24
45	2403	9		Lawrence Township	Pilla & Marlboro Ave	0.24
45	2403	8		Lawrence Township	Pilla & Marlboro Ave	0.12
45	2403	7		Lawrence Township	Pilla & Marlboro Ave	0.12
45	2403	12		Lawrence Township	Pilla & Marlboro Ave	0.23
45	2403	13		Lawrence Township	Pilla & Marlboro Ave	0.11
45	2403	14		Lawrence Township	Pilla & Marlboro Ave	0.12
56	2902	12	Drainage	Lawrence Township	Berwyn Pl	0.47
57	2903	11	Drainage	Lawrence Township	Wayside Ln	0.33
58	2904	9	Drainage	Lawrence Township	Windwood Rd	0.34
62	3401	6	Basin	Lawrence Township	Darrah Ln	4.94
64	3507	69	Drainage	Lawrence Township	Franklin Corner Rd	0.46
68	4001	3	Vacant, wet	Lawrence Township	U. S. Route 1	4.97
69	4001	20	Public Works Facility	Lawrence Township	Bakers Basin Rd	10.88
69	4001	18	Public Works Facility	Lawrence Township	Bakers Basin Rd	5.08
69	4001	19	Public Works Facility	Lawrence Township	Bakers Basin Rd	4.97
73	4201	25		Lawrence Township	Lawrence Station Rd	4.34
80	4601	13		Lawrence Township	Denow Rd	5.18
80	4701	43	Basin	Lawrence Township	Melvina Dr	0.53
80	4701	42	Basin	Lawrence Township	Denow Rd	1.27
91	5401	130		Lawrence Township	Federal City Rd	2.90
92	5401	150		Lawrence Township	Winthrop Rd	3.42
94	5703	173		Lawrence Township	Valerie Ln	1.88
97	5801	26	Leaf Composting Facility	Lawrence Township	Princeton Pk	29.24
103	6401	13	Basin	Lawrence Township	Mark Cermele Ct	6.27
107	6501	5	Basin	Lawrence Township	Branchwood Ct	0.64
Subtotal						123.35

Public Land Subject to Green Acres

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
3	501	40	Hamnett Park	Lawrence Township	1600 Ohio Ave	3.29
11	902	11		Lawrence Township	Helen Ave	2.12
11	902	18		Lawrence Township	Helen Ave	1.62
11	902	12		Lawrence Township	Helen Ave	3.14
12	902	17	Shabakunk Park	Lawrence Township	100 Tudor Ln	11.99
13	1001	32	Slackwood Park	Lawrence Township	2040 Princeton Pk	4.86
14	1301	22	Drexel Woods	Lawrence Township	Drexel Ave	0.18

