



# ENVIRONMENTAL RESOURCE INVENTORY

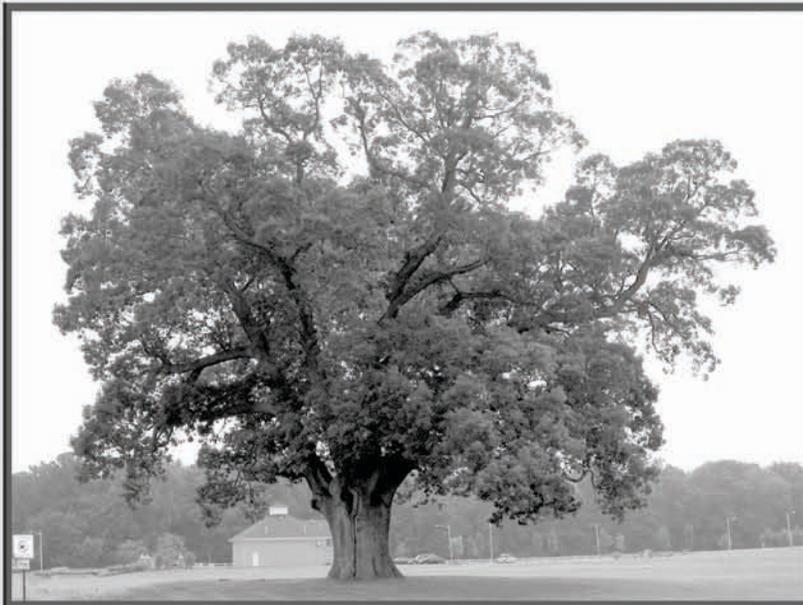


for the **TOWNSHIP** of



## **MANSFIELD**

**BURLINGTON COUNTY, NEW JERSEY**



prepared by:



**Delaware Valley  
Regional Planning  
Commission**

with:

**Environmental  
Commission of  
Mansfield Township**

**NOVEMBER 2007**



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

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

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

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# INTRODUCTION

The purpose of an Environmental Resource Inventory is to identify and describe the natural resources of a community. A community's natural resources – its soil, water, air, forests, fields, and waterways – are fundamental to its character. They are the foundation for its economic success and its quality of life. The protection and wise use of those resources is essential to the public health, safety, and welfare of current and future residents. The Environmental Resource Inventory provides the basis for the development of methods and steps to preserve, conserve, and utilize those resources.

Mansfield Township's natural resources have long shaped the lives of its inhabitants. Mansfield's forests, high-quality soils, and accessible waterways played major roles in its early settlement by Europeans. With its historic settlements of Hedding, Kinkora, Columbus, Georgetown, and Mansfield, the township is a rural residential community that preserves its Colonial charm. With its advantageous position along major north-south corridors and its location between major employment centers like Trenton and Philadelphia, Mansfield's historic character and rural setting have also attracted medium-density residential development. As this activity increases, the character of the township changes. Documentation of the community's environmental resources is a necessity, especially if Mansfield is to support a healthy mix of agricultural, commercial, industrial, and residential uses in the future.

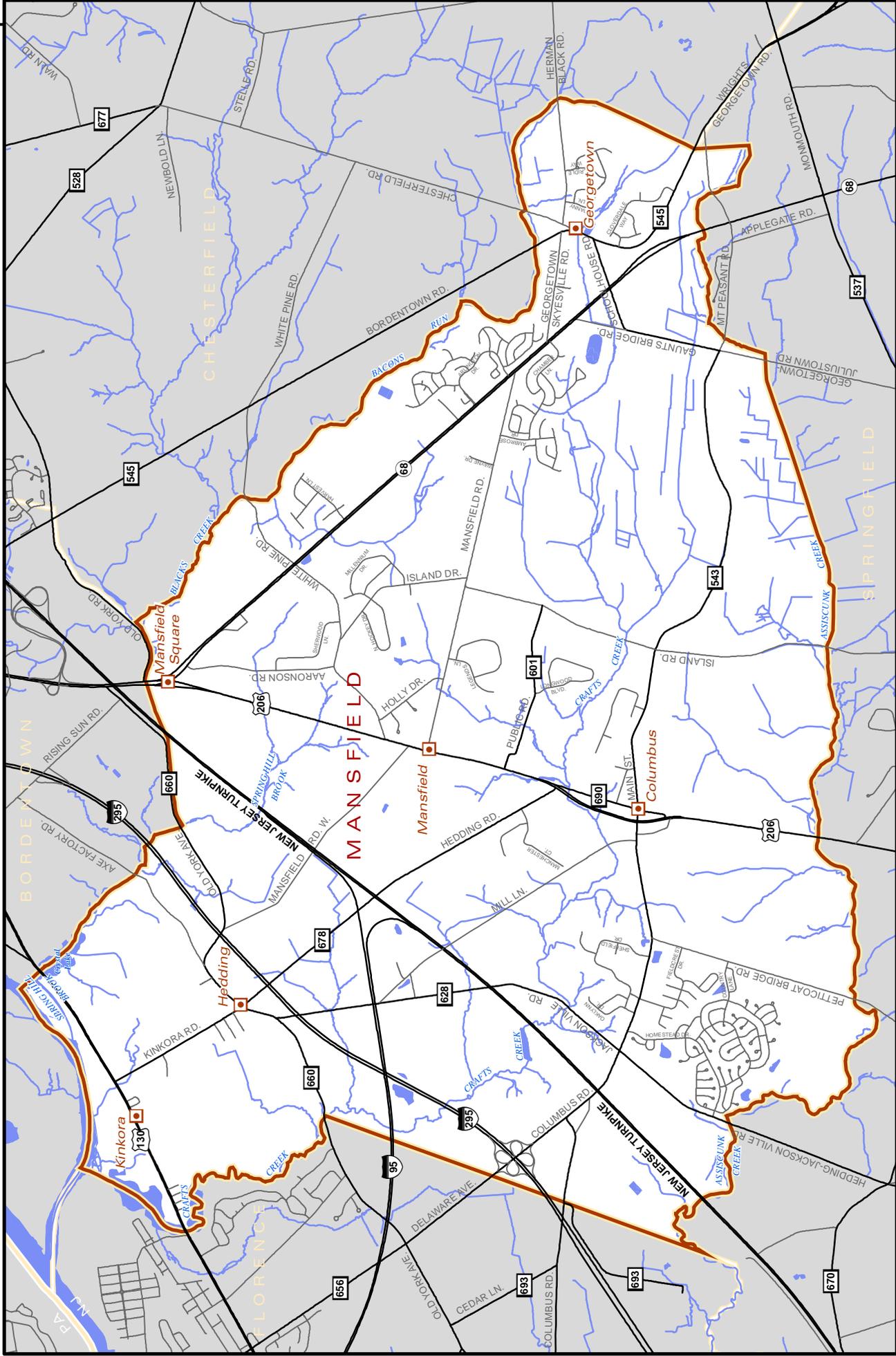
Mansfield's surface waters and groundwater resources will become increasingly important to its population and to that of neighboring communities. Its wetlands, upland forests, and grasslands, which provide significant habitat for endangered and threatened plants and animals, will be vital to the continued health of the community and the enjoyment of its citizenry. Knowledge of the environmental resources of the township will allow its citizens to make informed decisions as they decide Mansfield's future path and forge its identity.

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

Several documents and reports were utilized in preparing the *Environmental Resource Inventory for Mansfield Township*, including the Mansfield Township *Master Plan* from 2001, with special focus on the Natural Resources element, along with a number of reference works. These are listed at the end of this document. The maps and data relating to Mansfield Township's natural resources are derived principally from the New Jersey Department of Environmental Protection's (NJDEP's) Geographic Information System mapping, and from *The Landscape Project* produced by the Endangered and Nongame Species Program of the New Jersey Fish and Wildlife Division.

# MANSFIELD TOWNSHIP

# MAP 1: Mansfield Township



Sources : NUDEP, 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 NUDEP and is not state-authorized.



Delaware Valley  
Regional Planning Commission  
March 2007

## BRIEF TOWNSHIP HISTORY

The history of Mansfield Township is rooted in the history of Colonial New Jersey. The original residents of the area were Algonquin Indians, of the Leni-Lenape tribe; they traded with early Dutch settlers, mostly in furs, and maintained a culture combining hunting and agriculture.

In 1664, King Charles II of England took control of much of America's eastern seaboard, and deeded most of present-day New Jersey to his brother, the Duke of York, who split it into East and West. West Jersey was settled mostly by English Quakers. Throughout the 17<sup>th</sup> century, sections of New Jersey were acquired from the Lenape tribe, including present-day Mansfield. Like the rest of the Delaware Valley, Mansfield was an attractive area for new Quakers to settle after arriving in the colonies, as it had mature trees, fertile ground, and access to the Delaware River, an active transportation route.

The first known settler in Mansfield itself was an English Quaker named Thomas Scattergood, who settled near Crafts Creek in present-day Columbus. Like other early settlers, he and his family lived in a hand-dug cave near the creek until a house was built. Other early settlers included William Biddle, who purchased Biddle Island (Newbold Island) in 1681, Michael Newbold, William Black, after whom Blacks Creek is named, and Caleb Shreve.

In 1688, Mansfield was officially established as a British constabulary, and in 1798, it was incorporated as Mansfield Township. The township is named for Mansfield, England. Mansfield was once larger than it is today, and throughout the second half of the 19<sup>th</sup> century, other municipalities separated from it to form their own jurisdictions. These include Fieldsboro Borough, which separated in 1850 and formally incorporated in 1894; Bordentown Township, which was formed from parts of Mansfield and Chesterfield townships in 1852; and Florence Township, which incorporated in 1872.

Since New Jersey is geographically between New York and Philadelphia, Mansfield served as a major thoroughfare for troops during the Revolutionary War period. An important skirmish was fought in Mansfield Township at Petticoat Bridge, on the Assiscunk Creek. Just prior to the Battle of Trenton, General George Washington<sup>1</sup> relayed an order to Colonel Griffin to engage several thousand Hessian troops, diverting them away from their station in Bordentown City. On December 23, 1776, approximately 500 soldiers of the Continental Army, led by Colonel Griffin, marched through Mount Holly. When Colonel Carl von Donop, leader of the Hessian forces at Bordentown, learned of the Americans' march, his troops marched out to meet them. The two forces met at Petticoat Bridge, outside what was then the town of Black Horse (present-day Columbus), and engaged in a skirmish that lasted three days. The diversion was successful. Although the Hessian troops triumphed in the skirmish, they were too far away to help when Washington attacked the Hessian garrison in Trenton early on the morning of December 26. That famous battle was a decisive and important victory. There is now a commemorative plaque near the site of the skirmish, on Petticoat Bridge Road in Springfield Township.

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<sup>1</sup> According to some sources, the order came not from Washington, but from General Putnam.

The earliest roads in Mansfield were trails used by native peoples, which tended to follow stream banks. Settlers moved in and expanded these roads, which initially led between households and mills, rather than between towns. Excavations along these early roads have discovered that homes often faced the creeks instead of the roads, since much early travel was by boat. The first large road through Mansfield was Old York Road (County Route 660), which connected New York City to Philadelphia. Stagecoaches making the multi-day journey passed through Mansfield on this road. Other early roads include Columbus' main street, Mt. Pleasant Road, originally an Indian trail; Ax Factory Road, which connected Hedding to Bordentown, the location of an ax factory; and US Route 206, called Bordentown Turnpike, a toll road running between Bordentown and Columbus.

Like many of New Jersey's townships, Mansfield is composed of distinct residential settlements, or towns. Mansfield has one village – Columbus – and several small hamlets: Mansfield Square, Georgetown, Hedding, and Kinkora.

### *Columbus*

Columbus is a village on Route 206, five miles from Bordentown, ten miles from Trenton, eight miles from Mt. Holly, and seven miles from Burlington City, at an important crossroads in Northern Burlington County. As early as 1769, the area was known as Black Horse Village, since it was the location of the Black Horse Tavern. The name was officially changed to Columbus – named for Christopher Columbus – in 1827, when the post office was established. It is said that this decision so angered the owner of the Black Horse Tavern that he refused service to anyone calling the town by its new name. The site of the original Black Horse Tavern is now the Olde Columbus Inne. The current structure was built in 1812.



*Olde Columbus Inne in the historic village of Columbus*

### *Mansfield Square*

Mansfield Square is on Old York Road just off Route 206 in the northern part of the township. This village was originally called Rising Sun, again after a tavern of the same name. Rising Sun Tavern was one of several stops along the stagecoach road between New York and Philadelphia. The name was changed around 1849 to Mansfield Square.

### *Georgetown*

Georgetown is in the eastern part of the township and was named for George Sykes. Sykes was a Quaker who worked as a surveyor, and served in the U. S. Congress from 1834 to 1848. Georgetown was once called Foolstown, named after a man who bankrupted himself building a mansion – the Foolstown House, which still stands today.

### *Hedding*

Hedding is a hamlet on Old York Road in northwestern Mansfield. The community had several names, including the name still on the sign at the corner of Old York Road and Hedding Road – Three Tuns. A tun was a barrel, used to transport and store beer.

The Hedding Methodist Episcopal Church was built in 1847; it was named after Elijah Hedding, a Methodist Episcopal Bishop. Immediately after the church was built, the area was renamed Hedding, which in 1920 became the official name.

### *Kinkora*

Kinkora is on Route 130 and Hedding Road. The name Kinkora, although common in Ireland, is thought to actually come from a corruption of Quinkoringh, the Indian name for the area. This hamlet was formerly the rail terminal for the Kinkora branch of the Amboy Division, operated by the United New Jersey Railroad and Canal Company. This railroad line connected Burlington to Bordentown, with a spur running from Columbus to what is now Fort Dix. Milk was loaded at the Columbus station, and ice from Crystal Lake was loaded at the Kinkora station, both bound for Philadelphia and New York.

The railroads also took Mansfield children to high school in Burlington and Bordentown until the introduction of buses shortly after World War II. Mansfield built its own high school in 1970, which is a regional high school for Mansfield, Springfield, Chesterfield, and North Hanover townships, as well as Maguire Air Force Base.



*The Newbold House, in Georgetown, is on the National and State Register of Historic Places*



*A sign at Kinkora Road and Old Yorke Avenue reminds passersby that Hedding was once called Three Tuns.*

### *Roebling*

Neither the Roebling steel mill nor the town of Roebling is within present-day Mansfield Township, but for most of Mansfield's history, Roebling was the largest commercial operation within South Jersey. The redevelopment of the site and the town will likely have as strong an impact on Mansfield's future as the steel mill had on its past.

The Roebling brothers were giants of industry at the turn of the 20<sup>th</sup> century. The steel business, founded by John Roebling in 1847 in Trenton, was inherited by his sons, Charles, Washington, and Ferdinand, in 1869. Washington Roebling built the Brooklyn Bridge, and the Roebling Steel Company provided the wire rope for the Golden Gate Bridge, among other suspension bridges. They also provided wire rope for the

first Otis elevators. In 1906, the business relocated to Florence Township, across from Newbold Island. Charles Roebling designed a town of 750 homes for the mill's workers and their families, and named it Roebling. At its height, the Roebling Steel Company was the largest employer in South Jersey, with roughly 10,000 employees, many of whom lived in Mansfield. The town of Roebling is one of the few remaining "company towns" in New Jersey with many of its original dwellings still standing and maintained by private homeowners. The 200-acre industrial site was closed in 1982 and is now a Superfund cleanup site in the final stages of remediation. Roebling is poised for redevelopment with its location on NJ Transit's River LINE.

### *Newbold Island*

Newbold Island was originally named Biddle Island, and was owned by the Quaker settler William Biddle. Thomas Newbold, a descendent of Quaker settler Michael Newbold, bought the island in 1722 from Biddle and renamed it. When Bordentown became a separate township, it was unclear whether Newbold was in Bordentown or Mansfield. Court arbitration in 1955 granted the island to Bordentown Township. The site has no permanent residents on it, and has frequently been the focus of large-scale development proposals, including high-end homes, residential neighborhoods, and a gas-fired power plant. The most significant of these was a 1972 proposal by the Atomic Energy Commission (AEC) to build a nuclear power generating station. Debates between the AEC and the community lasted for nearly a year, until the AEC pulled the proposal and looked for a less densely populated area. Due in part to the incident at Three Mile Island, which happened in Pennsylvania in 1979, the station was never built.

Due to its lack of population and urban development, Newbold has now become a sanctuary for wildlife, and is a nesting site for bald eagles. The Nature Conservancy has identified it as a "critical habitat," meeting its criteria for an "outstandingly remarkable resource."



*Agriculture remains an important part of Mansfield's history, culture, and economy.*

Although Mansfield has had diverse agricultural products, for most of its history it has been known as a dairy farming center. There was a tomato factory on Mill Road and a cigar-making operation in the early 1800s. Until the 1950s, dairy was the dominant agricultural export. However, starting in the 1950s, dairy prices fell, and many farmers switched to cash crops, such as corn and soybeans. Now, in addition to these crops, Mansfield farmers also raise horses and grow nursery plants, particularly native plants for restoration projects in the Pinelands.

Other commercial enterprises that supported agriculture included several mills: Kerlins Mill (at the present site of the Civic Club), which was a fulling, or garment, mill that later became a gristmill; and Potts Mill, a gristmill in Hedding. There was also a brick-making operation on Mill Road near Hedding, at Crafts Creek.

Throughout the 20<sup>th</sup> century, Mansfield residents began working outside the township and commuting to their jobs by train and, later, by car. Mansfield Township is centrally located between three points: Mount Holly, the county seat; Trenton, the state capital; and Fort Dix, in New Hanover Township. Due to this geographic position, soon after the Second World War, it became a bedroom community, although it has retained its rural landscape.

Mansfield's largest single industry is the National Auto Dealers Exchange (NADE), which opened in Mansfield in the 1950s. Since that time, it has become one of the largest car dealer's auctions in the country. It sometimes sells as many as 4,000 cars in a single day.

In 1983, Mansfield Township's first retirement community was built. Homestead, a 1,100-home community located just off Columbus Road, is for people aged 55 and older. Another 430-unit

age-restricted community, Four Seasons, opened in 1999. Although people from elsewhere in Mansfield Township moved to these communities, Homestead and Four Seasons also attracted large numbers of retirees who relocated from other communities. This has made Mansfield Township one of the few municipalities in the Delaware Valley region with more than 30 percent of its population over the age of 65. See the **Population** section on Page 81 for more details.

There are several new and proposed housing developments in the township. Due to its rural setting and ‘small town’ community amenities, Mansfield is currently undergoing population growth as it continues to attract people of all ages.

### *Fossils*

In 1988, a Mansfield resident was approached by park ranger and amateur paleontologist Ralph Johnson, who asked and was granted permission to dig in a creek bed behind the property. Johnson discovered an enormous number of fossils in an exposed layer of marl clay from the Merchantville formation, which extends from Colts Neck to Salem, New Jersey. The find was so extensive that the American Museum of Natural History assisted in further excavations, and some of those fossils are now in its collections. The museum stated that it was the largest fossil mine of its type in North America. The majority of fossils are in the New Jersey State Museum, in Trenton. The fossils are from the Cretaceous Period and are approximately 78 million years old. Most were marine fossils, including the largest Nautilus fossil found on the North American continent. A Nautilus is a large mollusk with a spiral shell, similar to a snail, and lives in the open ocean. Nautilus today reach up to approximately 10 inches, compared to those of previous geologic eras, which were up to 20 inches in size.

Mansfield Township’s history stretches all the way back to pre-historic time, through the Native American era of settlement, to the American Revolution and the Industrial Revolution. In the context of that long history, Mansfield is in an era of rapid change, and will decide its future through the planning it undertakes now to protect its quality of life. Recent decisions to preserve farmland, protect historic landmarks, and guide future growth are examples of Mansfield’s intention to plan for its future.



*Columbus has a charming rural environment that is attractive to many residents, new and lifelong alike.*

## MANSFIELD TOWNSHIP LOCATION, SIZE, AND LAND USE

Mansfield is an incorporated township located in northern Burlington County, New Jersey. The township is bounded by four municipalities: Bordentown Township to the north, Chesterfield Township to the east, Springfield Township to the south, and Florence Township to the west.

The historic village of Columbus is located south of Crafts Creek, in the center of the township. The village of Columbus is representative of an early twentieth century village center, which supported its agricultural hinterland and small residential population. The township is bisected by US Route 206, which is a major transportation corridor leading to Trenton and Princeton. Interstate 295 has an exit in the township, and the New Jersey Turnpike exits just to the north, in Bordentown Township. US Route 130 (a historic toll road known as Kings Highway) is on the northwestern edge of the township. State Route 68, connecting Fort Dix to Trenton, runs along the northeastern edge of the township. Residential and commercial development is concentrated on Route 68 and near the I-295 exit. Mansfield is roughly 30 miles from Philadelphia and less than 15 miles from Trenton. See the **Transportation** section on page 83 for more information.



*Figure 1: Mansfield Township's Location*

Mansfield Township occupies approximately 14,009 acres, or 21.9 square miles, on the Inner Coastal Plain of New Jersey. Before European settlement, as much as 90 percent of the township was covered with a mostly mixed deciduous hardwood forest, consisting of oak, birch, ash, beech, hickory, walnut, chestnut, swamp maple, holly, elm, and sycamore trees. Although large portions of that expansive forest are now gone, more than 11 percent of the township remains forested. Given the good soils in Mansfield, it is not surprising that as of 2002, 39 percent of the township's land area was dedicated to agricultural uses. Mansfield maintains several large farmland belts in the western half and the large central portion of the township. The township's dominant agricultural crops are corn, soybeans, and hay.

Currently, Mansfield's land use is in a period of transition. Historically, the township has been a stronghold of agricultural production in Burlington County. Much of the southern portion of the township still retains its rural character. However, portions of the township are rapidly changing. Many agricultural parcels are subdivided for new residential development. Over 50 percent of Mansfield's housing units (1,729 of 3,243 total units) were built between 1990 and 2000. During the 1990s, Mansfield's population grew by 1,216 residents to a total population of 5,090 by 2000. This was a 31 percent increase over its 1990 US Census population. The US Census

Bureau estimates that Mansfield's population reached 7,921 people in 2005. Population projections issued in March 2005 by the Delaware Valley Regional Planning Commission (DVRPC) predict the population of Mansfield Township to increase to 10,000 people by the year 2010.

Table 1 shows Mansfield's land cover grouped into general categories based on the New Jersey Department of Environmental Protection's (NJDEP's) 2002 color infrared digital imagery. Table 2 breaks down the 2002 general land cover categories into detailed land cover categories. See also **Map 2: NJDEP Land Cover (2002)** on page 12.

**Table 1: Mansfield Township General Land Cover Classes (2002)**

General Land Classes	Acres	Percent
Agriculture	5446.91	39%
Barren land	323.97	2%
Forest (Upland)	1532.86	11%
Forest (Wetland)	1773.10	13%
Urban	2845.61	20%
Water	104.22	1%
Wetlands (Non forested)	1982.78	14%
<b>Total</b>	<b>14,009.45</b>	<b>100%</b>

Source: NJDEP, DVRPC, 2002 data, released 2006

**Table 2: Mansfield Township Detailed Land Cover (2002)**

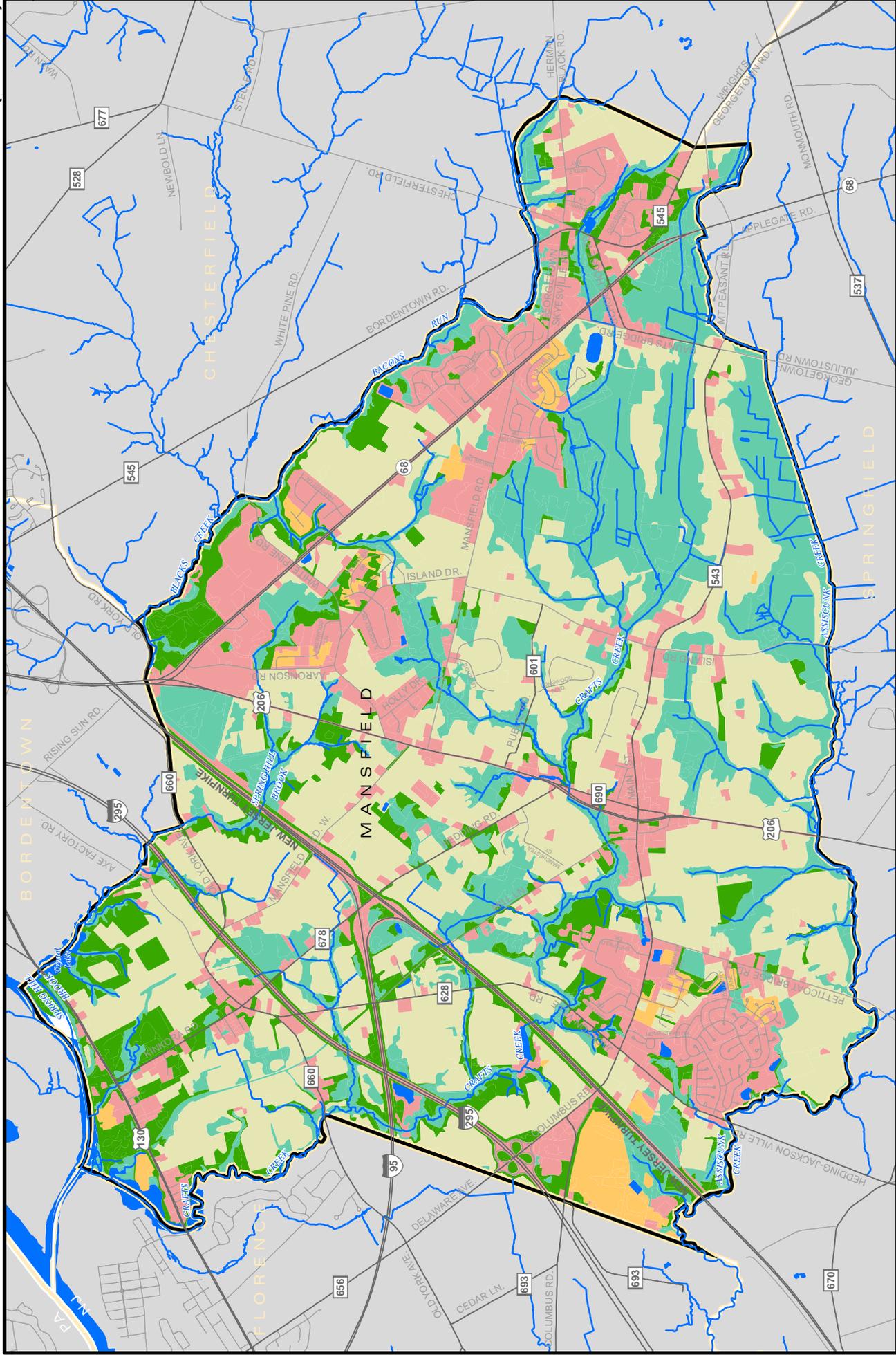
Land Use Categories	Acres	Percent
Agriculture - Other	313.30	2.24%
Agriculture - Confined feeding operations	1.60	0.01%
Agriculture - Cropland and pastureland	4,950.60	35.34%
Agriculture - Orchards, vineyards, nurseries, horticultural areas	181.41	1.29%
Barren Land - Altered land	142.11	1.01%
Barren Land - Extractive mining	30.98	0.22%
Barren Land - Transitional areas	150.87	1.08%
Forest - Coniferous brush/shrubland	7.16	0.05%
Forest - Coniferous forest (10-50% crown closure)	25.58	0.18%
Forest - Deciduous brush/shrubland	98.94	0.71%
Forest - Deciduous forest (>50% crown closure)	879.56	6.28%
Forest - Deciduous forest (10-50% crown closure)	195.22	1.39%
Forest - Mixed deciduous/coniferous brush/shrubland)	113.34	0.81%
Forest - Mixed forest (>50% coniferous with >50% crown closure)	21.89	0.16%
Forest - Mixed forest (>50% deciduous with >50% crown closure)	14.94	0.11%
Forest - Mixed forest (>50% deciduous with 10-50% crown closure)	10.96	0.08%
Forest - Old field (<25% brush covered)	162.99	1.16%
Forest - Plantation	2.30	0.02%
Modified Wetlands - Agricultural wetlands	1,360.82	9.71%

Land Use Categories	Acres	Percent
Modified Wetlands - Disturbed wetlands	36.01	0.26%
Modified Wetlands - Managed wetland in built-up maintained rec area	5.97	0.04%
Modified Wetlands - Managed wetland in maintained lawn greenspace	33.18	0.24%
Modified Wetlands - Rights-of-way	37.67	0.27%
Urban - Athletic fields (schools)	44.24	0.32%
Urban - Cemetery	10.82	0.08%
Urban - Commercial/services	241.84	1.73%
Urban - Industrial	68.86	0.49%
Urban - Industrial/commercial complexes	2.46	0.02%
Urban - Major roadway	279.26	1.99%
Urban - Mixed urban or built-up land	5.48	0.04%
Urban - Other urban or built-up land	271.57	1.94%
Urban - Recreational land	103.19	0.74%
Urban - Residential, high density, or multiple dwelling	213.29	1.52%
Urban - Residential, rural, single unit	993.66	7.09%
Urban - Residential, single unit, low density	242.81	1.73%
Urban - Residential, single unit, medium density	264.73	1.89%
Urban - Stormwater basin	51.49	0.37%
Urban - Transportation/communication/utilities	20.36	0.15%
Urban - Upland rights-of-way developed	0.40	0.00%
Urban - Upland rights-of-way undeveloped	31.15	0.22%
Water - Artificial lakes	60.47	0.43%
Water - Bridge over water	0.05	0.00%
Water - Natural lakes	1.25	0.01%
Water - Streams and canals	5.17	0.04%
Water - Tidal rivers, inland bays, and other tidal waters	37.28	0.27%
Wetlands - Coniferous scrub/shrub	15.83	0.11%
Wetlands - Deciduous scrub/shrub	179.11	1.28%
Wetlands - Deciduous wooded	1,773.10	12.66%
Wetlands - Former agricultural wetlands (becoming shrubby, not built-up)	53.49	0.38%
Wetlands - Freshwater tidal marshes	4.67	0.03%
Wetlands - Herbaceous	192.95	1.38%
Wetlands - Mixed scrub/shrub (coniferous dominated)	25.52	0.18%
Wetlands - Mixed scrub/shrub (deciduous dominated)	37.56	0.27%
<b>Total</b>	<b>14,009.45</b>	<b>100.00%</b>

Source: NJDEP, DVRPC, 2002 data, released 2006

# MANSFIELD TOWNSHIP

# MAP 2: NJDEP Land Cover (2002)



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.

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

0 0.25 0.5 1  
Miles

N

Delaware Valley  
Regional Planning Commission  
March 2007

# NATURAL RESOURCES

## PHYSIOGRAPHY

Physiography is the study of a location in relation to its underlying geology. New Jersey is characterized by four physiographic provinces. The rocky terrain of the Appalachian Province is at one extreme and the sands of the coast are at the other. Mansfield Township is located in the Atlantic Coastal Plain, the most southerly of these four provinces in New Jersey.

The Atlantic Coastal Plain landscape extends from Massachusetts to Texas and is divided into Inner and Outer sections. In New Jersey, the Inner Coastal Plain is made up of interbedded sand and clay. Deposits originating in the breakdown of Appalachian and Catskill sedimentary, metamorphic, and igneous rocks are interbedded with layers formed by oceanic (marine) deposition, which occurred as the ocean shoreline advanced and receded over geologic time. The Inner Plain layers date from the Cretaceous Period, 135 to 65 million years ago. Soils of the Inner Coastal Plain are quite fertile.

The Outer Coastal Plain was formed more recently than the Inner Coastal Plain. It was laid down by the ocean and developed during the mid-to-late part of the Cenozoic Era, 65 million years ago to the present. Outer Coastal Plain soils are sandier and less fertile than those of the Inner Plain and do not hold water as well.

In the general vicinity of the dividing line between the two segments of the Coastal Plain is a belt of low hills, which runs northeast and southwest through the southern half of New Jersey. These hills are the youngest of the Cretaceous formations and are largely made up of sand and marl formations. In Burlington County the hills can be identified between Arney's Mount in Springfield Township and Big Hill in Southampton Township. The Inner Coastal Plain lies to the west of the band of hills and the Outer Coastal Plain lies to the east.

Mansfield Township lies entirely within the Inner Coastal Plain, but has rocks dating from both the Cretaceous Period and Cenozoic Era outcropping in the township. The majority of the township's soils are agriculturally productive. Agriculture remains the dominant land use in Mansfield.

