

ENVIRONMENTAL RESOURCE INVENTORY

BOROUGH OF NEW MILFORD BERGEN COUNTY, NEW JERSEY

Prepared for:



**Borough of New Milford
Environmental and Energy Commission**

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PSEG
Foundation



Table of Contents

1. Introduction	1
a. Purpose of Environmental Resource Inventory	1
b. Municipal Context	1
2. Geology and Topography	5
a. Geology	5
b. Topography	10
3. Soils	11
a. Soils Overview	11
b. Soil Classification	11
c. Major Soils Series	12
4. Hydrology	15
a. Groundwater	15
b. Surface Water	16
5. Climate	28
a. Climate Zone	28
b. Temperature & Precipitation	28
c. Climate Change	29
6. Air	32
a. Ozone	35
b. Sulfur Dioxide	35
c. Carbon Monoxide	36
d. Nitrogen Dioxide	37
e. Particulate Matter	37
f. Lead	38
g. Radon	39
h. Indoor Air Quality	39
7. Flora and Fauna	41
8. Land Use	45
9. Known Contaminated Sites / Point Source Pollution	49

1. Introduction

a. Purpose of Environmental Resource Inventory

An environmental resource inventory (ERI), also known as a natural resource inventory, is a compilation of text and visual information about the natural resource characteristics and environmental features of an area. The ERI is an unbiased report of integrated data. It provides baseline documentation for measuring and evaluating resource protection issues. The ERI is an objective index and description of features and their functions, rather than an interpretation or recommendation. Identifying significant environmental resources is the first step in their protection and preservation. This document also provides information that will be integrated with other planning efforts, such as updates to New Milford's Master Plan, as the Borough prepares to address challenges associated with climate change.

b. Municipal Context

i. Location

The Borough of New Milford is a suburban municipality located in the heart of Bergen County, a short distance west of New York City. The Borough's 2.31 square miles are located close to major highways and shopping areas, as well as commuter railroad stations. New Milford is also essentially fully developed, with nearly all new construction taking place as redevelopment.

ii. History

The Borough of New Milford was incorporated as a municipality in 1922. However, its history stretches back over three centuries to the first permanent settlement. Known as "The Birthplace of Bergen County," in 1677 David Demarest purchased over 8,000 acres, prior to which present day New Milford and surrounding areas were inhabited solely by Native American people of the Lenape Nation.

According to the 2014 New Milford Master Plan Update, the Borough's Historic Preservation Commission has identified three main areas of historic interest in New Milford: New Bridge, Old Bridge and Peetzburgh. New Bridge is located in the vicinity of New Bridge Landing in the southwest corner of the Borough. New Bridge Landing's role in the nation's history dates back to at least the Revolutionary War, when the Continental Army safely crossed from New Milford to River Edge to evade the British Army. Old Bridge is located in the central portion of the Borough and was home to the Demarest family homestead as well as gristmills, sawmills and docks. Peetzburgh, in the northwest corner of the municipality, was a planned development that dates back to the 1890s and was home to the Borough's first school, firehouse and post office.

There are currently no local historic districts in New Milford, although one or more of the above areas could possibly qualify for designation. The Jacobus Demarest House on River Road was constructed circa 1680 and has the distinction as the oldest continuously occupied home in Bergen County and is listed on the National Register of Historic Places. Among the other historic sites in New Milford is the French

Burying Ground (aka French Huguenot – Demarest Cemetery), which is located behind Borough Hall. A number of homes are designated as historic sites by local ordinance.

iii. Environmental Planning in New Milford

This ERI was prepared for the Borough of New Milford’s Environmental and Energy Commission (EEC). The EEC has the power to conduct research into the use and possible use of the open land areas of New Milford and coordinates the activities of unofficial bodies organized for similar purposes. The EEC keeps an index of all open areas, publicly or privately owned. In addition, the EEC has the power to study and make recommendations concerning open space preservation, water resources management, air pollution control, solid waste management, noise control, soil and landscape protection, environmental appearance, marine resources, energy conservation and protection of flora and fauna. The Commission consists of seven members appointed by the Mayor with the advice and consent of the Council. One member is also a member of the Planning Board and all members must be residents of the Borough. In addition to the regular members there are two alternate members, also appointed by the Mayor with the advice and consent of the Council.

New Milford also has a “Green Team” which was established and appointed by the Mayor and Council in 2020. The purpose of the Green Team is to work with the Borough of New Milford to save tax dollars, assure clean air and drinking water, improve working and living environments to build a community that is sustainable and diverse environmentally, economically and socially. The mission of the New Milford Green Team is to advise the Borough officials on ways to improve municipal operations with “green” initiatives which are economically and environmentally sound through research and evaluation.

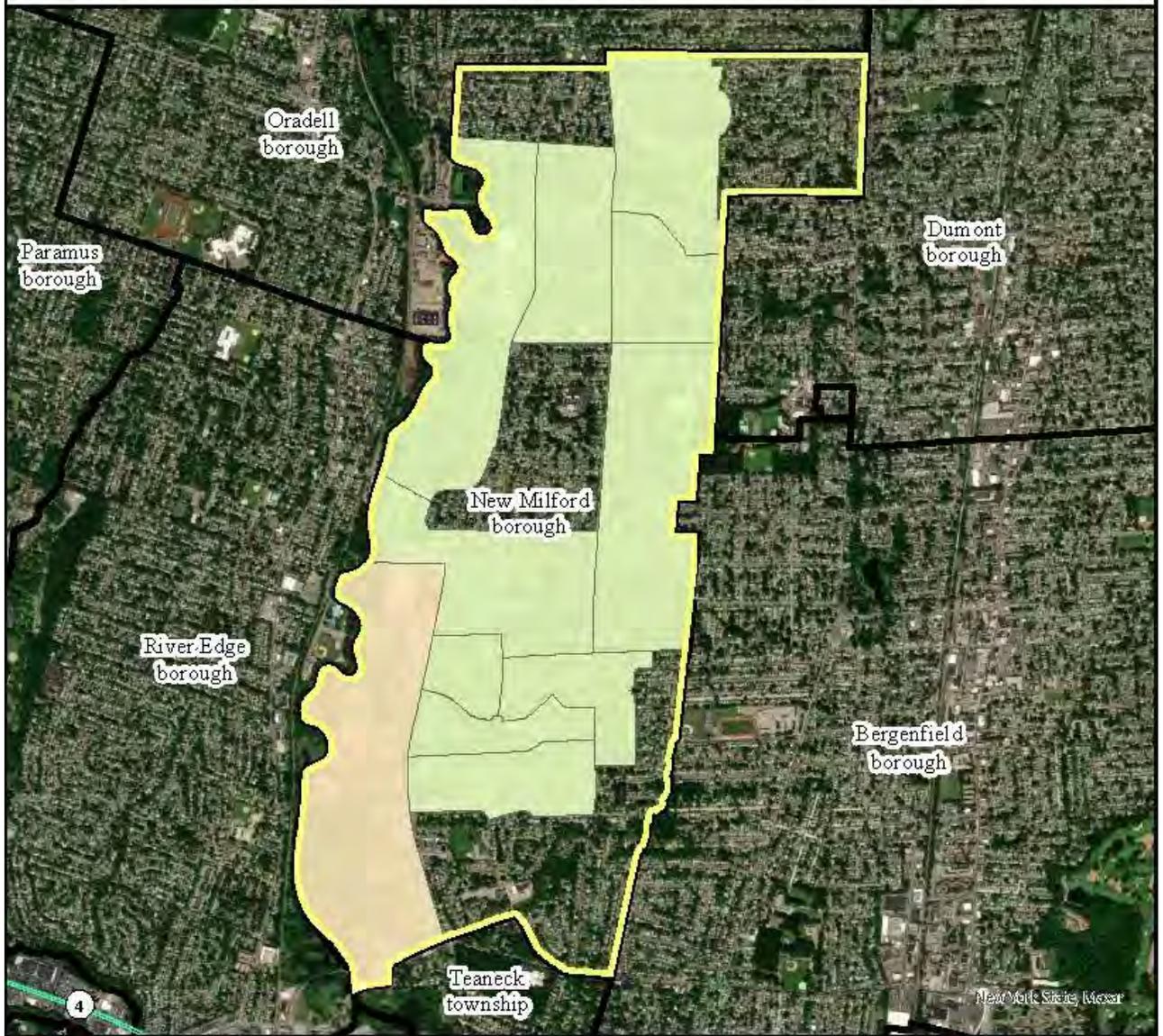
It is noted that New Milford is designated as an “Environmental Justice Community” by the State of New Jersey¹, as a majority of the census block groups in the Borough are designated as “Overburdened Communities” as shown on the map on the following page. Per the New Jersey Department of Environmental Protection:

“An overburdened community is any census block group, as determined in accordance with the most recent United States Census, in which: (1) at least 35 percent of the households qualify as low-income households; (2) at least 40 percent of the residents identify as minority or as members of a State recognized tribal community; or (3) at least 40 percent of the households have limited English proficiency.”

This designation is noted to highlight the presence of environmental features within the municipality, and to consider impacts on the Overburdened Communities in particular in future planning efforts.

¹ New Jersey defines “Environmental Justice Communities” by three criteria: presence in a community of concern; the presence of disproportionate environmental and public health stressors; and the absence or lack of environmental and public health benefits. More information: <https://dep.nj.gov/ej/communities-location/>

Overburdened Communities under the New Jersey Environmental Justice Law in New Milford Borough, Bergen County



An overburdened community is any census block group, as determined in accordance with the most recent United States Census, in which (1) at least 35 percent of the households qualify as low-income households; (2) at least 40 percent of the residents identify as minority or as members of a State recognized tribal community; or (3) at least 40 percent of the households have limited English proficiency. Census block groups with zero population and located immediately adjacent to an OBC are labeled as "adjacent." Existing or proposed facilities located in adjacent block groups may be required to conduct further analysis in accordance with the Environmental Justice Rules.

Disclaimer: The boundary information in the TIGER/Line Shapefiles used for the maps are for statistical data collection and tabulation purposes only; their depiction and designation does not constitute a determination of jurisdictional authority or rights of ownership or entitlement and they are not legal land descriptions.

Municipalities	Toll Road
New Milford Borough	Interstate
Overburdened Community Criteria	
Adjacent	US Highway
Limited English	State Highway
Low Income	
Low Income and Limited English	
Low Income and Minority	
Low Income, Minority, and Limited English	
Minority	
Minority and Limited English	

NEW JERSEY
 DEPARTMENT OF
 ENVIRONMENTAL
 PROTECTION

Date: 1/9/2023

N

0 0.17 0.35 Miles



Figure 1: Context Map

**Borough of New Milford
Environmental Resource Inventory**

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SOURCES: NJ OPEN DATA ARC GIS

2. Geology and Topography

a. Geology

i. Physiographic Provinces

New Jersey's Landscape is divided into four distinct regions, characterized by their landscape features, and underlying geology. These regions are known as physiographic provinces². Broadly, from northwest to southeast, these provinces are the Valley and Ridge, the highlands, the Piedmont, and the Coastal Plain. New Milford is located in the Piedmont province.

The Piedmont Province covers approximately a fifth of the state and is characterized by "slightly folded and faulted sedimentary rocks of Triassic and Jurassic age (240 to 140 million years old) and igneous rocks of the Jurassic age"³. The typical landscape is one of low rolling hills interspersed with higher ridges, which generally run southwest to northeast. The notable geological features of the province near New Milford are the Palisades, an igneous intrusion resulting in high cliffs overlooking the Hudson River, and the low-lying land bordering the Hackensack River and Newark Bay, formed in the valley between the Palisades and other ridge systems.

ii. Bedrock Geology

The ground underlying New Milford can be divided into three general layers: soils, surficial features, and bedrock⁴. Soils will be addressed later in this report. Surficial Features consist of unconsolidated sediments that are deposited by geologic actors including rivers, lakes, glaciers, and wind, as well as by the physical weathering of bedrock. These deposits are generally younger than 5 million years old, and less than 400 feet thick. Bedrock in northern New Jersey is typically at least 200 million years old and can consist of rocks that were formed over 1 billion years ago. These rocks have folds and faults caused by periods of tectonic activity. Bedrock in this region extends miles below the surface.