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
14	1301	36	Orexel Woods	Lawrence Township	Drexel Ave	9.63
14	1301	40	Drexel Woods	Lawrence Township	Drexel Ave	4.32
14	1301	13	Drexel Woods	Lawrence Township	Drexel Ave	38.02
18	1311	2	Eldridge Park	Lawrence Township	20 TuLn Ave	2.29
21	1801	15	Murray Park	Lawrence Township	630 Lawrence Rd	9.56
21	1401	1	Murray Park	Lawrence Township	2181 Princeton Pk	0.83
22	1502	2	Tamanis Park	Lawrence Township	1000 Lake Dr	6.29
23	1502	3	Shabakunk	Lawrence Township	132 Graf Dr	13.77
27	2001	10	Law. Shopping Cent. Park	Lawrence Township	2270 Princeton Pk	0.34
28	2001	67	Texas Avenue Minipark	Lawrence Township	99 Texas Ave	0.34
30	2101	6	Colonial Lake Park	Lawrence Township	51 Colonial Lake Dr	37.02
32	2204	22	Eastern Park	Lawrence Township	Hopatcong Dr	6.87
34	2301	24		Lawrence Township	Johnson Ave	3.54
39	2316	1	Gilpin Park	Lawrence Township	25 Craigie Ave	0.62
40	2301	29	Trolley Right-of-way	Lawrence Township	Johnson Ave	4.22
40	2319	47	Trolley Right-of-way	Lawrence Township	Johnson Ave	0.07
40	2319	47	Trolley Right-of-way	Lawrence Township	Johnson Ave	0.23
40	2701	4	Trolley Right-of-way	Lawrence Township	Eggert Crossing Rd	5.82
40	5704	20	Trolley Right-of-way	Lawrence Township	Green Ave	0.27
40	5704	19	Trolley Right-of-way	Lawrence Township	Green Ave	0.59
40	5703	52	Trolley Right-of-way	Lawrence Township	Titus Ave	0.44
40	5703	20	Trolley Right-of-way	Lawrence Township	Craven Ln	0.62
40	5703	110	Trolley Right-of-way	Lawrence Township	Green Ave	1.79
40	4701	3	Trolley Right-of-way	Lawrence Township	Denow Rd	2.09
44	2406	1	Lawr. Veterans' Park	Lawrence Township	101 Oaklyn Ter	0.91
44	2406	22	Lawr. Veterans' Park	Lawrence Township	101 Oaklyn Ter	0.09
44	2402	58	Lawr. Veterans' Park	Lawrence Township	101 Oaklyn Ter	16.11
46	2503	17	Glenn Avenue Minipark	Lawrence Township	Glenn/Ditmars	0.07
46	2503	16	Glenn Avenue Minipark	Lawrence Township	Glenn/Oitmars	0.07
46	2503	15	Glenn Avenue Minipark	Lawrence Township	Glenn/Ditmars	0.07
46	2503	14	Glenn Avenue Minipark	Lawrence Township	Glenn/Ditmars	0.07
46	2503	13	Gtenn Avenue Minipark	Lawrence Township	Glenn/Ditmars	0.07
46	2503	12	Glenn Avenue Minipark	Lawrence Township	Glenn/Ditmars	0.43
46	2503	11	Glenn Avenue Minipark	Lawrence Township	Glenn/Ditmars	0.48
48	2701	16	Loveless Tract	Lawrence Township	Eggert Crossing Rd	0.83
48	2701	15	Loveless Tract	Lawrence Township	Eggert Crossing Rd	1.41
48	2701	14	Loveless Tract	Lawrence Township	Eggert Crossing Rd	4.75
48	2701	12	Loveless Tract	Lawrence Township	Eggert Crossing Rd	6.34
48	2701	28	Loveless Tract	Lawrence Township	Eggert Crossing Rd	3.65
48	2701	11	Loveless Tract	Lawrence Township	Eggert Crossing Rd	1.61
48	2701	29	Loveless Tract	Lawrence Township	Eggert Crossing Rd	2.09
48	2701	30	Loveless Tract	Lawrence Township	Eggert Crossing Rd	2.02

NO	BLOCK	LOT	DESCRIPTION	OWNER	LOCATION	AREA
48	2701	31	Loveless Tract	Lawrence Township	Eggert Crossing Rd	3.36
48	2701	7	Loveless Tract	Lawrence Township	Eggert Crossing Rd	2.14
48	2701	10	Loveless Tract	Lawrence Township	Eggert Crossing Rd	5.66
48	2701	8	Loveless Tract	Lawrence Township	Eggert Crossing Rd	10.90
49	2801	51	Central Park	Lawrence Township	200 Eggert Crossing Rd	99.69
49	2701	9	Central Park	Lawrence Township	200 Eggert Crossing Rd	5.10
55	2805	1	Battleground Park	Lawrence Township	20 Lombard Ave	2.08
55	2803	1	Battleground Park	Lawrence Township	18 Shelmet Ln	1.07
55	2804	1	Battleground Park	Lawrence Township	16 Shelmet Ln	0.45
55	2802	1	Battleground Park	Lawrence Township	11 Shelmet Ln	0.99
60	3004	30	Turtleback Park	Lawrence Township	11 Balsam Dr	19.38
63	3507	27	Five Mile Run	Lawrence Township	68 Stonicker Dr	24.06
82	5101	8	Dyson Tract	Lawrence Township	Princeton Pk	71.36
82	5101	11	Dyson Tract	Lawrence Township	Princeton Pk	11.87
82	5101	10	Dyson Tract	Lawrence Township	Princeton Pk	49.24
82	5101	25	Dyson Tract	Lawrence Township	Princeton Pk	0.76
82	5101	26	Dyson Tract	Lawrence Township	Princeton Pk	23.82
82	5101	9	Dyson Tract	Lawrence Township	Princeton Pk	153.29
82	5101	34	Dyson Tract	Lawrence Township	Princeton Pk	6.02
82	5101	33	Dyson Tract	Lawrence Township	Princeton Pk	28.16
95	5801	19	Fackler Rd	Lawrence Township	101 Fackler Rd	9.78
103	6201	39	Village Park	Lawrence Township	100 Yeger Dr	62.33
124	7301	4	Shipetauken Woods	Lawrence Township	Carter Rd	58.17
124	7402	18	Shipetauken Woods	Lawrence Township	Carter Rd	2.56
124	7402	24	Shipetauken Woods	Lawrence Township	Carter Rd	2.18
133	7501	13	Carson Woods	Lawrence Township	Carson Rd	149.43
136	6201	44	Wilk Property	Lawrence Township	Keefe Rd	5.93
Subtotal						1,027.63
TOTAL						3,856.37