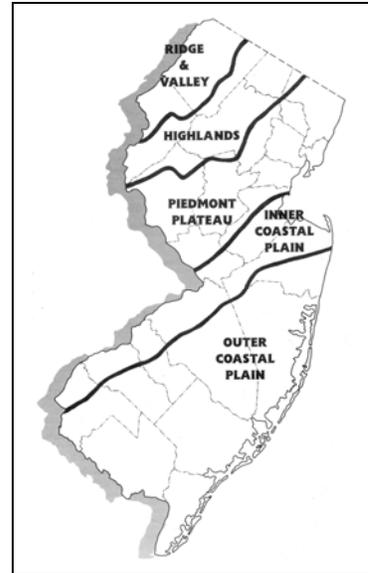
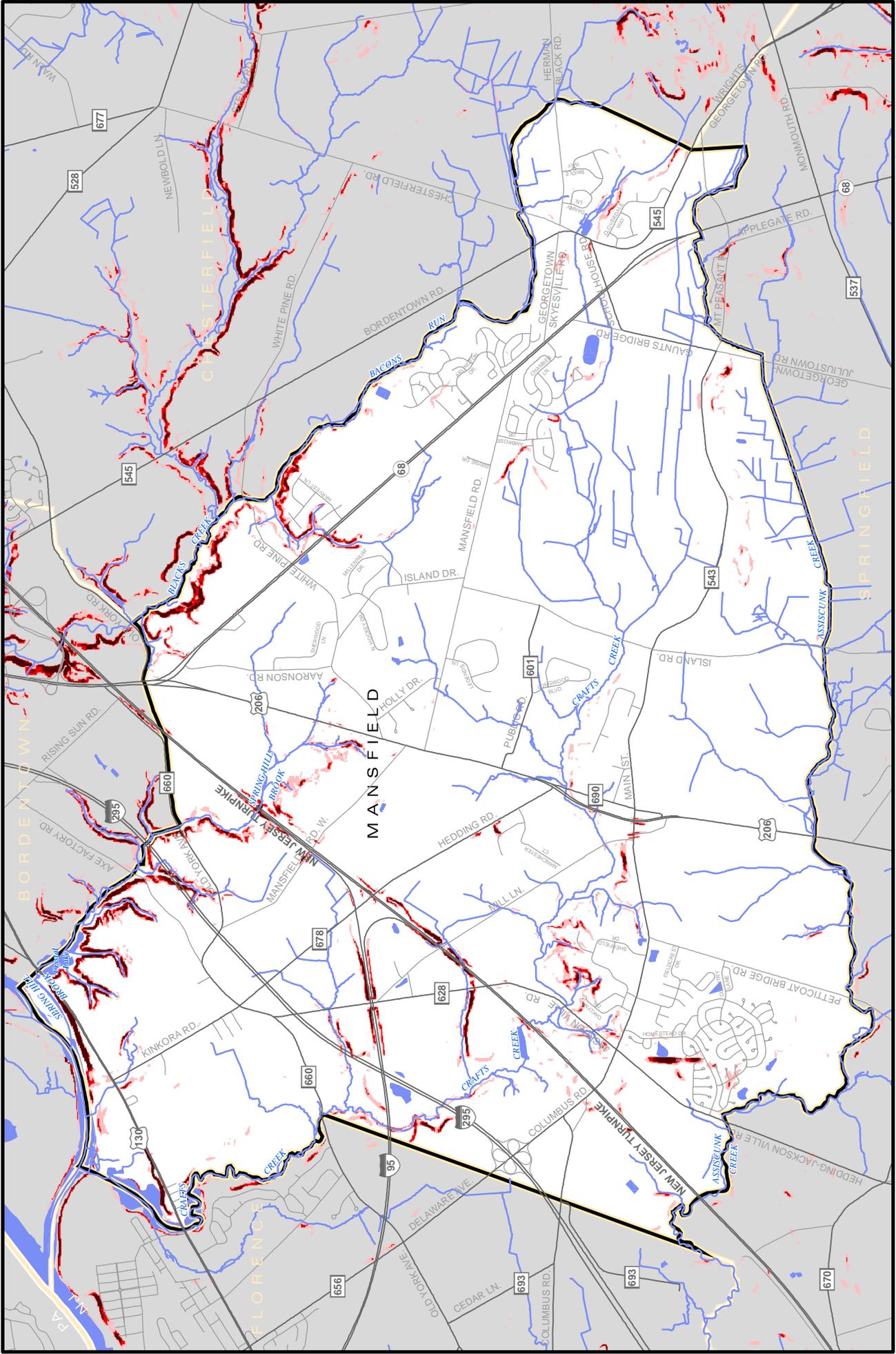


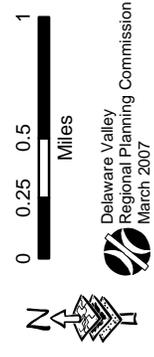
Figure 2: The Physiographic Regions of New Jersey

# MANSFIELD TOWNSHIP

# MAP 3: 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.



## TOPOGRAPHY

Mansfield Township's position near the Delaware River has given it a gently rolling, slightly hilly character. The landscape is heavily dominated by natural and agricultural wetlands along the creeks and between smaller tributaries. The relatively flat valleys of the Assiscunk Creek and its numerous tributaries define the southern part of the township, while the steeper valleys of Spring Hill Brook and Blacks Creek demarcate its northern border. Many of the streams retain lush riparian buffers of upland forest and wooded wetlands. The highest elevations in the township approach 150 feet above sea level and occur in several areas of residential development, including the Homestead development and the Georgetown area. The lowest point is found along the banks of Blacks Creek and Assiscunk Creek, at 50 feet above sea level.

The upland area is characterized by rich soils that once supported extensive mixed deciduous forests. Today, Mansfield's upland forests are dominated by beech, oak, maple, and birch trees. Along the river valleys are freshwater wetlands and wet forests of sweet gum and red maple trees. As in all of southern New Jersey, Mansfield's streams are relatively flat with mostly muddy and/or sandy bottoms, although the bottoms of some stream segments are lined with small rounded rocks and pebbles.

### Steep Slopes

Slope is measured as the percent of vertical rise to horizontal distance. The majority of Mansfield Township has slopes of less than ten percent. The steepest slopes are along Spring Hill Brook, especially as it approaches Crystal Lake, although there are also steep slopes along parts of lower Crafts and Blacks creeks as well. Steep slopes in Mansfield are found almost entirely along the township's waterways, including smaller streams.

Most of these slopes are well vegetated, although farm fields and residential properties may extend to the edge of the plateau. In some locations, for example in new residential and commercial developments upstream of Crystal Lake in Mansfield, Bordentown, and Chesterfield townships, development has occurred on moderate slopes.

In general, development of steep slope areas is inadvisable because it can result in soil instability, erosion, sedimentation of streams, increased stormwater runoff, and flooding. This causes habitat destruction, water pollution, and potential damage to property. Erosion on steep slopes is especially prevalent where excessive tree removal has taken place. See the **Erosion** section on page 99 for more details.

Where steep slopes remain forested, some very old trees can be found. No detailed inventory of these sites exists at present, although some of the Mansfield endangered plant records from the state's Natural Heritage Database (see *Appendix D: Rare Plant and Animal Species and Natural Communities Presently Recorded in the NJ Natural Heritage Database for Mansfield Township* on page A-13) are from these habitats. Some regions have been negatively affected by fertilizers from adjoining farm fields, by runoff from development,



or by recent flooding, but there may still be intact sites. Mansfield's steep slopes are depicted on **Map 3: Steep Slopes** on page 14.

On steep slopes bordering creeks and streams, it is not unusual to see trees that have fallen into the gulleys or into the streams themselves. In some places, the rate of tree loss is accelerated beyond natural rates by erosion from flash flooding, which in turn is often caused by increases in impervious surface upstream. However, trees on steep slopes fall for other reasons as well, including age, severe storms (especially if their roots have been exposed from erosion), and heat and water loss, which dries the soil.

## SOILS

Soil is the foundation for all land uses. A region's soil defines what vegetation is possible, influencing agricultural uses. It determines how land can be developed for other purposes and is a natural resource that takes millions of years to replenish.

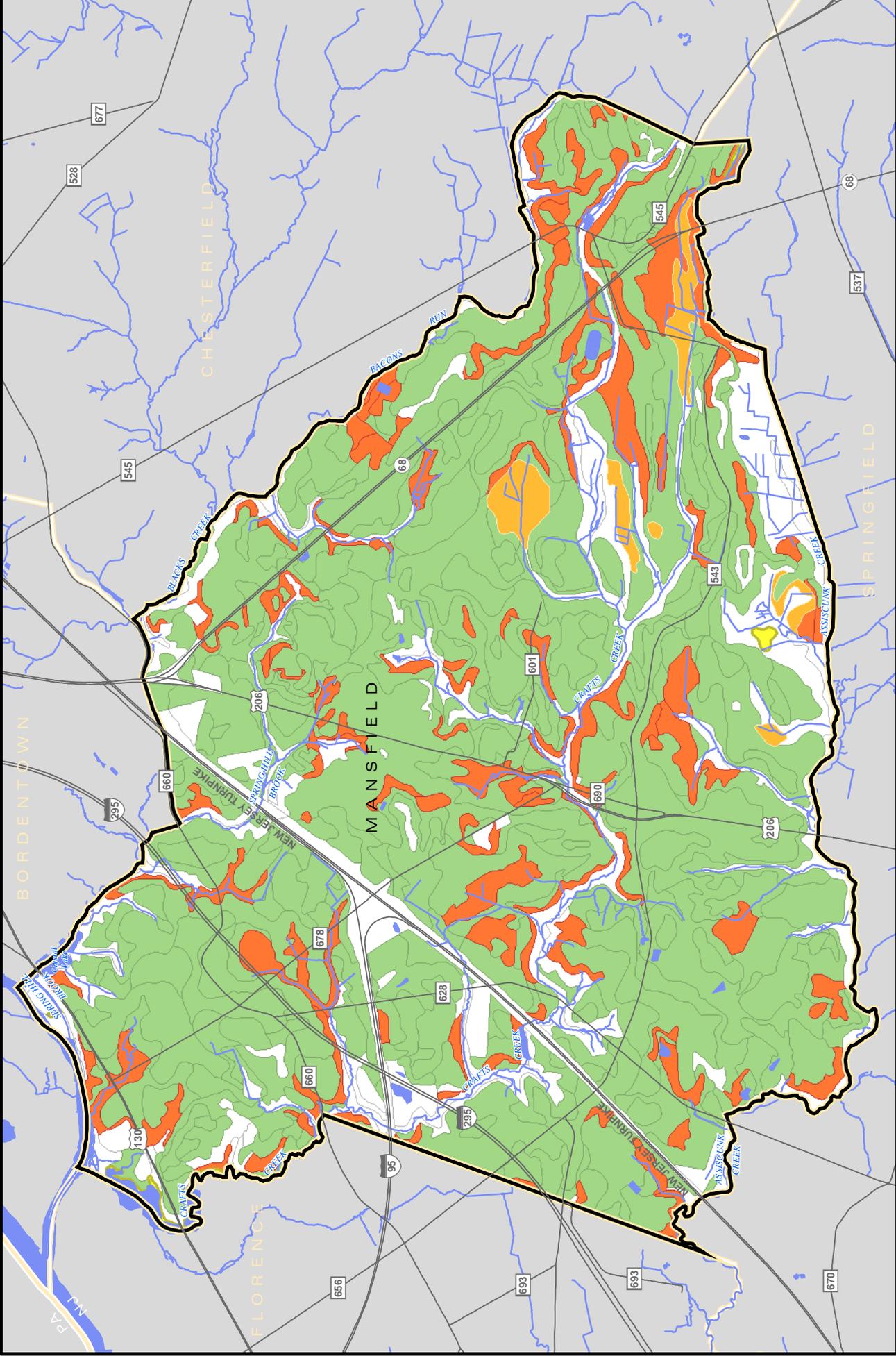
Mansfield Township soils consist of 21 series types and 65 variations within those series (excluding water) as identified by the US Department of Agriculture's Natural Resources Conservation Service. These are listed in *Table 4: Mansfield Township Soils* and shown on **Map 4: Soils** on page 16.

Mansfield's soils are rich in agricultural value. The most abundant of all soils in Mansfield Township are those classified as Prime Farmland (P-1), which occupy 68 percent (9,644 acres) of the land surface. Prime Farmlands are lands that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. They can sustain high yields of crops when managed with correct farming methods. Prime Farmlands are not excessively erodible or saturated with water for long periods of time and do not flood frequently.

About 16 percent (2,193 acres) of soils in Mansfield are classified as soils of Statewide Importance (S-1). These soils are close in quality to Prime Farmland and can sustain high yields of crops when correctly managed under favorable conditions. Farmland of Local Importance (L-1) consists of soils that can support the production of high value, regional crops like horticultural crops or indigenous foods; this occupies two percent of Mansfield's land. Mansfield also has two soil types categorized as soils of Unique Importance (U-1), totaling almost 50 acres. These are soils that are significant or rare to Mansfield Township, but not necessarily to the rest of South Jersey. The great majority of Mansfield's soils, over 85 percent, are valuable and rich farmland soils. See *Table 3: Agricultural Values for Mansfield Soils* on page 19, for the acreage of each of these classes of farmland. See also **Map 5: Agricultural Quality of Soils**, on page 18 for a visual depiction.

# MANSFIELD TOWNSHIP

# MAP 5: Agricultural Quality of Soils






- Soil Designation**
- P1 - Prime Farmland
  - S1 - Farmland of Statewide Importance
  - U1 - Unique Farmland
  - L1 - Local Importance
  - NA - Not Rated for Agricultural Use

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

**Table 3: Agricultural Values for Mansfield Soils**

Designation	Type	Area (Acres)	Percent
P-1	Prime Farmland	9,643.99	68.8%
S-1	Statewide Importance	2,193.44	15.6%
L-1	Local Importance	224.28	1.6%
U-1	Unique Importance	48.75	>1%
<b>Totals</b>		<b>12,110.46</b>	<b>86%</b>

Source: NJ Farmlands Inventory, 1995 classifications; NRCS SSURGO data 2005

## Soil Series

Several soil series appear more frequently in Mansfield Township than others and are briefly described as follows:

### *Freehold Series*

The most abundant soil series in Mansfield Township is the Freehold series. About 27 percent (3,638 acres) of Mansfield is made up of Freehold soils. These soils can be found on uplands in the coastal plains, have slopes ranging from 0 to 40 percent and are well-drained, moderately fertile soils formed by marine sediments containing glauconite. Found in many coastal plain soils, glauconite is a marine mineral that enhances soil fertility. Except for steep areas, Freehold soils support the growth of fruits, vegetables, grain, hay, pasture, nursery plants, and cultivated sod. They are designated as Prime Farmland or farmlands of Statewide Importance. In Mansfield, Freehold series soils are found throughout the township, with the largest contiguous areas in the central, south central, and southwestern areas. Freehold soils can often be found near soils from the Collington, Holmdel, Adelphia, and Tinton families. (Capability Units: I, II, III, IV, and VI)

### *Holmdel Series*

Roughly 15 percent (2,128 acres) of the soils in Mansfield Township are from the Holmdel series. The Holmdel series ranges from moderately well drained to somewhat poorly drained loamy and sandy soils formed from marine deposits. The fertility of Holmdel soils is moderate to moderately high. All variants of the Holmdel series present in Mansfield Township are considered Prime Farmland by the state of New Jersey. These soils allow for the production of corn, soybeans, small grains, hay, pasture, fruit, vegetables, and nursery plants. The native vegetation supported by the Holmdel series is forests consisting of red, white, and scarlet oak, yellow poplar, beech, and hickory. The Holmdel series soils are also found throughout the township, with the most concentrated areas in the center, southwest, and northwest. The soils most closely associated with the Holmdel series include the Adelphia, Freehold, Kresson, Collington, Colemantown, and Marlton series. (Capability Units: II, III)

### *Adelphia Series*

The third most common soil type in Mansfield Township is the Adelphia series, which makes up 14 percent (1,996 acres) of the township. This series consists of soils with a loamy composition containing moderate amounts of glauconite. Adelphia series soils have a moderate concentration of organic matter and are moderately high in their natural fertility. Crops grown on Adelphia

series soils include small grains, corn, soybeans, hay, pasture, tomatoes, potatoes, fruit, nursery stock, and sod. Adelphia series soils have been designated as Prime Farmland, although much of the Adelphia soils in the state have been urbanized. The Adelphia series soils can be found in the northeastern and southeastern areas of the township. The Adelphia series soils are most closely associated with Colemantown, Collington, Freehold, Kresson, Shrewsbury, Tinton, and Marlton series soils. (Capability Units: II)



*Mansfield has rich soils that support a wide variety of agriculture.*

### *Collington Series*

The fourth most common soil family in Mansfield Township is the Collington series. This series contains about 8 percent (1,169 acres) of the total township soil area. The Collington series soils are well drained loamy soils that contain fair amounts of clay, especially in the subsoil. The Collington series occur in high topographic positions and have slopes of as much as 10 percent. Collington soils have high organic matter content and a moderately high natural fertility. They are well suited for agricultural usage, especially the growth of fruits, vegetables, corn, small grains, soybeans, hay, and pasture. Historically, most potatoes grown in Burlington County have been raised in Collington soils. The natural vegetation that occurs on Collington soils is hardwood forest that consists of red oak, yellow poplar, hickory, ash, beech, with viburnums in the underbrush. However, most areas with Collington series soils have been urbanized. In Mansfield, the Collington series soils are located in long bands in the east along Route 68 and in the northwest of the township. The soils that are most closely associated with the occurrence of the Collington series are the Adelphia, Freehold, Holmdel, and Marlton series. (Capability Units: I, II, III)

### *Keyport Series*

The Keyport series also forms about 8 percent (1,132 acres) of the total soils in Mansfield Township. Keyport soils are deep, moderately well drained soils formed from marine sediments. They are yellow to brown in color. Keyport soils are mostly clay loams, which are good agricultural soils; however, Keyport soils are also slightly acidic and low in organic matter, and must therefore be well managed to be productive. While Keyport soils are found at slopes of up to 25 percent, most are relatively flat, at a 10 percent slope or less. The state has designated all flat Keyport soils as Prime Farmland. The natural vegetation supported by Keyport soils includes red, white and black oaks, beech, hickory, red maple, sweetgum, loblolly pine, Virginia pine, and in a few places, yellow poplar. Keyport soils are found along the beds of Blacks and Crafts creeks, and on significant areas of land where the Spring Hill Brook and Crafts Creek meet the Delaware River. The soils most closely associated with Keyport loams are the Elkton, Othello, and Matawan soil series. (Capability Units: II, III, IV, VI)

### *Shrewsbury Series*

The Shrewsbury series accounts for roughly 6 percent (836 acres) of the township's soils. Shrewsbury series soils consist of nearly level, wet, mottled gray soils. The soils drain poorly and occur in low topographic areas, where they receive much surface water running off from the slopes above. In their natural condition, the soils are moderately permeable, moderately fertile, moderately high in organic material, and saturated for six to eight months out of the year. As a result, these areas are prone to flooding. However, when Shrewsbury soils are drained, they have a high available water capacity and can support the cultivation of corn, soybeans, small grains, hay, pasture, turf grass, and in some areas, blueberries and vegetables. Most soils from the Shrewsbury series have been designated by New Jersey as farmlands of Statewide Importance. They are primarily located in the far eastern area of the township, along Bacons Run; however, Shrewsbury soils can be found near the headwaters of nearly all the creeks and their tributaries. The Shrewsbury soils are most commonly associated with the Adelphia, Collington, Holmdel, Freehold, and Tinton series soils. (Capability Units: III, IV)

### *Colemantown Series*

The Colemantown series comprises about 3.5 percent (490 acres) of the soils in Mansfield. These deep, poorly drained soils are greenish-gray, and are found in flat, low-lying areas of the

### **Capability Units**

**I** – Soils have few limitations that restrict their use.

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

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

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

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

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

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

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

coastal plain. The Colemantown series is formed from marine deposits, typically with high levels of glauconite. These soils are typically found in areas with a high water table and could be characterized as wetland soils. They do not make good agricultural soils, as they are frequently flooded and highly acidic, but if drained and limed, they can be productive. Where they have been converted to agriculture, they commonly produce hay, pasture, turf, corn, and soybeans. Their natural vegetation is dominated by sweetgum, red maple, white oak, American holly, and yellow poplar. Colemantown soils are mostly found along Assiscunk Creek, east of US Route 206. They are also found near the headwaters of several creeks and their tributaries. Colemantown soils are associated with the Adelpia, Collington, Colts Neck, Donlonton, Freehold, Marlton, and Kresson series. (Capability Units: III)

**Table 4: Mansfield Township Soils**

Soil Type	Soil Name	Acreeage	Percentage of All Acres	Designation*
AdmA	Adelpia fine sandy loam, 0 to 2 percent slopes	787.09	5.62%	P - 1
AdmB	Adelpia fine sandy loam, 2 to 5 percent slopes	359.65	2.57%	P - 1
AdmkA	Adelpia fine sandy loam, clayey substratum, 0 to 2 percent slopes	374.63	2.67%	P - 1
AdmkB	Adelpia fine sandy loam, clayey substratum, 2 to 5 percent slopes	214.51	1.53%	P - 1
AdmmA	Adelpia high glauconite variant fine sandy loam, 0 to 2 percent slopes	113.78	0.81%	P - 1
AdmmB	Adelpia high glauconite variant fine sandy loam, 2 to 5 percent slopes	125.92	0.90%	P - 1
AdnA	Adelpia loam, 0 to 2 percent slopes	20.73	0.15%	P - 1
CoeAs	Colemantown loam, 0 to 2 percent slopes, occasionally flooded	490.35	3.50%	NA
ComA	Collington fine sandy loam, 0 to 2 percent slopes	189.97	1.36%	P - 1
ComB	Collington fine sandy loam, 2 to 5 percent slopes	805.61	5.75%	P - 1
ComC	Collington fine sandy loam, 5 to 10 percent slopes	169.41	1.21%	S - 1
ConB	Collington loam, 2 to 5 percent slopes	4.24	0.03%	P - 1
DoaA	Donlonton fine sandy loam, 0 to 2 percent slopes	98.63	0.70%	P - 1
DobA	Donlonton loam, 0 to 2 percent slopes	280.23	2.00%	P - 1
FmhAt	Fluvaquents,** loamy, 0 to 3 percent slopes, frequently flooded	872.14	6.23%	NA
FrfB	Freehold loamy sand, 0 to 5 percent slopes	256.71	1.83%	P - 1
FrfC	Freehold loamy sand, 5 to 10 percent slopes	93.66	0.67%	S - 1
FrkC3	Freehold sandy loam, 5 to 10 percent slopes, severely eroded	43.27	0.31%	NA
FrkD3	Freehold sandy loam, 10 to 15 percent slopes, severely eroded	22.85	0.16%	NA
FrmA	Freehold fine sandy loam, 0 to 2 percent slopes	465.27	3.32%	P - 1
FrmB	Freehold fine sandy loam, 2 to 5 percent slopes	2,140.55	15.28%	P - 1
FrmC	Freehold fine sandy loam, 5 to 10 percent slopes	197.61	1.41%	S - 1
FrmD	Freehold fine sandy loam, 10 to 15 percent slopes	78.20	0.56%	NA

Soil Type	Soil Name	Acreage	Percentage of All Acres	Designation*
FrmE	Freehold fine sandy loam, 15 to 25 percent slopes	5.64	0.04%	NA
FrmkB	Freehold fine sandy loam, clayey substratum, 2 to 5 percent slopes	418.75	2.99%	P - 1
Hoab	Holmdel loamy sand, 0 to 5 percent slopes	14.35	0.10%	P - 1
HodA	Holmdel fine sandy loam, 0 to 2 percent slopes	811.31	5.79%	P - 1
HodB	Holmdel fine sandy loam, 2 to 5 percent slopes	513.70	3.67%	P - 1
HodkA	Holmdel fine sandy loam, clayey substratum, 0 to 2 percent slopes	335.79	2.40%	P - 1
HodkB	Holmdel fine sandy loam, clayey substratum, 2 to 5 percent slopes	453.72	3.24%	P - 1
HumAt	Humaquepts, 0 to 3 percent slopes, frequently flooded	7.86	0.06%	NA
KeaA	Keansburg fine sandy loam, 0 to 2 percent slopes	224.28	1.60%	L - 1
KenB	Keyport fine sandy loam, 2 to 5 percent slopes	29.83	0.21%	P - 1
KeoA	Keyport loam, 0 to 2 percent slopes	290.54	2.07%	P - 1
KeoB	Keyport loam, 2 to 5 percent slopes	242.68	1.73%	P - 1
KeoC	Keyport loam, 5 to 10 percent slopes	226.92	1.62%	S - 1
KeoD	Keyport loam, 10 to 15 percent slopes	242.94	1.73%	NA
KeoE	Keyport loam, 15 to 25 percent slopes	99.85	0.71%	NA
KreA	Kresson fine sandy loam, 0 to 2 percent slopes	16.44	0.12%	S - 1
MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	11.61	0.08%	U - 1
MamnAv	Mannington-Nanticoke complex, 0 to 1 percent slopes, frequently flooded	37.15	0.27%	U - 1
PHG	Pits, sand and gravel	94.62	0.68%	NA
PHM	Pits, clay	30.63	0.22%	NA
PefB	Pemberton sand, 0 to 5 percent slopes	57.32	0.41%	S - 1
PeftB	Pemberton sand, thick surface, 0 to 5 percent slopes	0.00	0.00%	S - 1
SabB	Sassafras loamy sand, 0 to 5 percent slopes	5.94	0.04%	S - 1
SaeA	Sassafras fine sandy loam, 0 to 2 percent slopes	50.63	0.36%	P - 1
SaeB	Sassafras fine sandy loam, 2 to 5 percent slopes	108.01	0.77%	P - 1
SaeC	Sassafras fine sandy loam, 5 to 10 percent slopes	6.42	0.05%	S - 1
SaekB	Sassafras fine sandy loam, clayey substratum, 2 to 5 percent slopes	31.51	0.22%	P - 1
ShsA	Shrewsbury fine sandy loam, 0 to 2 percent slopes	403.49	2.88%	S - 1
ShskA	Shrewsbury fine sandy loam, clayey substratum, 0 to 2 percent slopes	365.11	2.61%	S - 1
ShtA	Shrewsbury loam, 0 to 2 percent slopes	53.12	0.38%	S - 1
ShwA	Shrewsbury ironstone substratum variant fine sandy loam, 0 to 2 percent slopes	14.54	0.10%	NA
ThfB	Tinton sand, 0 to 5 percent slopes	44.53	0.32%	S - 1
ThfC	Tinton sand, 5 to 10 percent slopes	4.50	0.03%	S - 1
ThftB	Tinton sand, thick surface, 0 to 5 percent slopes	35.56	0.25%	S - 1
URCLAB	Urban land, clayey substratum, 0 to 8 percent slopes	72.01	0.51%	NA
URSAAB	Urban land, sandy, 0 to 8 percent slopes	362.31	2.59%	NA
URSACB	Urban land, sandy over clayey, 0 to 8 percent slopes	20.68	0.15%	NA

Soil Type	Soil Name	Acreage	Percentage of All Acres	Designation*
UdrB	Udorthents, refuse substratum, 0 to 8 percent slopes	14.21	0.10%	NA
WATER	Water	26.86	0.19%	NA
WofkA	Woodstown fine sandy loam, clayey substratum, 0 to 2 percent slopes	18.24	0.13%	P - 1
WofkB	Woodstown fine sandy loam, clayey substratum, 2 to 5 percent slopes	0.86	0.01%	P - 1
<b>Total</b>		<b>14,009.45</b>	<b>100.00%</b>	

Source: NJDEP (2005) based on data from USDA and NRCS

\*\* Soils are categorized hierarchically, from Soil Orders, which are global, to Soil Series, which are local. Fluvaquents are a Great Group, the third level of designation, and therefore cover a large range of soils. The reason they are listed with the soils series here is that they share common chemical and physical properties that make them easy to agglomerate. Fluvaquents are acidic and hydric, and are usually found in wetland areas.

### \*Explanation of Designations

P-1	Prime Farmland
S-1	Statewide Importance
L-1	Local Importance
U-1	Unique Importance
NA	Soil not rated for agricultural use by NRCS, but may be suitable or currently used for such use.

Soil characteristics can severely restrict the use of sites for construction and development. *Table 5: Soil Limitations for Development* records the soils and their possible limitations for building foundations and septic systems. As indicated in the table, the township has some soils that are severely limited for on-site septic systems. Septic systems require soils that have a low water table (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.

**Table 5: Soil Limitations for Development**

Soil Series	Soil Codes	Acres	Land Use Implications		
			Building without Basement	Building with Basement	Septic Systems
Adelphia	AdmA, AdmB, AdmmA, AdnA	1,996.31	B	C	C
Colemantown	Coes	490.35	C	C	C
Collington	ComA, ComB, ComC	1,169.23	B	A	C
Donlonton	DoaA, DobA	378.86	B	C	C
Fluvaquent	Fmht	872.14	C	C	C
Freehold	FrFB, FrfC, FrkC3, FrmA, FrmB, FrmC	3,638.66	A	A	C
Freehold	FrmD	78.20	B	B	C
Freehold	FrmE	5.64	C	C	C
Holmdel	Hoab, HodA, HodB	2,128.87	B	C	C
Humaquepts	HumAt	7.86	C	C	C
Keansburg	KeaA	224.28	C	C	C
Keyport	KenB, KeoA, KeoB, KeoC, KeoD	1,032.92	B	C	C
Keyport	KeoE	99.85	C	C	C
Kresson	KrbA, KreA, KrhA	16.44	C	C	C
Manahawkin	MakAt	11.61	C	C	C
Mannington-Nanticoke	MamnAv	37.15	C	C	C
Pemberton	PefB, PeftB	57.33	A	C	B
Pits, Sand and Gravel	PHG	125.25	A	A	C
Sassafras	SabB, SaeA, SaeB	164.59	A	A	A
Sassafras	SaeC	6.42	B	B	A
Sassafras	SaekB	31.51	A	B	C
Shrewsbury	Shs, Shsr	836.26	C	C	C
Tinton	ThfB, ThfC, ThftB	84.59	A	A	C
"U" Series	Udz, URCOB, USD, USF	455.00	NA	NA	NA
Udorthents	UdrB	14.21	B	C	C
Water	Water	26.86	NA	NA	NA
Woodstown	WofkA, WofkB	19.10	B	C	C
<b>Total</b>		<b>14,009.45</b>			

*NJDEP (2005) based on data from USDA and NRCS*

<b>Key to Land Use Implications</b>	
<b>A = Slight.</b>	Little or no limitation(s) or easily corrected by use of normal equipment and design techniques.
<b>B = Moderate.</b>	Presence of some limitations which normally can be overcome by careful design and management at somewhat greater cost.
<b>C = Severe.</b>	Limitations that normally cannot be overcome without exceptional, complex, or costly measures.

## **CLIMATE**

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 hot, cold, dry, and humid airstreams, and local weather is highly changeable. From May through September, New Jersey is dominated by moist, tropical air originating in the Gulf of Mexico and swept in by prevailing winds from the southwest. In winter, winds generally prevail from the northwest, bringing cold, polar air masses from subarctic Canada.

The National Climate Data Center (NCDC) operates 19 stations in Burlington County, none of which are in Mansfield Township. The closest station is in Mount Holly, with nearby stations in Pemberton and Burlington City. Mount Holly also houses the South Jersey Regional Station, which collates and redistributes data from the stations in its region. The station nearest Mansfield that reports annual mean temperature data is the Pemberton Station. According to data tabulated from 1971-2000, the annual mean temperature was 53.9°F. The average annual rainfall for Mansfield is approximately 40 inches per year.

Climate also varies within distinctive climate zones found throughout the state, including the ridges and valleys, the highlands, the central piedmont plateau, the inner coastal plain, and the outer coastal plain. For example, Burlington County extends east into the Pine Barrens, in the outer coastal plain. The soils in the outer coastal plain are sandier and exhibit a strong radiational cooling after sunset. Therefore, temperatures can be significantly lower in towns just a few miles east of Mansfield.

## **SURFACE WATER RESOURCES**

All of Mansfield's land ultimately drains to the Delaware River. A majority of the land surface drains to Crafts Creek, which flows through the center of the township. The far southern portion of the township drains into Assiscunk Creek. A significant northern portion of the township, adjacent to Bordentown Township, drains to Spring Hill Brook. The westernmost reaches of Mansfield Township drain into Bacons Run, a tributary of Blacks Creek. A small portion of the township drains into Blacks Creek, which mostly flows through Chesterfield Township.

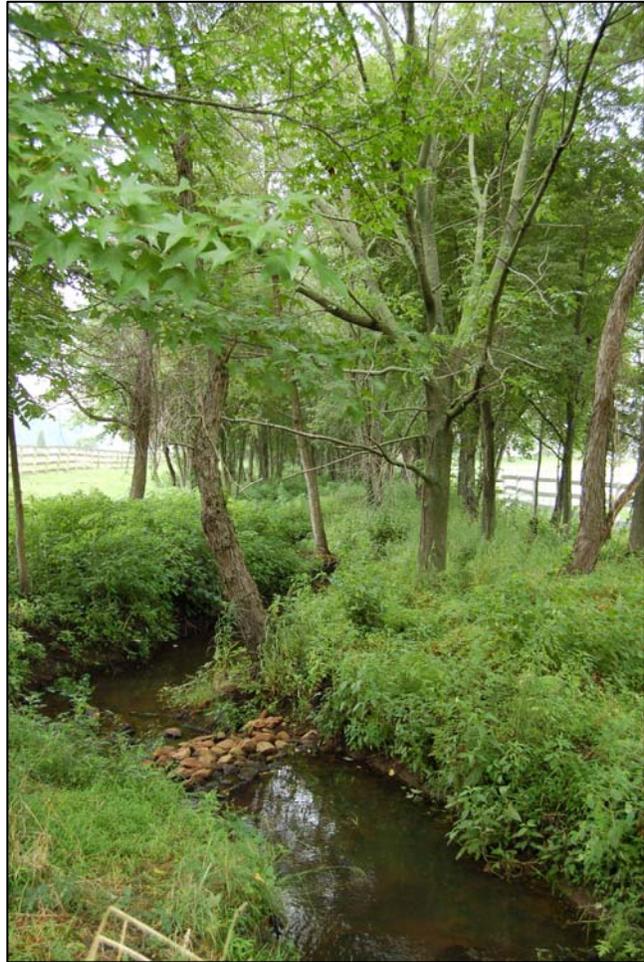
### **Watersheds**

A watershed is all the land that drains to a particular waterway, such as a river, stream, lake, or wetland. The high points in the terrain, such as hills and ridges, define the boundaries of a watershed. Large watersheds are made up of a succession of smaller ones, and smaller ones are made up of the smallest area – the catchment area of a local site. So, for example, the Delaware River watershed is made up of many smaller watersheds, such as the Crosswicks Creek watershed, which, in turn, consists of smaller watersheds, such as Blacks Creek. The Blacks Creek watershed is formed from several subwatersheds and consists of the land that drains to a major tributary or branch of the creek, such as Bacons Creek. These subwatersheds can be further subdivided into smaller ones, each surrounding smaller tributaries that flow to the larger channel, and so on down to the catchment level. Watersheds are natural ecological units, where

soil, water, air, plants, and animals interact in a complex relationship. There are three major creek systems that flow through Mansfield Township and are briefly described below.

### *Assiscunk Creek Watershed*

The Assiscunk Creek main channel has a total length of nine miles, from its origins in the Tilghmans Corner area, just over the border of Mansfield in southeast Springfield Township, to the Delaware River at Burlington Borough. This watershed includes large areas of both Mansfield and Springfield townships, and the main channel of the creek is the boundary between the two municipalities. The watershed also includes parts of Florence, Eastampton, Westampton, and Burlington townships. There are many small unnamed tributaries in Mansfield Township that flow south to the Assiscunk. Two large tributaries – Barkers Brook and Birch Brook – flow through townships to the south of Mansfield and join the main channel near Petticoat Bridge Road.



*Over 77 miles of streams flow through Mansfield Township.*

There are no lakes or sizable ponds within the watershed. The creek itself is tidal up to Neck Road in Burlington Township. All of the Assiscunk Creek within Mansfield Township is nontidal and freshwater. A long section of the creek between Island Road and Gaunt’s Bridge Road has been channelized and straightened. This area also has numerous drainage ditches, which are up to a half mile or more in length, that flow into the creek. They were created to drain surrounding land on both sides of the channel for use as agricultural fields. The soils in these regions are primarily Shrewsbury soils, which are hydric soils that do not support agriculture without draining and have severe limitations for building and septic systems, as well.

The Assiscunk Creek watershed is designated as a single HUC-11 watershed<sup>2</sup>, but is further subdivided into six subwatersheds. Three of these HUC-14 subwatershed areas encompass parts of Mansfield Township. About 24 percent of Mansfield’s land falls within the Assiscunk Creek watershed.

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<sup>2</sup> “HUC” stands for Hydrological Unit Code, which is a numerical identification number given to every drainage system in the United States by the U.S. Geological Survey. HUC-11 codes are the 11-digit numbers applied to a part of a drainage area that is approximately 40 square miles in size. HUC-11 areas are further subdivided into HUC-14 subwatersheds, with the identification number for each one having 14 digits.