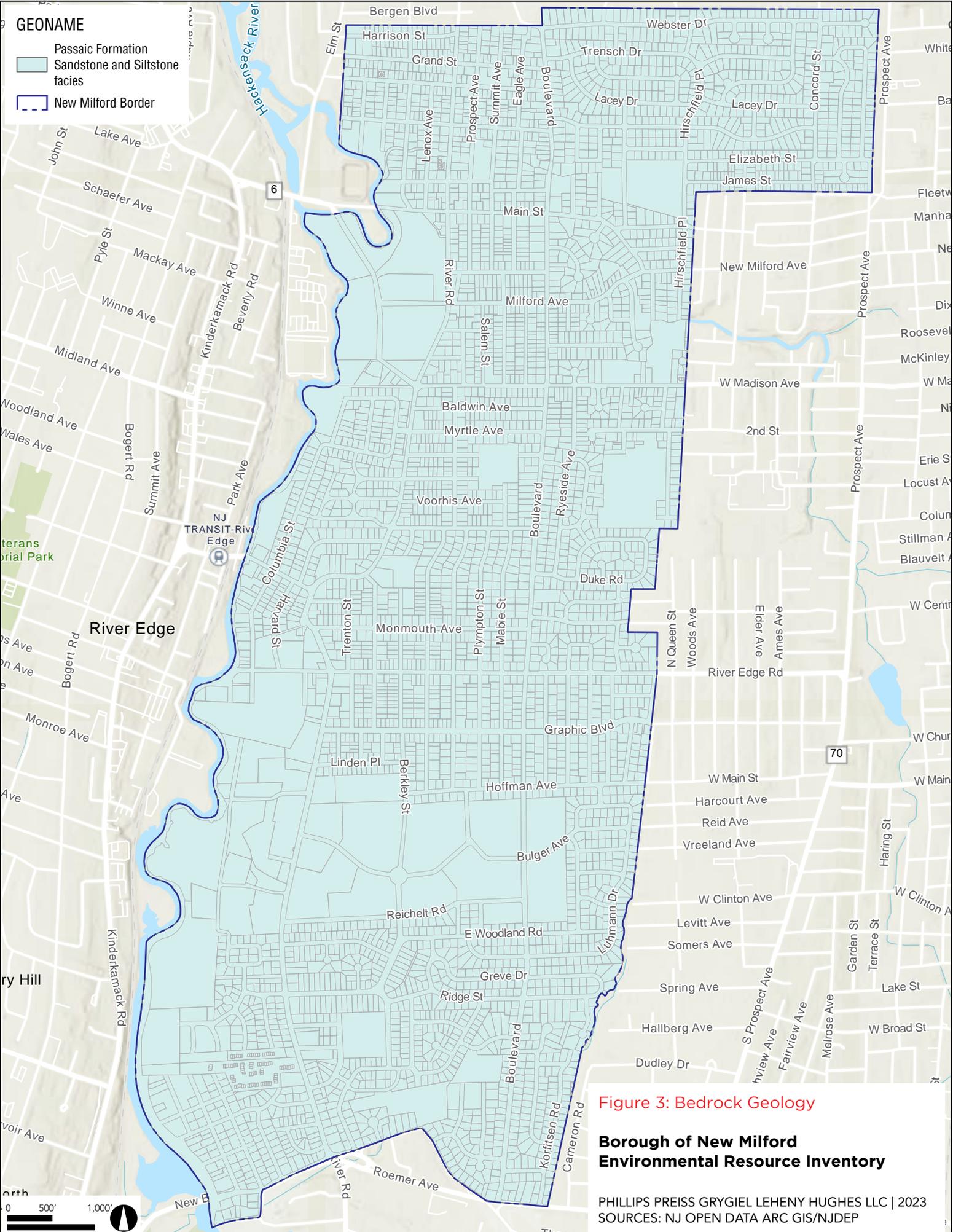
The Bedrock which underlies New Milford is part of the Passaic Formation, which dates from the Lower Jurassic and Upper Triassic periods. This formation is characterized as "sandstone, siltstone, and shale", and is "reddish-brown to purple and gray"⁵. These rocks are sedimentary, which are formed by the deposition of sediments, which are then compressed and transformed into rock. These rocks are around 1,250 feet deep, where they transition into the Lockatong Formation and then the Stockton Formation, both of which are sedimentary rocks of the Late Triassic. At around 2,500 feet deep the Lockatong formation is interrupted by an igneous intrusion dating to the Early Jurassic, this same formation is visible at the surface east of New Milford as the Palisades.

² <https://www.nj.gov/dep/njgs/enviroed/infocirc/provinces.pdf>

³ Ibid.

⁴ <https://www.nj.gov/dep/njgs/enviroed/infocirc/mapping.pdf>

⁵ Bedrock Geologic Map of New Jersey 2014 <https://www.state.nj.us/dep/njgs/pricelst/Bedrock250.pdf> whole section



iii. Surface Geology

Surficial Geology consists of deposits formed recently, relative to the geologic timescales of bedrock formation, and generally more impacted by contemporary local conditions, such as extant rivers, or flooding. In Northern New Jersey, these features are heavily influenced by the presence of glaciation in the recent past, with the last local glacial maximum occurring around 25 to 21 thousand years before present⁶.

In New Milford the majority of the surficial geology is Upper Postglacial Stream Terrace Deposits (66%), which were laid down in the Holocene and latest Pleistocene. These deposits were created along glacial and postglacial stream courses and consist of finer materials such as sand or silt overlaying pebble gravel and sand. Alluvium, consisting of sand, silt, clay and peat, as well as variable amounts of organic matter underlies around 10% of New Milford. Alluvium is more recently deposited in floodways and channels and can be up to 20 feet thick. Also occurring within the Borough are Rahway Till (9.5%) and Late Wisconsinan Glacial Delta Deposits (9.5%).

⁶ <https://gisdata-njdep.opendata.arcgis.com/datasets/njdep::surficial-geology-of-new-jersey/about>

Surficial Geology

- ALLUVIUM
- LATE WISCONSINAN
GLACIAL DELTA
DEPOSITS
- LOWER POSTGLACIAL
STREAM TERRACE
DEPOSITS
- RAHWAY TILL
- SALT-MARSH AND
ESTUARINE DEPOSITS
- UPPER POSTGLACIAL
STREAM TERRACE
DEPOSITS
- New Milford Border

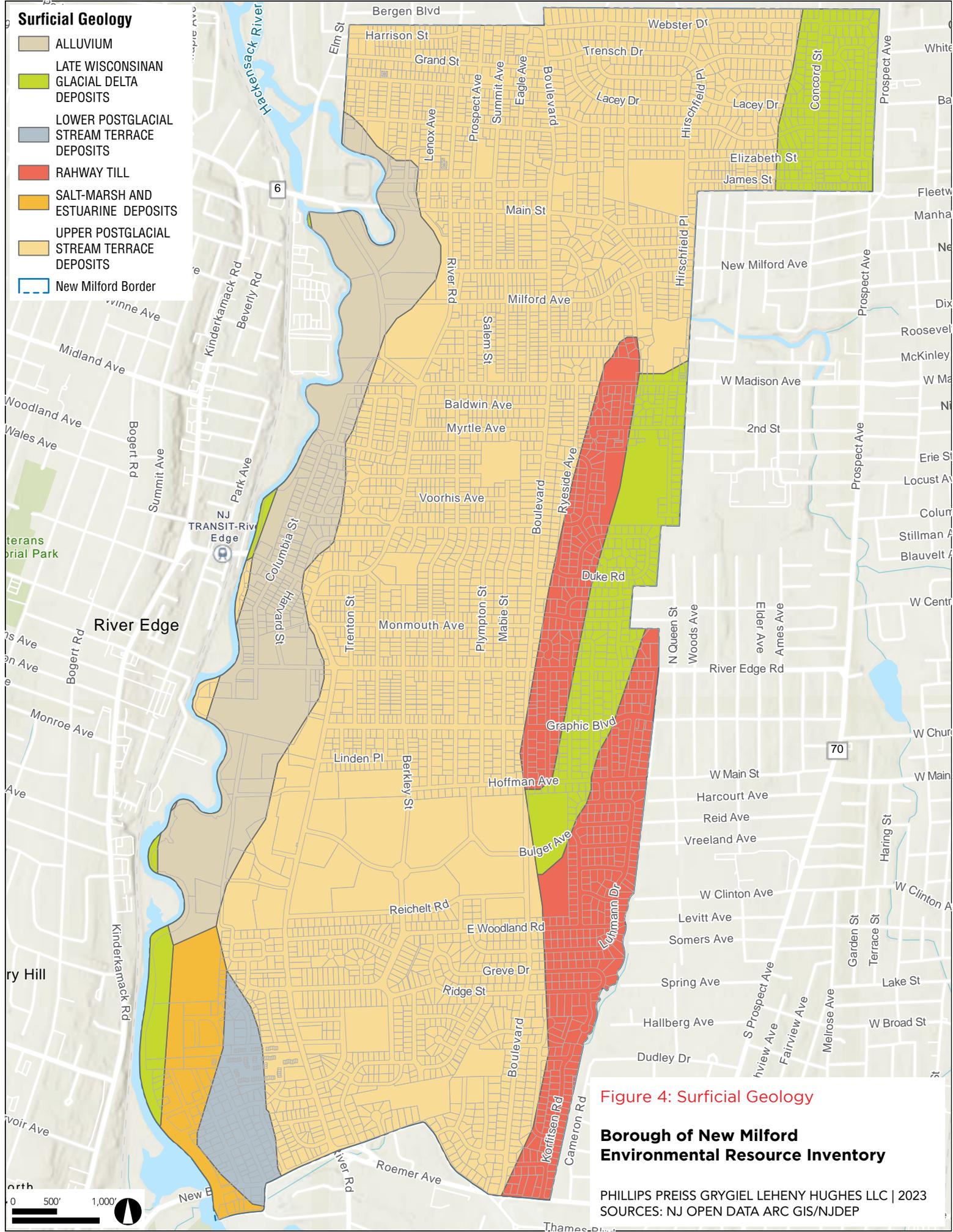


Figure 4: Surficial Geology

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Environmental Resource Inventory**

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SOURCES: NJ OPEN DATA ARC GIS/NJDEP



b. Topography

The Borough of New Milford has generally level topography, with moderate slopes in some places and isolated steeply sloped areas. New Milford’s approximate elevation is 30 feet above sea level.

i. Steep Slopes

The New Jersey Department of Environmental Protection defines “steep slopes” as land areas with slopes greater than 15% which are not adjacent to shoreline. Steep slopes can be either naturally occurring areas of steep topography, such as mountainous or hilly terrain, or ravines, or result from human intervention, such as mining or grading⁷. Steep slopes may be difficult or expensive to build on, and may impact the flow of water and stormwater across the landscape. Slope steepness can also impact the degree to which material is removed from a hillside by water, and, if not managed properly, create unsafe and unstable conditions, as well as impact downstream water quality, and other ecosystem features.

According to the Municipal Stormwater Management Plan, New Milford has no areas designated as steep slopes. However, as the report notes, all development can “dramatically alter the hydrologic cycle of a site and ultimately, an entire watershed”.

⁷ <https://www.nj.gov/dep/landuse/specialareas.html#32>

3. Soils

a. Soils Overview

Soils play a critical role in the environment. Soils support an area's vegetation, absorb rainwater, and provide habitat. The physical and chemical properties of soils reflect a large number of variables, including parent material (i.e. bedrock), climate, vegetative cover, animal activities, slopes and drainage patterns, and time. New Jersey's history of glaciation, complex geology, and patterns of human use have led to complex patterns of soil distribution.⁸

Soil provides fundamental support to both the ecosystem and to human uses. Through the wild and domestic plants it supports, the water it does or does not absorb, and through its structural utility, soils define the landscape. Soil health reflects the capacity for soils to continue to sustain the plants, animals, and people. Soils are a complex interaction of minerals, organic matter, and living fungi, bacteria, and other microorganisms. The health of a soil is linked to the health of these microorganisms, and to presence or absence of nutrients, rainwater, and pollutants.