APPENDIX L

Closed Known Contaminated Sites

Name	Address	Site ID	PI Number
1000 Stewards Crossing Way	1000 Stewards Crossing Way	147940	195490
101 Cold Soil Rd	101 Cold Soil Rd	405016	506761
116 Harding Ave	116 Harding Ave	75464	G000044093
122 Hoover Ave	122 Hoover Ave	71198	G000010761
128 Roxboro Rd	128 Roxboro Rd	75745	G000059812
14 Hendrickson Rd	14 Hendrickson Rd	74390	G000038924
15 Bunker Hill Rd	15 Bunker Hill Rd	88986	G000062968
15 Van Kirk Rd	15 Van Kirk Rd	450789	566876
164 Carter Rd	164 Carter Rd	75603	G000044632
166 Harding Ave	166 Harding Ave	87123	G000060717
180 Review Ave	180 Review Ave	75506	G000044251
193 Spring Beauty Dr	193 Spring Beauty Rd	75840	G000060244
19 Petroleum	1601 Princeton Ave	43528	6014
1 Carter Rd	1 Carter Rd	74173	G000037739
1 Van Kirk Rd	1 Van Kirk Rd	75555	G000044456
2004 Princeton Ave	2004 Princeton Ave	75071	G000042241
200 Berwyn Pl	200 Berwyn Pl	95709	134716
22 Slack Ave	22 Slack Ave	75698	G000045057
2340 Princeton Pk	2340 Princeton Pk	73157	G000030853
24 30 George St	24 30 George St	181623	237736
245 Carter Rd	245 Carter Rd	73099	G000030296
262 Carter Rd	262 Carter Rd	73820	G000036087
2890 Brunswick Pk	2890 Brunswick Pk	6379	7349
2 Allegheny Ave	2 Allegheny Ave	197501	259256
306 Carter Rd	306 Carter Rd	72880	G000028448
347 Cold Soil Rd	347 Cold Soil Rd	72674	G000026068
38 Rolfe Ave	38 Rolfe Ave	74974	G000041803
3 Holly Ln	3 Holly Ln	70546	G000033061
3 Monroe Ave	3 Monroe St	73344	G000033587
4060 Quakerbridge Rd	4060 Quakerbridge Rd	420791	526426
4338 Province Line Rd	4338 Province Line Rd	75739	G000059803
4370 Province Line Rd	4370 Province Line Rd	71238	G000011179
4511 Province Line Rd	4511 Province Line Rd	72768	G000027561
4560 Province Line Rd	4560 Province Line Rd	73771	G000035835
4582 Province Line Rd	4582 Province Line Rd	74736	G000040806
63 Carson Rd	63 Carson Rd	71269	G000011481
64 Carson Rd	64 Carson Rd	71992	G000021850
705 Lake Dr	705 Lake Dr	75443	G000043968