### *Blacks Creek Watershed*

For one mile of its length, the Blacks Creek main channel is the border between Mansfield and Chesterfield townships. The creek is approximately 12 miles in total length. Its headwaters are in North Hanover and Chesterfield townships, and it flows to the northwest before joining Crosswick Creek just before that stream empties into the Delaware River next to Bordentown Borough. A major tributary to Blacks Creek is Bacons Run, which is over four miles in length, most of which forms the remainder of the boundary between Mansfield and Chesterfield. Bacons Run joins Black Creek just above White Pine Road.

The Blacks Creek watershed is the smallest in Mansfield Township, with only 11 percent of Mansfield's acreage being within this watershed. The watershed is divided into two subwatersheds or HUC-14 areas, one above its confluence with Bacons Run, and the other below that point and encompassing the Bacons Run subwatershed land.

There are no lakes or significant ponds in the watershed in Mansfield. The creek is tidal up to the dam just west of Route 206 in Bordentown Township. It is freshwater throughout its length, and that of Bacons Run in Mansfield Township.

### *Crafts Creek Watershed*

The Crafts Creek watershed is eleven miles in length, from its headwaters in Chesterfield to where it meets the Delaware River opposite Newbold Island. It drains the majority of Mansfield Township, encompassing over 7,200 acres in the township. The last two miles of the creek form the boundary between Mansfield and Florence townships. The division between the Assiscunk Creek and Crafts Creek watersheds is a slight ridge line, on which County Route 543 (Main Street) in Mansfield Township is located for most of its length.



*Photo by Robert Tallon, Mansfield Environmental Commission*

Crafts Creek has several unnamed tributaries within Mansfield Township. There are no water impoundments on the creek, although it does widen at its mouth into a tidal basin. The creek is tidal to a point about  $\frac{3}{4}$  of mile below Route 130. Like the Assiscunk, there are several long, channelized sections of the creek and of its headwater tributaries in the eastern part of Mansfield. These serve to drain the region's hydric soils for purposes of agriculture. Most of the upper parts of the creek are bordered by extensive wetland forests or low-growing (emergent) wetlands.

*View of Crafts Creek from Jacksonville-Hedding Road*

The Crafts Creek watershed in Mansfield is divided into three HUC-14 subwatersheds, with the division between the upstream and downstream subwatersheds occurring roughly parallel to

Route 206. The third subwatershed consists of the land that drains to Spring Hill Brook. While this is designated as part of the Crafts Creek watershed, Spring Hill Brook is actually a separate stream that starts in Mansfield just east of Route 206 and flows northwest, discharging directly to the Delaware River at a point opposite Newbold Island. For half of its length, it forms the boundary between Mansfield and Bordentown townships. Spring Hill Brook (also listed as Crystal Creek) was dammed to form Crystal Lake, which is the largest impoundment in the township, and is nontidal and freshwater for its full distance above that point. The lake is recognized as a significant birding area by the New Jersey Audubon Society and is accessible for fishing. Liberty Lake and an unnamed pond on the Wainwright property are also significant waterbodies within the Crystal Creek watershed.



*Photo by Robert Tallon, Mansfield Environmental Commission*

*Crystal Lake dam at high tide*

The percentage of Mansfield Township land that is in each of these three watersheds, along with their HUC-14 subwatersheds and identification numbers, are listed in *Table 6: Watersheds in Mansfield Township* on page 31. See also **Map 6: Watersheds** on page 30 and **Map 7: Surface Water, Wetlands, and Vernal Pools** on page 36.



*Watershed Management Area 20*

The NJ Department of Environmental Protection manages natural resources on a watershed basis. The state has been divided into 20 Watershed Management Areas (WMAs). The three watersheds of Mansfield Township are part of WMA 20 – “Assiscunk, Crosswicks, and Doctors,” an area that also includes all or part of Mansfield’s neighboring communities in Burlington County, as well as parts of Mercer, Monmouth, and Ocean counties.

**Table 6: Watersheds in Mansfield Township**

Watershed (HUC 11 Number)	Subwatershed within Mansfield	Stream Classification	Acreage within Mansfield	Percent of Mansfield land	HUC 14 Number
<b>Blacks Creek (02040201080)</b>					
	Blacks Creek (Bacons Run to 40d06m10s)	FW2-NT	1,406.43	10.04%	02040201080020
	Blacks Creek (below Bacons Run)	FW2-NT	160.90	1.15%	02040201080030
<b>Crafts Creek (02040201090)</b>					
	Crafts Creek (above Route 206)	Not Classified	3,348.99	23.91%	02040201090010
	Crafts Creek (below Route 206)	Not Classified	3,879.35	27.69%	02040201090020
	Lower Delaware River tributaries (Assiscunk Creek to Blacks Creek)*	Not Classified	1,914.18	13.66%	02040201090030
<b>Assiscunk Creek (02040201100)</b>					
	Assiscunk Creek (Neck Road to Jacksonville Road)	FW2-NT (C1)	600.52	4.29%	02040201100050
	Assiscunk Creek (above Route 206) 02040201100	FW2-NT (C1)	1,673.78	11.95%	02040201100010
	Assiscunk Ck (Jacksonville Road to Route 206)	FW2-NT (C1)	1,025.31	7.32%	02040201100040
<b>Total</b>			<b>14,009.45</b>	<b>100%</b>	

Source: NJDEP

\* Drains to Spring Hill Brook

**Streams**

There are just over 77 stream miles flowing across Mansfield Township. Nearly 50 miles of these are first or second order (headwater) streams, meaning they are the initial sections of stream channels with no contributing tributaries (first order streams), or they are stream channels formed from only one branching section of tributaries above them (second order streams). The headwaters are where a stream is “born” and actually begins to flow.

Headwaters are of particular importance because they tend to contain a diversity of aquatic species and their condition affects downstream water quality. Because of their small size, they are highly susceptible to impairment by human activities on the land. First and second order streams are narrow and often shallow, and are characterized by relatively small base flows. This makes them subject to greater temperature fluctuations, especially when forested buffers on their banks are removed. They are also easily over silted by sediment-laden runoff and their water quality can be rapidly degraded. In addition, first order streams are greatly affected by changes in the local water table because they are fed by groundwater sources. Headwaters are important sites for the aquatic life that is at the base of the food chain and often serve as spawning or nursery areas for fish.

**Table 7: Mansfield Township Streams**

<b>Stream Order</b>	<b>Miles</b>
First Order streams (smallest)	30.58
Second Order streams	19.00
Third Order streams	10.44
Fourth Order and above streams	17.53
<b>Total</b>	<b>77.54</b>

*Source: NJDEP*

## **Wetlands**

Wetlands support unique communities that serve as natural water filters and as incubators for many beneficial species. The term “wetland” is applied to areas where water meets the soil surface and supports a particular biological community. The source of water for a wetland can be an estuary, river, stream, lake edge, or groundwater that rises close to the land surface. Under normal circumstances, wetlands are those areas that support a prevalence of defined wetland plants on a wetland soil. The U.S. Fish & Wildlife Service designates all large vascular plants as wetland (hydric), non-wetland (non-hydric) or in-between (facultative). Wetland soils, also known as hydric soils, are areas where the land is saturated for at least seven consecutive days during the growing season. Wetlands are classified as either tidal (coastal) or nontidal (interior). Tidal wetlands can be either saline or freshwater. There are also special wetland categories to denote saturated areas that have been altered by human activities.

New Jersey protects freshwater (interior) 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 DEP, called a “letter of interpretation (LOI),” can legally determine for sure 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 and on its web site under “land use.” See **Sources of Information** on page 103.

All of Mansfield's wetlands are freshwater. Natural wetlands of all types total approximately 2,257 acres within the township (16 percent of total land area), of which 1,773 acres are wooded wetlands, 451 acres are low-growing emergent, scrub/shrub or herbaceous wetlands, and almost five acres are freshwater tidal marshes. See **Map 7: Surface Water, Wetlands, and Vernal Pools** on page 36.

Mansfield also includes approximately 1,396 acres (about 10 percent of total land area) 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. Modified wetland areas do, however, show obvious signs of soil saturation and exist in areas shown to have hydric soils on U.S. Soil Conservation Service soil surveys.

Mansfield's modified wetlands fall into the following categories: 1,360 acres of agricultural wetlands, 36 acres of disturbed wetlands, 53 acres of former agricultural wetlands, 38 acres of wetlands used as right-of-ways, and 39 acres of wetlands found in maintained greenspace, lawns, or recreation area. A more detailed description of all of Mansfield's natural wetland areas is found in the *Biological Resources* section, under "Wetlands" on page 66.



*Over 16% of Mansfield Township consists of wetlands.*

### **Agricultural Wetlands**

Agricultural wetlands occupy 1,360 acres (slightly less than 10 percent of total land area) of Mansfield Township. These "quasi-wetlands" are concentrated in the southeastern area on either side of County Route 543. Large areas of agricultural wetlands exist scattered throughout the township. Some smaller agricultural wetlands may have been replaced by recent residential development. Agricultural wetlands are modified former wetlands under cultivation that are

modified former wetland areas, but still exhibit evidence of soil saturation in aerial infrared photo surveys. See **Map 7: Surface Water, Wetlands, and Vernal Pools** on page 36.

Agricultural wetlands were usually drained by a technique called “tile drainage.” Tile drainage was a common method of removing excess water from farm fields that exhibited one or more of the following characteristics: (1) small areas of isolated wetlands, (2) very flat land that ponded in wet weather, (3) soils were slow to warm in the spring because of a relatively high water table, or (4) soils had a very high clay content and, therefore, drained slowly. Tile drainage was very labor intensive, as it involved installing subsurface drainage pipes throughout a field at a depth of three to six feet. Tile drains were used sparingly – only where there were extremely wet spots. Therefore, the existence of tile drainage strongly indicates a natural wetland hydrology.

The Natural Resources Conservation Service sponsors the Wetlands Reserve Program, a voluntary program that offers landowners a chance to receive payments for restoring and protecting wetlands, including agricultural wetlands, on their property. Restoring agricultural wetlands would require removing them from agricultural use and restoring them to their natural state. This program provides technical and financial assistance to eligible landowners who can enroll eligible lands through permanent easements, 30-year easements, or restoration cost-share agreements.

## **Vernal Pools**

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



*Photo by Robert Tallon, Mansfield Environmental Commission*

*Vernal pools are found throughout the township, in fields, forests, near streams, and even backyards.*

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

The New Jersey Division of Fish and Wildlife has been conducting a Vernal Pool Survey project since 2001 to identify, map, and certify vernal ponds throughout the state. Once a vernal pond is certified, regulations require that a 75-foot buffer be maintained around the pond. NJDEP’s division of Land Use Regulation oversees this designation and restricts development around vernal

ponds by denying construction permits. Local municipalities can provide additional protection by negotiating conservation easements on the land surrounding the pond or by instituting restrictive zoning, such as passing a stream corridor protection overlay ordinance that specifically includes the vernal pools. A township can also include the pools in its official map.

The state has identified 20 certified or potential vernal pools in Mansfield Township. Surveys of each pond are needed to determine if the pond is still in existence as a natural habitat, and if it is, what species are present. Three of these sites had been surveyed and certified as vernal pools as of August 2006, numbers 1750, 1752, and 1908.<sup>3</sup> Additionally, more vernal pools may be undocumented, and thus threatened. See **Map 7: Surface Water, Wetlands, and Vernal Ponds** on page 36.

## 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 one percent chance of occurring in any given year).

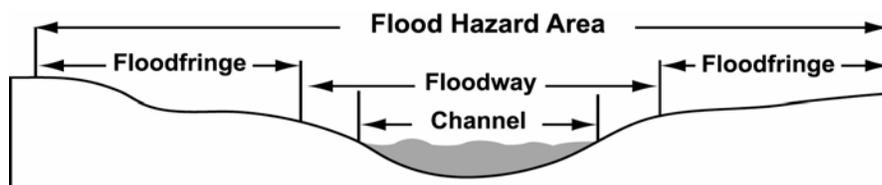


Figure 3: Parts of a Flood Hazard Area

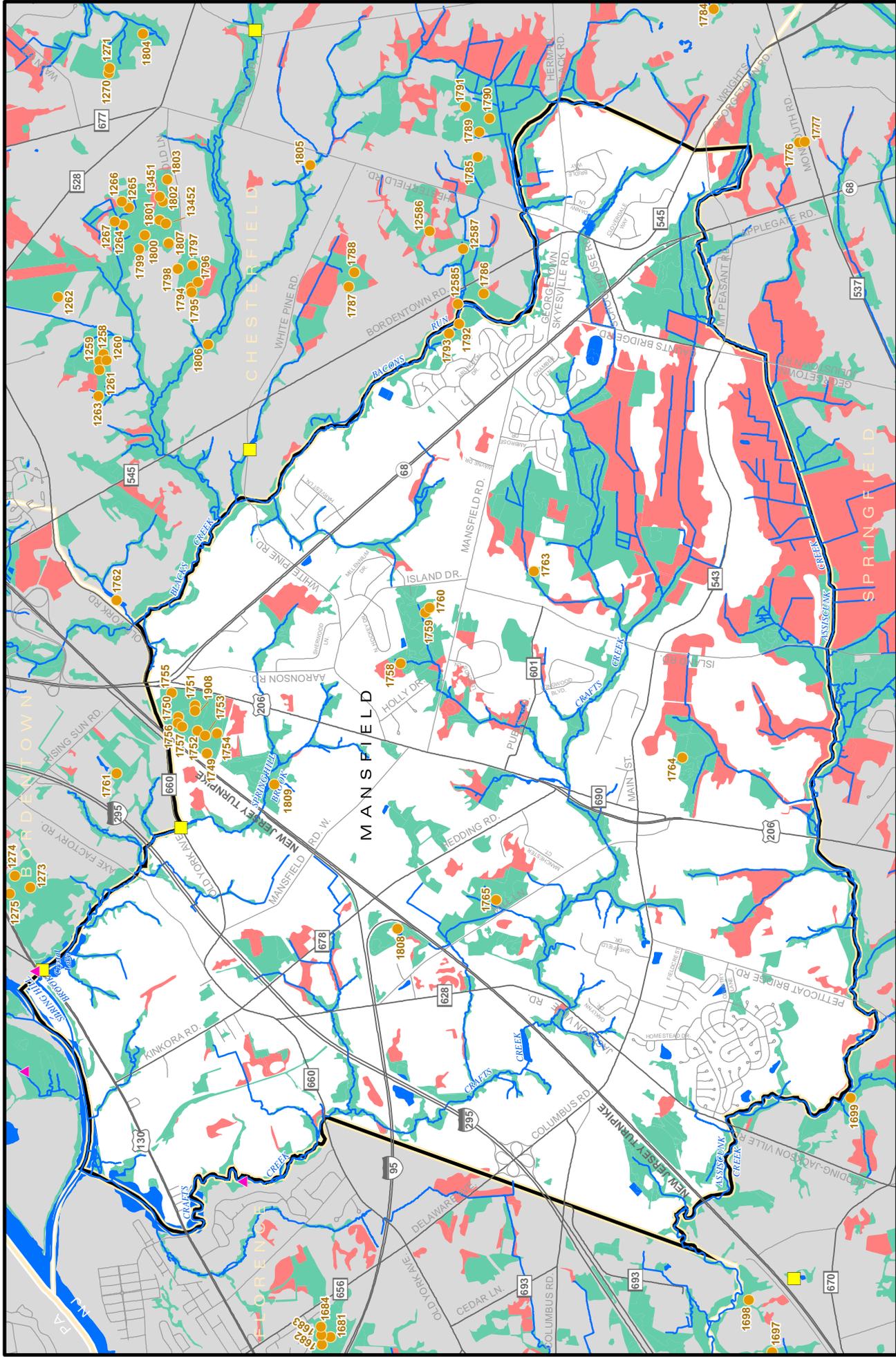
Although the terms “flood hazard area” and “100-year floodplain” denote similar concepts, NJDEP defines them in slightly different ways. New Jersey’s regulations define the flood hazard area as the area inundated by a flood resulting from the 100-year discharge increased by 25 percent. This type of flood is called the “flood hazard area design flood” and it is the flood regulated by NJDEP.

Floodplains require protection in order to prevent loss to residents, 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

<sup>3</sup> NJDEP and Rutgers Center for Remote Sensing and Spatial Analysis. <http://www.dbcrrsa.rutgers.edu/ims/vernal/>, accessed August 2006.

# MANSFIELD TOWNSHIP

# MAP 7: Surface Water, Wetlands, and Vernal Pools



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.

- Wetlands
- Agricultural Wetlands
- Vernal Pool Location
- Dam
- Head of Tide

N

0 0.25 0.5 1 Miles

Delaware Valley Regional Planning Commission  
March 2007

development out of floodplains will help to preserve the flood-carrying capacity of streams and their water quality.

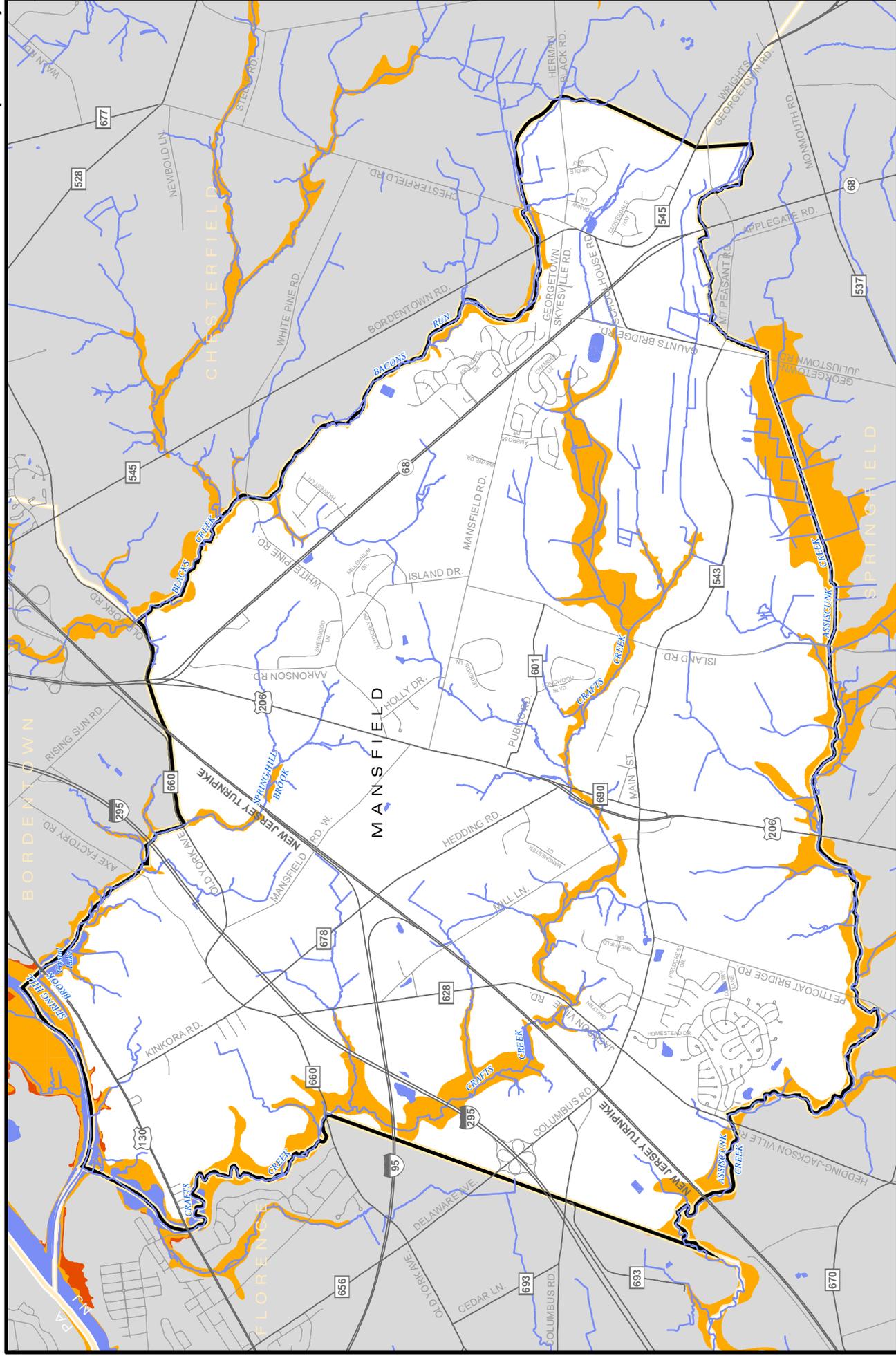
In New Jersey and throughout the country, building in areas subject to flooding is regulated to protect lives, property, and the environment. New Jersey regulates construction in the flood hazard area under the Flood Hazard Area Control Act, N.J.S.A. 58:16A-50 et seq., and its implementing rules at N.J.A.C. 7:13. Activities that are proposed to occur in a flood hazard area will require issuance of a stream encroachment permit or a letter of non-applicability from the NJDEP. Additional information on floodplain activities is available from NJDEP and from its web site under “Land use.” See **Sources of Information** on page 103.

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 Mansfield by using the Federal Emergency Management Agency’s (FEMA’s) 100-year floodplain maps. FEMA’s maps show that almost 1,288 acres, or 9 percent, of Mansfield Township’s land is within the 100-year flood hazard area, and an additional 5 acres are within the 500-year flood hazard area. Nearly all of Mansfield’s floodplain areas are located along the Assiscunk Creek and branches of Crafts Creek. Along Assiscunk Creek’s main branch, the 100-year floodplain extends about a quarter of a mile on either side of the creek’s channel. Crafts Creek’s floodplain widens as it flows under the New Jersey Turnpike towards the Delaware. Some of Mansfield’s oldest residences are located within this expansive floodplain. Spring Hill Brook has a wide floodplain over portions of Bordentown Township, but a somewhat narrow floodplain in Mansfield Township. Many of the other, smaller creeks, such as Blacks Creek and Bacons Run, lie in relatively steep-banked stream valleys, where the extent of the floodplain is more limited. See **Map 8: Flood Hazard Areas** on page 38.

## **Surface Water Quality**

Water quality standards are established by federal and state governments to ensure that water is suitable for its intended use. The federal Clean Water Act (P.L. 95-217) requires that wherever possible, water quality standards provide water suitable for fish, shellfish, and wildlife to thrive and reproduce and for people to swim and boat.

All waterbodies in New Jersey are classified by NJDEP as either freshwater (FW), pinelands water (PL), saline estuarine water (SE) or saline coastal water (SC). Freshwater is further broken down into freshwater that originates and is wholly within federal or state parks, forests, or fish and wildlife lands (FW1) and all other freshwater (FW2). The water quality for each of these groups must be able to support designated uses that are assigned to each waterbody classification (see *Surface Water Quality Standards N.J.A.C. 7:9B-1.12*). In addition to being classified as FW1 and FW2, fresh waterbodies are classified as trout producing (TP), trout maintaining (TM) or nontrout waters (NT). Each of these classifications may also be subject to different water quality standards.



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

N

0 0.25 0.5 1  
Miles

Delaware Valley  
Regional Planning Commission  
March 2007

Blacks Creek is classified by the NJDEP as FW2-NT, which means that it is a freshwater stream that is not a trout producing or trout maintaining water. Several of the other streams located in Mansfield Township, including Assiscunk Creek and Bacons Run are also classed as FW2-NT waters. NJDEP does not provide this information for Crafts Creek or Spring Hill Brook.

Assiscunk Creek, from its headwaters to its confluence with Barkers Brook, is classified as a Category One (C-1) stream. This designation indicates an extra level of protection for waterbodies that “provide drinking water, habitat for endangered and threatened species, and popular recreational and/or commercial species, such as trout or shellfish.” Any exceptionally significant waterway can be designated C-1, whether that significance is ecological, recreational, or for drinking water quality. A C-1 waterway operates under stringent stormwater regulations that emphasize groundwater recharge and also provide wider riparian buffers of 300 feet from top of bank, on each side.

**Table 8: Water Quality Classifications of Streams in Mansfield Township**

<b>Streams</b>	<b>Classification</b>
Assiscunk Creek (Columbus) - Headwaters to confluence with Barkers Brook, including all tributaries	FW2-NT (C1)
Assiscunk Creek (Burlington) - Confluence with Barkers Brook to the Delaware River	FW2-NT
Bacons Run	FW2-NT
Blacks Creek	FW2-NT
Crafts Creek	Not Classified
Spring Hill Brook	Not Classified

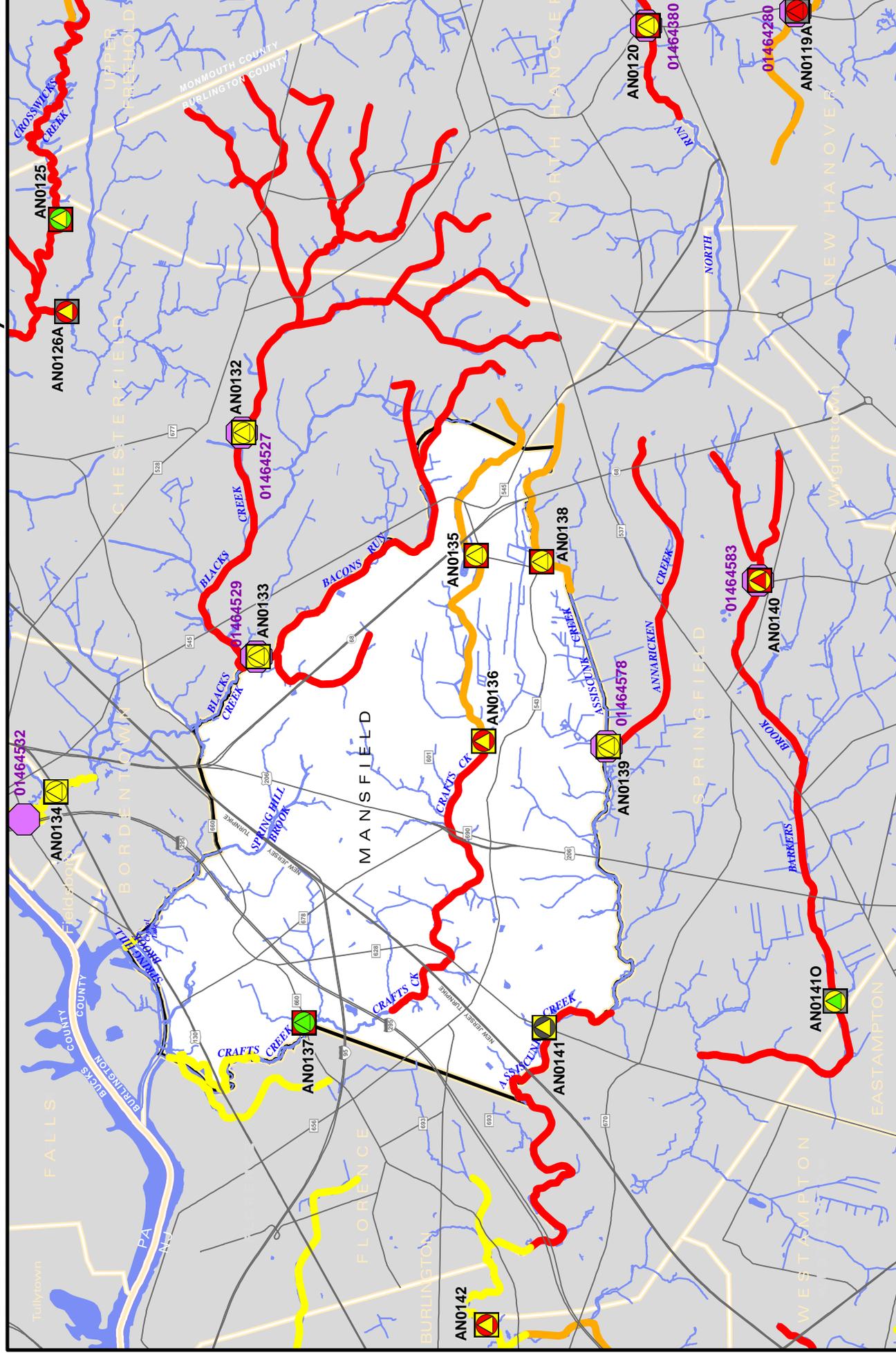
*Source: NJDEP*

According to NJDEP rules, FW2-NT waters must provide for (1) the maintenance, migration and propagation of the natural and established biota; (2) primary and secondary contact recreation (i.e., swimming and 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 or not 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.

*Mansfield Township Stream Water Quality*

NJDEP operates two water quality monitoring networks – the Ambient Surface Water Monitoring Network (ASWM) and the Ambient Biomonitoring Network (AMNET). In cooperation with the U.S. Geological Survey (USGS), the ASWM network contains 115 stations



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.

USGS Surface Water Quality Gauge (2005)  
 303d River Assessment (2004)  
 Does Not Attain Standards  
 Insufficient Data  
 Fish Advisory Only

NJDEP Ambient Biomonitoring Network (AMNET) Station: Sampling Results  
 1st Round (1995)  
 2nd Round (1997)  
 3rd Round (2000)

- No Sample
- Non-Impaired
- Non-Impaired
- Moderately Impaired
- Moderately Impaired
- Severely Impaired
- Severely Impaired
- Severely Impaired

Scale: 0 0.25 0.5 1 Miles  
 Delaware Valley Regional Planning Commission  
 March 2007

that monitor for nutrients (i.e., phosphorous and nitrogen), bacteria, dissolved oxygen, metals, sediments, chemicals, and other parameters.

Ambient Surface Water Monitoring Network (ASWM)

The USGS/NJDEP ASWM network conducts chemical monitoring at two sites in Mansfield Township. One is on Bacon’s Run near Mansfield Square (0146529) and the other on Assiscunk Creek at Island Road (01464578). In addition, there are two other ASWM monitoring stations near Mansfield, one on Blacks Creek, at Chesterfield-Georgetown Road in Chesterfield Township (01464527), and another on Barkers Brook near Jobstown in Springfield Township (01464583). These sites were tested for fecal coliform, pH, temperature, dissolved oxygen, ammonia, nitrogen, phosphorous, metals, and a wide range of organic and inorganic chemicals. The Bacons Run site was sampled 10 times between December 1998 and August 2000, and the Blacks Creek site was sampled 33 times between December 2000 and August 2004. The results of these samples are summarized in *Table 9: New Jersey ASWM Sampling Locations near Mansfield Township*. The station location is depicted on **Map 9: Water Quality – Non-tidal Waters** on page 40.

**Table 9: New Jersey ASWM Sampling Locations near Mansfield Township**

Site ID/ HUC 14 No.	Station Name/ Waterbody	Municipality	2004 Status (Parameters Measured)	2006 Status* (Parameters Measured)	Most Recent Sampling Dates Available
01464527/ 02040201080020	Blacks Creek at Chesterfield/ Georgetown Road	Chesterfield Township	<i>Impaired/Threatened:</i> Phosphorus	<i>Impaired/Threatened:</i> Phosphorous, Fecal Coliform, E. Coli	12/00-08/04
		Chesterfield Township	<i>Non-Impaired:</i> Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Unionized		
01464529/ 02040201080030	Bacon’s Run near Mansfield Square	Mansfield & Chesterfield townships	<i>Impaired/Threatened:</i> Fecal Coliform, pH,	<i>Impaired/Threatened:</i> pH, Phosphorous, Total Suspended Solids, Arsenic	12/98-08/00
			<i>Non-Impaired:</i> Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia		
01464578/ 02040201090010	Annaricken Brook near Jobstown [at Island Road]	Mansfield & Springfield townships	<i>Impaired/Threatened:</i> Fecal Coliform, Phosphorus	<i>Impaired/Threatened:</i> pH, Phosphorous	06/98-09/98
			<i>Insufficient Data:</i> pH, Total Suspended Solids		
			<i>Non-Impaired:</i> Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia		
01464583/ 02040201100040	Barkers Brook N Bridge near Jobstown	Springfield Township	<i>Impaired/Threatened:</i> Phosphorus, pH, Fecal Coliform	<i>Impaired/Threatened:</i> pH, Phosphorous, Fecal Coliform	12/00-08/04
			<i>Impaired/Threatened:</i> Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia		

Source: NJDEP, USGS, 2006

\* The 2006 Integrated List is not officially released; therefore these results are not complete or vested by NJDEP. This is not a complete list of all parameters measured and corresponding attainment/impairment status.

### Ambient Biomonitoring Network (AMNET)

The second water quality monitoring system maintained by NJDEP is the Ambient Biomonitoring Network (AMNET), which is administered solely by the state agency. It evaluates the health of aquatic life as a biological indicator of water quality. This network includes 820 monitoring stations located throughout the state. Each station is sampled once every five years. The first round of sampling for all stations took place between 1992 and 1996, a second round occurred between 1997 and 2001, and a third, the most recent, between 2002 and 2006. New Jersey's AMNET program lists monitoring stations by county and by watershed area. There are 18 monitoring stations in Burlington County, in Watershed Management Area 20. Of these, eleven are located on streams that run through Mansfield, with two stations being wholly within the township, six on its borders, and three in neighboring townships.



*Photo by Robert Tallon, Mansfield Environmental Commission  
Township residents participated in an AMNET training session in the spring of 2005.*

NJDEP sampled each of these AMNET sites in January 1995, again in January 2001, and again in a supplemental round of testing for specific areas of the Lower Delaware region. Each AMNET site was tested for only one water quality parameter – the diversity of the aquatic communities at that site; specifically, the community of benthic (bottom-dwelling) macroinvertebrates (insects, worms, mollusks, and crustaceans that are large enough to be seen by the naked eye).

In the 1995 (first round) sampling, nine of the sites in and near Mansfield were tested. Three of the sites – Crafts Creek at Gaunts Bridge Road (AN0135), Crafts Creek at Old York Road

(AN0137), and Assiscunk Creek at Columbus-Georgetown Road (AN0138) – were ranked as “severely impaired” for aquatic life support. The other four sites (AN0133, AN0136, AN0139, and AN0141) were ranked “moderately impaired.” Of the test sites outside Mansfield but located on tributaries flowing to streams in the township, one (in Springfield on Barkers Brook (AN0140), a tributary of the Assiscunk Creek) was also ranked “severely impaired.” (There was no sampling at the second Barkers Brook site – AN0141O.) The other test site outside Mansfield (AN0132), on Blacks Creek in Chesterfield Township, was moderately impaired. None of the sites in Mansfield or in adjoining townships was ranked “non-impaired.”

In the 2001 (second round) sampling, the score of all seven Mansfield sites either went up or stayed the same, so that six of the seven sites were ranked “moderately impaired.” Crafts Creek at Old York Road (AN0137) was upgraded from “severely impaired” to “non-impaired,” which was a dramatic improvement. The site on Blacks Creek (AN0132) remained “moderately impaired.” The severely impaired site on Barkers Brook (AN0140) remained “severely impaired,” but an added test site downstream from it, at Jacksonville-Smithville Road in Springfield (AN0141O), tested as “non-impaired.”