Soils, and the microorganisms they contain, play an important role in the nitrogen cycle, a critical ecosystem function. A range of human activities including runoff from agriculture, burning of fossil fuels, and landscape changes which increase erosion, can cause disruption to the cycle. Disruption to this cycle, and to other nutrient balancing soil cycles, can degrade ecosystem quality.

b. Soil Classification

The official Soil Survey for Bergen County was updated in 2008 by the Natural Resources Conservation Service (NRCS), an agency of the United States Department of Agriculture (USDA). The soil maps and tables in the ERI are based on the data from that official survey.

The NRCS Soil Survey plots soils by map units. The Soil Survey names each map unit based on the characteristics of the dominant soils within that unit. Each map unit is identified by an abbreviation, which describes the soil series name, as well as specific local conditions. For example, the slope of a map unit is given by a capital letter at the end of the abbreviation, such as "A" for map units typically with 0 to 3 degrees of slope, and "B" for map units with 3 to 8 degrees of slope. These codes can also communicate regular conditions of the map unit, for example, a "t" appended to the end of the code indicates that the map unit, and its soils, are frequently flooded.

The Soil Survey also categorizes each map unit as one of four map unit types: consociations, complexes, associations, and undifferentiated groups⁹. Consociations are named for the dominate component in the map unit, and generally the extent of dissimilar components is minor. Complexes and associations

⁸ <https://www.nj.gov/dep/njgs/enviroed/infocirc/mapping.pdf>

⁹ <https://casoilresource.lawr.ucdavis.edu/gmap/help/defn-map-unit-type.html>

consist of regular patterns of two or more dissimilar components with sufficiently distinct morphologies and behaviors. Complex components cannot be delineated at the scale of mapping, whereas those in associations can. Undifferentiated groups consist of map units where dissimilar components are grouped by their similar use and management. Complex map units cover about 76 percent of New Milford.

c. Major Soils Series

Soils with similar profiles are a soil series. The most prevalent soil series in New Milford are the Dunellen-Urban, Udorthents, and Boonton-Urban. These together account for around 82 percent of New Milford's area. A further 14% is classified as Urban Land, which is not technically a soil series. Nearly all the soil series in New Milford are either disturbed soil series, or a soils series which are complexes that include urban land. This is indicative of an extensively developed area, where soil considerations may be more driven by anthropocentric considerations, rather than conservation and preservation.

Boonton-Urban Complex¹⁰

Boonton soils are generally formed of glacial till and are typically of variable slopes in upland areas. Underlying bedrock is typically red to brown shale, sandstone, basalt, and some granitic gneiss. This soil series covers approximately 9 percent of New Milford. The primary component of the series is BouC (83 acres) and BouB (43 acres).

Drainage and Permeability

Boonton soils are moderately well to well drained. Saturated hydraulic conductivity is variable through the soil column. Runoff is slow to rapid.

Use and Vegetation

Most Boonton soils are in areas that have become highly urbanized, with undeveloped sites supporting woodlands or idle fields. Wooded areas support oaks, red maple, white ash, hickory, gray birch and dogwood.

Dunellen Loam and Dunellen-Urban Complex¹¹

The Dunellen soil series is the most prevalent soil series in New Milford. This series consists of stratified layers of deep, well drained soils. Dunellen Series soils are found overlaying bedrock of red, soft shale or siltstone. The soil series occurs in glacial outwash plains and stream terraces. The Dunellen-Urban Series covers approximately 836 acres of New Milford, or 56 percent of the Borough. The primary

¹⁰ https://soilseries.sc.egov.usda.gov/OSD_Docs/B/BOONTON.html

¹¹ <https://casoilresource.lawr.ucdavis.edu/sde/?series=dunellen#osd>

**Environmental Resource Inventory
Borough of New Milford**

components of this series are DuuA (318 acres), DuuB (284 acres), and DuuC (217 acres). Dunellen Loam soils cover limited areas in the east-central portion of the Borough.

Drainage and Permeability

Dunellen soils are well drained. Saturated hydraulic conductivity ranges from moderately high or high in the solum and high or very high in the substratum. Runoff ranges from negligible to high.

Use and Vegetation

Dunellen soils are principally used for community development. Most remaining areas are idle on the urban fringe and some areas are used for pasture, hay or general crops. Trees in wooded areas include red, white and black oak, hickory, red maple, and ash.

Fluvaquents

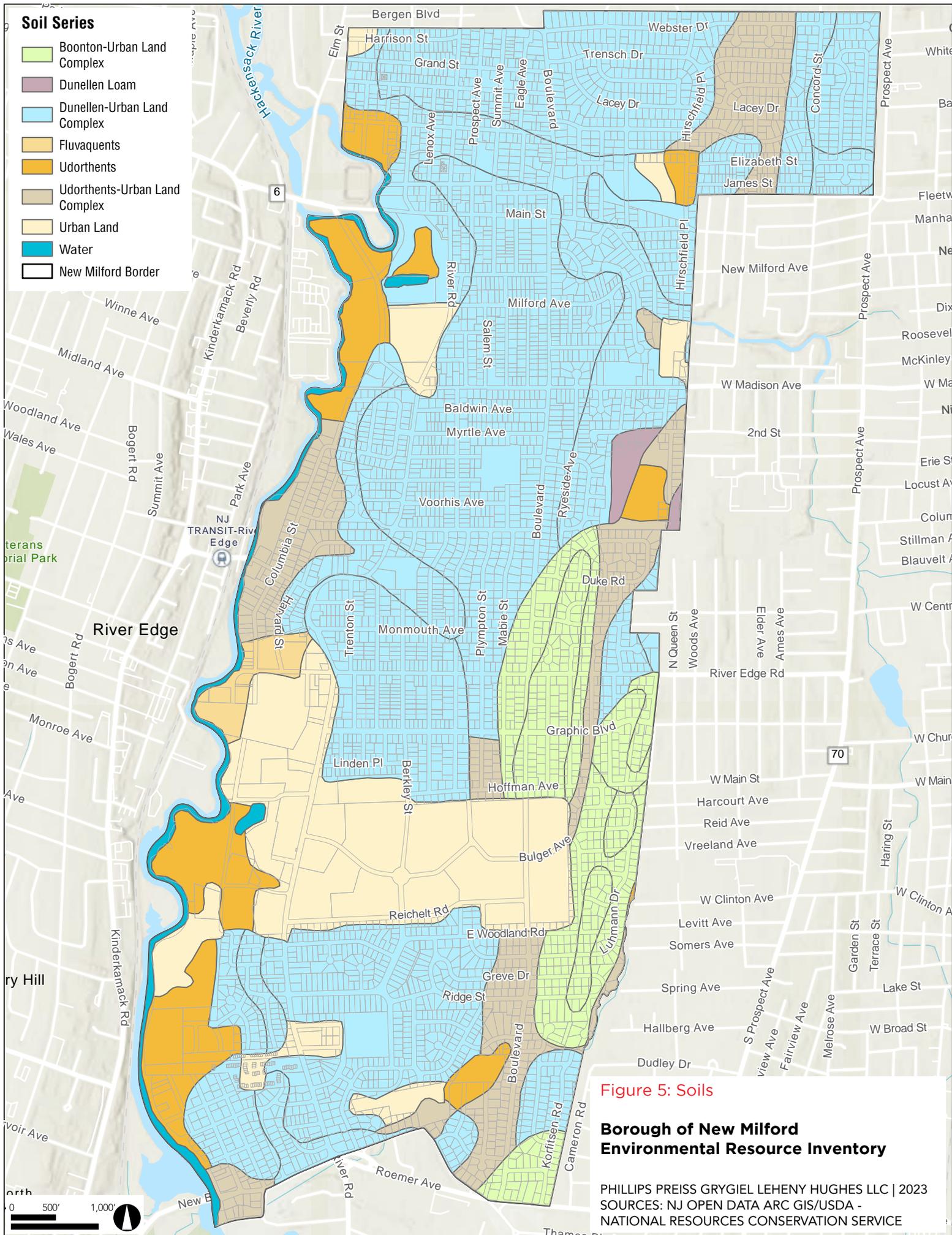
Fluvaquents consist of soils characterized by frequent flooding. In New Milford, there is one location of this soil classification in the southwest portion of the Borough along the Hackensack River near Henley Avenue.

Udorthents

Udorthents consist of areas which have been transformed by earth disturbance activities, including grading, residential development, commercial and industrial buildings, cemeteries, and recreational areas. Typically, this soil is mixed with human artifacts. Approximately 17 percent of New Milford is the Udorthents soil series.

Urban Land

Urban land is defined as areas altered by structures so that the soil is not viable for vegetation without extensive reclamation. The soil's parent material is a surface covered by pavement, concrete, or buildings, which are underlain with disturbed and natural soil. Urban land accounts for about 14 percent of the Borough.



Soil Series

- Boonton-Urban Land Complex
- Dunellen Loam
- Dunellen-Urban Land Complex
- Fluvaquents
- Udorthents
- Udorthents-Urban Land Complex
- Urban Land
- Water
- New Milford Border

Figure 5: Soils

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Environmental Resource Inventory**

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 SOURCES: NJ OPEN DATA ARC GIS/USDA -
 NATIONAL RESOURCES CONSERVATION SERVICE

4. Hydrology

a. Groundwater

i. Aquifers

An aquifer is an area of permeable rock or unconsolidated surficial geology that contains water. Water from aquifers is extracted through wells for drinking, and other uses, including agricultural irrigation. Doing so depletes the water in the aquifer, lowers its height, and eventually, if the aquifer is not replenished, will render it unsuitable as a source of water. The capacity of an aquifer is determined by its size, and by the type of rock or material which is in the aquifer. In New Jersey aquifer yields are calculated using an average of non-residential wells, and are divided into five ranks, A-E, based on the median gallons per minute (GPM) the aquifer's wells produced.

Rainfall and Snowmelt provides input water to aquifers. When precipitation falls, some of the water remains on the surface as lakes, streams, and rivers, some moves through the ground as groundwater and surfaces at a later point, and the remaining portion seeps into underground aquifers and "recharges" the aquifer.

ii. Groundwater Recharge Rates

Because aquifers are an essential source of water throughout the state, it is important to know if water is being drawn from an aquifer faster than it is being replenished, which would result in the aquifer eventually being depleted and unable to provide water. The NJDEP calculates the recharge rate of aquifers using rainfall data, to understand how much water is being provided, and then uses soil, wetland, and land use and land cover data to calculate the amount of water which reaches the aquifer. The resulting recharge rate is stated in inches per year, which refers to the height of the water in the aquifer.

Areas of high aquifer recharge rates are important regions of the environment because their conditions impact a disproportionate amount of the aquifer's waters, and their current land use and land cover conditions allow their underlying aquifer to continue to provide a sustainable source of water. New Milford and nearly all of Bergen County is located atop the Newark Group aquifers, which consist of shale and sandstone. Water generally is present in weathered joint and fracture systems in the upper 200 to 300 feet. The Newark Group aquifers and other non-Coastal Plain aquifers of New Jersey generally yield water of satisfactory quality but are susceptible to local contamination due to their proximity to the land surface.¹²

Because New Milford is located entirely in the state's PA-1 metropolitan planning area, the Borough is not subject to groundwater recharge requirements. However, as part of the Municipal Stormwater Management Report, the Borough has stated the goal of maintaining groundwater recharge. Actions to

¹² <https://www.usgs.gov/centers/new-jersey-water-science-center/major-aquifers-new-jersey>

accomplish this goal include limits on development, which may increase impervious surfaces, and by introducing non-structural stormwater strategies, such as driveway swales or porous pavements.

iii. Wellhead Protection Areas

Wellhead Protection Areas are located around potable public water supplies and cover a horizontal area that a standard well will draw water from over the course of two, five, and twelve years. New Milford does not contain any Wellhead Protection Areas.

b. Surface Water

i. Watersheds

Watersheds are defined as an area where the surface runoff drains into a specific point in a stream, or a single waterbody such as a lake. Watersheds are natural areas for tackling environmental problems because pollutants carried by surface runoff from the watershed are contained to the watershed, interact with flora and fauna in the watershed and travel towards the defining water feature of the watershed.