Name	Address	Site ID	PI Number
719 President Ave	719 President Ave	224519	293066
721 Mayflower Ave	721 Mayflower Ave	73844	G000036199
723 Nathan Hale Ave	723 Nathan Hale Ave	70573	G000033095
75 Lawrenceville Pennington Rd	75 83 Lawrenceville Pennington Rd	163900	G000024496
89 Coolidge Ave	89 Coolidge Ave	74747	G000040845
8 Landfall Ln	8 Landfall Ln	72834	G000028163
9 Laurelwood Dr	9 Laurelwood Dr	69928	G000031533
Al Mason's Garage	1930 Brunswick Ave	169547	222825
ALS	135 Lawrenceville Rd	6368	3791
AT&T Lawrenceville Bldg 2	Cold Soil Rd & Keefe Rd	49304	23914
Bakers Basin Service Center Inc.	3201 Brunswick Pk	57037	32489
B Circle Associates LLC	301 Brunswick Cir Ext	355191	438517
Biddle Co. Inc.	644 Whitehead Rd	42367	2615
Bristol-Myers Squibb	Rt 206 & Province Line Rd	15826	2864
Britton Industries Inc.	227 Bakers Basin Rd	17822	331684
Capital City Ford	2865 Brunswick Pk	400465	26525
Central Jersey Waste MVA	Cold Soil Rd & Van Kirk Rd	377176	467439
Chronar Corporation (Former)	330 Lawrence Station Rd	66186	G000003583
Clarksville Motel	Brunswick Pk & Quakerbridge Rd	71047	G000009647
D&R Canal Field Office	3050 Brunswick Ave	41572	7042
Dyson Tract	3900 Princeton Pk	378680	469567
Ed Cahill Chevrolet Inc Former	1100 1120 Spruce St	6360	25548
ETS	660 Rosedale Rd	15827	2562
EHRET Construction Company	1781 Princeton Ave	68287	G000024333
Elizabeth L Mills	840 Pretty Brook Rd	53766	22313
Ewing-Lawrence Sewerage Authority	600 Whitehead Rd	14539	292
Fermenta Animal Health Co. / SDS Biotech Corp	4100 Quakerbridge Rd	42986	4301
Firestone Store	2925 Brunswick Pk	55962	30196
Former Garnet Chevrolet-Geo	1100 1120 Spruce St	6360	31900
Gemstone Cleaners at Lawrence Square Village	584 Lawrence Square Blvd S	6358	536325
Hess Station 30299	2480 Brunswick Pk	6392	6671
Hub City Distributors	649 Whitehead Rd	42169	2133
Hydrocarbon Research Incorporated	1501 New York Ave	6353	27114
J&B Realty Associates LLC	2572 Brunswick Pk	19030	505583
J P Murry Co.	2750 Brunswick Pk	50805	14519
Kessel Realty Partnership	274 Bakers Basin Rd	6351	18701
Kmart 3259	3371 3373 Brunswick Pk	120264	5345
Lawrence Headquarters Library	2751 Brunswick Pk	56527	31282
Lawrence Industrial Park	40 Enterprise Ave	57375	32501
Lawrence Landscaping Inc.	209 Bakers Basin Rd	22554	10518
Lawrence Lincoln-Mercury	2920 Brunswick Pk	22617	8329
Lawrence Road Presbyterian Church	1039 Lawrenceville Rd	57264	32231