In a supplemental round of testing for selected portions of the Lower Delaware River basin, five of seven moderately impaired sites remained “moderately impaired,” one moderately impaired site (AN0136) was downgraded to “severely impaired,” one non-impaired site (AN0141O) was downgraded to “moderately impaired,” one non-impaired site (AN0137) remained “non-impaired” but its impairment score slightly decreased, one severely impaired site (AN0140) was upgraded to “moderately impaired,” and two sites (AN0133A and AN0138) were not tested.

Mansfield’s AMNET stations are listed in *Table 10: New Jersey AMNET Sampling Locations for Mansfield Township and the 2004 Integrated Water Quality Monitoring and Assessment Report Status* on page 44 and are depicted on **Map 9: Water Quality – Nontidal Waters** on page 40.



*Photo by Robert Tallon, Mansfield Environmental Commission*

*Schoolchildren gathering water samples.*

**Table 10: New Jersey AMNET Sampling Locations for Mansfield Township and the 2004 Integrated Water Quality Monitoring and Assessment Report Status**

Site ID	Station Name/Waterbody	Municipality	Parameters Measured	1995 NJ Impairment Score**	2001 NJ Impairment Score**	Supplemental Round of Sampling	2004 Impairment Status
AN0132	Blacks Creek at Georgetown Road	Chesterfield Township	Benthic Macroinvertebrates	15	15	12	Impaired/Threatened
AN0133	Bacons Run at White Pine Road	Chesterfield Township	Benthic Macroinvertebrates	18	12	15	Insufficient Data
AN0133A*	Bacons Run at Georgetown-Bordentown Road	Chesterfield Township	Benthic Macroinvertebrates	NA	NA	NA	Impaired/Threatened
AN0135	Crafts Creek at Gaunts Bridge	Mansfield Township	Benthic Macroinvertebrates	6	12	15	Insufficient Data
AN0136	Crafts Creek at Island Road	Mansfield Township	Benthic Macroinvertebrates	9	12	3	Impaired/Threatened
AN0137	Crafts Creek at Old York Road	Florence Township	Benthic Macroinvertebrates	3	27	24	Non-Impaired
AN0138	Assiscunk Creek at Columbus-Georgetown Road	Mansfield Township	Benthic Macroinvertebrates	6	15	NA	Insufficient Data
AN0139	Annaricken Brook at Island Road	Springfield Township	Benthic Macroinvertebrates	21	18	18	Insufficient Data
AN0140	Barkers Brook N Branch at Juliustown Road [near Jobstown]	Springfield Township	Benthic Macroinvertebrates	6	6	15	Insufficient Data
AN0141	Assiscunk Creek at Hedding-Jacksonville Road	Springfield Township	Benthic Macroinvertebrates	18	21	9	Impaired/Threatened
AN0141O*	Barkers Brook at Jacksonville Road	Springfield Township	Benthic Macroinvertebrates	NA	24	21	Impaired/Threatened

Source: NJDEP, 2004

\* Site does not appear on Map 9, as it was recently created by NJDEP.

\*\* KEY:

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

*New Jersey's Integrated Water Quality Monitoring and Assessment Report*

The federal Clean Water Act under Section 303(d) requires states to identify “Impaired Waters” where specific designated uses are not fully supported. Accordingly, in 2002, in 2004, and again in 2006, NJDEP compiled the *Integrated Water Quality Monitoring and Assessment Report* ([www.state.nj.us/dep/wmm/sgwqt](http://www.state.nj.us/dep/wmm/sgwqt)), which included as “sublist 4” and “sublist 5” those waters that were determined to be impaired. Other lists in the report included waterways that are attaining standards (“sublist 1”) or where additional data is needed to determine their status (“sublist 2” and “sublist 3”).

The four ASWM stations in or near Mansfield are listed on the 2004 *Integrated Report's* sublists 4 and 5 (“Impaired Waters”) for phosphorus (three stations), pH (two stations), and fecal coliform (two stations). They are all on Sublist 1 (fully attaining or non-impaired) for temperature, dissolved oxygen, nitrate, dissolved solids, and unionized ammonia.

NJDEP released the 2006 *Integrated Report* for public comment in June 2006. The 2006 *Integrated Report* has several changes in the distribution of information. Impairment status is given for the HUC 14 subwatershed rather than for each monitoring station and corresponding stream segment. The 2006 Report assesses each subwatershed for attainment on a suite of parameters rather than by individual parameter. Many HUC 14 subwatersheds have more than one monitoring station within them. Subwatershed evaluation will, therefore, be more comprehensive and consistent over time. It also allows for changes in the location of sampling stations.

Although the seven AMNET stations in Mansfield showed moderate impairment for aquatic life in the 2001 round of monitoring, by 2004, only two of these stream segments (AN0136 and AN0141) were still on the 2004 *Integrated Report's* Sublist 5 as “Impaired Waters.” Four of these stream segments (AN0133, AN0135, AN0138, and AN0139) were deemed to lack sufficient data for delisting, placing them on Sublist 3. The last site, Crafts Creek at Old York Road (AN0137), because of its significant improvement, was moved from Sublist 5 to Sublist 1. It is the only non-impaired waterway among the seven sites. A new site in Mansfield, Bacon’s Run at Georgetown-Bordentown Road (AN0133A – a site added too recently to be included in the 2001 monitoring) was included on Sublist 5 as impaired.



*Photo by Robert Tallon, Mansfield Environmental Commission*

*Crafts Creek, as it flows under Route 206, is impaired for aquatic life.*

Of the three AMNET sites outside Mansfield but on streams running to the township (AN0132, AN0140, and AN0141O, which was added by 2001), AN0132 and AN0141O were placed on Sublist 5 of the 2004 *Integrated Report* as “Impaired Waters.” Site AN0140 was placed on sublist 3 because there was insufficient data for delisting.

In summary, the following waters in Mansfield are moderately or severely impaired:

For aquatic life:

- The headwaters of Crafts Creek (the areas near Gaunts Bridge, which are also the headwaters for the Assiscunk Creek, were not “delisted” due to insufficient data)
- Bacons Run from Georgetown-Bordentown Road (Bacons Run at White Pine Road, near its meeting with Blacks Creek, was not “delisted” due to insufficient data)

- Assiscunk Creek near the Homestead Retirement community (the headwaters of Assiscunk Creek were not “delisted” due to insufficient data)

For phosphorus and pH:

- Blacks Creek near Mansfield Square
- Bacons Run at Chesterfield-Georgetown Road
- Annaricken Brook in Springfield Township, near Jobstown

For fecal coliform:

- Blacks Creek near Mansfield Square
- Annaricken Brook in Springfield Township, near Jobstown

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

#### *Other Monitoring*

Certain fish may contain toxic chemicals, such as PCBs, dioxins, or mercury, which accumulate in water and aquatic life. Chemical contaminants, such as dioxin and PCBs, are classified by the U.S. Environmental Protection Agency as probable cancer-causing substances in humans. Elevated levels of mercury can pose health risks to the human nervous system. Infants, children, pregnant women, nursing mothers, and women of childbearing age are considered to be at higher risk from contaminants in fish than other members of the general public. Since 1982, NJDEP 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. NJDEP conducts fish tissue sampling for fish in Crystal Lake and the Delaware River. Crystal Lake is ranked as a category 5 non-attaining waterbody for mercury in its fish population. The section of the Delaware River from Crosswick Creek (at Bordentown) south to Assiscunk Creek (at Burlington) is ranked as a category 4 non-attaining waterbody for polychlorinated biphenyls (PCBs) and dioxins

#### *Total Maximum Daily Loads*

For each impaired waterway (waters on Sublist 5), the state is required by the US Environmental Protection Agency to establish a Total Maximum Daily Load (TMDL). A TMDL quantifies the amount of a pollutant a waterbody can assimilate (its loading capacity) 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 percent reductions of the pollutant that must be achieved by each source. These sources can be point sources, such as sewage treatment plants, or non-point 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 its report, ‘approved’ by EPA Region 2, and ‘adopted’ when NJDEP adopts it as an amendment to a water quality management plan.

In general, implementation of a TMDL relies on actions mandated by the Municipal Stormwater Management program, including the ordinances that municipalities are required to adopt under that permit (see **Figure 4: Stormwater Management Basic Requirements** on page 50 for details of the Statewide Basic Requirements of this program). It also depends on voluntary improvements in land and runoff management of agricultural areas. A list of U.S. Department of Agriculture and New Jersey programs that provide funding and technical assistance on relevant projects for farm landowners is included in *Appendix B: Federal and State Conservation Programs for Farmers* on page A-3.

In September 2003, three TMDLs for fecal coliform were approved for several stream segments in or near Mansfield Township. One segment is the part of Bacons Run from its headwaters in Chesterfield Township to its confluence with Blacks Creek near Mansfield Square (monitoring site 01464529, HUC 14# 02040201080020). Another is Annaricken Brook, from its headwaters in Springfield Township to Assiscunk Creek on Mansfield's border (monitoring site 01464578, HUC 14# 02040201090010). The last is the North Branch of Barkers Brook from its headwaters in Springfield Township (monitoring site 01464583, HUC 14# 02040201100040).

The Surface Water Quality Standards for Fresh Water 2 (FW2) streams mandate that fecal coliform shall not exceed a geometric average of 200 colony forming units (CFU) per 100 milliliters of water, or 10 percent of the total samples taken during any 30-day period shall not exceed 400 CFU/100 ml. More stringent criteria can be applied if site-specific or use-specific conditions exist.

A TMDL determines the percentage of reduction needed in order for a stream segment to meet the water quality standard. Nonpoint and stormwater point sources are the largest contributors, as runoff transports fecal coliform from sources, such as geese, farms, and domestic pets, during rain events into waterbodies. Nonpoint sources also include inputs from "illicit" sources, such as failing sewage conveyance systems, sanitary sewer overflows, and failing or inappropriately located septic systems. Reductions in fecal coliform are first determined by calculating a "load" that the stream segment can accommodate and still be below the concentration limit, given the range of flows at the monitoring station. Bacons Run's calculations require an overall 93 percent reduction in fecal coliform, Annaricken Brook requires a 95 percent reduction, and the North Branch of Barkers Brook requires a 96 percent reduction.

In September 2005, a TMDL for phosphorus was approved for the portion of Blacks Creek that flows through Chesterfield Township and meets Bacons Run on Mansfield's border (monitoring site 01464527, HUC 14# 02040201080020).

Similar to Surface Water Quality Standards for fecal coliform, standards for Fresh Water 2 (FW2) streams mandate that phosphorous shall not exceed 0.1 mg/L in any stream. More stringent criteria can be applied if site-specific or use-specific conditions exist.

Reductions in phosphorous are first determined by calculating a "load" that the stream segment can accommodate and still be below the concentration of the standard, given the range of flows at the monitoring station. Blacks Creek's calculations require an overall 67 percent reduction in

total phosphorous. To meet this reduction, NJDEP identified the general sources of phosphorous, assigned a reasonable “load” to each source (a “load allocation”), and established the reduction needed from each source. Within this subwatershed, there are no regulated point sources. Nonpoint sources consist of both natural sources (forests, wetlands, water, and barren land) and stormwater sources. Load allocations were formulated based on the type of land uses within the subwatershed. In the Blacks Creek subwatershed, all land uses must reduce the amount of total phosphorous loading by 67 percent.

In February 2007, NJDEP proposed two additional TMDLs for Annaricken Brook near Jobstown (monitoring site 0146578, HUC 14# 0204020110010) and Barkers Brook Bridge near Jobstown (monitoring site 01464583, HUC 14# 0204020110020). The Annaricken Brook subwatershed is partially within Mansfield Township, while the Barkers Brook subwatershed is completely outside of Mansfield, in Springfield, but affects Mansfield because the stream segment eventually joins Assiscunk Creek at the township’s border. Both subwatersheds are mostly agricultural. It is proposed that each type of land use reduce the amount of total phosphorous by 55 percent.

## Causes of Water Quality Impairments

### *Stormwater Runoff*

Stormwater runoff and other non-point source pollution (pollution coming from a wide variety of sources rather than from a single point, such as a discharge pipe) have the largest effect on the water quality and channel health of streams in Mansfield. These sources are also the most difficult to identify and remediate because they are diffuse, widespread, and cumulative in their effect. Most non-point source pollution in Burlington County is known to derive from stormwater drainage off paved surfaces, such as streets, commercial/industrial areas, and residential sites (with and without detention basins), and from agricultural fields that lack adequate vegetative buffers. Some of this runoff comes to the waterways from similar sources in upstream townships and some of it derives from Mansfield land uses. Mansfield is in a unique situation because several major highways (I-95, I-295 and the New Jersey Turnpike) converge within the township. Additionally, the large industrial complex, National Auto Dealers Exchange, is an expansive area of paving that is adjacent to Blacks Creek.



*Runoff from bare soil on construction sites, as well as other point and non-point sources, creates impairments in Mansfield’s streams.*

In March 2003, the NJDEP issued a new Stormwater Management Rule, as required by the US Environmental Protection Agency’s Phase II Stormwater Management Program for Municipal Separate Stormwater Sewer Systems (MS4). The rule lays out guidance and requirements for

management of and education about stormwater at the local level. It applies to all towns in New Jersey, all county road departments, and all public institutional facilities on large sites (e.g. hospitals and colleges). Beginning in 2004, municipalities were required to obtain a New Jersey Pollution Discharge Elimination System (NJPDES) general permit for the stormwater system and its discharges within their borders, which are considered to be owned and “operated” by the municipality.

Under the 2004 NJPDES permit, a town must meet certain specific requirements in planning, ordinance adoption, education, management of township facilities, and investigation of parts of the stormwater system. Fulfillment of these Statewide Basic Requirements is scheduled to occur over the course of five years. All of the requirements are intended to reduce the water pollution from stormwater runoff.

See **Figure 4: Stormwater Management Basic Requirements** on page 50 for details of the Statewide Basic Requirements of this program.

#### *Impervious Coverage*

The volume of runoff that is carried to a stream impacts the 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.<sup>4</sup> When impervious cover reaches 25 percent to 30 percent, streams can become severely degraded.

Several HUC 14 subwatersheds that are completely or partially within Mansfield Township have a relatively high amount of impervious coverage. See **Map 6: Watersheds** on page 30 for a depiction of these subwatersheds. About 25 percent of the land within HUC 02040201080030 is covered with impervious materials. This subwatershed contains only a small part of Mansfield consisting mostly of the National Auto Dealers Exchange (NADE) complex. About 19 percent of the land within HUC 02040201090030 is covered with impervious materials. All the major north-south routes – I-295, I-95, US 130 and US 206 – that divide the township are within this HUC 14 subwatershed.

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<sup>4</sup> Center for Watershed Protection. *Rapid Watershed Planning Handbook: A Comprehensive Guide for Managing Urbanizing Watersheds*. Produced for the U.S. EPA, Office of Wetlands, Oceans, and Watersheds. Ellicott City, MD: Center for Watershed Protection, Inc., 1998. pp. 1.21-1.25.

**Stormwater Management Statewide Basic Requirements  
Towns, Highway Agencies, and Institutions**

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% 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 was revised to incorporate the low-impact design and other requirements of the stormwater control ordinance.
  - Ensuring long-term operation and maintenance of Best Management Practices on municipal property.
  - 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 most 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.
  - Distribute information annually regarding proper identification, handling, and disposal of wastes including pet waste and litter.
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 about all of the above.

Source: NJDEP

Figure 4: Stormwater Management Basic Requirements

Conversely, several HUC 14 subwatersheds have a low amount of impervious surface. HUC 02040201100010 and HUC 02040201090010 have less than 5 percent of land area covered with impervious surfaces. Both HUC subwatersheds are areas with large swaths of preserved farmland and wetlands. See *Table 11: Impervious Coverage by HUC 14 Watersheds* on page 51 for information regarding impervious cover.

**Table 11: Impervious Coverage by HUC 14 Watersheds**

HUC 14 Number	Name	% of Land Area with More Than 25% of Impervious Cover
02040201080020	Blacks Creek (above Bacons Run)	4.16%
02040201080030	Blacks Creek (below Bacons Run)	24.20%
02040201090010	Crafts Creek (above Rt 206)	4.37%
02040201090020	Crafts Creek (below Rt 206)	10.99%
02040201090030	Lower Delaware River tribs (Assiscunk Creek to Blacks Creek)	18.62%
02040201100010	Assiscunk Creek (above Rt 206)	2.30%
02040201100040	Assiscunk Creek (Jacksonville Rd to Rt 206)	6.80%
02040201100050	Assiscunk Creek (Neck Rd to Jacksonville Rd)	10.86%

Source: NJDEP Impervious Coverage, based on 2002 aeriols, released 2006

### *Inadequate Stream Buffers*

The stream buffer is the region immediately beyond the banks of a stream that serves to limit the entrance of sediment, pollutants, and nutrients into the stream itself. Stream buffers are quite effective at filtering substances washing off the land. The vegetation of the buffer traps sediment and can actually utilize (uptake) a percentage of the nutrients flowing from lawns and farm fields. When forested, a stream buffer promotes bank stability and serves as a major control of water temperature. The buffer region also serves as a green corridor — 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.

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



*An example of an inadequate stream buffer between a parking lot and the stream.*

The New Jersey Freshwater Wetlands Protection Act incorporates buffer requirements into its wetland protection regulations. The width of the “transition zone” extending beyond a wetland is determined by the value of the wetland, based on its current use and on the documented presence/absence of threatened or endangered species. Municipalities may not establish buffers on wetlands that exceed those required by the state statute. However, the municipality can make

certain that those limits are accurate through its review of the wetlands delineation process, and it can also monitor use of the land within the transition area and take action against encroachments.

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



*Photo by Robert Tallon, Mansfield Environmental Commission*

*The tidal marshes at the meeting of Spring Hill Brook and the Delaware River are an important wetland habitat.*

### *Point Sources of Pollution*

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

NJDEP, through the Division of Water Quality and the Bureau of Point Source Permitting, administers the NJPDES program. Under NJPDES, any facility discharging over 2,000 gallons per day (gpd) of wastewater directly into surface water or ground water (generally through a septic system) must apply for and obtain a permit for discharging. Rather than creating individually tailored permits for each and every facility, the Division of Water Quality uses scientific standards to create and issue general permits for different categories of dischargers. NJDEP enforces the terms of the NJPDES permit 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 July 2006, eight NJPDES permits were issued to individual facilities in Mansfield Township. These are shown in *Table 12: New Jersey Pollution Discharge Elimination Permit System (NJPDES) Permits* and depicted on **Map 16: Approved Sewer Service Area (2006)**.

Since the adoption of the federal Clean Water Act and the implementation of NJPDES 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 in recent decades. NJDEP's new Stormwater Management Rules, described previously, focus on reducing and controlling nonpoint sources of water pollution.

**Table 12: New Jersey Pollution Discharge Elimination Permit System (NJPDES) Permits**

NJPDES Permit Number	Facility Name	Effective Start Date	Expiration Date*	Discharge Category Description	Street Address
NJ0082741	Burlington County Resource Recovery Complex	8/1/2003	7/31/2008	Land Application Biosolids-Class A	21939 Burlington Columbus Road
NJ0101371	Homestead Treatment Utility	2/1/2003	1/31/2008	Discharge to Groundwater	Wagon Wheel Lane
NJ0098663	Homestead Treatment Utility	6/1/2005	5/31/2010	Sanitary Wastewater	Wagon Wheel Lane
NJ0105031	National Auto Dealers Exchange	5/1/2004	4/30/2009	Discharge to Groundwater	Route 68
NJ0108120	Mansfield Farms	5/1/2004	4/30/2009	Discharge to Groundwater	Route 68
NJ0109266	Mt Holly Water Company	5/1/1996	4/30/2001	Industrial Wastewater	Route 206 & Columbus Hedding Road
NJG0109291	Mansfield Water Treatment Plant	9/1/2003	8/31/2008	Potable WTP Basins & Drying Beds General Permit	Route 206 & Columbus Hedding Road

Source: NJDEP, Division of Water Quality, 2006

\* Expired permits are still listed on OPRA because the NJPDES sites may still be active, despite not having updated the permit.

## GROUNDWATER

The geology of the New Jersey Coastal Plain can be visualized as a tilted layer cake, with its "layers," or strata, formed of gravels, sands, silts, and clays. The saturated gravel and sand layers, with their large pore spaces, are the aquifers from which water is drawn. The silt and clay layers, which impede the movement of water, are called confining beds.

A cross section across southern New Jersey from west to east would show that the aquifers are not horizontal, but tilted toward the southeast, getting deeper as they cross the state toward the Atlantic Ocean. Because of this tilting, each aquifer emerges on the land surface in a sequential manner. The deepest strata emerge on the surface near the Delaware River. Where a layer



emerges is its “outcrop” area. The Potomac–Raritan–Magothy (PRM) formation, the deepest and most abundant aquifer, is a major water source for Inner Coastal Plain communities, including Mansfield Township. A small portion of it outcrops in the northwest section of Mansfield Township. Other smaller aquifers on top of the PRM are the Englishtown and the Mt. Laurel-Wenonah. The large Kirkwood-Cohansey formation, which overlies these older formations, begins east of the inner/outer coastal plain divide and does not, therefore, outcrop in Mansfield Township.

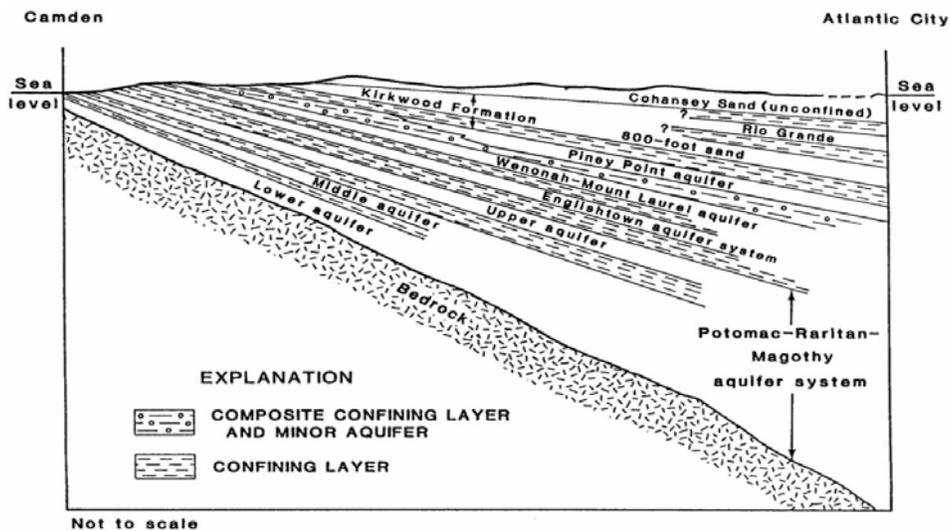


Figure 5: Aquifers of Southern New Jersey along a line from Camden to Atlantic City

Source: U.S. Geological Survey

## Geological Formations

Eight geological formations outcrop in Mansfield Township. Three of these formations are aquifers and five are confining beds. The aquifers that outcrop in Mansfield are the Englishtown and the Mount Laurel-Wenonah aquifer system, composed of water-bearing sands and gravels. See **Map 10: Geologic Outcrops** on page 54 for a visual depiction of the aquifer and confining bed outcrop areas. The Marshalltown, Merchantville, Navesink and Woodbury confining units outcrop in Mansfield.

## Aquifers

Several aquifers underlie parts of Mansfield Township. Three major aquifers – Wenonah-Mount Laurel, Englishtown, and Potomac-Raritan-Magothy (PRM) – provide public and private drinking water for Mansfield residents.

### *Englishtown Aquifer System*

Some private wells in residential developments built more than 20 years ago may draw from the Englishtown aquifer system. The Englishtown Formation, of the late Cretaceous age (65 to 100 million years ago), outcrops in the Inner Coastal Plain in an irregular band that extends from Raritan Bay to the Delaware River, adjacent to Salem County. Where the Englishtown Formation is exposed, the primary components are fine-to-medium-grained sands. In parts of Burlington, Camden, Gloucester, and Salem counties, the aquifer is commonly less than 40 feet thick. It is not a major source of water in Burlington County due to its small size and greater proportion of fine-grained sediments, which results in lower yields. More productive aquifers lie above and below it. In Monmouth and Ocean counties, this aquifer system is a significant water source.

### *Wenonah-Mount Laurel Aquifer System*

A few private wells may draw from the Wenonah-Mount Laurel aquifer system. The Wenonah-Mount Laurel aquifer is composed of the Wenonah Formation and the Mount Laurel Sand, both of the late Cretaceous age. It is thickest in Burlington, Camden, Gloucester, and Salem counties, reaching 100 to 120 feet, with its top and base being approximately 175 feet and 205 feet below sea level, respectively. Like the Englishtown aquifer, it is not a major water source in Burlington County due to low yield.

### *Potomac-Raritan-Magothy Aquifer System (PRM)*

The Potomac-Raritan-Magothy (PRM) is the principal geological formation underlying Mansfield Township and the primary source of drinking water for Mansfield's public wells and most private ones. This multiple aquifer is actually a large series of formations that have been combined and described as a single unit because the individual formations – the Potomac group and the Raritan and Magothy formations – are lithologically indistinguishable from one another over large areas of the Coastal Plain. That is, they are composed of materials of like kind and size laid down by both an advancing and retreating sea across southern New Jersey, and by deposits of material that came from the breakdown and erosion of the Appalachian and Catskill Mountains beginning in the Cretaceous Period.

### **New Jersey American Water Pipeline**

The New Jersey American Water's (NJAW) Pipeline project extends from Burlington County to Gloucester County. In 1981, the Delaware River Basin Commission and the state identified over-pumping of the Potomac-Raritan-Magothy aquifer as a major threat to drinking water supplies. The aquifer was threatened by salt water intrusion, low well yields, and contamination. After NJDEP designated Critical Area #2, local municipal utility authorities that fell within the area had to reduce groundwater pumping and find alternative sources of water. Depending on current, future, and projected population levels, some municipalities were allocated more groundwater than built-out communities.

In 1992, NJAW entered into a contract with NJDEP and built the Delaware River Water Treatment Plant to purify surface water from the river and augment communities' water supplies. The treatment plant and connecting pipeline became fully operational in 1996. The first users of the system were those communities that had to cut back from groundwater usage. In the 1990s, many more municipalities have purchased water from NJAW to accommodate new development and growth. NJAW supplies water on a need basis so communities can have a contract for the minimum amount (50,000 GPD) and purchase more water if demand rises (as it does seasonally).

NJAW plans to invest in its infrastructure according to the state's Smart Growth directives and Board of Public Utilities regulations. All pipeline extensions have to be in State Planning Area 1, State Planning Area 2, Pinelands Regional Growth areas or Pinelands (Burlington, Camden, and Gloucester counties), routes 73 and 30 (Camden County), and Route 322 (Gloucester County) as growth corridors. Other expansions will serve model centers such as Woolwich's TDR receiving area, Garden State Park, Pennsauken Mart, Bellmawr landfill site, and Cramer Hill in Camden.

In the Delaware Valley, three aquifers have been distinguished within the PRM system, designated as lower, middle, and upper, and divided by two confining units or layers between the three water-bearing strata. The aquifers themselves are largely made up of sands and gravels, locally inter bedded with silt and clay. The lower aquifer sits on the bedrock surface. Confining beds between the aquifers are composed primarily of very fine-grained silt and clay sediments, which are less permeable and thus reduce the movement of water between the aquifers. They also help to slow the entry of any contaminants on the surface down into the groundwater.

A very small portion of the PRM outcrops in Mansfield Township. The PRM outcrops under and immediately beside the Delaware River in New Jersey and Pennsylvania. River water actually enters and recharges the upper and middle PRM aquifers.

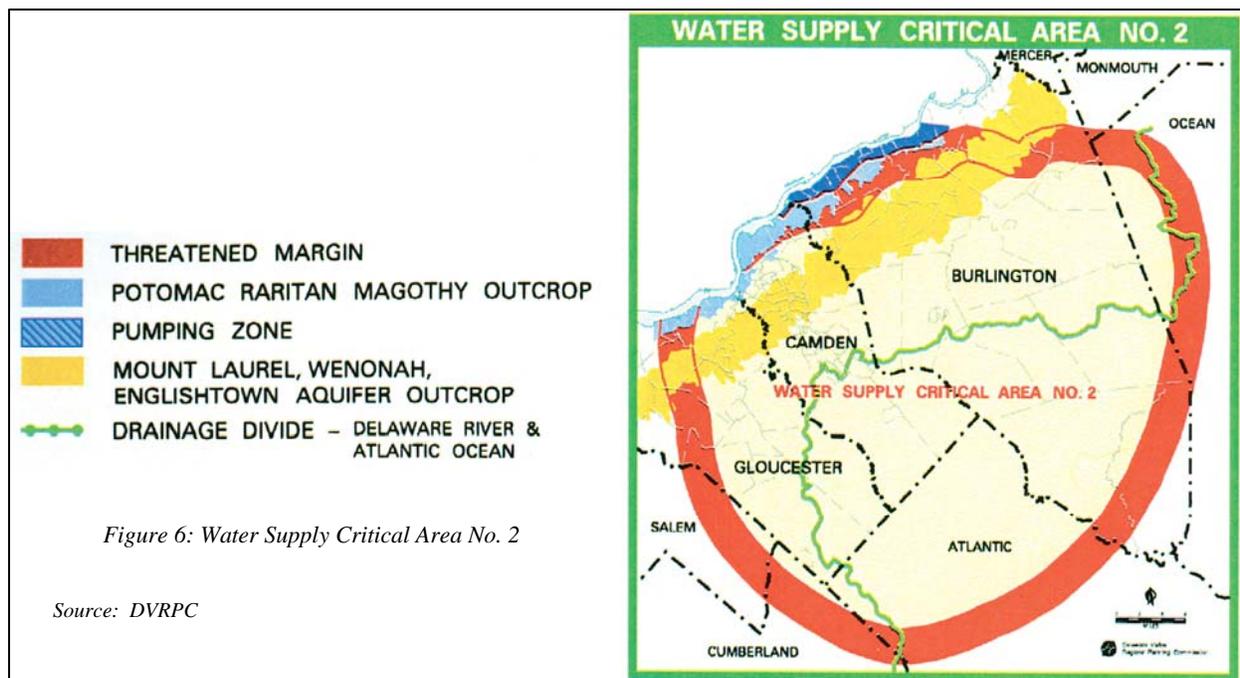
The PRM is the primary source of drinking water for New Jersey residents from Burlington to Salem counties, as well as communities in Delaware. Because of such high usage, PRM aquifer water levels have declined. This became so serious that the New Jersey Department of Environmental Protection established Water Supply Critical Area No. 2 in 1986. All water supply companies within Critical Area #2 were given annual limits on water withdrawals in the PRM. Usage from the PRM was cut back by over 20 percent and no increases in pumping were allowed. Piping of treated Delaware River water filled the gap in much of the region. Most of Mansfield Township is within the “threatened margin” of Critical Area No. 2.

There is increased concern that additional pumping from the aquifer in the borderline areas will necessitate the expansion of the Critical Area No. 2 boundaries. Thus, water supply companies in Burlington, Ocean, Gloucester, and Salem counties have and will continue to have difficulty getting approvals from the New Jersey Department of Environmental Protection for any additional water allocations from the PRM.

#### **PRIVATE DRINKING WELLS**

Private wells supplying potable water are not routinely monitored like public community water systems (public water) and public non-community wells. Beginning in 2002, however, the state of New Jersey, under the Private Well Testing Act, required that well water be tested for contaminants when properties are sold or leased. Prior to 2002, each county health department mandated what parameters were to be tested for real estate transactions.

See *Appendix A: Private Well Testing Act* on page A-1 for more information about private wells and drinking water in Burlington County.



In the last decade, groundwater levels in the township’s observation wells have diminished. These readings coincide with large-scale development in and around Mansfield. *Table 13: USGS Groundwater Observation Sites* provides data detailing the groundwater levels in Mansfield Township. As a “water level” reading increases, the groundwater level decreases, meaning the depth at which one would find water is increasing below the land surface; wells must be drilled deeper to reach sizable and usable quantities of water.

**Table 13: USGS Groundwater Observation Sites**

Observation Site	Name	Date of First Observation	Water level (feet below land surface)	Date of Last Observation	Water level (feet below land surface)	Aquifer
400242074422301	Rhodia	6/30/1964	90	9/19/2006	101.86	PRM
400313074500401	Test 1	7/27/1970	68	11/5/2003	76.9	PRM
400515074410901	High School 1	July 1959	85	11/3/2003	104.1	PRM
400312074433301	Columbus Farm	1/13/1992	76	11/3/2003	72	PRM
400531074443001	IRR	10/30/1978	70.3	12/8/2003	78.1	PRM

Source: USGS, accessed October 2006.

## Water Supply Wells

There are nine active public water supply wells serving Mansfield Township. They are listed in *Table 14: Public Water Supply Wells Serving Mansfield Township* below and shown on **Map 11: Public Water Supply Wells** on page 60. All the wells pump from the PRM.

**Table 14: Public Water Supply Wells Serving Mansfield Township**

Well ID #	Original Owner	Aquifer	Depth to Top of Well (feet)	Depth to Bottom of Well (feet)
0000174	Columbus Water Co	Upper PRM	240	260
2806599	Columbus Water Co	Upper PRM	259	274
2812349	Homestead Water Utility	Upper PRM	175	216
2815286	Homestead Water Utility	Upper PRM	165	205
2835140	Mount Holly Water Co	Middle PRM	434	525
2835141	Mount Holly Water Co	Middle PRM	443	526
2835936	Mount Holly Water Co	Middle PRM	449	531
2835937	Mount Holly Water Co	Middle PRM	447	533
2851617	Mount Holly Water Co	Lower PRM	Unreported	Unreported

Source: NJDEP, 2006

Public non-community wells are another part of a public water system. There are two types of non-community water systems, transient and non-transient. The name refers to the type of populations that utilize them. A non-transient water system serves at least 25 of the same people daily at a minimum of 6 months per year. Non-transient non-community water systems serve places like schools, factories, and office parks. A transient non-community water system serves at least 25 people daily, but the population changes each day, such as rest stops, gas stations, and restaurants. See *Table 15: Public Non-Community Wells in Mansfield Township* below.