The NJDEP has divided the state into watershed management areas (WMAs). New Milford is located in the Hackensack, Hudson, and Pascack WMA. The United States Geological Survey (USGS) identifies watersheds by a hierarchical numbering system, known as a hydrological unit code (HUC). This smallest watershed areas identified by a HUC use a 14 digit code. The table below shows the watersheds that underlie New Milford. New Milford sits primarily in the Hackensack River below/including Hirschfeld Brook watershed.

WMA	WMA Name	Watershed Name	Sub-Watershed Name	Acres	Percent of New Milford
05	Hackensack, Hudson, and Pascack	Hackensack River (below/including Hirschfeld Brook)	Hackensack River (Ft. Lee Rd to Oradell gauge)	1147.7	77.3
05	Hackensack, Hudson, and Pascack	Hackensack River (below/including Hirschfeld Brook)	Hirschfeld Brook	310.3	20.9
05	Hackensack, Hudson, and Pascack	Hackensack River (above Hirschfeld Brook)	Hackensack River (Oradell to Old Tappan gauge)	26.2	1.8

Watersheds

Sub-Watershed

-  Hackensack R (Ft Lee Rd to Oradell gage)
-  Hackensack R (Oradell to OldTappan gage)
-  Hirschfeld Brook
-  New Milford Border

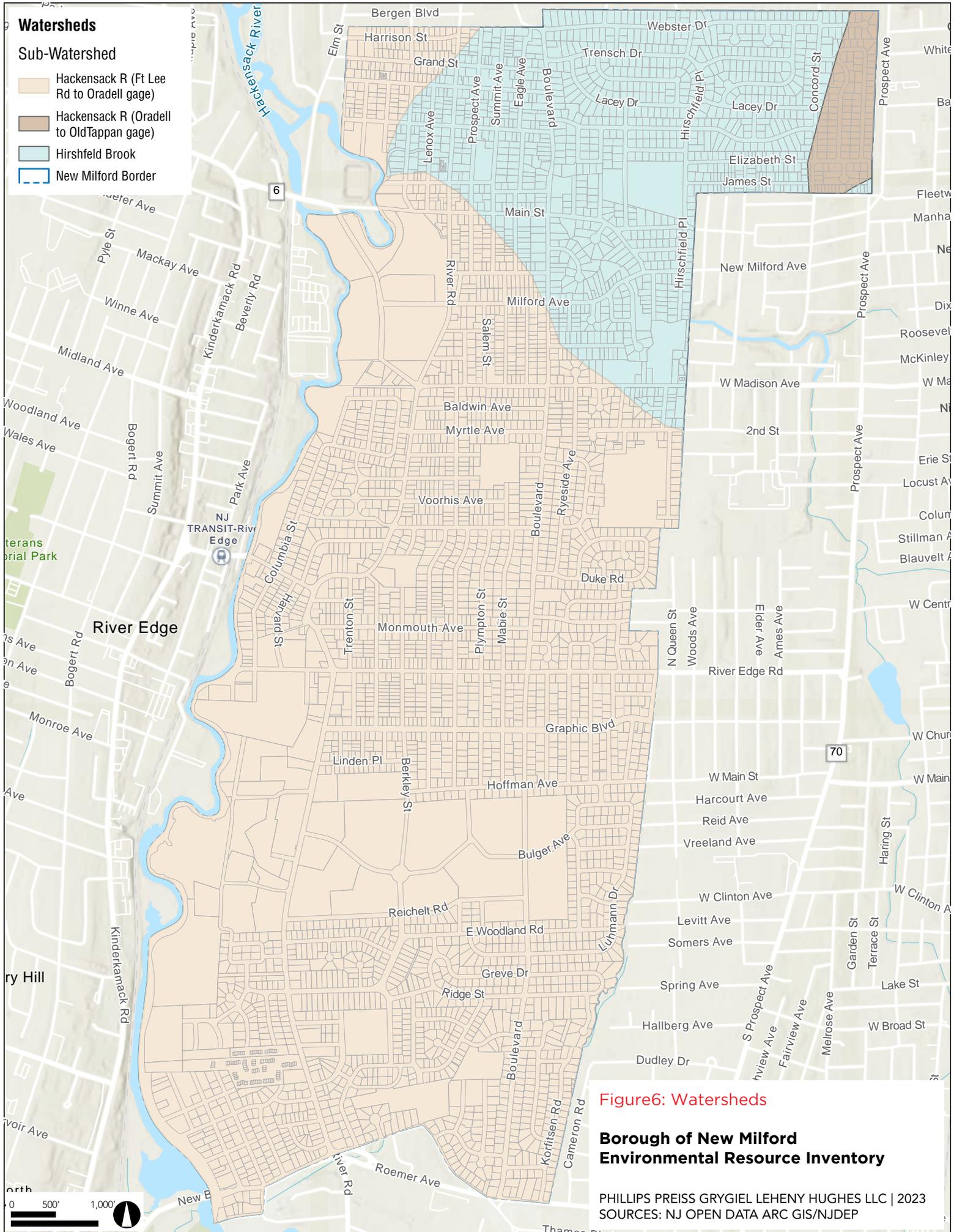


Figure6: Watersheds

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Environmental Resource Inventory**

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SOURCES: NJ OPEN DATA ARC GIS/NJDEP

ii. Wetlands

Wetlands are critical natural resources. They contribute significantly to the economic and environmental health of an area through a variety of ecosystem services. These services can be divided into three general interrelated categories. An ecosystem is unlikely to be able to supply one service without the capacity to supply others. These are the physical benefits, which include filtration of chemicals and sediments, flood control, critical habitat benefits, and human use benefits, which include recreation and tourism. While some of these benefits may be simulated through human intervention in the landscape, wetlands as complete and undisturbed ecosystems are critical actors in the ecosystem and are generally irreplaceable assets to the community¹³.

The New Jersey Department of Environmental Protection defines freshwater wetland as “an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.”¹⁴

Because of their value and sensitivity, wetlands are extensively regulated by the NJDEP. In addition, most wetlands have a regulated buffer which extends beyond the boundaries of the wetland. Most freshwater wetlands require a 50-foot buffer, but other factors, such as habitat for an endangered species, may require a larger buffer radius.

Wetlands in New Jersey are classified into three categories

Wetland Classification Definitions

Exceptional Resource Value Wetland:

- Discharges into FW-1 water and FW-2 trout producing waters and their tributaries;
- Is a present habitat for threatened or endangered species; or
- Is a documented habitat for threatened or endangered species, and remains suitable for breeding, resting, or feeding by these species during the normal period these species would use the habitat.

Ordinary Resource Value Wetland:

A freshwater wetland that does not exhibit any of the characteristics of an exceptional resource value wetland, which is:

- An isolated wetland, as defined at N.J.A.C. 7:7a-1.4; and
- Is smaller than 5,000 square feet; and
- Has the uses listed below covering more than 50% of the area within 50 feet of the wetland boundary. In calculating the area covered by a use, NJDEP will only consider a use that was legally existing that location prior to July 1, 1988, or was permitted under this chapter since that date:

- Lawns;
- Maintained landscaping;
- Impervious surfaces;
- Active railroad right-of-way; and
- Graveled or stoned parking/storage areas and roads

A drainage ditch;
A swale; or
A detention facility that was uplands at the time it was created regardless of the wetland resource classification of the wetlands under these rules, or classification of the body of water, as FW-1 or FW-2 trout production, to which it discharges.

Intermediate Resource Value Wetland:

A freshwater wetland of intermediate resource value is any wetland not defined as exceptional or ordinary.

Source: NJDEP 2015 Land Use Map Data

¹³ https://www.nj.gov/dep/landuse/fww/fww_main.html

¹⁴ NJAC 7:7a https://www.nj.gov/dep/rules/rules/njac7_7a.pdf

**Environmental Resource Inventory
Borough of New Milford**

which reflect their value as an environmental resource: Ordinary Resource Value, Intermediate Resource Value, and Exceptional Resource Value.

New Milford contains 42.75 acres of documented wetlands, or about 2.88% of the total area of the Borough. Almost 90% of this wetland is deciduous wooded wetland, while the remaining 10% is split between Deciduous Scrub/Shrub Wetlands and Phragmites. The majority of these wetlands are concentrated along the western border of the Borough in the low-lying areas near the Hackensack River. Wetlands are also present along the French Brook, in the south of the Borough.

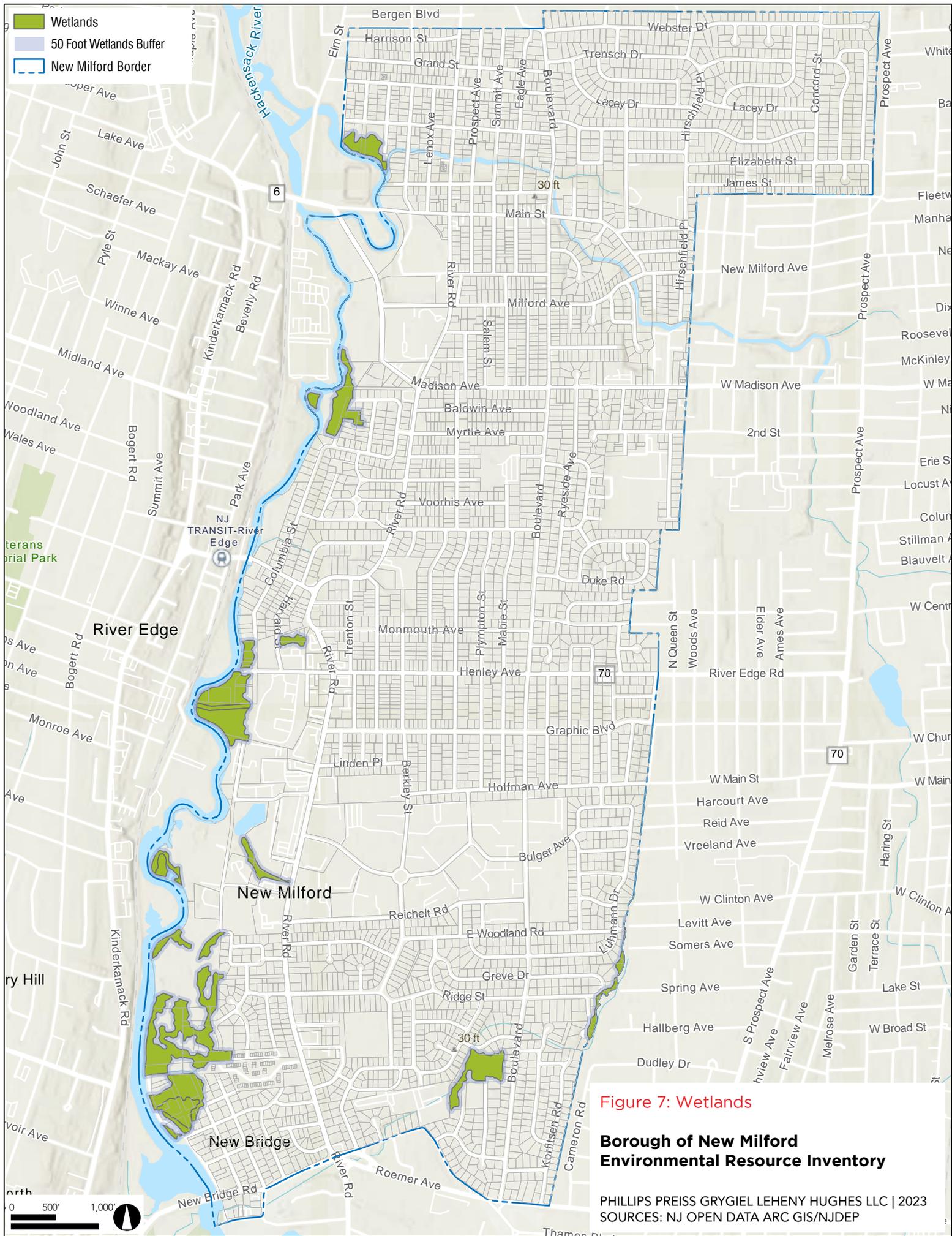


Figure 7: Wetlands

**Borough of New Milford
Environmental Resource Inventory**

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SOURCES: NJ OPEN DATA ARC GIS/NJDEP