Name	Address	Site ID	PI Number
Lawrence Road Service Center	1175 Lawrenceville Rd	6371	11171
Lawrence Road Vol Fire Co. Inc.	1252 Lawrenceville Rd	47112	12204
Lawrence Shopping Ctr	2495 Brunswick Pk	6345	214735
Lawrence Station Rd	Lawrence Station Rd	73853	G000036225
Lawrence Toyota Inc	2845 2871 Brunswick Pk	26938	5322
Lawrenceville Amoco	360 Lawrence Rd	158070	179
Lawrenceville Armory & Fms	151 Eggert Crossing Rd	6357	675
Lawrenceville Fire Co.	64 Phillips Ave	43947	7783
Lawrenceville Fuel Co.	20 Gordon Ave	6374	19702
Lawrenceville School	2500 Main St	6349	21694
Lawrenceville School	2500 Main St	6349	259078
Little Explorers	680 690 Whitehead Rd	451570	567951
LSH Associates LLC	7 Gordon Ave	391142	489000
Materials Electronic Products Co.	1040 Spruce St	13013	23911
Mercer Council Alcohol Drug Addiction-Meas	1931 Brunswick Ave	476699	601296
Morris Hall Home for The Aged	2381 Lawrenceville Rd	6365	7029
Municipal Building	2207 Lawrenceville Rd	45392	1159
Olde Tymes Caterers Inc	2021 Brunswick Ave	52388	19186
One Retail Associates	3221 Brunswick Pk	71057	G000009712
Paper Products	New York Ave & Puritan Ave	47617	14335
Pitney Bowes	2900 Brunswick Pk	76850	G000008477
PNC Bank	2431 Main St	141434	187988
PNC Church of Our Savior	2300 Princeton Pk	53781	22337
Presbyterian Church Of Lawrenceville	2688 Main St	124950	90260
Princeton Motorsport Inc	2910 Brunswick Pk	22291	80
Princeton University Press	3175 Princeton Pk	6354	33299
Project Freedom-Lawrenceville	Princeton Ave	125123	165171
PSE&G Southern Division— Lawrenceville	4140 Quakerbridge Rd	6400	4193
Rice Charles B & Marian R	649 Rosedale Rd	172906	526873
Rider College	2083 Lawrenceville Rd	14631	21542
Route 1 & Bakers Basin Road	Brunswick Pk & Bakers Basin Rd	72033	G000022307
Sears Roebuck & Co.	300 Quakerbridge Mall	6399	12087
Sg Frantz Co. Inc.	31 E Darrah Ln	6373	15666
Shell Service Station	1720 Brunswick Pk	6356	7617
Slackwood Elementary School	2060 Princeton Pk	18657	13282
Slackwood Fire Company	21 Slack Ave	41875	1162
Slackwood Presbyterian Church	2016 2020 Brunswick Ave	224523	293070
Somama Vineyards (Former)	6 Princess Rd	20760	22784
St Lawrence Rehabilitation Ce	2381 Lawrenceville Rd	6365	24526
Sussman Panitz Partnership	1321 Brunswick Ave	54024	22792
Transco J17 Trenton Lateral Tap	Hopatcong Dr	94912	133794
Trenton Fibre Drum Co., Inc.	1545 New York Ave	66099	G000001956

Name	Address	Site ID	PI Number
Trenton Field Installation	3200 Brunswick Pk	46350	16793
Triangle Art Center	2721 Brunswick Pk	56284	30828
United Parcel Service	Bakers Basin Rd	45427	1545
United Savings & Loan Admin Bldg	134 Franklin Corner Rd	53935	22631
US Rte 1 & Whitehead Rd	Brunswick Pk & Whitehead Rd	120874	159005
Village Townhouses	148 Lawrenceville Pennington Rd	72193	G000023585
Volk Tire Corp.	1010 Spruce St	6363	4086
Volvo of Princeton	3333 Brunswick Pk	29979	16529
Westgate Apartments	550 560 Lawrenceville Rd	52520	19581
Willis Greenhouse Incorporated	1365 Lawrenceville Rd	73350	G000033684
Zarboff Oriental Rugs	2845 Brunswick Pk	73098	G000030295

Source: NJDEP, 2016

Abstract Page

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Key Words

Agriculture, air, aquifers, biodiversity, biological resources, built environment, climate, conservation, development, endangered species, environmental issues, environmental resource inventory, farms, floodplains, forests, grasslands, groundwater, habitat, historic resources, impervious coverage, known contaminated sites, lakes, land preservation, Landscape Project, Lawrence Township, master planning, Mercer County, Mercer Meadows, natural resources, New Jersey, open space, population, soils, steep slopes, streams, surface water, topography, U.S. Census, vegetation, vernal pools, water quality, watersheds, wetlands.

Abstract

This publication documents the natural and community resources of Lawrence Township, Mercer County, New Jersey. The natural resource information includes descriptions, tables, and maps of: land use; soils; drinking water, aquifers, and wells; surface waters, including watersheds, streams, lakes, wetlands, and floodplains; impacts on water resources and surface water quality; impervious coverage; vegetation, including wetlands, forests, and grasslands; animal communities; threatened and endangered species; Natural Heritage Priority Sites; Landscape Project Priority Habitats; and known contaminated sites. Community resources that are briefly described include population, transportation, township utilities and services, historic buildings, and protected open space. A short history of the community is also included.

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