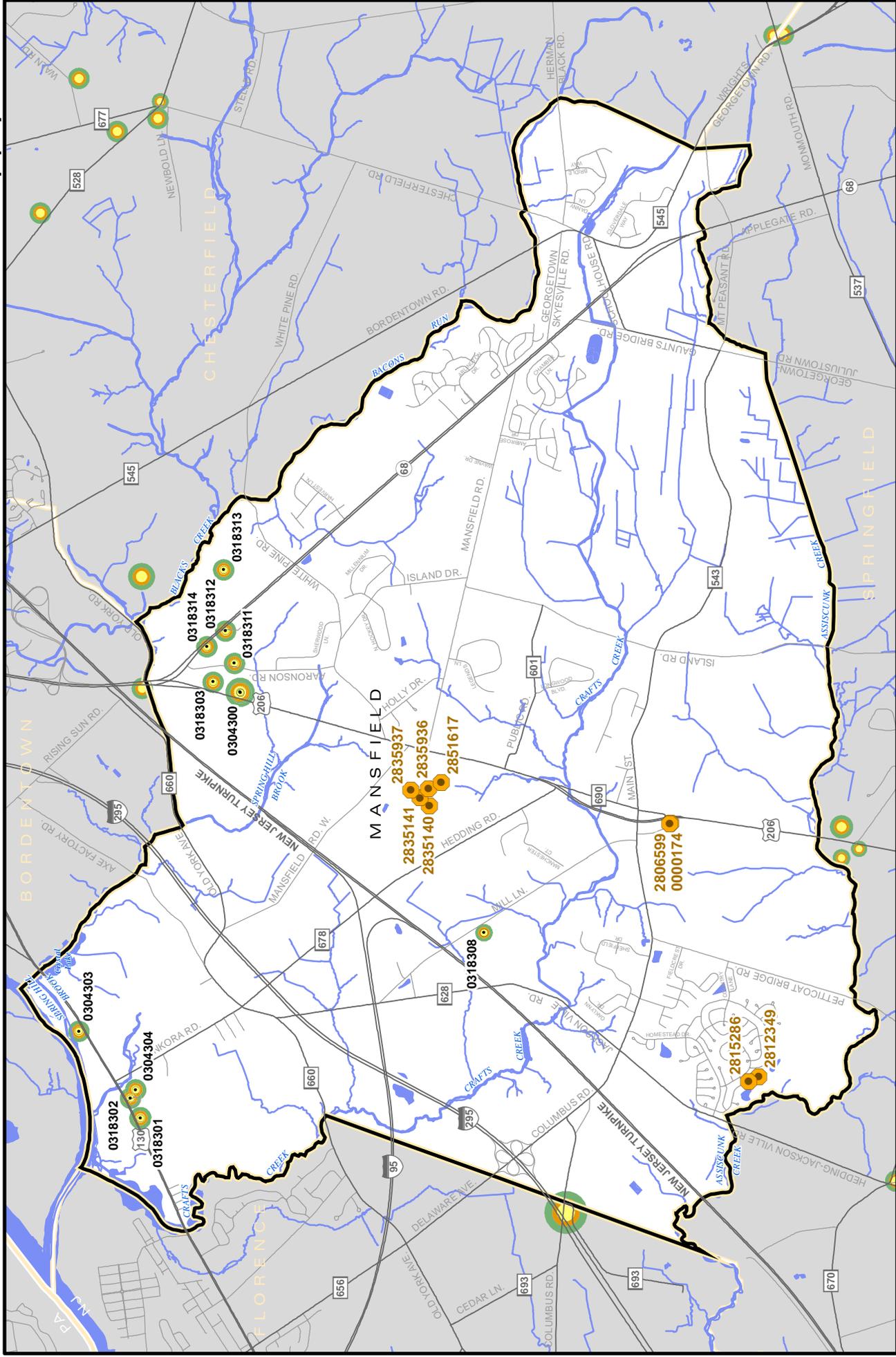
**Table 15: Public Non-Community Wells in Mansfield Township**

Well ID #	Original Owner	Well Depth	Well Type
0318308	ABC Nursery School	202	Non-Transient
0318301	C Reeds Place	100	Transient
0304300	Imperial Motel and Restaurant	180	Transient
0304300	Imperial Motel and Restaurant	145	Transient
0318302	Liberty 2 Diner	180	Transient
0318303	Nade Dealership	180	Non-Transient
0318311	Nade Dealership	180	Non-Transient
0318312	Nade Dealership	180	Non-Transient
0318313	Nade Dealership	180	Non-Transient
0318314	Nade Dealership	180	Non-Transient
0304304	Pine Motel	180	Transient
0304303	Riverfront Motel	180	Transient

Source: NJDEP, 2004

# MANSFIELD TOWNSHIP

# MAP 11: Public Water Supply Wells



Sources : NUDEP, 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 NUDEP and is not state-authorized.

- NJ Wells**
- Public Non-Community Water Supply Well (2004)
  - Public Community Water Supply Well (2005)

- Well Head Protection Areas (Public Non-Community, 2004)**
- Time of Travel
- 2 Years
  - 5 Years
  - 12 Years

N

0 0.25 0.5 1 Miles

Delaware Valley Regional Planning Commission  
 March 2007

## Groundwater Recharge

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

Using precipitation records, soil surveys, and land use/land cover data, the New Jersey Geological Survey has developed a methodology for evaluating land areas for their ability to transmit water to the subsurface. NJDEP has used this methodology to map and rank land areas throughout the state as to groundwater potential. Recharge is equivalent to the amount of precipitation that will reach the water table in an area with a particular combination of soils and land use. It is expressed as inches per year.

In Mansfield, lands with groundwater recharge of greater than 13 inches per year are located in sizable patches on land in between Crafts Creek and its tributaries. A substantial section of high recharge lands are located at the headwaters of Crafts Creek, Bacons Run, and Assiscunk Creek in the vicinity of County Route 545. There are also sizeable patches near the high school complex, the Eco-complex, and Wenses Meadow near Crystal Lake. Lands immediately adjacent to the creeks’ floodplains, marshes, and developed lands in the southern and eastern sections of the township exhibit less groundwater recharge. About 40 percent of the township’s land provides recharge to the Englishtown aquifer system and another 15 percent recharges to the Mount Laurel-Wenonah Aquifer system; the remaining land recharges the confining units, which are not water-bearing geologic strata, meaning the water cannot be extracted for human use. More than 48 percent (6,783 acres) of Mansfield’s land recharges between 11 and 17 inches per year. About 15 percent (2,066 acres) recharges between 8 and 10 inches per year. See *Table 16: Groundwater Recharge in Mansfield Township* below and **Map 12: Groundwater Recharge** on page 62.

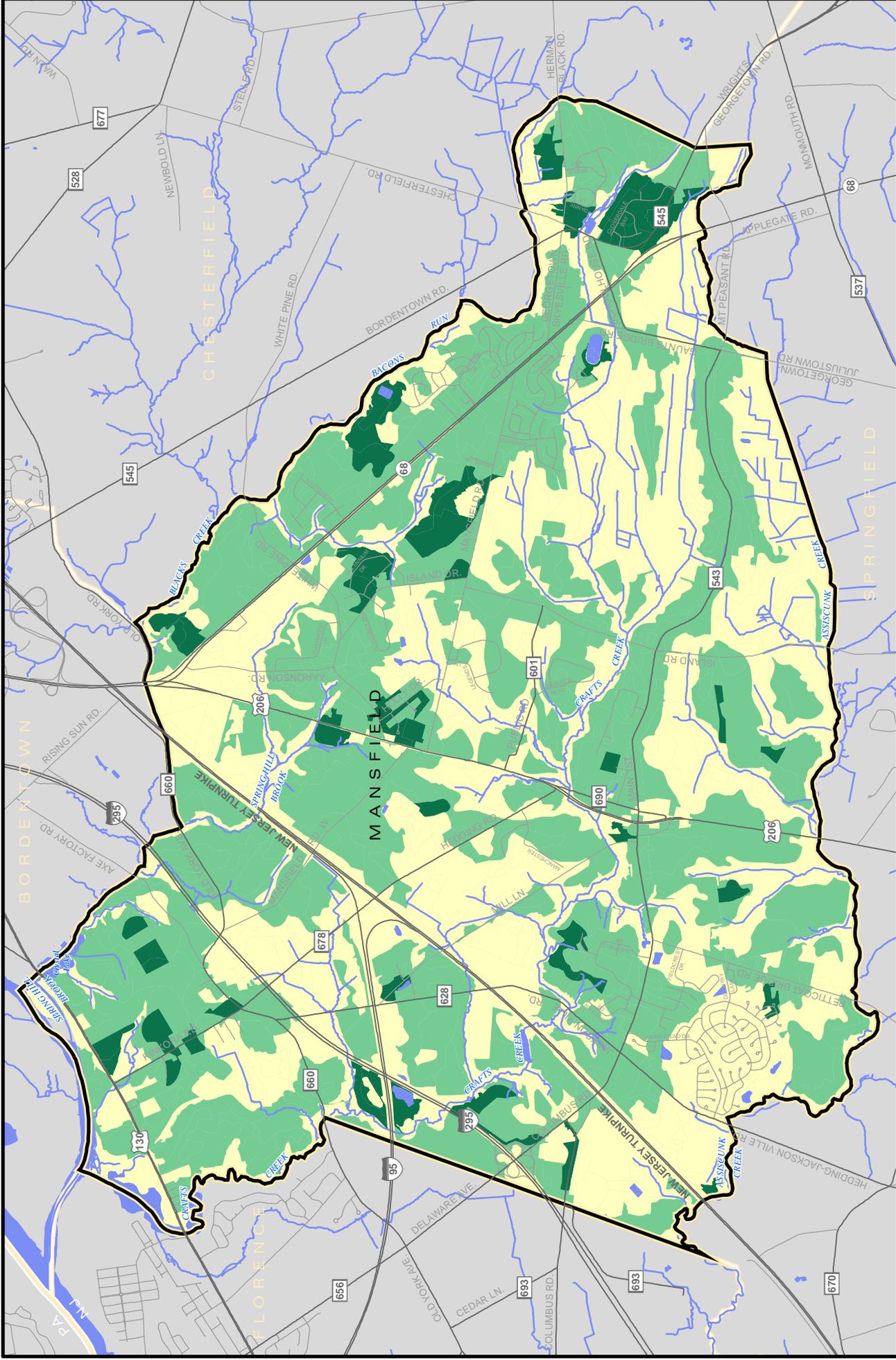
**Table 16: Groundwater Recharge in Mansfield Township**

Recharge Rate (inches per year)	Acres
0 to 3	4,868.24
4 to 6	261.70
7 to 9	1,586.92
10 to 12	6,356.37
13 to 15	895.53
16 and above	40.68
Total	14,009.45

Source: NJDEP 2006

# MANSFIELD TOWNSHIP

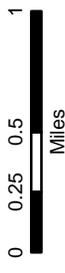
# MAP 12: Groundwater Recharge



Inches Per Year

- 9 or Below
- 10 - 13
- 14 - 17

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.



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March 2007

In general, on these high recharge lands, the amount of paving and other impervious cover has the most detrimental impact, although they are also usually the places that are most suitable for building because they are areas of 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, depending on the soils.

### **Wellhead Protection Areas**

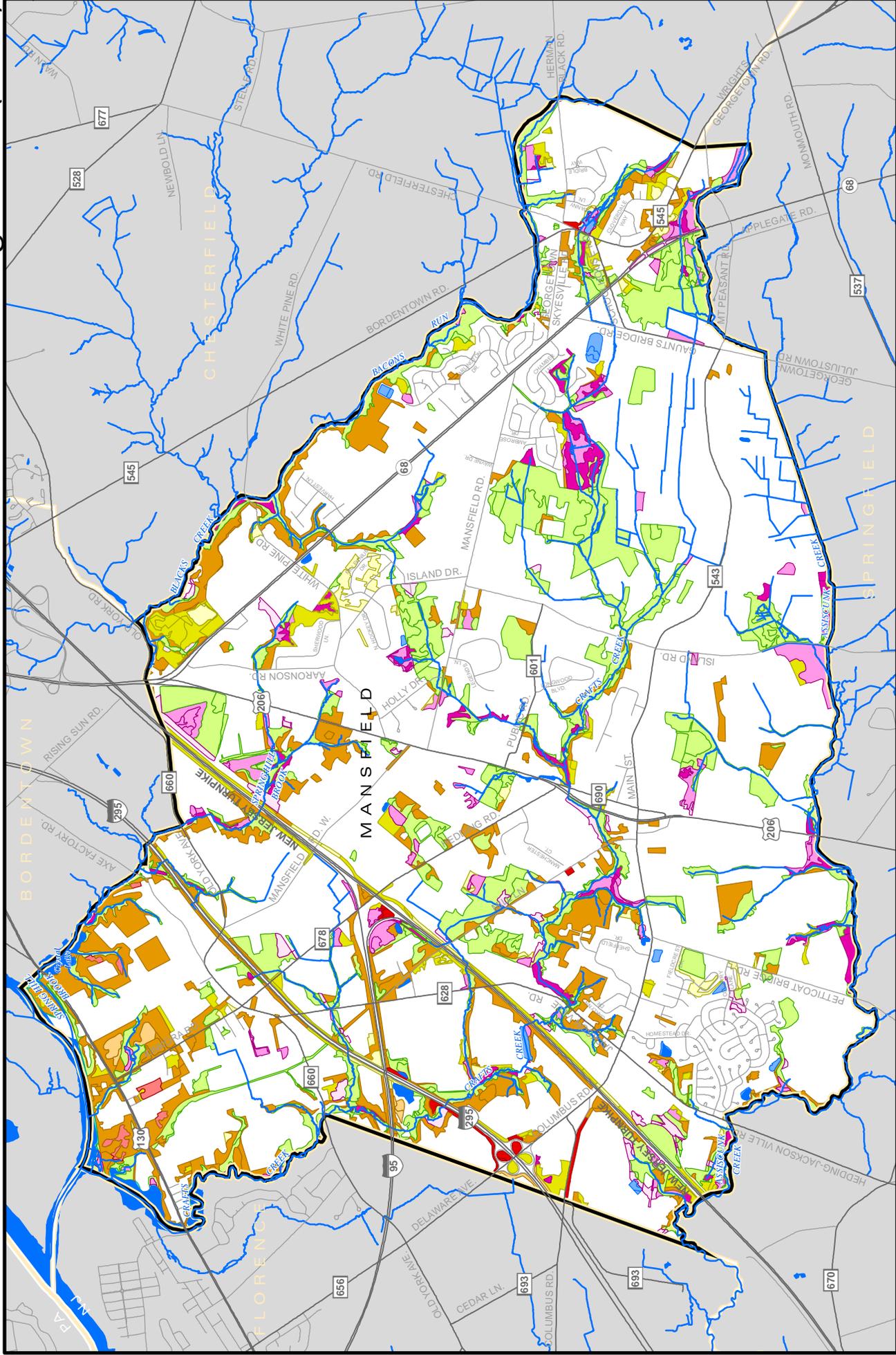
Mansfield’s public wells draw on three different aquifers – the Upper PRM, the Middle PRM, and the Lower PRM.

As part of its 1991 Wellhead Protection Program Plan, NJDEP has delineated Wellhead 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 time frame. Once delineated, these areas become a priority for efforts to prevent and clean up groundwater contamination. Other components of the Wellhead Protection Plan include implementing best management practices 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 WHPAs delineated around Mansfield’s public wells are very small because these wells tap the PRM. The PRM’s recharge lands are immediately beside and below the Delaware River and in Pennsylvania. In Mansfield, confining layers protect the aquifer layers from contamination.

# MANSFIELD TOWNSHIP

# MAP 13: Natural Vegetation (2002)



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
- Tidal Waters
- Tidal Marshes - Freshwater
- Upland Forest - Coniferous
- Upland Forest - Mixed (Conif. dom.)
- Upland Forest - Deciduous
- Upland Forest - Mixed (Decid. dom.)
- Lakes and Streams
- Wetlands - Modified
- Wetlands - Scrub/Shrub
- Wetlands - Herbageous
- Wetlands - Wooded - Decid.
- Wetlands - Wooded - Conif.
- Wetlands - Wooded Mixed (Decid. Dominated)
- All Other Land Cover

**Scale:** 0 0.25 0.5 1 Miles

**North Arrow:** N

Delaware Valley Regional Planning Commission  
 March 2007

## 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 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.

Mansfield contains numerous types of habitats, all of which are important for maintaining biodiversity. Wooded wetlands are the most common natural ecosystem type in Mansfield. Along Mansfield's stream corridors and lakeshores are herbaceous wetlands, which support plants that require constantly saturated soils; within and around waterbodies are submerged communities, which require persistent standing water. Upland forests, which were once the most abundant type of natural habitat in Mansfield, occur where land is dry and undeveloped. The following sections will identify and describe in more detail the plant and animal communities that inhabit these unique ecosystems within Mansfield Township.

## NATURAL VEGETATION

A region's vegetation is dependent on many factors, the most important of which are climate and soils. Mansfield's climate is cool and temperate, with rainfall averaging 46 to 47 inches per year. The majority of Mansfield's soils are generally well-drained soils, supporting a large diversity of trees and crops. The area also has a substantial amount of poorly drained soils that exhibit ponding and sustain wetland plants. See the *Soils* section on page 17 for a detailed description of Mansfield's soils.

Mansfield's natural vegetation types, along with human-influenced types of land cover, have been tabulated and mapped by NJDEP's 2002 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 U.S. Geologic Survey. See **Map 13: Natural Vegetation (2002)** on page 64.

**Table 17: Mansfield Township Natural Vegetation**

Type of Vegetation	Acres	% of Total Land Area
Artificial Lakes	60.47	0.43%
Brush/Shrubland (coniferous)	7.16	0.05%
Brush/Shrubland (deciduous)	98.94	0.71%
Brush/Shrubland (mixed deciduous/coniferous)	113.34	0.81%
Brush/Shrubland (old fields)	162.99	1.16%
Coniferous Forest	25.58	0.18%
Deciduous Forest	1,074.77	7.67%
Freshwater Tidal Marshes	4.67	0.03%
Mixed Forest (>50% coniferous)	21.89	0.16%
Mixed Forest (>50% deciduous)	25.90	0.18%
Natural Lakes	1.25	0.01%
Streams and Canals	5.17	0.04%
Tidal Rivers, Inland Bays, and Other Tidal Waters	37.28	0.27%
Wetlands (coniferous scrub/shrub wetlands)	15.83	0.11%
Wetlands (deciduous scrub/shrub wetlands)	179.11	1.28%
Wetlands (deciduous wooded wetlands)	1,773.10	12.66%
Wetlands (herbaceous wetlands)	192.95	1.38%
Wetlands (mixed scrub/shrub wetlands)	63.08	0.45%
Modified Wetlands (agricultural wetlands)	1,360.82	9.71%
Modified Wetlands (disturbed wetlands)	36.01	0.26%
Modified Wetlands (former agricultural wetlands, becoming shrubby)	53.49	0.38%
Modified Wetlands (managed wetland in maintained greenspace)	33.18	0.24%
Modified Wetlands (managed wetland in maintained rec area)	5.97	0.04%
Modified Wetlands (wetland rights-of-way)	37.67	0.27%
<b>Total Vegetation Land Cover</b>	<b>5,390.61</b>	<b>38.48%</b>

Source: NJDEP, DVRPC, 2002 data, released 2006

## Wetlands

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

Nearly all wetlands in Mansfield Township are found in association with major streams and their tributaries. Wetlands are dominant along the township's major waterways: Assiscunk, Blacks, and Crafts Creeks. Wetlands provide high-quality animal and plant habitat, purify the township's surface and ground waters, and create picturesque landscapes that add immeasurably to the quality of life for township residents. According to the Anderson Land Use Classification System, Mansfield Township has 5 major types of natural wetlands: (1) wooded wetlands dominated by deciduous trees, (2) scrub/shrub wetlands dominated by deciduous woody plants, (3) scrub/shrub wetlands dominated by coniferous woody plants, (4) herbaceous wetlands, and (5) freshwater tidal marshes.



*Photo by Robert Tallon, Mansfield Environmental Commission*

*At the confluence with the Delaware River, both Spring Hill Brook and Crafts Creek have tidal marshes.*

tributaries. Crafts Creek flows through a substantial area of deciduous and coniferous wooded wetlands near the Four Seasons residential development. Wooded wetlands are also found, to a lesser extent, associated with upland forests.

In Mansfield, herbaceous wetlands occupy about 193 acres (1.5 percent) of the township's land area. Herbaceous wetlands generally occur along lake edges, open floodplains, and former agricultural wetland fields. Herbaceous wetlands are found in close proximity to wooded wetlands along some of Mansfield's major and minor streams. A significant amount of

Common throughout Mansfield Township are deciduous wooded wetlands (sometimes referred to as wetland forests). Deciduous wooded wetlands occupy about 1,775 acres (13 percent) of Mansfield's total land area and support mixed hardwoods that flourish in lowlands. Some common trees in Mansfield's deciduous wooded wetlands are American sycamore, river birch, white ash, swamp white oak, green ash, and sweetgum.

Closely associated with deciduous wooded wetlands are scrub/shrub wetlands, occupying about 260 acres (1.8 percent) of Mansfield. These wetlands are generally composed of young, medium-height, primarily deciduous woody plants. Mansfield's scrub/shrub wetlands are composed of young saplings of red maple, ash, and sweetgum, and are dominated by shrub species like silky dogwood, buttonbush, winterberry, swamp rose, elderberry, southern arrowhead, and hazel alder.

Large swaths of deciduous wooded and scrub/shrub wetlands are present at the headwaters around many unnamed

Mansfield's herbaceous wetlands are found near the I-295 exit ramp, Four Seasons, and the juncture of County Route 646 and State Route 68. Herbaceous wetland plants include rice cutgrass, reed canary grass, pond lily, tearthumb, arrow-leafed tearthumb, broadleaf cattail, and the common reed (*Phragmites*).

Modified wetlands are areas that have been altered by human activities and do not support natural wetland vegetation, but which do show signs of soil saturation on aerial infrared surveys. Modified wetlands encompass agricultural wetlands, former agricultural wetlands, disturbed wetlands, and wetlands that occur in maintained greenspaces, such as open lawns, golf courses, and stormwater swales. Mansfield has extensive swaths of modified wetlands covering 1,527 acres (11 percent) of the township's land area. Nearly all (1,360 acres) of Mansfield's modified wetlands consist of agricultural wetlands. In fact, agricultural wetlands are the second most common type of wetlands, after deciduous wooded wetlands, as categorized by the Anderson Land Use Classifications System.

### **Upland Forests**

Upland areas are those locations without water at or near the soil surface. Over 1,148 acres (8.2 percent) of Mansfield is composed of upland forests, as of the 2002 land cover analysis by NJDEP. Most of Mansfield's original upland forests were cleared and converted to farms or residential or commercial development. Nearly all old growth forests were harvested for lumber during colonial times. The remaining upland forests are second or third growth, and tend to be located near stream corridors, or are patchy woodlands on less desirable soils associated with large farms.

Upland forests are the second most abundant natural vegetative land cover in Mansfield, after natural wetlands (and excluding modified wetlands). The great majority, 1,075 acres, of Mansfield's upland forests consists of deciduous trees. The

composition of Mansfield's upland deciduous forests is largely one of mixed oaks – black, red, chestnut, Shumard, and scarlet oaks – joined by other hardwoods, such as paper birch, American beech, honey locust, hickory, and sweetgum. The understory is dominated by flowering dogwood, black cherry, ironwood, and sassafras. Vines, such as Virginia creeper, wild grapes, Japanese honeysuckle, and poison ivy, are common. Spicebush, arrowwood, and black haw are common shrubs in moister locations.



*A Caltapa tree*

Coniferous trees occur on about 25 acres (0.2 percent) of Mansfield. These forests are mostly made up of successional, or pioneer, plants (Virginia pine, scrub pine, and pitch pine) which will eventually be overgrown by dominant deciduous trees, such as ash, birch, oak, and hickory.

### **Grasslands and Agricultural Lands**

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 3 to 20 years. 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.

Roughly 380 acres (2.7 percent) of Mansfield's land cover consists of brushland, shrubland or old fields. In Mansfield, brushland is generally found adjacent to residential, commercial, and industrial development, while old fields occur more often near agricultural or wetland areas. A large area of old fields is directly adjacent to the National Auto Dealers Exchange (NADE) site, northeast of Route 68.

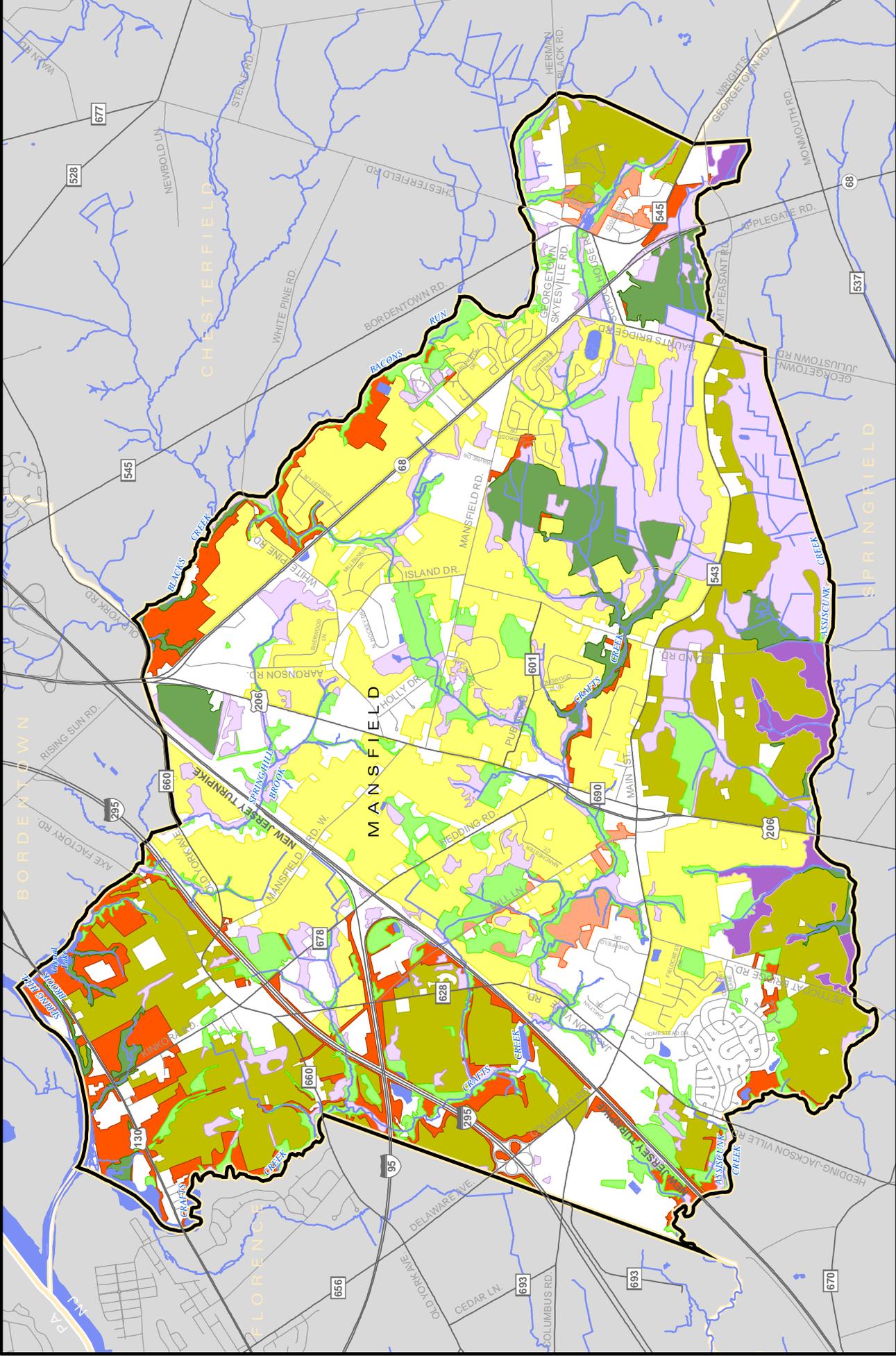


*Brush and shrubland can be found along roadsides.*

In addition to brushland and old fields, active agricultural cropland and pastureland is considered suitable “grassland” habitat for wildlife. That is, grassland species will use agricultural cropland and pastureland, as well as brushland and old fields. Agricultural cropland and pastureland is the single most abundant type of vegetative land cover in Mansfield Township, accounting for 4,950 acres (35 percent) of the township's land area in 2002.

### **LANDSCAPE PROJECT PRIORITY HABITATS**

The Landscape Project, developed by the Endangered and Nongame Species Program of the NJDEP Division of Fish & Wildlife, documents the value of various types of habitats within New Jersey. It categorizes these habitats into one of five groups according to their importance (five being the highest). Categories three through five include habitats throughout the state that possess two exceptional conditions: (1) a documented occurrence of one or more species on either the federal or the state threatened and endangered species lists, and (2) a sufficient amount of habitat type to sustain these species. These habitats are collectively known as “critical habitat.” Categories one and two include habitats that either have a documented occurrence of a



Sources: NJDEP, NJDOT, DVRPC, NJ Division of Fish and Wildlife.  
 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**
- Emergent Wetlands**
    - Critical Habitat
    - Suitable Habitat
  - Forested Wetlands**
    - Critical Habitat
    - Suitable Habitat
  - Upland Forest**
    - Critical Habitat
    - Suitable Habitat

**Grasslands**

- Critical Habitat
- Suitable Habitat

Scale: 0 0.25 0.5 1 Miles

North Arrow

Delaware Valley Regional Planning Commission  
 March 2007

*Species of Special Concern*<sup>5</sup> in New Jersey, or are deemed suitable for species on the state or federal threatened and endangered species lists, but for which there are no documented occurrences or sightings. These habitats are labeled “suitable habitats.”

The Landscape Project identifies both critical and suitable habitat in Mansfield Township. It is important to preserve both levels of habitat in order to maintain the diversity of species that still exists in the township. The rankings in Mansfield are primarily the result of habitat being either critical or suitable for rare bird species, such as the bald eagle, barred owl, eastern meadowlark, and upland sandpiper, or for endangered reptiles and amphibians, such as the Fowler’s toad. See **Map 14: Landscape Project Habitat Priorities (2004)** on page 71.

**Table 18: Landscape Project Habitat Rankings – Acreage in Mansfield Township**

Category	Rank	ACRES	% of Total Habitat	% of All Mansfield Land
Emergent Wetlands	Critical Habitat (5)	1,656.92	14.26%	11.83%
	Suitable Habitat (1)	204.93	1.76%	1.46%
Forested Wetlands	Critical Habitat (5)	96.74	0.83%	0.69%
	Suitable Habitat (2)	553.51	4.76%	3.95%
	Suitable Habitat (1)	1,209.03	10.40%	8.63%
Upland Forest	Critical Habitat (5)	400.85	3.45%	2.86%
	Suitable Habitat (2)	1,397.23	12.02%	9.97%
	Suitable Habitat (1)	335.36	2.89%	2.39%
Grassland-Dependent Species Lands	Critical Habitat (5)	227.84	1.96%	1.63%
	Critical Habitat (3)	814.31	7.01%	5.81%
	Suitable Habitat (2)	1,186.74	10.21%	8.47%
	Suitable Habitat (1)	3,538.84	30.45%	25.26%
<b>Total Habitat</b>		<b>11,622.30</b>	<b>100.00%</b>	<b>82.96%</b>
<b>Total Mansfield Land</b>		<b>14,009.45</b>		<b>100.00%</b>

Source: NJDEP, 2005

### Landscape Project Data on Wetland Habitat

The Landscape Project divides wetland habitats into two types – forested and emergent wetlands. Emergent wetlands are marshy areas characterized by low-growing shrubs and herbaceous plants in standing water. About 1,862 acres (13 percent of total land area) in Mansfield are identified as priority emergent wetlands habitat, with the majority ranked at the “critical” level. Animal species that can be found in these wetland habitats include endangered turtles, rare fish, mollusks, crustaceans, and insects. Emergent wetlands are also important habitat for migratory waterfowl and passerines (smaller perching birds), such as migrating flycatchers and warblers.

<sup>5</sup> A Species of Special Concern is a formal definition; it indicates a species that may be under consideration for listing as threatened due to documented population decline or habitat loss.

Mansfield's wooded wetlands occupy nearly the exact amount of land as emergent wetlands: 1,859 acres (13 percent of total land area). About 97 acres (0.7 percent of total land area) are identified as critical habitat. Forested wetland habitat in Mansfield is located along the upper stretches of Crafts Creek and Bacons Run, as well as Assiscunk Creek near the Homestead development. Wooded wetlands support species such as migratory and nesting warblers, many of which are species of special concern. They can also be home to various rare amphibians (frogs and salamanders). Mansfield's wooded wetlands are habitat for the Bald Eagle and bog turtle, both of which are on the New Jersey Threatened and Endangered Species List, as well as to more common species, such as the Carolina chickadee, gray catbird, great blue heron, prothonotary warbler, spotted turtle, and wood thrush.

The township's emergent wetlands are habitat for a large group of threatened and endangered animal species and species of special concern. Rare and endangered species that utilize emergent wetland habitat include the American bittern, Arogos skipper, bald eagle, black rail, black skimmer, black-crowned night-heron, blue-spotted salamander, bobcat, bog turtle, bronze copper, Cope's gray treefrog, eastern tiger salamander, frosted elfin, great blue heron, Henslow's sparrow, least tern, longtail salamander, Mitchell's satyr, northern harrier, osprey, peregrine falcon, pied-billed grebe, Pine Barrens treefrog, roseate tern, and yellow-crowned night-heron. In Mansfield Township, critical emergent wetland habitat supports document bog turtle populations, and other animal species.



*Photo by Robert Tallon, Mansfield  
Environmental Commission*

*A gray catbird is a common sight in  
Mansfield.*

### **Landscape Project Data on Upland Forest Habitat**

The Landscape Project ranks 2,133 acres (15 percent) of Mansfield's total land cover as "suitable" or "critical" upland forest habitat. Over 400 acres (3 percent of total land area) are ranked as critical upland habitat. This critical upland forest is found in three main stretches: along Bacons Run from the National Auto Dealers Exchange (NADE) complex to Old York Road; along all three sides of the triangle formed by I-95, the New Jersey Turnpike, and Crafts Creek; and along the entire township border with the Delaware River and Crystal Lake. Suitable upland forest habitat can be found along upper sections of Crafts Creek and in the eastern-most part of the township. Mansfield's critical upland forests provide habitat for bald eagles, and bog turtles.

## **Landscape Project Data on Grassland-Dependent Species Habitat**

The Landscape Project designates nearly 42 percent of the township as “suitable” or “critical” grassland-dependent species habitat. Approximately 1,090 acres of farmland (8 percent of total land area) are ranked as critical grassland-species habitat. These areas are found along the entire southern border of the township and along the western border from Columbus Road to the Delaware River. Both of these swaths of critical habitat are approximately one mile wide. Another 4,725 acres of farmland (34 percent of total land area) are ranked as suitable grassland-species habitat. These areas make up a large percentage of the interior of the township and extend to the border with Chesterfield in the east. Grassland-dependent species are the most threatened group of species in New Jersey, primarily because the most common form of grassland species habitat, agricultural fields, is also the most threatened habitat in the state. This is due to development pressure associated with rising land values and changes in agricultural practices on remaining agricultural lands. Fortunately, Mansfield has so far retained a significant amount of its critical grassland-dependent species habitat; it is noteworthy that the largest breaks in an otherwise contiguous belt of critical grassland habitat are the Homestead development and the landfill.