iii. Flood Zone Areas

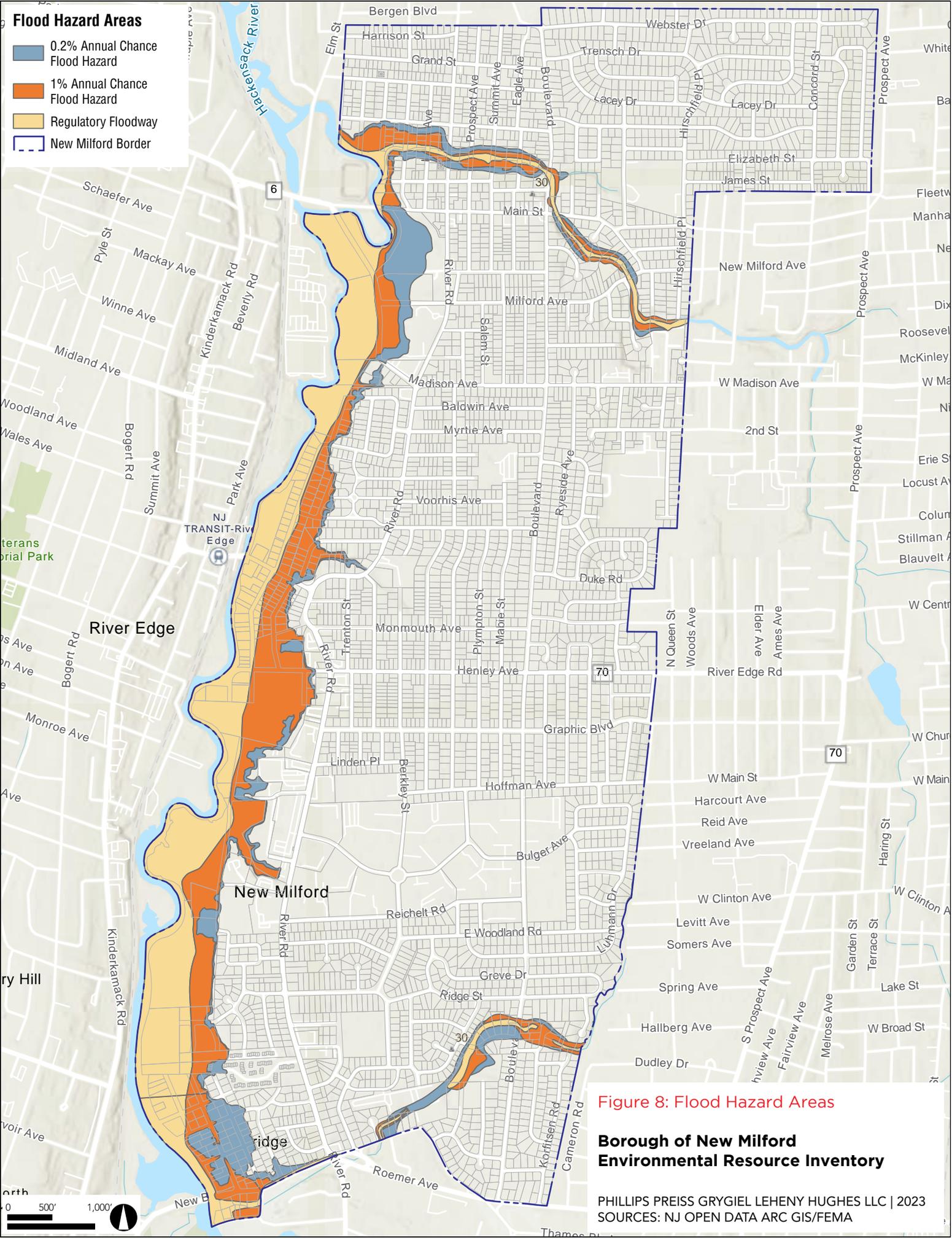
FEMA provides three broad categories of flood hazard risk, Special Flood Hazard Areas, Moderate Flood Hazard Areas, and areas of Minimal Flood Hazard. The Special Flood Hazard Areas are commonly referred to as a 100-year floodplain, an area that is likely to flood once in a hundred years, or alternatively, has a 1% chance of flooding annually. Moderate Flood Hazard Areas are expected to flood once every 500 years, or have a 0.2% chance of flooding each year. Areas of minimal flood hazard are calculated to flood with less frequency than once every 500 years.

When considering these categories, it is important to consider that while flooding in a 100-year floodplain may occur only once every hundred years over the studied time period, the interval between floods will exhibit significant variation, and the occurrence of flooding in during a particular year is not indicative of if flooding will occur in the near future. Additionally, given the increase in climate variability resulting from global GHG emissions, the actual annual flooding risks for a particular area may differ from a calculated risk which uses historical data.

Special and Moderate Flood Hazard Areas are present in New Milford. Similar to the distribution of wetlands within the Borough, these hazard areas primarily occur along the Hackensack River and French Brook. Flood Hazard Areas also occur along Hirschfeld Brook.

In New Milford, a total of 86 acres is classified as Special Flood Hazard Areas, and 45 acres is classified as Moderate Flood Hazard Areas. In total 8.8% of the Borough is classified as having a 0.2% chance or above of an annual flood. A further 120 acres is designated as a regulated floodway, which is a FEMA designation that “means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height”.¹⁵

¹⁵ <https://www.fema.gov/glossary/floodway>



Impervious Surface Coverage 2015

- CLASS**
- Building
 - Other
 - Road
 - New Milford Border

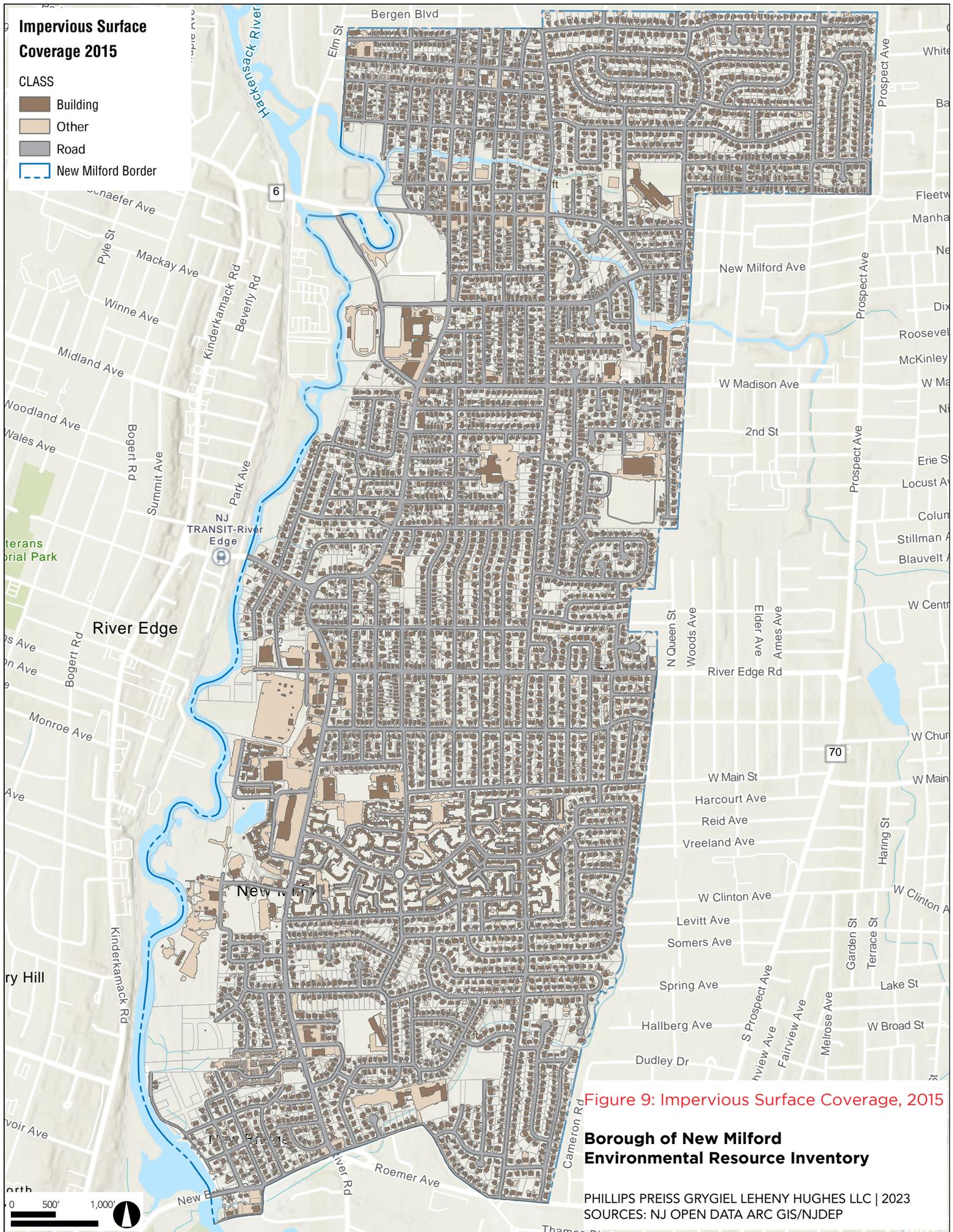


Figure 9: Impervious Surface Coverage, 2015

**Borough of New Milford
Environmental Resource Inventory**

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SOURCES: NJ OPEN DATA ARC GIS/NJDEP

iv. Surface Water Areas and Quality

Surface water is water that collects on the ground or in a stream, river, lake, wetland, or ocean. New Jersey's Surface Water Quality Standards (SWQS) classifies surface waters in the state and establishes antidegradation policies for these waters¹⁶. Freshwater in the state is classified as FW1, FW2, and PL, the latter reserved for Pinelands waters. FW1 waters are not subject to anthropogenic wastewater disposal and are considered nondegradation waters set aside for posterity. FW2 waters are freshwaters that do not meet the FW1 or PL criteria. FW2 waters are further divided on their ability to support trout; FW-TP are trout producing, FW-TM at trout maintain, and FW2-NT are nontrout waters.

Saline waters are classified as either SE (saline estuarine) or SC (saline coastal), and SE waters are further divided into SE1, SE2, and SE3 based on their ability to support recreation, shellfish harvesting and warm water fish species. PL classification also applies to saline waters in the pinelands. Some waters transition between fresh and saline as they approach the coast, and therefore are given dual classifications.

The antidegradation status of the waters is categorized as either ONRW (Outstanding Natural Resource Waters) for FW1 and PL waters, C1, for waters with exceptional environmental, recreational, water supply or fishery resource, and C2, where some water quality degradation may be economically or socially justified.

In addition to the Hackensack River, New Milford contains two additional surface water features, Hirschfeld Brook near the north end of the Borough, and French Brook to the south. Both brooks are tributaries of the Hackensack River. Hirschfeld Brook originates in the vicinity of Milton A. Votee Park in Teaneck, flowing north until it turns northwest at Idaho Street. It meets the Hackensack River between Pine Ave and Main Street. French Brook arises southwest of Somers Ave and flows broadly southwest until it meets the Hackensack just south of New Bridge Road. Several small unnamed tributaries of the Hackensack are located in New Milford between French Brook and Hirschfeld Brook.

In total, New Milford contains 5.72 miles of classified waterway. Two point seven nine (2.79) miles are classified as FW2-NT/SE1 a designation used for saline/freshwater interface. Where salinity levels are above or below 3.5 ppt (parts per trillion), the waterway is treated as its saline or freshwater component, respectively¹⁷. Two point nine four (2.94) miles are classified as SE1 exclusively. The Hackensack River is the sole SE1 classified waterway in the Borough, and its tributaries, both the two named waterways and several unnamed ones, are classified as FW2-NT/SE1.

Like other areas of the environment, surface waters are impacted by both point and nonpoint sources of pollution. Point sources are distinct and easily discernible single sources of pollutants. These include wastewater discharges from sewer treatment plants and factories, stormwater drains, illegal dumping,

¹⁶ <https://www.state.nj.us/dep/wms/bears/swqs-overview.htm>

¹⁷ https://www.nj.gov/dep/rules/rules/njac7_9b.pdf

and malfunctioning underground storage tanks, including septic tanks. Mitigation of these pollutants may be possible through mitigation efforts at the point source, or through the removal of the point source.

In contrast to point sources, non-point source pollution is introduced to surface waters as they move through the watershed. Rainfall and snowmelt will wash pollutants, such as fertilizers, herbicides, and motor oil, as well as sediments, into streams, rivers, and lakes. These pollutants degrade water quality and can cause significant harm to the aquatic and terrestrial ecosystems. Non-point source pollution from lawns, gardens, and agricultural sources that contain fertilizers will disrupt the nitrogen cycle present in waterways, leading to an increase in algae growth, which deoxygenates the water, and can cause mass die-offs of fish and other aquatic species.

While naturally occurring, sediments transported through rainfall into surface waters can result in increased turbidity, blocking the sunlight from aquatic plants, and disrupting the food chain. Increases in sediment transport are often caused by anthropogenic interventions in the watershed. Removal of vegetative cover associated with development exposes soils and makes them more readily transportable by rainfall. Increases in impervious surface in developed areas without proper management of stormwater can also lead to increased flow speeds, which allows stormwater events to disturb and transport increased quantities of sediment.

According to the Borough's Municipal Stormwater Management Report, both French Brook and Hirschfeld Brook experience frequent flooding and significant erosion. Goals stated in the report include reductions in soil erosion in the Borough, but the strategies described under the goal do not include addressing the erosion of these stream banks.

New Milford also sets out the goal of maintaining the integrity of biological functions of stream channels, but the only actions mentioned in pursuit of this goal are the adoption of a wildlife feeding ordinance and a pet waste ordinance. While these actions may contribute to a reduction in excess nitrogen disrupting the chemical balance of streams in the Borough, they leave other sources of excess nitrogen introduction unaddressed. A related goal, to maintain the biologic, physical, and chemical integrity of the waters of the state, and safeguard aquatic life, only lists non-intervention education-driven strategies.

Expansion of impervious surfaces, even absent steep slopes, is likely to decrease the travel time of water during rainfall-runoff events and cause downstream waterways to have higher and faster peak flows.

The Municipal Stormwater Management Plan is a tool which manages these potential impacts, and works to achieve the following goals:

- Reduce flood damage, including damage to life and property
- Minimize, to the extent practical, any increase in stormwater runoff from any new development
- Reduce soil erosion from any development or construction project

**Environmental Resource Inventory
Borough of New Milford**

- Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures
- Maintain groundwater recharge
- Prevent, to the greatest extent feasible, an increase in non-point pollution
- Maintain the integrity of stream channels for their biological functions, as well as for drainage
- Minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the State, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water
- Protect public safety through proper design and operation of stormwater basins

Surface Water Classification

CATEGORY

- Freshwater 2-Non-Trout/
Saline Estuarine 1
- Saline Estuarine 1
- New Milford Border

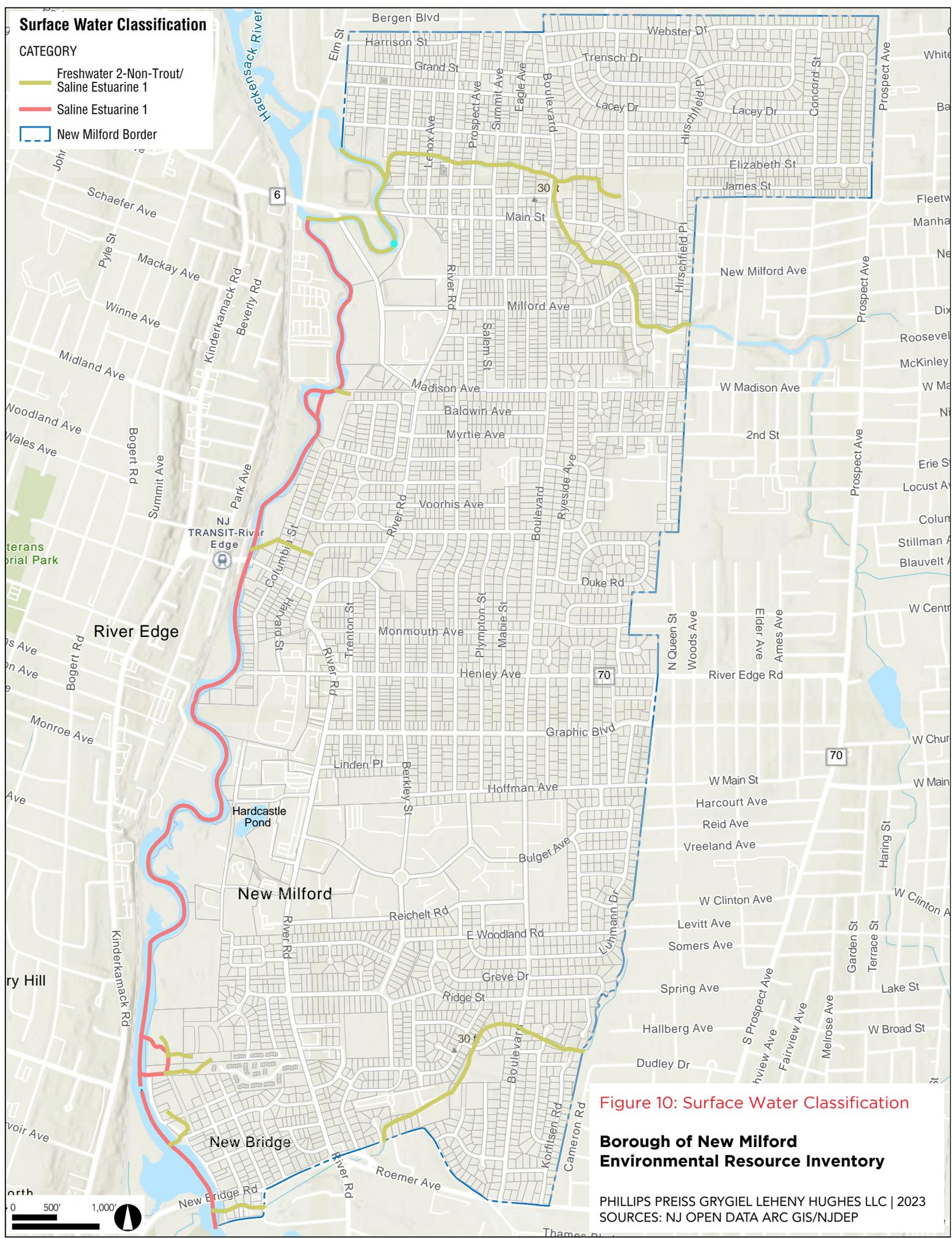


Figure 10: Surface Water Classification

Borough of New Milford Environmental Resource Inventory

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SOURCES: NJ OPEN DATA ARC GIS/NJDEP



5. Climate

a. Climate Zone

While New Jersey is among the smallest states, the diverse geophysical environment and proximity to the Atlantic Ocean means that the state experiences regional variation in climate and weather. The Office of the New Jersey State Climatologist divides the state into five distinct climate zones, Northern, Central, Pine Barrens, Southwest, and Coastal. New Milford is located in the Central Climate Zone.

The climate of the Central Zone is distinguished by the presence of significant amounts of buildings and paved surfaces, which produce an “heat island” effect raising temperatures in areas of dense development. The Central Zone is often the border between freezing and non-freezing precipitation in the winter, and is the southernmost extent of comfortable nighttime sleeping during the summer months. This zone has substantially fewer days with temperatures above 90 degrees than New Jersey’s southern climate zones¹⁸.

b. Temperature & Precipitation

The Office of the New Jersey State Climatologist (ONJSC) maintained a weather station in New Milford from 1919-2012, which recorded monthly precipitation totals. The mean annual precipitation for that time period was 44.34 inches. The highest annual precipitation recorded was in 2011, when the annual precipitation total was 71.40 inches. However, the data is incomplete for 15 out of the 120 months from 2008 to 2012, meaning that annual precipitation totals were not calculated for the years 2008-2010 and 2012.

The ONJSC’s nearest weather station to New Milford which is currently recording is located at Teterboro Airport. This station records temperature data in addition to precipitation. Since the station became operational in 1969, average annual temperatures have increased. This can be expressed several different ways, but regardless of the way the information is communicated, the overall trend is clear: New Milford is getting warmer.

New Milford is getting warmer:

At the Teterboro Airport weather station a trend of hotter and hotter temperatures is apparent in the data from 1969 to 2021. Below are some ways that this trend can be described:

The average annual temperature has increased throughout the period. For the 10 years ending in 1980, the average annual temperature was 53.38 degrees. For the 10 years ending in 2020, the average annual temperature was 55.92 degrees.

The five hottest years recorded at the weather station are 2012, 2016, 2006, 1998, and 2011. In contrast, the five coldest years are 1992, 1978, 1976, 1972, and 1989

Average temperatures in December have been elevated above the period average for nine out of the last 10 years.

Source: data from the Office of the New Jersey State Climatologist

¹⁸ <https://climate.rutgers.edu/stateclim/?section=njcp&target=NJCoverview>

c. Climate Change

New Jersey is already experiencing the effects of climate change. The burning of fossil fuels and subsequent releases of greenhouse gasses (GHGs), including carbon dioxide (CO₂) and Methane (CH₄), has significantly altered the composition of the atmosphere and resulted in fundamental changes to the planet's climate, and contributed in part to the Holocene mass extinction event, one of only six such events in the 500 million year history of life on this planet.

New Jersey currently produces a significant amount of GHG emissions from a variety of sources. The state has recognized the environmental harm of these emissions and in 2007 passed the Global Warming Response Act (GWRA), which requires the state to meet emissions reductions targets. The targets are measured in million metric tons of CO₂ equivalent (MMTCO_e). The law requires a reduction of GHGs emissions to 1990 levels by 2020 and to 80 percent below 2006 levels by 2050. An interim target established by executive order sets a target of 50 percent of 2006 levels by 2030. These targets were established by the NJDEP with the goal of limiting warming to 1.5C above pre-industrial levels, an amount which would lower but not eliminate risks associated with climate change and is likely to still lead to irreversible environmental impacts, even if net zero emissions are reached¹⁹.

The state met the 2020 reduction goal 11 years early, however, current trends in emissions reduction indicate that the state is not on target to meet either the interim goal or the 2050 goal²⁰. While the overall goal was met, the transportation sector has still not decreased emissions to 1990 levels, the difference in total state emissions was made up by the electricity generation sector, where emissions reductions were substantial, and caused by a shift from coal to natural gas as a fuel source.

i. Susceptibility

New Milford, like every municipality, is susceptible to the negative impacts of climate change. The large number of probable outcomes means that making specific predictions for New Milford is impossible. There are impacts which are known and which do affect the Borough today and will continue to increase in severity over the next centuries.