Nearly all of Mansfield’s agricultural land is designated as “critical” or “suitable” grassland-dependent species habitat because of some of the following reasons: (1) migrating birds cannot visually distinguish cropland from grassland; (2) cropland turns into grassland when it is fallow for one year or more; (3) some crops, like alfalfa and soybeans, provide suitable nesting habitat for some birds, especially for sparrows; and (4) all or most of endangered and threatened birds are area-sensitive, requiring large ranges that include agricultural “grasslands.” The Landscape Project includes this land in its assessment because agricultural lands provide important disturbance buffers between the rare and endangered wildlife species and humans, and between the rare species and widespread predatory animals like dogs and cats.

Examples of grassland-dependent species that use Mansfield’s grassland habitat for nesting or feeding include the bald eagle, bobolink, eastern bluebird, eastern box turtle, eastern meadowlark, grasshopper sparrow, savannah sparrow, and some species of butterflies and moths.

## **ANIMAL COMMUNITIES**

Although no comprehensive inventory of the different animal species within Burlington County or Mansfield Township exists, there are records of sightings, biological studies of range, and assessments of endangered and threatened species status. Using federal, state, and other scientific sources, it is possible to identify and describe known and possible animal communities of Mansfield Township. These are included in *Appendix C: Vertebrate Animals Known or Probable in Mansfield Township* on page A-7.

## 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 and microscopic copepods), mollusks (mussels, clams, snails, and slugs), and worms.

Macroinvertebrates are invertebrates that are visible to the naked eye but smaller than 50 millimeters. Benthic (bottom dwelling) macroinvertebrate communities provide a basis for ecological monitoring and are relatively simple to collect from shallow stream bottoms. 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 Ambient Biomonitoring Network (AMNET) surveys streams for macroinvertebrate communities, which indicate certain levels of water quality, as was discussed in the **Surface Water Quality** section of this document on page 37.



*Photo by Robert Tallon, Mansfield  
Environmental Commission*

*A sow bug is a macroinvertebrate found in Mansfield's waters.*

There are nine endangered invertebrate species (two beetle species, four butterfly species, and three mussel species) and eight threatened invertebrate species (three butterfly species and five mussel species) in the State of New Jersey. Of particular interest are freshwater mussels. At one time freshwater mussels were abundant in the streams of the area and were a major food source for native peoples. Unfortunately, due to destruction of suitable aquatic habitats by dams and pollution, the native mussel population has sharply declined. Of those species on the New Jersey Endangered and Threatened List, one, the dwarf wedgemussel, is listed as endangered under the federal Endangered Species Act.

There is no survey data on invertebrates or any listed threatened or endangered invertebrate species for Mansfield Township. However, the wetland areas in the eastern part of the township, as well as the tidal wetland complex on Crafts Creek recorded in the New Jersey Natural Heritage database for Mansfield Township (see *Appendix D* on page A-13), are likely to have diverse invertebrate communities.

## **Vertebrates**

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

### *Mammals*

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

Management of white-tailed deer is an issue in New Jersey. While many residents prize the presence of mammalian life, deer often come into conflict with humans in suburban areas. According to the US Department of Agriculture, deer cause more damage to agricultural crops than any other vertebrate wildlife species. Farmers in densely human-populated areas appear to be the most affected. Additionally, deer can devastate the understory of forests through overgrazing, destroying the growth of seedlings and young trees. Finally, as most motorists are aware, collisions between deer and automobiles frequently result in serious damage.

Controlling deer numbers has become increasingly difficult in New Jersey, primarily because suburban landscaping provides year-round food, which supports population growth; and because the principal method of culling the population – hunting – is not feasible in suburban environments.

To minimize human-deer conflicts, the New Jersey Agricultural Experiment Station recommends both lethal and nonlethal deer management options for community-based deer management programs. For example, municipalities can extend the hunting season, issue depredation permits to private landowners, engage in sharp shooting, and employ traps and euthanasia to reduce deer numbers. Alternatively, communities and private landowners can choose to apply nonlethal, although more costly, 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.

### *Birds*

New Jersey has over 500 species of birds, which is an exceptional number given the state's small size. New Jersey is an important location for migratory birds heading south for the 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 Mansfield Township and Burlington County are geese, ducks, vultures, woodpeckers, doves, swallows, crows, grackles, jays, robins, starlings, wrens, cardinals, finches, sparrows, and some hawks. Wild Turkeys are becoming increasingly common in the township. The bald eagle, an endangered bird species, the upland sandpiper, another endangered bird species, the American bittern, a threatened bird species, and other rare species have been sighted in the township. According to the Landscape Project, Mansfield contains suitable habitat for a variety of predatory birds, including hawks, falcons, and especially eagles.



*Photo by Robert Tallon, Mansfield Environmental Commission*

*The great blue heron is a threatened species in New Jersey.*

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

Removing geese or preventing them from residing in park areas is a difficult task. Because geese move freely, the most effective management solutions are best conducted at the community level. Canada geese are protected by the Migratory Bird Treaty Act. Therefore, a management program may require the US Department of Agriculture’s approval and permits. A new federal rule signed into law in December 2005 eases hunting restrictions and allows county and municipal officials to coordinate with state fish and wildlife departments to destroy birds and/or eggs that pose a threat to public health and safety. Management techniques include planting shrubby vegetation around streams, lakes, and ponds to block waterfowl access, discouraging humans from feeding geese, and removing geese eggs and replacing with decoys.

### *Common Reptiles and Amphibians*

Reptiles can be quite elusive when surveys attempt to document them. Some species, such as the bog turtle, an endangered species, have been well documented in Mansfield. Amphibians of some types are abundant, such as bullfrogs. Other species are rare because they depend on vernal ponds, as discussed in the *Surface Waters Resources* section of this document (page 26).

## Fishes

When European settlers arrived in present-day Burlington County, they encountered Algonquin Indians, who regularly fished along the inland streams and gathered shellfish in the Delaware River. Shad fishing was an important industry along the Delaware River until the early twentieth century. Due to the unintended consequences of urban development, industrial advancement, overfishing, and mechanized agriculture, the amount and diversity of aquatic life has decreased dramatically throughout most of New Jersey.

The New Jersey Division of Fish and Wildlife, under the Bureau of Freshwater Fisheries, monitors and actively aids the propagation, protection, and management of the state's freshwater fisheries. The bureau raises several million fish for stocking in suitable waterbodies and conducts research and management surveys.

Rudolf G. Arndt, a professor at the Richard Stockton College of New Jersey, created the "Annotated Checklist and Distribution of New Jersey Freshwater Fishes, With Comments and Abundance" (see **Sources of Information** on page 105) by drawing together all the fish inventories for New Jersey, along with his own collection data. Thirty fish species are documented in the waterways of Mansfield. A record of those fish species is included in *Appendix C: Vertebrate Animals Known or Probable in Mansfield Township* on page A-7.

## Endangered Vertebrates

According to the Natural Heritage Database and the Landscape Project, a significant amount of rare wildlife has been sighted in Mansfield Township over the course of the past 100 years. Unfortunately, a few species have not been recently spotted in the township. Brief descriptions of those species listed on the Natural Heritage Database for Mansfield Township, provided by the New Jersey Fish and Wildlife Service, follow. Additionally, there are other rare species sighted by township residents but not yet verified by the Endangered and Nongame Species Program. They are, therefore, not included in this list.

### N.J. DEPARTMENT OF ENVIRONMENTAL PROTECTION FRESHWATER FISH ADVISORIES

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

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

NJDEP issued a fish advisory for the following species of fish in Burlington County: largemouth bass, smallmouth bass, striped bass, chain pickerel, yellow bullhead, sunfish, brown bullhead, American eel, striped bass, channel catfish, white catfish, and bluefish. Recreational fishermen and women should regularly check for local fish advisories on NJDEP's Division of Science, Research and Technology web site: <http://www.nj.gov/dep/dsr/njmainfish.htm>

The **bald eagle** (*Haliaeetus leucocephalus*) is an endangered species in New Jersey. Their seven to eight foot wingspan, full white heads, and dark brown plumage make the adult bald eagle easily identifiable. Their habitat consists of areas of forest near the Delaware River and its tributaries. Bald eagles choose the largest and tallest trees in a forest to set up their nests. They also prefer these trees to be in close proximity to water. This allows the bald eagle to forage for fish from their nest. The bald eagle population was depleted in New Jersey through habitat destruction, shootings, intentional poisons, and especially the application of DDT, a pesticide that was widely used in post-World War II New Jersey to control the mosquito population. This chemical accumulated in the bodies of the bald eagle, which caused the eggshells of fledgling bald eagles to crack easily during the incubation period. By 1970, only one bald eagle nest remained in the state. As a direct result, the bald eagle was listed as endangered under New Jersey's Endangered Species Act in 1974. New Jersey's bald eagle population has improved since the federal government placed a ban on DDT in 1972. In 2006, the New Jersey Endangered and Nongame Species Program recorded 55 bald eagle nests as active in the state. One nest is located near Newbold Island, along the Delaware River.



*Photo by Robert Tallon, Mansfield Environmental Commission*

*Bald eagles nesting on Newbold Island.*

The **barred owl** (*Strix varia*) is a threatened species in New Jersey. It is a large fluffy-looking owl with brown barring on the upper breast and brown streaking on the lower breast and belly. Its eyes are a distinctive dark brown color. Traditionally, the barred owl was known as the “swamp owl.” This name originated from the barred owl’s choice habitat in old-growth wetland forests. The owl needs old-growth mature wet woods that contain large trees with cavities for nesting. In southern New Jersey, the barred owl inhabits both deciduous wetland forests and Atlantic white cedar swamps associated with stream corridors. Mixed hardwood swamps dominated by red maple and black gum are also suitable habitats. The destruction of these old-growth wetland forests during the post-World War II building boom is thought to be the main reason for the decline of the barred owl. Hunting has also played a part in the barred owl’s precarious situation. In 1979, the barred owl was listed as a threatened species in New Jersey. Currently, the barred owl population is declining further as forested lands become developed. However, the barred owl has been documented in Mansfield Township.

The **eastern box turtle** (*Terrapene carolina*) is listed as a species of special concern in New Jersey. It is known to be currently present in Mansfield Township. This small (four- to six-inch) turtle can be found all over the state and lives in many different habitats. They can be identified by their tall domelike shells and coloration, which ranges from spots of yellow, orange or olive on a dark brown background. Even though eastern box turtles can live in many different habitats, they are mostly terrestrial. However, box turtles enjoy soaking themselves in water or mud

during the summer. Continued residential development has limited the habitats available to the eastern box turtle and reduced their number over the years.

The **eastern meadowlark** (*Sturnella magna*) is a medium-sized songbird whose numbers are in decline in Mansfield Township. The eastern meadowlark can be discerned by its yellow throat, chest, and belly, and they are accentuated with a streaked brown back. The eastern meadowlark's habitat consists of grasslands, pastures, hayfields, cropland, golf courses, and various other types of open fields. Their nests are constructed on the ground, intertwined with the surrounded grasses. Often their nests have roofs or arches for added protection. The eastern meadowlark's numbers have declined in recent years in relation to agriculture's decline in southern New Jersey and to changes in agricultural practices. The large expanses of farms that covered Burlington County provided the eastern meadowlark with many habitat choices.

The **Fowler's toad** (*Bufo woodhousii fowleri*) is a species of special concern in New Jersey. It is a small (two- to three-inch) toad that can be identified by its brown/dark brown colorations, multiple warts, and the light line running down its spine. Fowler's toads inhabit sandy locations and vernal pools throughout the state. In Mansfield, the health of the species is linked to the health of the few remaining vernal pools. These pools are favored breeding grounds of the toad.

The **upland sandpiper** (*Bartramia longicauda*) is an endangered species in New Jersey. Upland sandpipers are slender brown shorebirds of dry inland fields with thin necks, long tails, varied brown



Photo by Robert Tallon, Mansfield Environmental Commission

These Mansfield schoolchildren are sitting with a probable eastern box turtle, a species of special concern in New Jersey.

#### FEDERAL ENDANGERED SPECIES ACT\*

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

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

#### NEW JERSEY ENDANGERED SPECIES ACT\*\*

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

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

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

\* Definitions adapted from U.S. Fish and Wildlife Service, "Listing a Species and Threatened or Endangered: Section 4 of the Endangered Species Act." Washington, DC: February 2001.

\*\* Definitions adapted from N.J. Division of Fish, Game, and Wildlife, Endangered and Non-game Species Program, "Status Definition." Trenton, NJ: April 2002.

colorations, and long yellow legs. The bill of the upland sandpiper is short and straight with a slight curve at the tip. The upland sandpiper inhabits grasslands, fallow fields, and meadows that are often associated with pastures, farms, or airports. Pastures that particularly receive light to moderate levels of grazing offer quality habitat for upland sandpipers. Hayfields and small farms also provide habitats; however, large monocultures of row crops are of limited value because of heavy mechanical and chemical activity. Airports also provide habitat for the upland sandpiper, especially in southern New Jersey. During the nineteenth century the upland sandpiper populations grew rapidly as agricultural fields expanded production in southern New Jersey. However, by the turn of the twentieth century, the upland sandpiper was on the verge of extinction in New Jersey, caused by over hunting. Recovery throughout the first half of the twentieth century was followed by the development of modern monoculture farming in the second half, which has caused substantial habitat loss and has exacerbated the quick decline in the sandpiper population. As a result, the state of New Jersey placed the upland sandpiper on its threatened species list in 1979, and in 1984 upgraded its status to endangered. Although the upland sandpiper has been documented in Mansfield Township, there have been no new occurrences in recent years. This species seems to have disappeared in most parts of New Jersey. At the national level, however, the upland sandpiper is only considered a species of management concern.

See *Appendix C* for a list of *Vertebrate Animals Known or Probable in Mansfield Township* on page A-7. See *Appendix D* for a list of *Rare Plant and Animal Species and Natural Communities Presently Recorded in the New Jersey Natural Heritage Database for Mansfield Township* on page A-13. See *Appendix E* for a list of *State Endangered and Threatened Species* on page A-15.

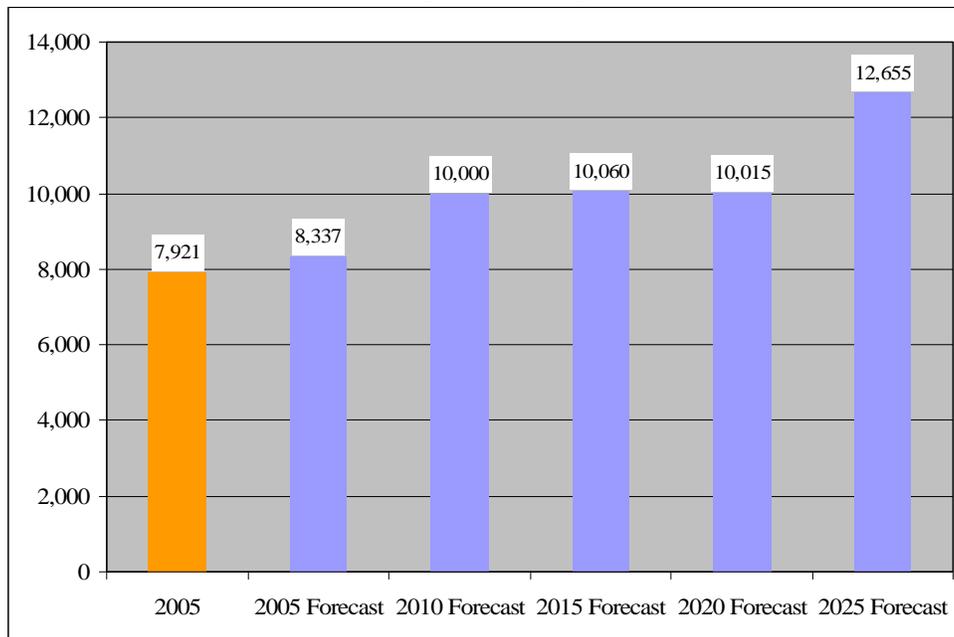
# THE BUILT ENVIRONMENT

## POPULATION

According to the US Census, Mansfield’s population in 1990 was 3,874. By 2000, the population had grown to 5,090, an increase of 1,216 people, or 31 percent. However, according to DVRPC estimates, which use US Census projections, Mansfield’s population in 2004 was 7,615 people, an increase of 2,525 people, or 50 percent, in only four years. This rapid growth makes Mansfield Township one of the fastest growing municipalities in the 9-county Delaware Valley region. Between 2000 and 2005, it was the fourteenth fastest growing municipality measured by absolute change (2,646 people), and the fifth fastest measured by percent change (50 percent).<sup>6</sup>

Population projections made by DVRPC estimate the township will continue to grow rapidly until approximately 2010, when growth is expected to plateau, and will then rise again between 2020 and 2025, as seen in *Chart 1: DVRPC Population Projections 2005-2025*.

**Chart 1: DVRPC Population Projections 2005-2025**

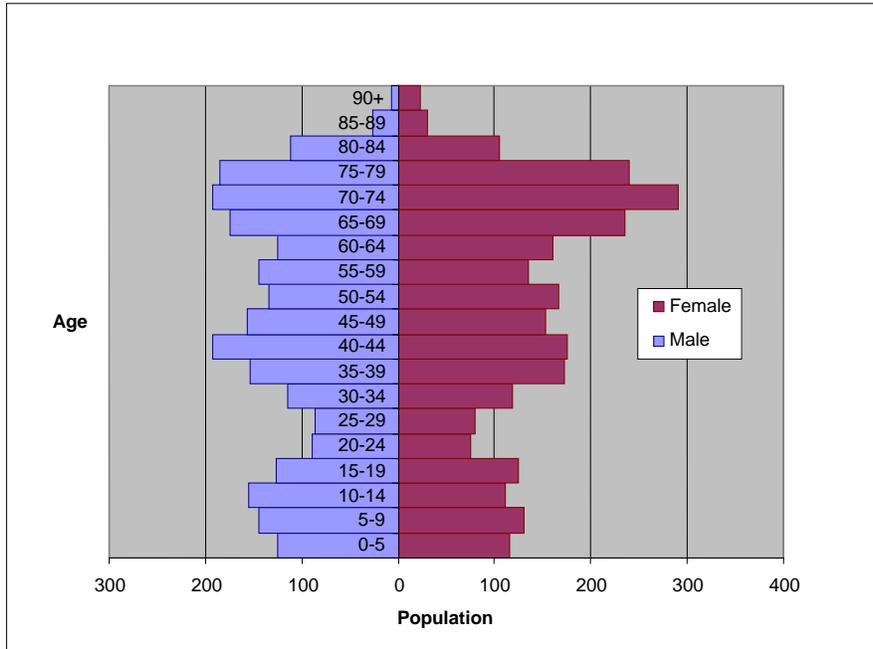


Source: *DVRPC Data Bulletin #73 (update)*

About 32 percent of Mansfield’s population is over 65, which is significantly higher than all but one other municipality (Southampton Township) in Burlington County. Many retired people call Mansfield their home, living in the planned communities of Homestead and Four Seasons.

<sup>6</sup> These figures are measured using ‘construction permits issued as a percentage of existing housing stock.’  
Source: *DVRPC Data Bulletin #84* – <http://www.dvrpc.org/data/databull/rdb/db84.htm>.

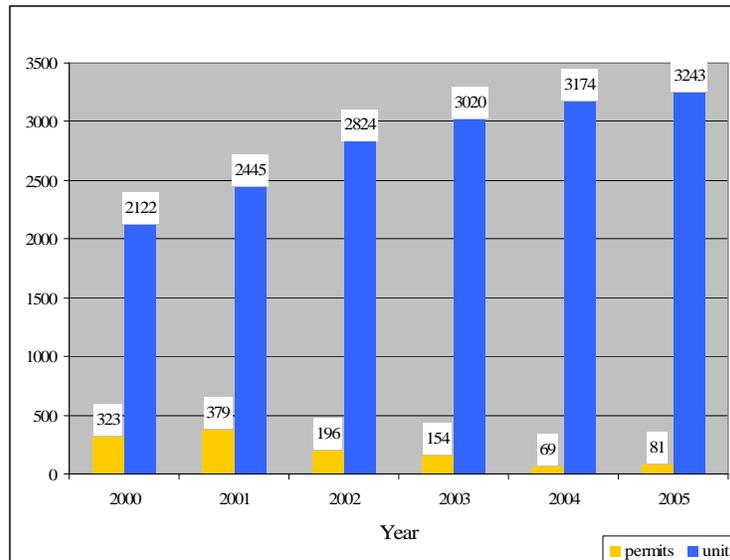
**Chart 2: Mansfield's Population by Age and Sex (2000)**



Source: US Census 2000

US Census data for Mansfield indicate that 608 housing permits were granted from 1990-1999, representing a 29 percent increase in Mansfield's housing stock. Between 2000 and 2005, 1,121 permits were granted, representing a 35 percent increase. According to the 2000 US Census, Mansfield had 2,122 housing units and a vacancy rate of only 2 percent. In 2005, Mansfield had 3,243 housing units.

**Chart 3: Mansfield Housing Permits (2000 – 2005)**



Source: DVRPC, Regional Data Bulletin #83, May 2006

## TRANSPORTATION

Mansfield Township is located in the more populous part of Burlington County. It is about 30 miles from Center City, Philadelphia, and 14 miles from downtown Trenton, New Jersey. US Route 206, which runs directly through the center of the township, leads to Trenton, Princeton, and other central New Jersey employment centers. Interstate 295 has exits on the western side of Mansfield Township, and the New Jersey Turnpike has exits immediately outside the township in both directions. Route 68 also travels through the township on its eastern side. Mansfield has an advantageous position, as it is part of the suburban-rural interior of large Burlington County, but has access to the major thoroughfares that traverse the county's urbanized communities in the west.

US Route 206 is a main road that connects New Jersey's Pinelands to the Highlands, by way of urban Trenton. The road is used by both weekday commuters and weekend outdoor enthusiasts. The major artery passes through the center of Mansfield Township and provides access to exit 7 on the New Jersey Turnpike. It also intersects with Route 68, a 4-lane divided highway traveling along the eastern side of Mansfield Township, which connects Fort Dix to the state capital, Trenton. Route 68 is far enough removed from the heart of the township to avoid some of the impacts associated with such a high-speed byway.

Continued easy access to major roads is integral to the quality of life of Mansfield residents because over 91 percent of the township's employed population commutes to work by automobile, as reported by the 2000 US Census (nearly 83 percent of township residents commute by driving alone, while 9 percent carpool). Roughly 59 percent of the employed residents of Mansfield commute 30 minutes or less to places of employment. The mean travel time to work for New Jersey residents is 30 minutes.



*A quiet county road in Mansfield Township.*

County roads within the township include routes 660, 678, 628, 543, 545, 601, and 690. These provide access and connections within the township and are reminiscent of past land uses that connected farming areas with small residential areas, like Georgetown and Hedding. In some cases, these formerly rural routes struggle to handle the increasing volumes of traffic associated with the township's growth. Smaller roads in the township are a mixture of old rural lanes and newer subdivision thoroughfares.

County routes brought early settlers and travelers to Mansfield and supported industry, commerce, and the shipping of foodstuffs. Early settlers traveled through Mansfield and its small villages on bumpy country roads as they made their way to larger communities. After the



College of New Jersey (Princeton University) was moved from Newark to Princeton in 1756, people traveling from all points south of Mansfield, including Philadelphia and Camden, took Route 541, a stagecoach route and toll road, through Medford, Mansfield, and Mount Holly, and continued on present-day U.S. Route 206, which was also a toll road. Route 660 was a toll road connecting the city of Burlington and the towns of Kinkora, Allentown, and Hightstown.

## HISTORIC RESOURCES

Protection and preservation of historic structures, lands, and views are of high importance to Mansfield Township residents. The township has two sites – The Bowne House (listed as Barzillai Newbold House) and the William and Susannah Newbold House – on both the National and State Registers of Historic Places. Numerous additional sites and two railroad historic districts were issued State Historic Preservation Office (SHPO) opinions, which review a site’s eligibility for inclusion on the State Register of Historic Places.<sup>7</sup> Other sites may have the potential to be listed as local, state or national landmarks, but have not been nominated by local citizens or identified by SHPO for such a designation. The township boasts numerous eighteenth and nineteenth century structures, including charming storefronts and merchant homes, most of which are along Mansfield’s Main Street, in Columbus. Several larger historic farm homesteads are scattered throughout the township. See *Table 19: Sites listed on the National and State Registers of Historic Places* for sites currently listed on the National and State Registers.

**Table 19: Sites Listed on the National and State Registers of Historic Places**

Name	Location	Register	State ID#
Alloway Site	Archeological Site	State Historic Preservation Office Opinion 10/2/2003	4207
Bunting-Lovenduski Farmstead	Archeological Site	State Historic Preservation Office Opinion: 7/16/1991	4007
Camden and Amboy Railroad Main Line Historic District	Railroad right-of-way from Bordentown City to North Brunswick	State Historic Preservation Office Opinion 7/12/1991	2970
Delaware and Atlantic/Columbus, Kinkora, and Springfield Railroad Historic District	Railroad right-of-way from Kinkora to Assiscunk Creek	State Historic Preservation Office Opinion 3/27/2002	4291
Ivins House Site	Archeological Site	State Historic Preservation Office Opinion 7/16/1991	4006
Lister House Site	Archeological Site	State Historic Preservation Office Opinion: 7/16/1991	4004
Lovenduski Aboriginal Site	Archeological Site	State Historic Preservation Office Opinion: 7/16/1991	3996
Barzillai Newbold (Bowne) House	Columbus-Georgetown Road and Gaunt’s Bridge Road	National & State 1/26/1978	823

<sup>7</sup> Filing an Environmental Impact Statement (EIS) usually prompts the issuance of a SHPO opinion. The use of federal funding for a project often triggers the requirement to perform an EIS, which may result in NJDEP recognizing possible threats to certain historic sites and identifying those sites as eligible for listing in the State Register of historic places.

Name	Location	Register	State ID#
Scattergood Homestead Aboriginal Site	Archeological Site	State Historic Preservation Office Opinion: 7/16/1991	3994
Scattergood Aboriginal Site	Archeological Site	State Historic Preservation Office Opinion: 7/16/1991	4005
Thomas Scattergood House Site	Archeological Site	State Historic Preservation Office Opinion: 7/16/1991	4003
Scattergood/Wright House	Jacksonville-Hedding Road and New Jersey Turnpike	State 8/2/1978	824
Saint Michael and Gabriel Roman Orthodox Cemetery	US Route 130	State Historic Preservation Office Opinion: 3/27/2002	4293
Turnpike Aboriginal Site	Archeological Site	State Historic Preservation Office Opinion: 7/16/1991	3995
William and Susannah Newbold House	Georgetown (partly in Chesterfield Township)	National & State 9/29/1980	780

Source: New Jersey State Historic Preservation Office

The Mansfield Township Historical Society serves the township and collects and holds information on the community's historic resources. The historical society accepts donations of historic and interesting objects, and formerly operated a museum, housed in the Old Schoolhouse.

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). The township does not have an established historic district or historic preservation commission. The New Jersey SHPO did not review Mansfield's visually distinct historic area in Columbus along Main Street.

The National Park Service and the New Jersey SHPO jointly administer the Certified Local Governments (CLG) program, which provides technical assistance and funding for community-based preservation efforts. As of October 2003, only three municipalities in Burlington County – Burlington City, Evesham Township, and Mount Holly Township – are CLGs. 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. If Mansfield Township were to become a CLG, it would be eligible to draw on 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 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.

Investing in historic preservation efforts can provide a municipality with important and impressive returns. Private and public efforts to preserve and rehabilitate historic districts create attractive places to live, work, and play, and stimulate new investment in older residential and

commercial centers. A historic district, like that in nearby Mount Holly, can become a regional draw for tourists and boutique customers. Furthermore, historic preservation maintains a municipality's character, distinctly separating it from other rural and suburban communities, for both new and established residents.

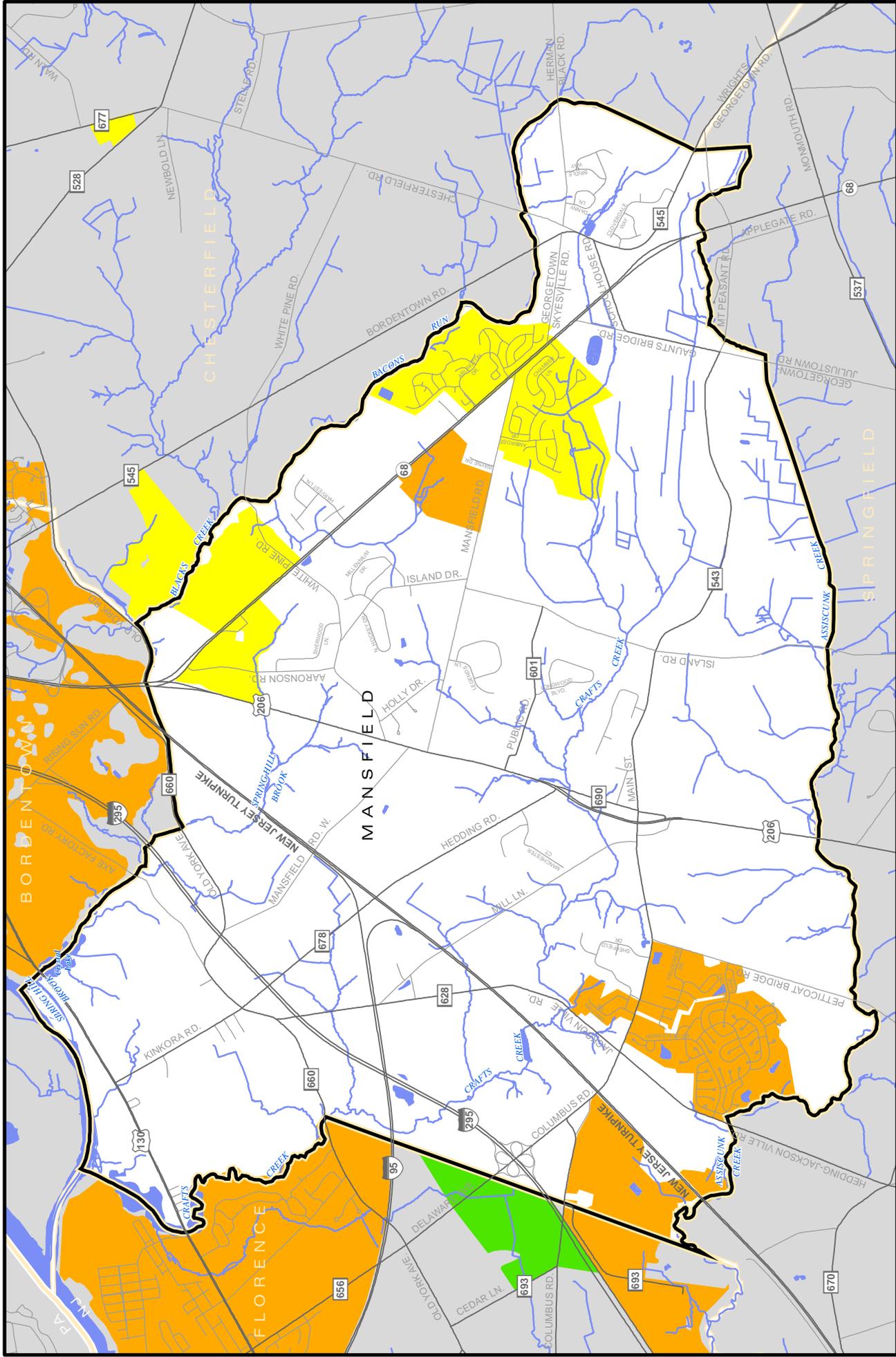


*Main Street in Columbus is lined with historic houses, such as this one.*

## **TOWNSHIP UTILITIES AND SERVICES**

### **Drinking Water**

Mount Holly Water Company (MHWC) supplies public drinking water to residences in the more developed sections of Mansfield, including the historic village of Columbus and newer communities of Mapleton and Four Seasons. Homestead is now also supplied by MHWC, since its purchase of Homestead Water Utility Company. Drinking water is derived primarily from public supply wells drilled into the PRM aquifer and located throughout the township (see **Aquifers** on page 56). Residential developments Homestead, Country Walk, Mapleton, and Four Seasons are served with public water, as is the Northern Burlington Regional High School complex. The National Auto Dealer Exchange complex and the EcoComplex/Landfill area both rely on private wells, as do township residents who live in less developed areas. The Homestead housing development recently applied for a permit to build a treatment facility that would allow



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 Sewer Service Area**
- Ground water discharge less than 20,000 gallons per day
  - Discharge to ground water through an individual NJPDES permitted facility
  - Surface water discharge

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it to reuse its wastewater for on-site landscaping. It would be the first residential development in New Jersey to do so.

The nine public drinking water wells in Mansfield Township are all owned and operated by the Mount Holly Water Company. They are listed in *Table 14: Public Water Supply Wells Serving Mansfield Township* on page 59. **Map 11: Public Water Supply Wells** on page 60 shows the locations of public non-community water supply wells.

## Sewer

As with public water, sewer service is provided to the more-developed sections of Mansfield, including the larger residential developments. The National Auto Dealer Exchange maintains its own package plant. Homestead is served by a private company, Applied Waste Water Management. All public sewage treatment is provided through the Mount Holly Municipal Utility Authority and its wastewater treatment plant, located on Rancocas Road in Mount Holly, which discharges to the north branch of the Rancocas Creek. The Mount Holly Municipal Utility Authority is currently undergoing a complete update of its wastewater management plan to better serve the growing communities of Mansfield, Eastampton, and Southampton.

See **Map 16: Approved Sewer Service Area** on page 87 for the location of the currently approved sewer service areas.

## Township Services

### *Trash and Recycling*

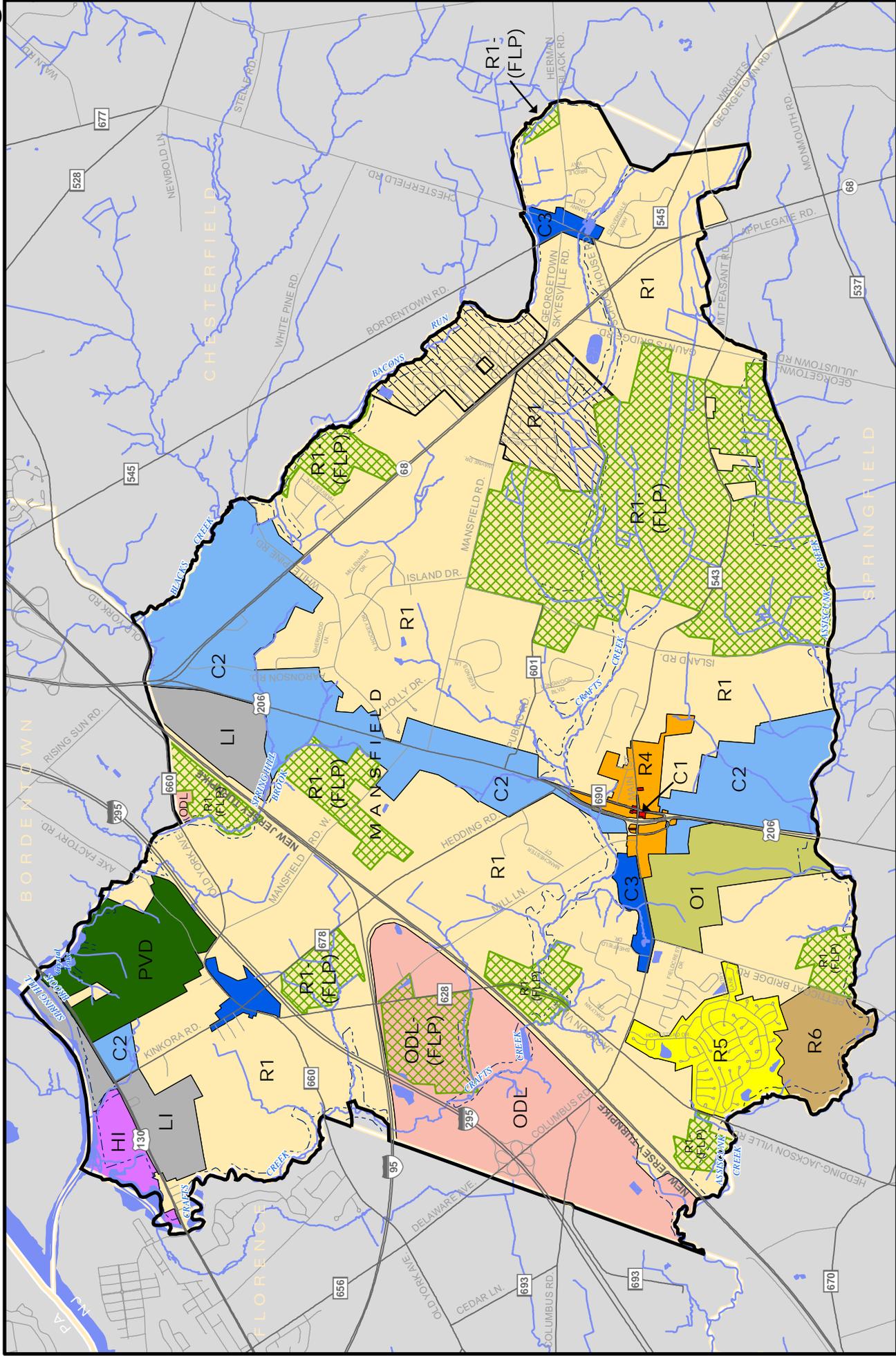
In Mansfield Township, trash is picked up twice weekly by municipal employees in the Department of Public Works. The Department of Public Works also picks up bulk trash (grass clippings, yard waste, and Christmas trees) on second garbage day of every week, and scrap metal and appliances on every other Wednesday on a call-in basis. Burlington County collects commingled glass, metal cans, plastics, cardboard, and paper on a biweekly schedule. There is also a recycling depot at the Mansfield Municipal Building. Hazardous materials, such as paints, oil, asbestos, gasoline, pesticides, and fertilizer, are disposed of at the Resource Recovery Center (EcoComplex), a specially equipped landfill in Mansfield/Florence Township, Burlington County. Mansfield township also has a recycling depot at the Township Building, which is open each Saturday morning for drop-offs.



*Wood awaiting recycling at the Resource Recovery Complex.*

# MANSFIELD TOWNSHIP

# MAP 17: Mansfield Zoning



Sources: NJDEP, NJDOT, DVRPC, Remington, Vernick & Arango Engineers  
 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.

	R1-Residence		LI-Light Industrial		FLP - Farmland Preservation Area
	R4-Residence		HI-Heavy Industrial		Areas Subject to Final Consent Order of 6/26/1990, & Amendments
	R5-Residence		PVD - Planned Village Development		Flood Plain
	R6-Residence		ODL - Office Distribution Lab.		
	C1-Neighborhood Commercial				
	C2-Highway Commercial				
	C3-Office Residential				
	O1-Office Distribution Lab.				

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### *Education*

Mansfield Township has three public elementary schools – John Hydock Elementary School, Mansfield Township Elementary School, and Northern Burlington County Regional Junior School. Mansfield Township Elementary School educates approximately 635 children in grades third through sixth. John Hydock Elementary School educates 349 township children in grades kindergarten through second, and Mansfield Township Elementary School serves grades third through sixth. After finishing elementary school, Mansfield’s students attend the Northern Burlington County Regional Junior and High School in the township, located on East Mansfield Road. The Northern Burlington County Regional School District serves over 720 junior high school students and 1,230 high school students from Chesterfield, Mansfield, North Hanover, and Springfield townships, as well as students from McGuire Air Force Base.

### *Parks and Recreation*

Mansfield Township has an extensive recreation program for a modestly-sized municipality. Mansfield’s Public Works Department maintains over 70 acres of active and passive recreation lands, which include recreation facilities, sport fields, and municipal administrative buildings. The township relies on a Recreation Committee that organizes and coordinates youth sports programs and on-going community events.

Mansfield Community Park is located on East Main Street (Route 543) and offers passive open space and trails through wooded areas, as well as active recreation facilities, including baseball and softball fields, an outdoor batting cage, soccer fields, outdoor basketball courts, tennis courts, a shuffle board court, horseshoe pit, and a large playground. The park was recently expanded to include a public service building with a concession area, public restrooms, and storage area. The large community park is adjacent to Town Hall Field, a regulation youth baseball field that features a mural depicting a crowded grandstand.

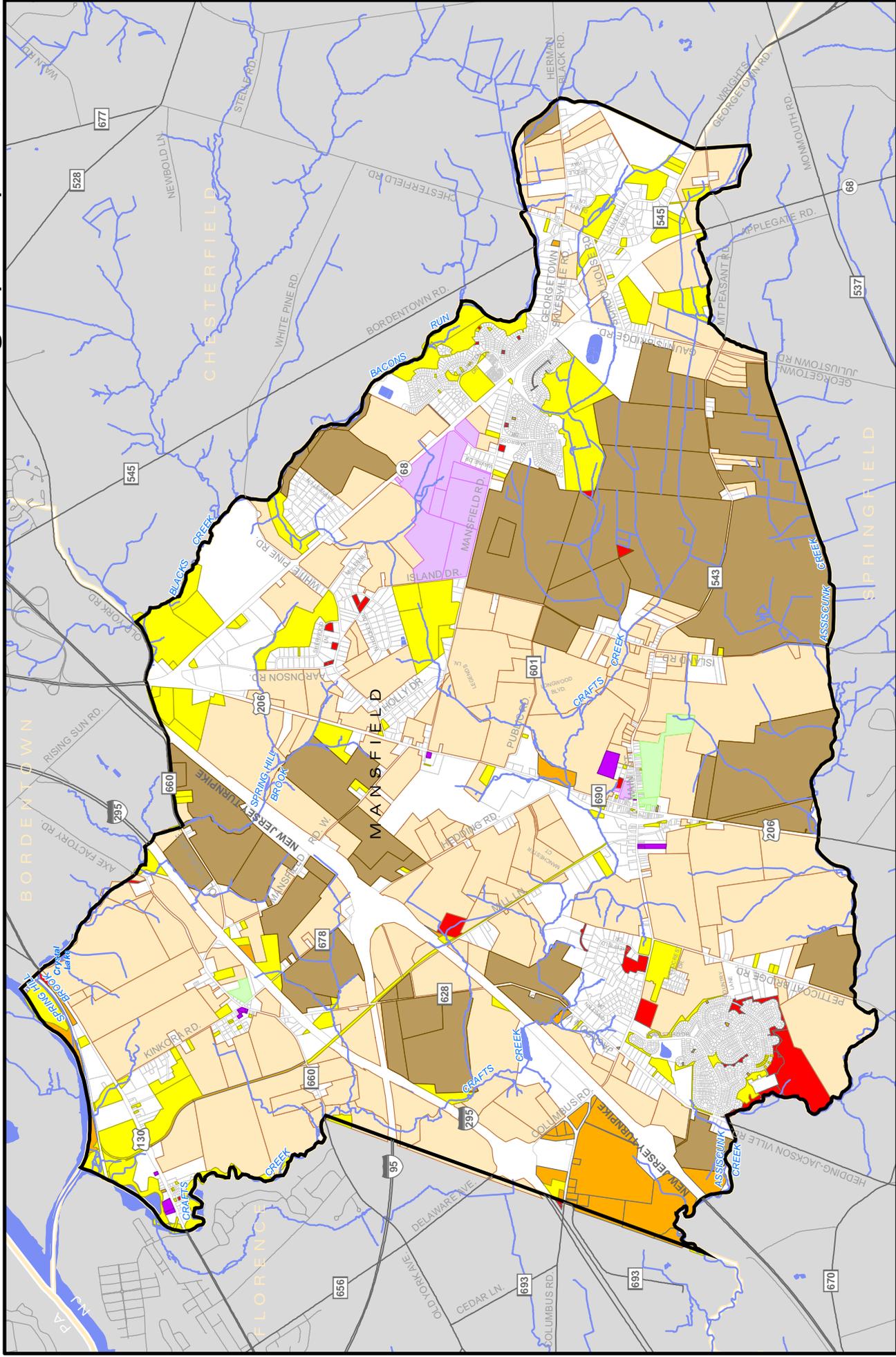
Hedding Park is located off Old York Road and offers a baseball/softball field, two tennis courts, a paved walking path, a playground, and a picnic grove in a large open space area. The Columbus Civic Club, located off of US Route 206, was deeded over to Mansfield Township in 1997 by the Columbus Civic and Recreation Club. This park includes a youth baseball field, a soccer field, a small pond, and a building that is currently used as the township’s recreation center.

Although not an official part of the Mansfield Township park and recreation program, recreation fields on school land are a part of the community’s recreation amenities and are often used after school hours by people of different age groups. The Recreation Committee works in cooperation with the board of education to coordinate the use of indoor and outdoor facilities for the township’s sports programs.

The township has plans to create future park and recreation facilities. The Georgetown Community Park, located in the residential development of Mapleton, will be a 17-acre recreation park. It should be noted, however, that this future park is not yet owned by the township as of November 2007. Country Walk Park, in the residential development of the same

# MANSFIELD TOWNSHIP

# MAP 18: Existing Open Space (2006)



Sources: NJDEP, NJDOT, DVRPC, Burlington County Division of GIS. 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.

- Vacant Land
- Developed
- Unknown
- Farm (Regular or Qualified)
- Farmland Preservation (Permanent)
- Public Property
- Public School Property
- Church and Charitable Property
- Other Exemption

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name, will include a walking path, multi-purpose recreation fields, and tennis and basketball courts.

In 2003, Mansfield Township residents approved a referendum to issue a one million dollar bond dedicated to open space acquisition and preservation. The bond was used to finance the purchase of 79 acres on Island Road across from the middle school. The township is an active participant in Burlington County's farmland preservation program, and as of 2006, over 2,860 acres of farmland are permanently preserved in Mansfield Township.

See **Map 18: Existing Open Space (2006)** on page 92.

### **EcoComplex**

The New Jersey EcoComplex is the Environmental Research and Extension Center for Rutgers University, in partnership with Stevens Institute of Technology and the Burlington County Board of Freeholders. The mission of the EcoComplex is to enhance New Jersey's environmental and agricultural practices through "education, outreach, and 'green' business development." Dedicated in 2001, the EcoComplex is itself an example of green building technologies and houses research facilities for several programs in agriculture and environmental business, such as remediation and restoration, industrial ecology, aquaculture, and stormwater and wastewater management. The EcoComplex is a unique resource for Mansfield Township. It is an innovative demonstration project, as well as a functioning green facility.

The EcoComplex main building is on Florence-Columbus Road in Mansfield Township. It also manages the 550-acre Burlington County Resource Recovery Complex, including the recycling program and the active landfill that lies within both Mansfield and Florence townships. One of the innovations at the EcoComplex is the Burlington County Research and Demonstration Greenhouse, a 46,000 square foot production greenhouse and associated buildings. Currently used for growing tomatoes, the greenhouse utilizes captured methane from the landfill for heat and energy, and uses a water recycling system to water the tomato plants. The EcoComplex is funded through a variety of sources, including the Burlington County Board of Freeholders, NJDEP, EPA, and even NASA, which funds programs that have potential non-terrestrial applications. The complex is run by a combination of Rutgers faculty and students, as well as private management.



# ENVIRONMENTAL ISSUES

## KNOWN CONTAMINATED SITES

There are 630 known contaminated sites in Burlington County. Twelve of these sites are located in Mansfield Township and an additional 41 sites are in adjoining townships. See *Table 21: Known Contaminated Sites in Mansfield Township and Surrounding Areas*. See also **Map 19: Known Contaminated Sites (2005)** on page 96.

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, can be listed as Superfund sites, which make them eligible for federal and state cleanup funds. Other sites may be remediated by state cleanup funds (via the New Jersey Spill Compensation and Control Act), and the majority of the sites are remediated by the responsible parties as required pursuant to state and federal regulations.

Thirty-six hazardous waste sites in Burlington County have been nominated for the National Priority List. Fourteen of these sites are currently on the National Priority List (NPL), meaning they pose a major human health hazard and are in need of federal funds for cleanup. These sites are more commonly referred to as Superfund sites. There are two Superfund sites on Mansfield's border that are partially within the township. The larger of the two is the Roebing Steel Company site immediately adjacent to the township's northwestern border in Florence Township. The other is the Florence Land Recontouring site, along the western border with Florence Township.

The 200-acre Roebing Steel Company site was an active steel business starting in 1906 that engaged in steel fabrication until it closed in 1982 due to human health hazards. It was heavily contaminated with polychlorinated biphenyls (PCBs), asbestos, and heavy metals, including barium, cadmium, and zinc. Unlined lagoons and buried storage drums posed threats to ground and surface waters.

In 1983, the Roebing site was added to the NPL list as groundwater contamination threatened an estimated 5,000 to 10,000 residents in the area. A remediation plan, accepted by the USEPA in 1996, called for the removal of contaminated soil, demolition of abandoned buildings, and the excavation and removal of pumps, barrels, and tanks. In July 1999, the USEPA announced that the Roebing site would be included in a national effort to encourage redevelopment of Superfund sites across the nation. Florence Township prepared a redevelopment plan for the site with the assistance of federal funds. On a suggestion from the USEPA, New Jersey Transit located a station stop along the RiverLine, hoping to encourage transit-oriented development. The site is still undergoing cleanup under a 2003 USEPA cleanup plan.

The Florence Land Recontouring site is a 60-acre former landfill. In 1975, NJDEP discovered toxic substances in the groundwater and soils from illegal dumping, and the landfill was capped and closed in 1981. After a new cover and leachate system were installed, the site was removed from the NPL in May 2004. EPA and NJDEP consider cleanup complete.

### Underground Storage Tanks

There are a few commercial sites with regulated underground storage tanks that contain hazardous substances, pursuant to *N.J.A.C. 7:14B et seq.* They are listed in *Table 20: Underground Storage Tanks in Mansfield Township*. If there is a known release to soil and/or groundwater, a site will also be listed on *Table 21: Known Contaminated Sites in Mansfield Township and Surrounding Areas*. There may also be private residences in Mansfield Township that still have underground storage tanks, 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 20: Underground Storage Tanks in Mansfield Township**

ID Number	Name	Street Address	Town	Status	Lead Agency
018693	Columbus Texaco	Route 206 N	Mansfield	Active	BSCM
024026	Valero (Mobile Service Station)	3372 N Route 206	Mansfield	Active	BSCM

Source: NJDEP, 2006

**Table 21: Known Contaminated Sites in Mansfield Township and Surrounding Areas**

Site ID	Name	Address	Town	Status	Lead Agency*	Remedial Level*
001121	Private Property	Route 206	Mansfield	Active	BSCM	C2
004853	Mansfield Oil Company	17 Mill Lane	Mansfield	Active	BFO-S	B
018693	Columbus Texaco	Route 206 N	Mansfield	Active	BSCM	C2
024026	Valero (formerly Tri-State Columbus/Mobil Service Station)	3372 N RT 206	Mansfield	Active	BSCM	C1
027169	Northern Burlington County Regional High School	160 Mansfield Square Georgetown Road	Mansfield	Active	BSCM	C2
033717	Roebing Steel Co.	Hornberger & 2nd Avenues	Mansfield/Florence	Active	BDC	C3**
187638	NJDOT Kinkora Branch Bridges	Route 130	Mansfield	Active	BFO-S	B
195844	Private Property	Vancza Drive	Mansfield	Active	BFO-S	C1
208716	Vacant Lot at Zeiger Property	Route 130	Mansfield	Active	BSCM	C2
218434	Durr Farm	625 Route 68	Mansfield	Active	BFO-S	C2
237587	Private Property	Wrightstown Road	Mansfield	Active	BFO-S	C2

Site ID	Name	Address	Town	Status	Lead Agency*	Remedial Level*
254391	Private Property	Route 68	Mansfield	Active	BFO-S	C2
G000004498	Florence Land Recountoring Inc	Cedar Lane	Mansfield/ Florence	Active	BOMM	C3**
007412	Circuit Foil USA, INC	88 Rt 130 S	Bordentown	Active	BNCM	D
012429	J&S Automotive & Lawnmower	30 Rt 130	Bordentown	Active	BSCM	C2
013345	Bordentown Gasway Gas Station	51 Rt. 130 N	Bordentown	Active	BSCM	C1
015211	Pauls Service Center, INC	Rt 206 S	Bordentown	Active	BSCM	C2
016733	Pilot Travel Center #382	2008 Rt. 206 S	Bordentown	Active	BSCM	C2
022851	Southgate Apartments	272 Ward Avenue	Bordentown	Active	BFO-S	C2
037622	ER Johnston Training & Research Center	Burlington Street	Bordentown	Active	BSCM	C1
047848	NJ State Police Barracks	Rt. 130 N	Bordentown	Active	BSCM	C1
049239	Badshah Oil Corp	1077 Rt. 206	Bordentown	Active	BSCM	C1
070845	Private Property	Valley Forge Road	Bordentown	Active	BFO-S	C1
130531	NJDOT Route 206 Section 39	Rout 206 Section 39	Bordentown	Active	BCM	C3
156237	Bordentown Regional High School	34 & 318 Ward Avenue	Bordentown	Active	BFO-S	B
192129	Private Property	Jacksonville-Smithville Road	Bordentown	Active	BFO-S	C1
G000026030	North American Salvage Company	2691 Rt 130 & Burlington Street	Bordentown	Active	BFO-S	C2
001296	Katona Farms	355 Ellisdale Road	Chesterfield	Active	BSCM	C1
013302	Maintenance District 3 (NJ Turnpike)	NJ Turnpike MM 57.3 N	Chesterfield	Active	BSCM	C2
160457	Private Property	Bordentown-Georgetown Road	Chesterfield	Active	BFO-S	C1
261465	Private Property	White Pine Road	Chesterfield	Active	BFO-S	B
263016	Private Property	White Pine Road	Chesterfield	Active	BFO-S	C1
000047	Griffin Pipe Products Co.	1100 W. Front Street	Florence	Active	BCM	D
000613	Hapcord	Hornberger & Rt 130	Florence	Active	BSCM	C2
007058	Amoco Service Station 60760	Rt. 130 & Cedar Lane	Florence	Active	BFO-S	C1
012480	Florence Tollgate Condo Assoc.	Cedar & 9th Street	Florence	Active	BFO-S	C2
027095	Tedan INC	2089 RT 130	Florence	Active	BFO-S	C2
031959	BUCS	Hornberger & 4th Street	Florence	Active	BSCM	C1
168411	Private Property	East 5th Street	Florence	Active	BFO-S	C1
239872	Private Property	Bustleton Road	Florence	Active	BFO-S	C1
G000030268	Private Property	2nd Street	Florence	Active	BFO-S	C1
G000041212	NJDOT Route 130 Delaware Avenue	Rt 130	Florence	Active	BFO-S	C1
011862	S&H Columbus Mart	Rt. 206	Springfield	Active	BSCM	C2
012449	Commercial Credit Corp	Juliustown Road & Monmouth Road	Springfield	Active	BSCM	C2
014611	Wrightstown Amoco/BP	213 Georgetown Road	Springfield	Active	BSCM	C2
015060	Interstate Storage & Pipeline Co.	RT 670 & Old York Road	Springfield	Active	BFO-S	C2

Site ID	Name	Address	Town	Status	Lead Agency*	Remedial Level*
156318	Private Property	Beechwood Lane	Springfield	Active	BFO-S	C2
217056	Private Property	Neck Road	Springfield	Active	BFO-S	C1
232043	Sod Farm Associates Property	Warner Road	Springfield	Active	BFO-S	B
2499278	Private Property	Springfield-Meeting House Road	Springfield	Active	BFO-S	C1
G000036628	Private Property	Jacksonville-Smithville Road	Springfield	Active	BFO-S	C1
G000060415	Private Property	Moran Drive	Springfield	Active	BFO-S	C1
G000061352	Private Property	Burlington-Jacksonville Road	Springfield	Active	BFO-S	C1

Source: NJDEP, 2006

\*See the following tables for explanations of Status, Lead Agencies, and Remedial Level

\*\* The Roebing Steel and Florence Recontouring sites are considered "Superfund" or National Priority List sites. The Florence Recontouring site was successfully remediated and removed from the NPL on 5/13/2004.

### Explanation of Codes

Code	Lead Agencies
<b>BOMM</b>	Bureau of Operation, Maintenance and Monitoring 609-984-2990
<b>BFO-S</b>	Bureau of Field Operations – Southern Office 609-584-4150
<b>BNCM</b>	Buren of Northern Case Management (formerly Bureau of Environmental Evaluation, Cleanup and Response Assessment) 609-777-0899
<b>BSCM</b>	Bureau of Southern Case Management (formerly BUST – Bureau of Underground Storage Tanks) 609-292-8761
<b>BDC</b>	Bureau of Design and Construction 609-984-2991
<b>BCM</b>	Bureau of Case Management 609-633-1455

### Explanation of Remedial Levels

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

## EROSION

Soil erosion is a natural process. Geologic, or "background," erosion occurs at approximately the same rate as soil formation, leading to neither a net loss nor a net gain of soil. Background

erosion is an important process; erosion from rock is carried and deposited by wind and water. In areas with vegetative cover, the rock mixes with decomposed vegetation and creates more nutrient-rich soil.

Erosion caused by human activity has greatly increased the amount, and the rate, of soils lost (accelerated erosion). Unfortunately, human activity cannot significantly contribute to soil formation, a process that takes place over thousands of years. Human-caused erosion is a serious environmental problem across the world. In the United States, the most significant impacts are the loss of prime-agricultural soils (on-site erosion), pollution of stream and rivers (off-site erosion), and increased flooding due to stream siltation.

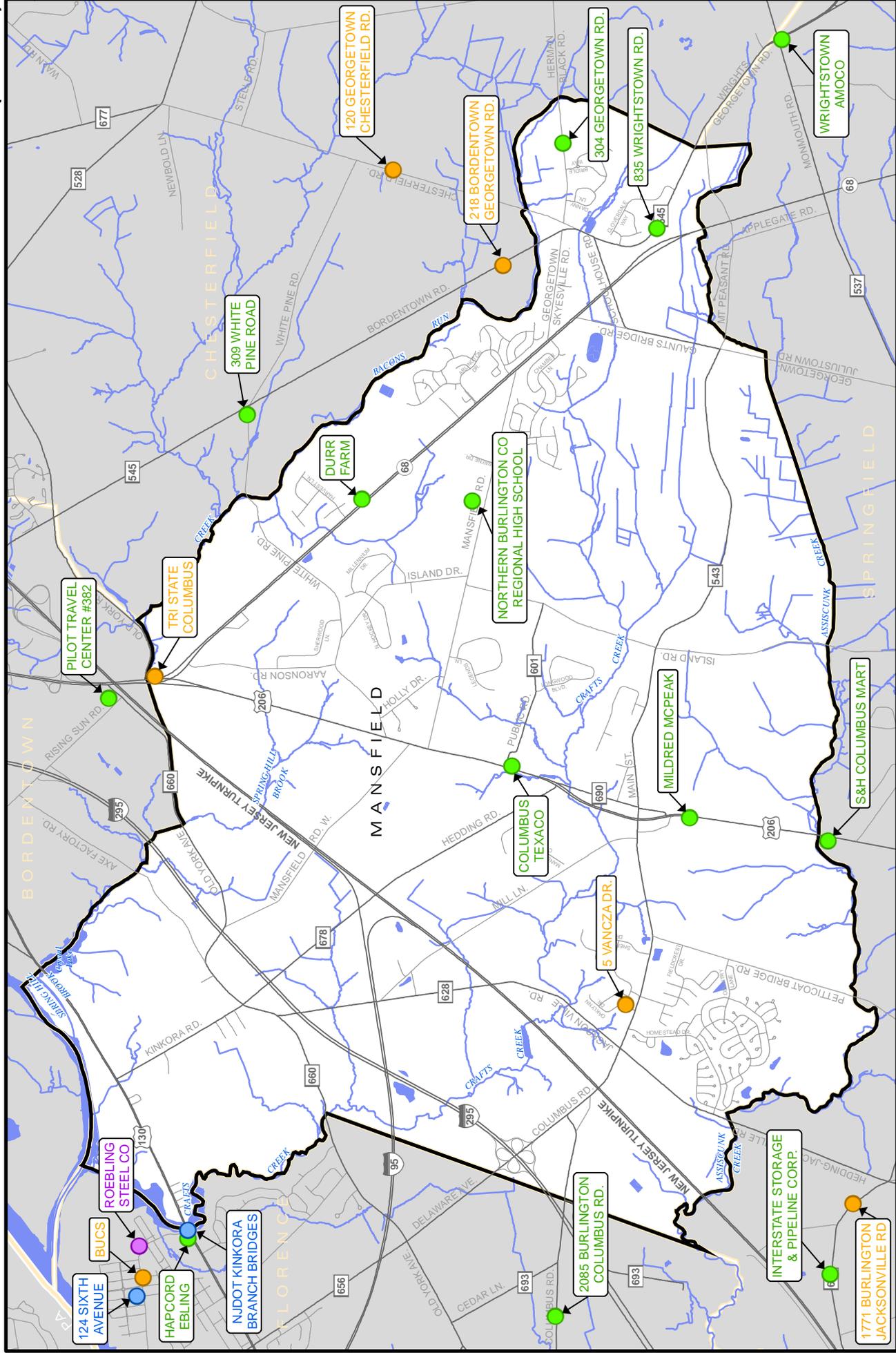


*Some of Mansfield's stream banks suffer from significant erosion.*

The immediate environmental impact of on-site erosion is unproductive farmland. Topsoil, which is the most quickly eroded soil, also contains the majority of the nutrients and soil biota required for plant life. In addition, once topsoil is eroded, the water-holding capacity of soil decreases. This further impacts plant life and increases flooding. The agricultural industry compensates for the loss of soil fertility with the use of chemical fertilizers. However, these fertilizers can wash directly into streams and rivers, causing water pollution downstream before they can be used by plants.

# MANSFIELD TOWNSHIP

# MAP 19: Known Contaminated Sites (2005)



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

- Status, Level of Site Complexity
- Active, B: Single Phase RA - Single Contamination Affecting Only Soils
  - Active, C1: No Formal Design - Source Known or Identified-Potential GW Contamination
  - Active, C2: Formal Design - Known Source or Release with GW Contamination
  - Active, C3: Multi-Phased RA - Unknown or Uncontrolled Discharge to Soil or GW

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As Mansfield is a predominately agricultural township, soil conservation and erosion prevention are important considerations. Erosion affects not only the productive quality of the soil, but also the health of Mansfield's streams and wetlands. Crystal Lake has experienced extreme siltation over the last 30 years, resulting in a 3-4-foot loss of depth in the back lake.

The built environment also causes erosion. Construction on or near steep slopes greatly increases the incidence of soil erosion. The loss of tree cover and plant material on steep slopes is especially damaging. Where steep slopes adjoin streams, erosion may contaminate the water and endanger wildlife habitat. In road building, there are numerous means for managing roadside erosion during and after construction, ranging from the highly technical (polyester and steel) to the simple (compost and tree plantings). Most state departments of transportation have best management practices to alleviate and manage roadside erosion, to protect the environment, and ensure the future safety of the road itself. The USEPA recently began a program called "GreenScapes," which promotes environmental alternatives for large-scale landscaping projects, including reducing erosion from road construction.

In New Jersey, any developer who creates soil disturbance of greater than 5,000 square feet is required to file a Soil Conservation Management Plan. All disturbances must be within the approved limits of the plan.

The New Jersey Department of Agriculture (NJDA) houses the State Soil Conservation Committee (SSCC), which is responsible for the conservation and management of New Jersey's soils. The SSCC administers the natural resources conservation program, which supports the work of 16 local Soil Conservation Districts and the New Jersey Conservation Partnership (NJCP), another diverse group of federal and state regulatory and advocacy organizations. The NJCP and individual soil conservation districts offer a wide range of voluntary conservation, technical assistance, and education programs that focus on agricultural conservation planning assistance, cost-sharing programs, application of organic materials, water supply and management, soil erosion and sediment control, stormwater discharge, and soil surveys. More information about NRCS programs is available in *Appendix B* on page A-3.

## **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 within a home can pose a long-term health hazard to residents, specifically for lung cancer. The only method of detection is to conduct a test of the air within a home. Fortunately, radon testing is inexpensive.

NJDEP classifies townships into three categories as to the risk of having high radon levels. Mansfield Township is listed as a Tier 1 municipality, indicating a high risk of high radon levels in homes. Tier 3 is the lowest level. The radon concentration at which homeowners should take immediate action is 4.0 picocuries per liter in air. While state law does not require radon testing before a real estate transaction, NJDEP recommends that a contingency clause be included in a

sale contract allowing the buyer to have the home tested for radon and requiring the seller fix the home if an elevated level of radon gas is discovered. State law (N.J.A.C. 26:2D-73) does require, at the time of a real estate transaction, that the seller provide the buyer with a copy of the results of any radon testing if such testing was conducted during the seller's tenure in the house.

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. The latter can be done with an inexpensive pipe-and-fan system that draws radon out from under the foundation and vents it outside.

NJDEP provides information on testing, mitigation, radon's health effects, and additional information on their website at [www.state.nj.us/dep/rrp/radon](http://www.state.nj.us/dep/rrp/radon). They can also be reached for radon-related questions by phone at 800/648-0394.

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To learn more about a contaminated site, contact one of the lead agencies overseeing the case or visit the web site: <http://www.state.nj.us/dep/srp/>. Site Remediation and Waste Management, formerly known as the Site Remediation Program, is a program unit within NJDEP that provides financial aid and technical guidance in cleaning up the state's more serious contaminated sites that pose a danger to human health and the environment. SRWM maintains an inventory of 38,000 sites, of which 25,000 require no further remediation action. The bureaus within SRWM are listed below for easy reference:

Bureau	Acronym	Telephone No.	Bureau	Acronym	Telephone No.
Contract & Fund Management	BCFM	(609) 777-0101	Operation, Maintenance & Monitoring	BOMM	(609) 984-2990
Case Management	BCM	(609) 633-1455	Southern Case Management (formerly BUST)	BSCM	(609) 292-8761
Design & Construction	BDC	(609) 984-2991	Case Assignment Section	CAS	(609) 292-2943
Emergency Response Region I	BER-I	(973) 631-6385	Initial Notice Section	INS	(609) 633-1464
Emergency Response Region II	BER-II	(609) 584-4130	Office of Brownfield Reuse	OBR	(609) 292-1251
Field Operations - Northern Field Office	BFO-N	(973) 631-6401	Office of Wellfield Remediation	OWR	(609) 984-2990
Field Operations - Southern Field Office	BFO-S	(609) 584-4150	Site Assessment	SA	(609) 584-4280
Landfill Compliance & Recycling Management	BLRM	(609) 984-6650	Cleanup Star Program	STAR	(609) 292-1251
Northern Case Management (formerly BEECRA)	BNCM	(609) 777-0899			

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# **APPENDICES**



## APPENDIX A: Private Well Testing Act

The Private Well Testing Act (*N.J.S.A. 58:12A-26 et seq.*), passed in 2002 and administered by NJDEP, requires that well water be tested for contaminants when properties served by certain types of drinking water wells are sold or leased. The law does not prohibit the sale of property if the water fails one or more drinking water test standards. Rather, the fundamental goal of the PWTA is to ensure that purchasers and lessees of properties served by private potable wells are fully aware of the quality of the untreated drinking water sources prior to sale or lease. The state law allows the buyer and seller to determine which party will pay for the test, as well as what actions, if any, need to be taken if test results indicate a contaminant is present in the water above an applicable standard. However, individual county health rules may mandate that certain actions are required in order for a real estate transaction to be finalized.

The PWTA program requires that water be tested for primary contaminants (health-based) and secondary parameters (aesthetic characteristics). Primary contaminants are contaminants that may cause a potential health risk if consumed on a regular basis above the established maximum contaminant level (MCL). New Jersey regulates 18 primary contaminants, five more than federal EPA requirements. Primary contaminants include bacteriological (fecal coliform and *E. coli*), Volatile Organic Compounds (VOCs), inorganics (arsenic, lead, mercury, and nitrates), and radiological (radium decay) substances. A certified laboratory must collect a water sample at a point before the water goes through any treatment. This sample represents the condition of the ground water in the aquifer, which may be different from water out of a kitchen faucet. Property owners may choose to also have the tap water tested to assure that filters or treatments are working effectively.

The PWTA program requires tests for three naturally occurring secondary parameters: pH, iron, and manganese. Secondary drinking water standards address aesthetics such as corrosivity, taste, and color, and testing for these parameters determines if water is suitable for laundering, plumbing, and showering. For example, due to the nature of soils and geology in southern New Jersey, the ground waters tend to be acidic (pH below 7), while ground waters in northern New Jersey are neutral (pH=7) to basic (pH above 7). If the pH is too low (less than 6.5) water has a bitter metallic taste, and causes corrosion of pipes and fixtures. If the pH is too high (greater than 8.5) the water has a slippery feel, it tastes like soda, and deposits can form on plumbing fixtures.

Test results are reported by the lab to the person who requested the testing, to NJDEP, and to the local health authority. Suspicious or unexpected results are neither confirmed nor

### Volatile Organic Compounds regulated by NJDEP

- Benzene
- Carbon Tetrachloride
- meta-Dichlorobenzene
- ortho-Dichlorobenzene
- para-Dichlorobenzene
- 1, 1-Dichloroethane
- 1, 2-Dichloroethane
- 1, 1-Dichloroethylene
- *cis* – 1, 2-Dichloroethylene
- *trans* – 1, 2-Dichloroethylene
- 1, 2-Dichloropropane
- Ethylbenzene
- Methyl tertiary butyl ether
- Methylene Chloride
- Monochlorobenzene
- Naphthalene
- Styrene
- 1, 1, 2, 2-Tetrachloroethane
- Tetrachloroethylene
- Toluene
- 1, 2, 4-Trichlorobenzene
- 1, 1, 1-Trichloroethane
- 1, 2, 2-Trichloroethane
- Trichloroethylene
- Vinyl Chloride
- Xylenes (Total)

verified by NJDEP. Local health authorities will investigate suspect results, if necessary.