Sea Level Rise

Melting ice in the polar regions and glaciers as a result of anthropogenic warming is causing sea levels to rise globally. Even if warming is held to 1.5°C, sea levels will continue to rise beyond 2100. Sea level in New Jersey is likely to rise between 0.9 and 2.1 feet by 2050, and could rise by as much as 6.3 feet by 2100. This rise will not directly flood New Milford, but the Borough's position on the estuarine Hackensack River means that it will experience increased risk of severe flooding, especially during storms.

¹⁹ <https://www.ipcc.ch/sr15/chapter/spm/>

²⁰ https://dep.nj.gov/wp-content/uploads/ghg/2022-ghg-inventory-report_final-1.pdf (for most of the prior paragraph)

Extreme Weather

Major tropical cyclones are driven by warm, moist ocean air. Although climate change cannot be explicitly linked to individual storms, the increase in heat in oceans and the atmosphere allows for the formation of large and more destructive storms. These can cause severe flooding, extensive property damage, and significant loss of life.

Higher atmospheric temperatures also alter patterns of precipitation and may encourage the development of stronger and more destructive non-tropical storms. Because of fundamental alterations to the climate and weather patterns of New Jersey, infrastructure designed for a pre-climate change normal may struggle to effectively manage storm events in this century.

Temperatures in the state are already noticeably higher than the past century and are projected to continue to increase. Days with dangerously high heat index are becoming more frequent and pose a health risk to residents of New Milford.

Ecosystem Effects

Climate change is one of the many anthropogenic factors causing the earth's sixth mass extinction. While the urbanized ecosystem of New Milford is already fundamentally altered, and almost all vulnerable species are expatriated from the area, the continued loss of biodiversity has far-reaching impacts with complex and unknown effects. It is reasonable to expect that continued loss of biodiversity will directly impact the Borough at some point.

Other Impacts

The above list of potential impacts is not an exhaustive list. The implications of a fundamental alteration to the climate cannot be fully known, and while most models suggest a range of likely outcomes, the possibility of even more severe and harmful impacts cannot be excluded.

ii. Mitigation

The 2014 Master Plan includes a Sustainability Plan Element. The element introduces the following goals:

1. Improve the environment
2. Reduce energy usage
3. Incorporate health and wellness consideration in planning actions
4. Encourage transportation choices
5. Support local employment, services, and shopping
6. Improve overall quality of life

The specific actions that result from these goals in the sustainability element are limited to obtaining a Sustainable New Jersey certification, which involves the completion of several required and elective actions. The Borough also considers revisions to the zoning ordinance, the most promising of which is the reduction in parking requirements. Overall, the plan element fails to identify important

sustainability criteria related to GHG emissions and offers limited direct actions for the Borough to take. While receiving a Sustainable New Jersey certification may be an important step for communicating the Borough’s approach to sustainability, the actions required can generally be considered preliminary organizational steps and involve studies to understand GHG emissions from the Borough. Furthermore, one of the direct-action steps recommended by this plan element, the imposition of environmental impact statements for larger scale developments, may actually impede the Borough from reducing GHG emissions, as larger buildings are generally more efficient, and dense development is associated with reduced residential carbon footprints.

Personal vehicle use is a major driver of GHG emissions. In New Milford approximately 82 percent of workers over 16 drove to work, with around 70 percent driving alone²¹. About 11 percent took public transit, and 1.4 percent walked or biked. Shifting commute and non-commute trips from personal vehicles to other modes, as well as making possible the adoption of electric vehicles in place of ICE vehicles, is a critical component of reducing GHG emissions from New Milford. Modeshift can be encouraged through either “push” or “pull” mechanisms. Push mechanisms include steps like reducing parking requirements, a resident without a dedicated parking spot may choose to not own a car, or make trip-by-trip decisions to not use their car. Pull decisions increase the appeal of other sustainable modes. Many of the actions which fall into this category, such as improvements to public transit service and ease of use, are not available to the municipality. However, improvements to bike and pedestrian infrastructure, making these modes safer and more comfortable, is an important example of a “pull” action. Mode choice, and by extension, transportation GHG emissions are closely related with a region’s underlying land use. Adequately addressing the production of GHG emissions in New Milford is unlikely without changes to land use patterns.

GHG emissions are also produced through the heating of buildings. Most homes in New Milford use fossil fuels for heat²². Fuel usage, and therefore cost and GHG emissions, can be reduced by home efficiency improvements. Additionally, conversion to high-efficiency electric appliances where fossil sources were previously used, such as stoves, water heaters, and furnaces, can eliminate direct emissions from the home, although electricity sourced from plants that burn fossil fuels still has an environmental impact. The sustainability plan element notes the Borough’s encouragement for developers to meet LEED standards. The Borough should also develop plans to address inefficiency and provide for electrification of existing buildings in the Borough.

²¹ 2020 5-Yr ACS

²² 2020 5-yr ACS

6. Air

Air quality throughout the state of New Jersey is measured by the NJDEP at sites across the state. The measurements from these sites are used to ensure compliance with the Clean Air Act, as well as providing critical public health information to persons in the state. Air pollutant levels can vary significantly day to day, as they are strongly influenced by prevailing weather conditions. Air pollutants also travel readily across state lines, causing events in states west of New Jersey (due to prevailing wind currents) to have a significant impact on air quality in the state, and in New Milford.

The Clean Air Act, passed in 1970, set federal standards for air quality throughout the country. This act was amended in 1990 to focus on four areas of pollution, acid rain, urban air pollution, toxic air emissions, and stratospheric ozone depletion. The act directs the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQs) for six common pollutants, ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, fine particulates, and lead). States are required to develop State Implementation Plans (SIPs) and to attain and maintain these federal standards. In New Jersey, the Bureau of Air Monitoring (BAM) fulfills these obligations as part of the Division of Air Quality (DAQ) of the NJDEP.

A network of sensors across the state monitors air quality. Because gasses and particulates that impact air quality tend to mix evenly through the atmosphere over time, and are subject to regional wind and weather conditions, the air monitoring network relies on a relatively low number of sites, which are sufficient to obtain a general picture of air quality across the state's regions. However, it is important to note that localized variations in air quality exist and proximity to point sources, as well as dense concentrations of non-point sources (such as a residence near a busy road) may result in noticeably degraded air quality, and significant impact on the environment and on health outcomes.

The nearest air quality monitoring stations to New Milford are shown in the table below, including which criteria pollutants they measure, if those measurements are taken continuously or require manual assessment of filters, and their approximate distance to the Borough.

**Environmental Resource Inventory
Borough of New Milford**

NJDEP Air Monitoring Station	Continuous						Filter				Distance (mi)
	O ₃	PM 2.5	NO ₂	SO ₂	CO	Meteorological	PM 2.5	PM 10	PM coarse	Lead	
Leonia	X*										4.7
Fort Lee Near Road		X	X		X	X					6.3
Paterson							X				7.8
Union City High School							X				11.4
Jersey City			X	X	X						14.2
Jersey City Firehouse		X					X	X			14.6
Ramapo	X*										15.0
Newark Firehouse	X	X	X	X	X	X	X	X	X	X	17.3
Bayonne	X		X	X		X					19.2

*Only active seasonally during the summer when ozone concentrations are higher

Legend:

O₃: Ozone

NO₂: Nitrogen dioxide

SO₂: Sulfur Dioxide

CO: Carbon monoxide

PM2.5: fine inhalable particles (or “particulate matter”), with diameters that are generally 2.5 micrometers and smaller

PM10: inhalable particles, with diameters that are generally 10 micrometers and smaller

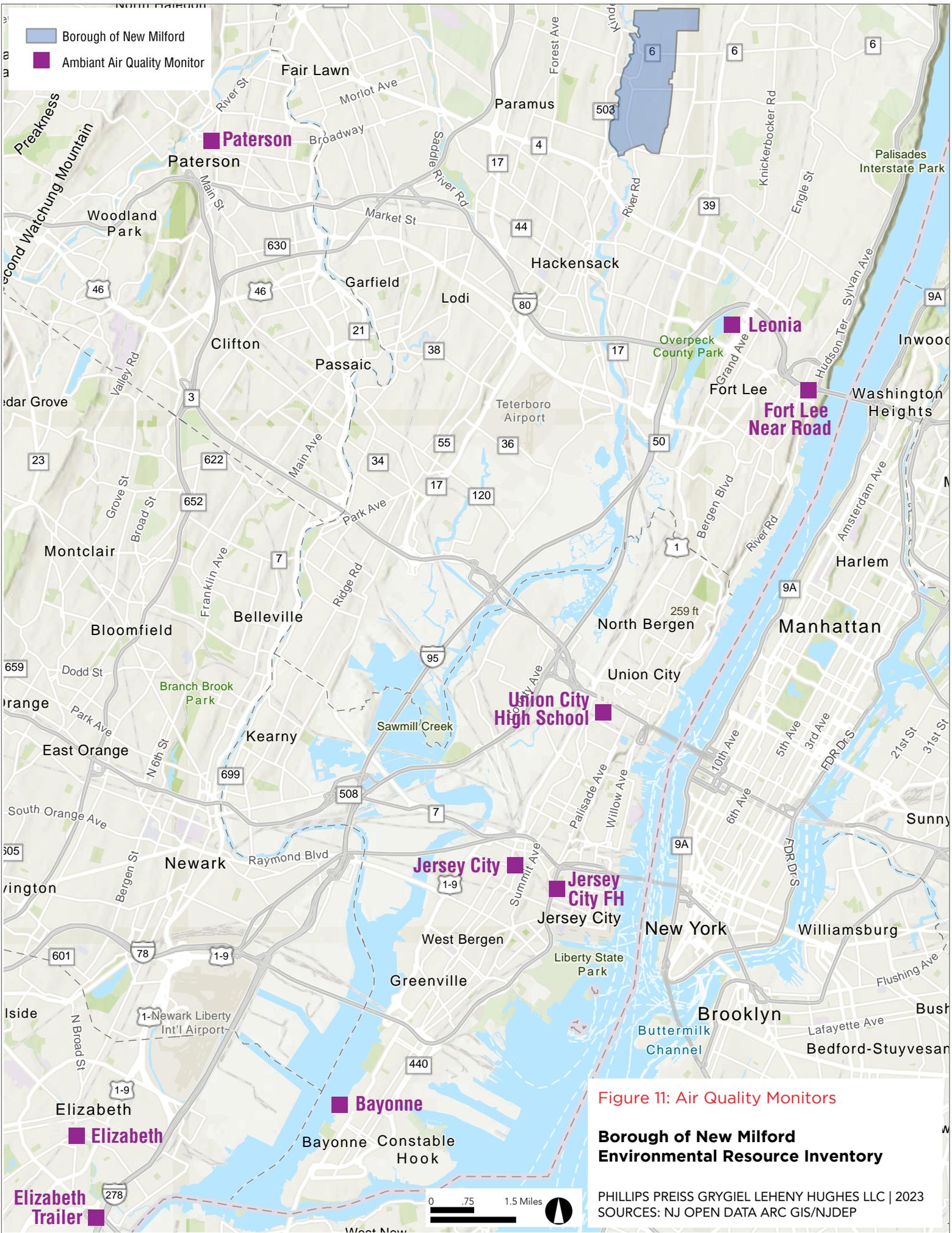


Figure 11: Air Quality Monitors

**Borough of New Milford
Environmental Resource Inventory**

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SOURCES: NJ OPEN DATA ARC GIS/NJDEP

a. Ozone

Ozone (O₃) is a gaseous molecule that is comprised of three bonded oxygen atoms (oxygen molecules have two bonded oxygen molecules) and occurs naturally in the upper atmosphere. At these altitudes ozone plays an important role in protecting the planet's surface (and its inhabitants) from harmful and cancer-causing ultraviolet radiation. When it occurs at ground level ozone can have serious adverse health effects, and negatively impact plant growth and crop yields. '

Ground-level ozone is not directly emitted as a pollutant, but instead is produced through chemical reactions that involve nitrous oxide (NO_x), volatile organic compounds (VOCs) and require sunlight and heat as reaction catalysts. Nitrous oxide and VOCs are considered precursor pollutants whose emissions must be controlled to decrease ground-level concentrations of ozone. NO_x is produced during combustion, particularly of fossil fuels, and VOCs are widely emitted by vehicles, chemical plants, factories, and even consumer products. Because of the requisite catalysts, ozone concentrations are highest in the summer, and concentrations are more widely measured during the summer.