In February 2004, NJDEP released an online report summarizing the initial well test results reported to the agency during the PWTA program's first six months (September 2002 to March 2003). Results for 5,179 wells are included, which represent approximately 1 percent of private wells used as potable water supplies in New Jersey. The compilation of water test results is organized by county and municipality but does not include the names of specific property owners, their addresses, or well locations, because releasing that information is prohibited by law. About 92 percent of the 5,179 wells passed all the required (health-based) standards, with the exception of lead. Of the 8 percent (417 wells) of wells sampled that exceeded the maximum contaminant level for primary contaminants, the most common reason for failure statewide was nitrate (inorganics), followed by fecal coliform (bacteriological), and VOCs. Nitrates are found in ground water due to a number of factors, including natural deposits, runoff from fertilizer, leaching from septic tanks, and from sewage pipes.

More wells in northern New Jersey were found to have fecal coliform or *E. coli* bacteria than in southern New Jersey. The northern/southern difference is probably due to the different geology in these regions. Northern New Jersey is characterized by limestone subject to solution cavities, fractured bedrock, or gravel water-bearing zones, while the southern part of the state is composed mainly of coastal plain sand and gravel, which appears to provide better protection for ground water from fecal contaminants.

For those wells in the counties where mercury testing is required, 14 wells failed for mercury. Nine southern counties, including Burlington, Camden, Gloucester, and Salem, are required to test for mercury, which has been linked to neurological problems.

The test results for Burlington County and Mansfield Township are summarized in the table below. NJDEP's initial report indicates the presence of several drinking water contaminants, including mercury, gross alpha (radium), 1,2,3 trichloropropane, and 1,2 dichloropropane, in the county's groundwater, but not necessarily in the township's groundwater.

**Summary of PWTA Test Results for Burlington County (Most recent data available:  
September 2002 – March 2003)**

<b>Municipality</b>	<b># Wells sampled</b>	<b>Total # Wells over the MCL*</b>	<b>Fecal coliform/ E. coli</b>	<b>Nitrate</b>	<b>Mercury</b>	<b>Any VOC** over the MCL</b>
Mansfield Township	8	0	0	0	0	0
<b><i>Burlington County Totals</i></b>	<b><i>392</i></b>	<b><i>15</i></b>	<b><i>2</i></b>	<b><i>12</i></b>	<b><i>1</i></b>	<b><i>0</i></b>

*Source: NJDEP, Division of Science, Research, and Technology (DSRT)*

\* MCL – Maximum Contaminant Level, set as the limit of a particular substance allowable to achieve a water quality standard

\*\* VOC – Volatile Organic Compound.

## APPENDIX B: Federal and State Conservation Programs for Farmers

There are several financial and economic incentive programs and technical assistance to help farmers plan and use conservation practices on their farms. The United States Department of Agriculture Natural Resources Conservation Service (NRCS) has a Farm Service Agency office in Woodstown, Salem County that serves Gloucester County. NRCS staff members are available to work with farmers to help identify their conservation goals and then craft appropriate conservation plans to meet those goals.

Numerous programs provide financial incentives to help farmers voluntarily engage in these practices. Financial incentives can include rental payments to farmers for reserved land, easement payments, and cost sharing (up to 100 percent) for some programs, to develop and follow conservation plans.

The **Conservation Reserve Program (CRP)** is offered by NRCS and administered by the Farm Service Agency. It provides technical and financial aid and gives farmers assistance in complying with federal, state and tribal environmental laws. The primary environmental goals of this program include reducing soil erosion, reducing sedimentation in streams and lakes, improving water quality, establishing wildlife habitat, and enhancing forest and wetland resources. Website: <http://www.nrcs.usda.gov/programs/crp/>.

The state of New Jersey partnered with the USDA to help farmers protect water quality by establishing a \$100 million **Conservation Reserve Enhancement Program (CREP)**, which is the New Jersey version of the federal program. Under an agreement signed by Governor McGreevy in February 2004, the USDA provides \$77 million and the state contributes \$23 million for New Jersey farmers to install stream buffers in order to reduce the flow of nonpoint source pollution into the state's waterways. New Jersey's goal is to enroll 30,000 acres of agricultural land into this state-federal program over a 10-year period. Types of buffers to be installed include trees, shrubs, vegetative filter strips, contour grass strips, and grass waterways. Under the program, a landowner installs and maintains approved practices through a 10- or 15-year rental contract agreement. A landowner entering the state Farmland Preservation Program or Green Acres Program also may opt for a permanent easement under the Conservation Reserve Enhancement Program. This would provide additional payment for permanent maintenance of approved conservation practices. The program will pay landowners annual rental and incentive payments for participating in the program, as well as 100 percent of the cost to establish approved practices. Additional information can be found at [www.fsa.usda.gov](http://www.fsa.usda.gov), or contact the local FSA office or Soil and Water Conservation District Office.

Another program targeted for wetlands preservation is called the **Wetlands Reserve Program (WRP)**. WRP is a voluntary resource conservation program that provides landowners the opportunity to receive financial incentives to restore, protect, and enhance wetlands in exchange for returning marginal land from agriculture. WRP is made possible by a reauthorization in the Farm Security and Rural Investment Act of 2002, known as the Farm Bill. The program has three enrollment options: permanent easement, 30-year easement, or restoration cost-share agreement, which has a minimum 10-year commitment. Applications are accepted on a

continuous basis and may be obtained and filed at any time. Please see the website for more details: [www.nrcs.usda.gov/programs/farmbill/2002/](http://www.nrcs.usda.gov/programs/farmbill/2002/)

The **Grassland Reserve Program (GRP)** is another conservation program authorized by the Farm Bill 2002. GRP is a voluntary program that protects grasslands, pasturelands, and rangelands without prohibiting grazing. Participants voluntarily put limitations on the future land use of their land while retaining the ability and right to conduct grazing practices, hay production, mow or harvest for seed production, conduct fire rehabilitation, and construct firebreaks and fences. There are four enrollment options: permanent easement; 30-year easement; rental agreement, which is available in 10-, 15-, 20- or 30-year contracts; and restoration agreement. Participants are compensated in different ways according to the enrollment option. For more information and application procedures, visit the GRP website: [www.fsa.usda.gov/dafp/GRP/default1.htm](http://www.fsa.usda.gov/dafp/GRP/default1.htm)

The **Wildlife Habitat Incentives Program (WHIP)** is similar to those above in that it is also a USDA voluntary program, but differs in that WHIP targets landowners who want to preserve and protect fish and wildlife habitat on non-federal lands. The program provides technical and cost sharing provisions to protect these environments. Enrollment consists of a cost share agreement lasting from 5 to 10 years. In New Jersey, NRCS has received over \$900,000 to implement WHIP since 1998, where the majority of funds have been used for cost share payments to landowners. A state plan has been developed in New Jersey and targets several areas as priority wildlife habitat areas. NRCS has also targeted a priority species, the bog turtle, for protection. For more information, visit the NRCS New Jersey website: [www.nj.nrcs.usda.gov](http://www.nj.nrcs.usda.gov)

The **Environmental Quality Incentives Program (EQIP)** is also a part of the reauthorized Farm Bill of 2002. EQIP is a voluntary program that focuses on conservation that promotes both agricultural production and environmental quality. The program itself offers technical and financial assistance with installation and implementation of structural and management practices on agricultural land. EQIP features a minimum contract term compared to other programs lasting a maximum of 10 years. Landowners are eligible for incentive and cost share payments of up to 75 percent and sometimes up to 90 percent while still engaging in livestock or agricultural production activities. For more information, please visit the website: [www.nrcs.usda.gov/programs/eqip](http://www.nrcs.usda.gov/programs/eqip)

The **Conservation Security Program (CSP)** is a voluntary program administered by the NRCS and authorized by the Farm Bill 2002. This program is intended to promote conservation and improvement of soil, water, air, energy, plant and animal life, etc on tribal and private working lands. Working lands refer to a variety of land types including cropland, grassland, prairie land, improved pasture and rangeland. In some cases, forested lands would also be included in this category. CSP is available in 50 states, as well as the Caribbean and Pacific Basin areas and provides equal access to funding. For more information, please visit the website: [www.nrcs.usda.gov/programs/csp/](http://www.nrcs.usda.gov/programs/csp/)

The **Forestland Enhancement Program (FLEP)** is also authorized through the Farm Bill 2002 and replaces the Stewardship Incentives Program (SIP) and the Forestry Incentives Program (FIP). FLEP is a voluntary program for landowners of non-industrial private forest and provides

technical, educational, and cost-sharing assistance in an effort to promote the conservation of these forested areas. Landowners must have a forest management plan and are limited to 1,000 acres per year for the cost-share practices. For more information about this program, please visit the website: <http://www.fs.fed.us/spf/coop/programs/loa/flep.shtml> and the National Association of State Foresters website to find your local agency: [www.stateforesters.org](http://www.stateforesters.org)

The **Farm and Ranch Lands Protection Program (FRPP)** is a voluntary land conservation program that assists farmers to keep their lands for agricultural purposes. FRPP provides matching funds to those provided by state, tribal, local government, or non-government organizations offering farm and ranch protection programs designed to purchase conservation easements. The FRPP is authorized by the Farm Bill 2002 and is managed by the NRCS. Conservation easements are purchased by the state, tribal or local entity. The participating landowner agrees not to convert his or her land to non-agricultural uses, as well as to develop a conservation plan for any highly erodible lands. Landowners do, however, maintain all of their rights to utilize their land for agricultural purposes. For more information about FRPP, please visit the website: [www.nrcs.usda.gov/programs/farmland/2002/](http://www.nrcs.usda.gov/programs/farmland/2002/) and search for the Farm and Ranch Lands Protection Program.

The **State Agricultural Development Committee (SADC) in New Jersey** has made soil and water conservation grants available as part of the Farmland Preservation Program. The grants give landowners up to 50 percent of costs associated with approved soil and water conservation projects. Farms are only eligible if they are already enrolled in a permanent or 8-year easement program. Soil projects can include measures to prevent or control erosion, control pollution on agricultural land, and improve water management for agricultural purposes. Projects must be completed within 3 years of SADC funding approval. However, under special circumstances, the grant may be renewed for an additional year. For more information, contact the local Soil Conservation District or the State Agricultural Development Committee at (609) 984-2504 or visit the website: <http://www.state.nj.us/agriculture/sadc/sadc.htm> for additional details.

The **Landowner Incentive Program (LIP)** is a preservation program for private landowners who wish to protect and conserve rare wildlife habitat and species. LIP is funded by the U.S. Fish and Wildlife Service and administered by the New Jersey Department of Environmental Protection's Division of Fish and Wildlife Endangered Nongame Species Program. Participating landowners receive both technical and financial assistance through this competitive grant program. Grants are awarded for a variety of preservation programs, including habitat improvements, habitat management and habitat protection projects. Generally, a 5-year minimum commitment is required and longer terms are preferred. A 25 percent cost share is required of the landowner. While the LIP is seeking funding for additional habitat protection projects, it may be another year before grants are available. Interested landowners are encouraged to contact Kim Korth, ENSP assistant zoologist, at (609) 984-1581 for additional details. To learn more about the program in general, visit the website: [http://www.state.nj.us/dep/fgw/ensp/lip\\_prog.htm](http://www.state.nj.us/dep/fgw/ensp/lip_prog.htm) or [http://www.state.nj.us/dep/fgw/ensp/pdf/lip\\_broch.pdf](http://www.state.nj.us/dep/fgw/ensp/pdf/lip_broch.pdf)



**APPENDIX C: Vertebrate Animals Known or Probable in Mansfield Township**

<b>Species</b>	<b>General Habitat</b>	<b>Township Locations</b>
<b>Mammals</b>		
Opossum	All Habitats	Throughout
Short-tailed Shrew	Woodlands	Throughout
Eastern Mole	Uplands	Throughout
Star-nosed Mole	Uplands	Throughout, Occasional
Little Brown Bat	Uplands	Throughout
Eastern Pipitrel	Uplands	Throughout
Eastern Cottontail	All Habitats	Throughout, Common
Eastern Chipmunk	Woodlands	Throughout
Woodchuck	Woodlands and Fields	Throughout
Gray Squirrel	Woodlands	Throughout, Common
White-footed Mouse	Woodlands	Throughout
Jumping Mouse	Fields	Throughout
Meadow Vole	Open Fields	Throughout
Red-backed Vole	Woodlands	Throughout
Muskrat	Wetlands	Throughout
Brown Rat	Wetlands, Homes, Farms	Throughout
House Mouse	Homes and residential areas	Throughout
Red Fox	All Habitats	Throughout
Raccoon	All Habitats	Throughout, Common
Long-tailed Weasel	Wetlands	Throughout
Striped Skunk	Uplands	Throughout, Common
White-tailed Deer	All Habitats	Throughout, Common
Mink	Wetlands	Throughout
Coyote	Woodlands and Fields	Throughout
Weasel	Woodlands and Fields	Throughout
<b>Birds</b>		
Great Blue Heron	Open Marsh, Lake Edges	Throughout
Great Egret	Open Marsh, Lake Edges	Throughout
Snowy Egret	Open Marsh, Lake Edges	Throughout
Green-backed Heron	Open Marsh, Lake Edges	Throughout
Mute Swan	Open Water	Large Lakes
Snow Goose	Winter Migrant in Fields	Open farms
Canada Goose	Open Water, Fields	Throughout
Wood Duck	Forested Wetlands	Throughout
Green-winged Teal	Wetlands	Winter Migrant
Black Duck	Marsh, Lakes	Throughout
Mallard	Wetlands	Throughout
Gadwall	Open Water	Winter Migrant
Blue-winged Teal	Wetlands	Winter Migrant
Northern Shoveler Duck	Open Water	Winter Migrant

<b>Species</b>	<b>General Habitat</b>	<b>Township Locations</b>
Ring-necked Duck	Open Water	Winter Migrant
Greater & Lesser Scaup	Open Water	Winter Migrant
Bufflehead	Open Water	Winter Migrant
Hooded Merganser	Open Water	Winter Migrant
Ruddy Duck	Open Water	Winter Migrant
Black Vulture	Open fields	Throughout
Turkey Vulture	All Habitats	Throughout
Osprey	Open Water	Lakes and ponds
Northern Harrier	Open Fields	Throughout
Sharp-shinned Hawk	Woodlands	Throughout
Cooper's Hawk	Woodlands	Throughout
Greater Yellowlegs	Wetlands	Winter Migrant
Barn Owl	Open fields – marshes and grasslands	Throughout
Red-shouldered Hawk	Wetland Forests	Throughout; Endangered
Broad-winged Hawk	Woodlands	Throughout
Red-tailed Hawk	All Habitats	Throughout
American Kestrel	Open Fields	Throughout
Ringed-neck Pheasant	Old Fields, Farms	Released; Throughout
Wild Turkey	Woodlands	Throughout
Bobwhite	Old Field, Woodlands	Throughout
Killdeer	Bare Ground, Lake Edges	Throughout
Lesser Yellowlegs	Lake Edges	Throughout
Solitary Sandpiper	Lake Edges	Throughout
Spotted Sandpiper	Lake Edges	Throughout
American Woodcock	Wetland Forests	Throughout
Laughing Gull	Open Water, Parking Lots	Summer Visitor
Ring-billed Gull	Open Water, Parking Lots	Throughout
Herring Gull	Open Water, Dumps	Winter Visitor
Rock Dove	Houses and Bridges	Residential areas
Mourning Dove	Woodlands	Throughout, Common
Black-billed Cuckoo	Woodlands	Occasional
Yellow-billed Cuckoo	Woodlands	Throughout
Barn Owl	Farmland	Throughout
Eastern Screech Owl	Woodlands	Throughout
Great Horned Owl	Woodlands	Throughout
Barred Owl	Wetland Forests	Wooded Wetlands
Saw-whet Owl	Wetland Forests	Wooded Wetlands
Common Nighthawk	Upland Woodlands	Summer Night Sky
Chimney Swift	Bridges, House Chimneys	Residential areas
Ruby-throated Hummingbird	Woodlands and Fields	Throughout
Belted Kingfisher	Wetlands	Throughout
Red-headed Woodpecker	Upland Forest	Upland Woods
Red-bellied Woodpecker	Woodlands	Throughout
Yellow-bellied Sapsucker	Woodlands	Fall Migrant
Downy Woodpecker	Woodlands	Throughout
Hairy Woodpecker	Woodlands	Throughout

<b>Species</b>	<b>General Habitat</b>	<b>Township Locations</b>
Northern Flicker	Woodlands	Throughout; Common
Wood Pee-wee	Woodlands	Upland Woods
Eastern Phoebe	Woodlands	Throughout
Great Crested Flycatcher	Woodlands	Upland Woods
Eastern Kingbird	Fields, Farmland	Throughout
Purple Martin	Open Fields, Wetlands	Agricultural areas
Tree Swallow	Wetlands	Throughout
Barn Swallow	Buildings, Bridges	Throughout
Blue Jay	Woodland	Throughout; Common
American Crow	All Habitats	Throughout, Common
Carolina Chickadee	Woodlands	Throughout, Common
Eastern Tufted Titmouse	Woodlands	Throughout, Common
White Breasted Nuthatch	Woodlands	Throughout
Brown Creeper	Woodlands	Throughout
Carolina Wren	Edge of Woodlands	Edges, Yards
House Wren	Edge of Woodlands	Throughout
Golden and Ruby crowned Kinglets	Woodlands	Winter Migrant
Eastern Bluebird	Edge of Woodlands	Throughout
Wood Thrush	Woodlands	Throughout
American Robin	All Habitats	Throughout, Common
Catbird	Edge of Woodlands	Throughout
Mockingbird	Edge of Woodlands	Throughout, Common
Brown Thrasher	Woodlands	Throughout
Cedar Waxwing	Old Fields, Young Woodlands	Throughout
Starling	All Habitats	Residential areas; Pest
White Eyed Vireo	Woodlands	Throughout
Philadelphia Vireo	Woodlands	Migrant
American bittern	Mashes	Throughout
Red-eyed Vireo	Woodlands	Wetland Forests
Yellow Warbler	Upland Forest	Throughout
Chestnut-sided Warbler	Woodlands	Migrant
Black-throated Blue Warbler	Woodlands	Migrant
Yellow-rumped Warbler	Woodlands	Throughout
Pine Warbler	Woodlands	Throughout
Prairie Warbler	Shrubby Areas	Throughout
Palm Warbler	Pine Woodlands	Throughout
Black and White Warbler	Pine Woodlands	Migrant
American Redstart	Rich Woodlands	Throughout
Ovenbird	Woodlands	Throughout
Yellowthroat	Shrubby Areas	Throughout
Scarlet Tanager	Woodlands	Throughout
Cardinal	Edge of Woodlands	Throughout; Common
Indigo Bunting	Edges of Old Fields	Throughout
Chipping Sparrow	Woodlands	Throughout
Field Sparrow	Old Fields	Throughout

<b>Species</b>	<b>General Habitat</b>	<b>Township Locations</b>
Song Sparrow	Old Fields	Throughout
White-throated Sparrow	Woodlands	Winter Migrant
Dark-eyed Junco	Woodlands	Winter Migrant
Common Grackle	All Habitats	Throughout; Common
Brown-headed Cowbird	Open Areas	Throughout; Pest
Orioles: Orchard and Baltimore	Woodlands	Throughout
House Finch	Open Areas	Throughout
Pine Siskin	Woodlands	Winter Migrant
American Goldfinch	Open Areas, Old Fields	Throughout
House Sparrow	Old Fields	Residential areas; Common
<b>Reptiles</b>		
Wood turtle	Forested wetlands	Endangered
Bog Turtle	Muddy Agricultural Fields/Wetlands	Endangered
Common Snapping Turtle	Ponds and Lakes	Throughout
Stinkpot Turtle	Wetlands	Throughout
Spotted Turtle	Freshwater Wetlands and Ponds	Throughout
Eastern Box Turtle	Uplands	Throughout
Red-bellied Turtle	Lakes and Ponds	Throughout
Eastern Painted Turtle	Lakes and Ponds	Throughout
Northern Fence Lizard	Uplands	Throughout
Northern Water Snake	Wetlands	Throughout
Corn Snake	Woodlands, open fields	Endangered
Garter Snake	All Habitats	Throughout
Eastern Ribbon Snake	Wetlands	Throughout
Southern Ring neck Snake	Woodlands	Throughout
Northern Black Racer	Edge of Woodlands	Throughout
Rough Green Snake	Woodlands	Throughout
Black Rat Snake	All Habitats	Throughout
<b>Amphibians</b>		
Red-backed Salamander	Woodlands	Throughout
Fowlers Toad	Uplands	Throughout
Spring Peeper	Wetlands	Throughout
Bull Frog	Lakes and Ponds	Throughout
Green Frogs	Wetlands	Throughout
Wood Frog	Woodlands	Throughout
Southern Leopard Frog	Wetlands	Throughout
<b>Fishes</b>		
American Eel	All Waters	Throughout
Blueback herring	Rivers	Throughout
American shad	Rivers and Streams	Throughout
Alewife	Rivers and Streams	Possible
Gizzard shad	Rivers and Streams	Throughout
Satinfin shiner	Rivers and Streams	Throughout

<b>Species</b>	<b>General Habitat</b>	<b>Township Locations</b>
Common carp	Streams	Throughout
Eastern Silvery Minnow	Rivers and Streams	Throughout
Golden Shiner	Streams and Ponds	Throughout
Ironcolor shiner	Streams and Ponds	Throughout
Spottail shiner	Streams and Ponds	Throughout
Cheek chub	Streams	Throughout
Fallfish	Streams	Throughout
White Sucker	Streams	Throughout
Creek chubsucker	Streams	Throughout
White catfish	Rivers and Streams	Throughout
Brown Bullhead	River, Lakes and Streams	Throughout
Yellow Bullhead	River, Lakes and Streams	Throughout
Channel catfish	Rivers and Streams	Throughout
Redfin Pickerel	Streams, Lakes and Ponds	Throughout
Chain Pickerel	Lakes and Streams	Throughout
Pirate Perch	Streams	Throughout
Eastern Mudminnow	Streams	Throughout
Banded Killifish	Streams and Ponds	Throughout
Mummichog	Streams	Throughout
White Perch	Rivers, Streams, Lakes and Ponds	Throughout
Striped Bass	Lakes and ponds	Throughout
Blackbanded sunfish	Rivers, Streams, Lakes and Ponds	Throughout
Bluespotted sunfish	Rivers, Streams, Lakes and Ponds	Throughout
Banded sunfish	Rivers, Streams, Lakes and Ponds	Throughout
Bluespotted Sunfish	Streams and Ponds	Throughout
Redbreast Sunfish	Lakes and Streams	Throughout
Green sunfish	Lakes and Streams	Throughout
Bluegill	All Waters	Throughout
Large mouth Bass	Lakes, ponds	Throughout
Pumpkinseed	All Waters	Throughout
Black Crappie	Lakes, ponds	Throughout
Tessellated (Johnny) Darter	Streams	Throughout
Yellow Perch	Streams	Throughout
Walleye	Streams	Throughout
Swamp Darter	Swamps	Probable
Mud Sunfish	Streams and Swamps	Probable
Tadpole Madtom	Lakes and Streams	Probable
Shortnose Sturgeon	Lakes and Streams	Endangered

Source: Modified version of Table 11 of the *Environmental Resource Inventory for Franklin Township, Gloucester County New Jersey*. Fish data obtained from NJ Division of Fish & Wildlife, Bureau of Fisheries and from Arndt, Rudolf G. "Annotated Checklist and distribution of New Jersey Freshwater Fishes..." See Biological Resources in Sources of Information, p. 105.



**APPENDIX D: Rare Plant and Animal Species and Natural Communities Presently Recorded in the NJ Natural Heritage Database for Mansfield Township**

Scientific Name	Common Name	Federal Status*	NJ Status*	State Rank**
<b>Eco-Systems/Habitat</b>				
<i>Freshwater tidal marsh complex</i>				S3
<i>Haliaeetus leucocephalus</i>	Bald eagle foraging area	LT	E	S1B, S2N
<i>Haliaeetus leucocephalus</i>	Bald eagle nest buffer	LT	E	S1B, S2N
<b>Vertebrates</b>				
<i>Strix varia</i>	Barred owl		T/T	S3B
<i>Terrapene carolina</i>	Eastern box turtle		Special concern	S5B
<i>Sturnella magna</i>	Eastern meadowlark		D/S	S3B, S4N
<i>Bufo woodhousii fowleri</i>	Fowler's toad		Special concern	S4
<i>Bartramia longicauda</i>	Upland sandpiper		E	S1B

**\* Key to Federal and State Status Codes**

<b>T</b>	Threatened species – may become endangered if conditions surrounding the species begin to or continue to deteriorate.
<b>E</b>	Endangered species – one whose prospects for survival within the state are in immediate danger due to one or many factors.
<b>INC</b>	Increasing species – population has exhibited a significant increase
<b>S</b>	Stable species
<b>D</b>	Declining species – species that exhibited a continued decline in population numbers over the years.

**\*\* Key to State Element Rank**

<b>S1</b>	Critically imperiled in NJ because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres).
<b>S2</b>	Imperiled in NJ because of rarity (6 to 20 occurrences).
<b>S3</b>	Rare in state with 21 to 50 occurrences. Includes elements which are widely distributed but with small populations/acreage, or with restricted distribution but locally abundant.
<b>S4</b>	Apparently secure in state, with many occurrences.
<b>S5</b>	Demonstrably secure in state and essentially ineradicable under present conditions.
<b>B</b>	Breeding populations
<b>N</b>	Non-Breeding populations

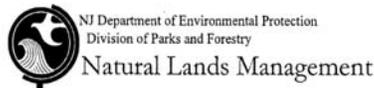
## CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

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

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

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

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



**APPENDIX E: State Endangered and Threatened Species**

<b>Birds</b>			
<b>Endangered</b>		<b>Threatened</b>	
American Bittern	<i>Botaurus lentiginos</i>	Bobolink	<i>Dolichonyx oryzivorus</i> BR
Eagle, bald	<i>Haliaeetus leucocephalus</i> BR **	Eagle, bald	<i>Haliaeetus leucocephalus</i> NB **
Falcon, peregrine	<i>Falco peregrinus</i>	Hawk, Cooper's	<i>Accipiter cooperii</i>
Goshawk, northern	<i>Accipiter gentilis</i> BR	Hawk, red-shouldered	<i>Buteo lineatus</i> NB
Grebe, pied-billed	<i>Podilymbus podiceps</i> **	Night-heron, black-crowned	<i>Nycticorax nycticorax</i> BR
Harrier, northern	<i>Circus cyaneus</i> BR	Night-heron, yellow-crowned	<i>Nyctanassa violaceus</i>
Hawk, red-shouldered	<i>Buteo lineatus</i> BR	Knot, red	<i>Calidris canutus</i> BR
Owl, short-eared	<i>Asio flammeus</i> BR	Osprey	<i>Pandion haliaetus</i> BR
Plover, piping	<i>Charadrius melodus</i> **	Owl, barred	<i>Strix varia</i>
Sandpiper, upland	<i>Batramia longicauda</i>	Owl, long-eared	<i>Asio otus</i>
Shrike, loggerhead	<i>Lanius ludovicianus</i>	Rail, black	<i>Laterallus jamaicensis</i>
Skimmer, black	<i>Rynchops niger</i> BR	Skimmer, black	<i>Rynchops niger</i> NB
Sparrow, Henslow's	<i>Ammodramus henslowii</i>	Sparrow, grasshopper	<i>Ammodramus savannarum</i> BR
Sparrow, vesper	<i>Poocetes gramineus</i> BR	Sparrow, Savannah	<i>Passerculus sandwichensis</i> BR
Tern, least	<i>Sterna antillarum</i>	Sparrow, vesper	<i>Poocetes gramineus</i> NB
Tern, roseate	<i>Sterna dougallii</i> **	Woodpecker, red-headed	<i>Melanerpes erythrocephalus</i>
Wren, sedge	<i>Cistothorus platensis</i>		
<b>Reptiles</b>			
<b>Endangered</b>		<b>Threatened</b>	
Rattlesnake, timber	<i>Crotalus h. horridus</i>	Snake, northern pine	<i>Pituophis m. melanoleucus</i>
Snake, corn	<i>Elaphe g. guttata</i>	Turtle, Atlantic green	<i>Chelonia mydas</i> **
Snake, queen	<i>Regina septemvittata</i>	Turtle, wood	<i>Clemmys insculpta</i>
Turtle, bog	<i>Clemmys muhlenbergii</i> **		
Atlantic hawksbill	<i>Eretmochelys imbricata</i> **		
Atlantic leatherback	<i>Dermochelys coriacea</i> **		
Atlantic loggerhead	<i>Caretta caretta</i> **		
Atlantic Ridley	<i>Lepidochelys kempii</i> **		
<b>Amphibians</b>			
<b>Endangered</b>		<b>Threatened</b>	
Salamander, blue-spotted	<i>Ambystoma laterale</i>	Salamander, eastern mud	<i>Pseudotriton montanus</i>
Salamander, eastern tiger	<i>Ambystoma tigrinum</i>	Salamander, long-tailed	<i>Eurycea longicauda</i>

Treefrog, southern gray	<i>Hyla chrysocelis</i>	Treefrog, Pine Barrens	<i>Hyla andersonii</i>
<b>Invertebrates</b>			
<b>Endangered</b>		<b>Threatened</b>	
Beetle, American burying	<i>Nicrophorus mericanus</i> **	Elfin, frosted (butterfly)	<i>Callophrys irus</i>
Beetle, northeastern beach tiger	<i>Cincindela d. dorsalis</i> **	Floater, triangle (mussel)	<i>Alasmidonta undulata</i>
Copper, bronze	<i>Lycaena hyllus</i>	Fritillary, silver-bordered (butterfly)	<i>Bolaria selene myrina</i>
Floater, brook (mussel)	<i>Alasmidonta varicosa</i>	Lampmussel, eastern (mussel)	<i>Lampsilis radiata</i>
Floater, green (mussel)	<i>Lasmigona subviridis</i>	Lampmussel, yellow (mussel)	<i>Lampsilis cariosa</i>
Satyr, Mitchell's (butterfly)	<i>Neonympha m. mitchellii</i> **	Mucket, tidewater (mussel)	<i>Leptodea ochracea</i>
Skipper, arogos (butterfly)	<i>Atrytone arogos arogos</i>	Pondmussel, eastern (mussel)	<i>Ligumia nasuta</i>
Skipper, Appalachian grizzled (butterfly)	<i>Pyrgus wyandot</i>	White, checkered (butterfly)	<i>Pontia protodice</i>
Wedgemussel, dwarf	<i>Alasmidonta heterodon</i> **		
<b>Mammals</b>		<b>Fishes</b>	
<b>Endangered</b>		<b>Endangered</b>	
Bat, Indiana	<i>Myotis sodalis</i> **	Sturgeon, shortnose	<i>Acipenser brevirostrum</i> **
Bobcat	<i>Lynx rufus</i>		
Whale, black right	<i>Balaena glacialis</i> **		
Whale, blue	<i>Balaenoptera musculus</i> **		
Whale, fin	<i>Balaenoptera physalus</i> **		
Whale, humpback	<i>Megaptera novaeangliae</i> **		
Whale, sei	<i>Balaenoptera borealis</i> **		
Whale, sperm	<i>Physeter macrocephalus</i> **		
Woodrat, Allegheny	<i>Neotoma floridana magister</i>		

\*\* Also on the federal Endangered and Threatened list

## DELAWARE VALLEY REGIONAL PLANNING COMMISSION

### Publication Abstract

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**Title:** *Environmental Resource Inventory for the Township of Mansfield, Burlington County, New Jersey*      **Date Published:** November 2007  
**Publication No.** 07048

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**Geographic Area Covered:** Mansfield Township, Burlington County, New Jersey

**Key Words:** Biodiversity, biological resources, built environment, Burlington County, endangered species, environment resource inventory, conservation, forests, grasslands, greenways, habitat, land preservation, Mansfield Township, master planning, natural resources, open space, Rancocas Creek, soils, topography, water quality, watersheds, wetlands

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### ABSTRACT

This publication documents the natural and community resources of Mansfield Township, Burlington 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; deer management; Heritage Priority Sites; and known contaminated sites. Community resources that are briefly described include population, transportation, township utilities and services, and protected open space. A short history of the community is also included.

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### For More Information Contact:

Delaware Valley Regional Planning Commission  
190 North Independence West  
Philadelphia, PA 19106-1520  
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for the **TOWNSHIP** of



**MANSFIELD**

**BURLINGTON COUNTY, NEW JERSEY**



Delaware Valley  
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# ENVIRONMENTAL RESOURCE INVENTORY

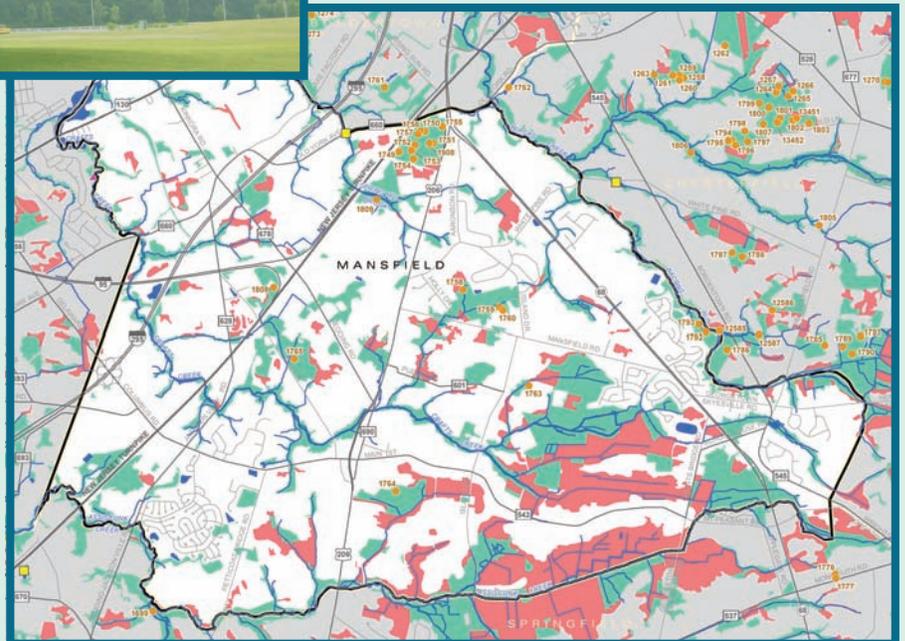


for the **TOWNSHIP** of



## MANSFIELD

BURLINGTON COUNTY, NEW JERSEY



prepared by:



Delaware Valley  
Regional Planning  
Commission

with:

Environmental  
Commission of  
Mansfield Township

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