Since regulations of ground level ozone concentrations were first promulgated by the EPA in 1971, the allowable concentration has been reduced as the adverse health impacts of higher concentrations of ozone have become known. The standard was most recently lowered, to a maximum 8-hour average concentration of 0.070 ppm, in 2016. The state of New Jersey is considered to be in nonattainment of the standard if any air quality monitors across the state exceed this value. In 2021 the state was in nonattainment of the NAAQS for ozone on 13 days.

The closest ozone monitoring station to New Milford is the Leonia station. In 2021 this station recorded a 1-hour maximum concentration of 0.103 ppm. The highest 8-hour average was 0.084 ppm, and the 4th-highest daily maximum was 0.076 ppm. These values are above the NAAQS, and measurements from this station contributed to nonattainment on 8 of the 13 nonattainment days in 2013.

Over the past two and a half decades the state has observed a decrease in ground-level ozone concentrations²³.

b. Sulfur Dioxide

Sulfur Dioxide (SO₂) is a heavy, colorless gas with a strong odor. It is readily soluble in water, where it forms sulfuric acid. SO₂ is produced when fuels containing sulfur, such as coal, oil, and gasoline, are burned. In 2017 in New Jersey, most SO₂ emissions were generated at point sources, particularly at electricity generation stations which burn fossil fuels. Additionally, about 20 percent of SO₂ emissions were from on-road mobile sources.

²³ <https://www.nj.gov/dep/airmon/pdf/2021-nj-aq-report.pdf> (whole section and all following air pollutants unless otherwise noted)

SO₂ is soluble in water, and when it dissolves it produces sulfuric acid. Because of this property, it produces irritation of mucus membranes, and can cause swelling and shortness of breath in high enough concentrations. Sulfuric acid is also produced in the atmosphere from SO₂ emissions and when it falls with precipitation it is known as acid rain, which causes significant harm to the environment. This rain acidifies waterbodies, jeopardizing aquatic populations, damages forests and cropland, and can even cause damage to structures.

NAAQS for SO₂ require a 1-hour average below 75 ppb as a primary standard (which is intended to protect the health of vulnerable populations), and a 3-hour average below 0.5 ppm (500 ppb) as a secondary standard (which is intended to protect a more generalized public welfare). State air quality standards (NJAAQS) additionally require 24-hour averages of 0.14 ppm and 0.1 ppm (primary and secondary, respectively) and 12-month averages of 0.03 ppm and 0.02 ppm (primary and secondary, respectively).

The closest monitoring station to New Milford which measures SO₂ concentrations is in Jersey City, however, in 2021 the site was not operational for the first five months of the year. The next closest site was in Newark. In 2021 the highest 24-hour average value recorded at the Jersey City site was 3.2 ppb, and at Newark was 0.9 ppb. The highest 1-hour average concentration at these sites was 7.2 and 8.5 ppb, respectively.

Statewide, SO₂ concentrations have been decreasing, and are below established standards.

c. Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas which is formed when the carbon in fuels is subject to incomplete combustion. Most carbon monoxide is produced by ICE (internal combustion engine) vehicles, however, any combustion process involving carbon produces CO, including gas stoves, generators, furnaces, and forest fires. CO is usually dispersed in the atmosphere, and it is rare to find elevated concentrations outside. However, interior combustion can readily lead to elevated CO levels without proper ventilation. Breathing in CO interferes with the body's ability to transport oxygen, and can cause headaches, nausea, memory lapses, and in higher concentrations can result in unconsciousness and death. Because CO is colorless and odorless, CO detectors are an important tool for the monitoring of CO levels in residences. NAAQS for CO are set for 1-hour and 8-hour averages, at 35 and 9 ppm respectively. These values are not to be exceeded more than once in any calendar year.

The nearest monitoring station to New Milford which measures CO is in Fort Lee. In 2021 the station recorded a maximum 1-hour average of 1.9 ppm and a maximum 8-hour average of 1.6 ppm. All sites in New Jersey which record CO were significantly below the NAAQs in 2021. The statewide trend since 1990 is decreasing concentrations of CO, and the last violation of the 8-hour NAAQS was in 1994.

d. Nitrogen Dioxide

Nitrogen dioxide (NO₂) is a reddish-brown highly reactive gas that is formed in the atmosphere from the oxidation of nitric oxide (NO). NO₂ is used as an indicator gas for the range of pollutants known as nitrogen oxides (NO_x), which are formed of nitrogen bonded to a number of oxygen atoms. These gases are emitted during combustion, particularly of fossil fuels, and through industrial processes, such as welding. Because NO is produced by combustion, including combustion of methane (CH₄ or natural gas), it is produced in homes that heat or cook with natural gas or other fossil sources (see Indoor Air Quality below).

In New Jersey, around 45 percent of NO_x emissions are produced by transportation sources (aka ICE vehicles), resulting in peak concentrations during high traffic periods. Because building heating is often provided through fossil fuels, NO_x concentrations also seasonally peak during the winter.

Elevated levels of NO_x present a serious health and environmental hazard. Exposure can aggravate existing respiratory conditions, and, over the long-term cause permanent damage to the lungs. NO_x also causes haze, reduces visibility, reacts to form ozone and particulate matter, and can disrupt the nitrogen cycle. When NO₂ reacts with water and oxygen it forms nitric acid, a component of acid rain, a significant disrupter of ecosystems.

The National Ambient Air Quality Standards (NAAQS) for NO₂ promulgated in 2010 allow a maximum of 100 ppb over a 1-hour average, and prior NAAQs limit concentrations to 53 ppb as an annual average. State level standards use a 12-month running average and permit a maximum of 0.05 ppm (which is equivalent to 50 ppb).

The closest monitoring station to New Milford is located in Fort Lee. In 2021 this site recorded a 1-hour average daily maximum of 75 ppb, with a 98th percentile 1-hour average of 54 ppb. The daily maximum was the second highest of NO₂ monitoring sites in the state. The annual mean for the site was 15 ppb. Statewide the NAAQS has not been violated since standards were implemented. The overall trend statewide is of decreasing NO₂ concentrations.

e. Particulate Matter

Unlike other pollutants subject to NAAQS which have specific chemical formulas (such as SO₂), particulate matter is a complex mixture of organic and inorganic compounds and cannot be described by a simple chemical formula. Particulate matter may be either solid or liquid, and its small size, generally up to 70 microns in diameter, allows particles to remain suspended in the atmosphere for extended periods and emulate the behavior of a gaseous pollutant.

Because of the diversity of components of particulate matter, it is categorized by size, rather than by its constituent parts, although distinct components can have different impacts on human health and the environment. Particulate matter with a diameter of 2.5 microns or less is considered “fine particulate matter” and is referred to as PM_{2.5}. Particulate matter with diameter of 10 microns or less is “inhalable

particulate matter” and is referred to as PM10. “Total suspended particulate” (TSP) refers to all suspended particulates. Particles can be naturally occurring, or anthropogenic in origin; windblown dust, sea salt, and pollen are naturally occurring particulate matter, though their abundant presence in the atmosphere can be altered by anthropogenic activities. Combustion of fossil fuels creates particulate matter directly, and indirectly, when the gaseous emissions react in the atmosphere to form additional particulate matter.

Fine particles (PM2.5) are a serious health concern. Their small size allows them to penetrate deep into the lungs, and even cross into the bloodstream. As a result of exposure, a person can experience heart or lung disease, decrease in lung function, heart attacks, and death. PM10 particulate matter is less dangerous because it is prevented from directly interacting with the bloodstream, but it remains inhalable, and can cause respiratory symptoms. People with preexisting conditions (such as asthma) experience elevated risk from particulate matter pollution. Particulate matter also impacts ecosystem functions, both through sunlight-obscuring haze, and through direct impacts on flora and fauna.

The NAAQS for particulate matter have both annual average limits and 24-hour limits. Concentrations are measured in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). For PM2.5 annual average primary and secondary standards are $12 \mu\text{g}/\text{m}^3$ and $15 \mu\text{g}/\text{m}^3$ respectively. The standard for a 24-hour average for PM2.5 is $35 \mu\text{g}/\text{m}^3$ and for PM10 is $150 \mu\text{g}/\text{m}^3$.

The closest PM2.5 monitoring station to New Milford is in Fort Lee, and the closest monitoring station which records PM10 is in Jersey City. The monitoring station at Fort Lee operates continuously, and the Jersey City site is a filter monitor. The annual average for PM2.5 in Fort Lee was $8.33 \mu\text{g}/\text{m}^3$, and the highest 24-hour average at the site was $49.9 \mu\text{g}/\text{m}^3$. The 98th percentile for 24-hours at the site was $23.4 \mu\text{g}/\text{m}^3$. In Jersey City, 59 samples were taken in 2021, and the annual average for PM10 was $16.7 \mu\text{g}/\text{m}^3$, and the highest 24-hour average was $41 \mu\text{g}/\text{m}^3$.

Overall, statewide concentrations of particulate matter have declined over the past two decades.

f. Lead

Lead (Pb) is a heavy, dull metal used extensively throughout history, including in paint and gasoline. Lead is extremely toxic. There is no safe level of lead exposure. Lead interferes with the nervous system, and therefore the developing brains of children are more vulnerable to the health impacts of lead, which causes serious and life-long effects, even after exposure ceases, including learning disabilities, kidney failure, and heart disease.

Lead as a gasoline additive was phased out in the 1970s, except in some aviation fuels, which remain the largest source of lead emissions in New Jersey. Nationwide since the 1980s there has been a 99% decrease in average lead air concentration. NAAQS promulgated in 2008 limit lead concentrations to a 3-month rolling average of $0.15 \mu\text{g}/\text{m}^3$.

The nearest monitoring site to New Milford is located in Newark. In 2021 the maximum recorded 3-month average concentration was 0.003 $\mu\text{g}/\text{m}^3$. 3-month rolling average lead concentrations in New Jersey have not exceeded 0.004 $\mu\text{g}/\text{m}^3$ since 2012.

g. Radon

Radon gas is a colorless, odorless, tasteless gas that can only be detected by specialized equipment. It is a radioactive substance and is therefore harmful to the health of humans; the EPA estimates that it is the cause of approximately 21,000 incidents of lung cancer per year, and is the number one cause of lung cancer among non-smokers²⁴. Radon gas naturally occurs in the environment and is produced by the decay of uranium in soils. Radon gas can seep through small openings in foundations and accumulate in structures. Municipalities in New Jersey are assigned a risk tier for indoor radon problems by the NJDEP, based on testing data reported to the department. Tier assignments are based on the percentage of homes with radon concentrations greater than or equal to 4 pCi/L; Tier 1 requires twenty-five percent or more of tested homes to reach this threshold, Tier 2, five to twenty-five percent, and Tier 3, less than 5 percent. However, it is important to note that there is no safe level of exposure to radon gas.

The NJDEP has a sample size of 2,358 radon gas tests from New Milford. Of these, 35 have concentrations above the 4 pCi/L, which is approximately 1.48%²⁵. Therefore, New Milford is designated a Tier 3 community for radon gas risk.

h. Indoor Air Quality

Changes to air quality generally occur at a regional level, gases produced at point sources typically mix in the atmosphere and are dispersed across the region based on prevailing wind and weather conditions. However, modern homes are often equipped with a variety of means to produce harmful gases, which may, without proper ventilation, build up in the home, similar to the radon gas discussed above. Any combustion activity will produce harmful by-products, including nitrogen dioxide and carbon monoxide. In addition, the use of fossil fuels in home heating and cooking contribute significantly to climate change (around 10% of US carbon emissions are produced by homes and businesses burning fossil fuels on site²⁶). Childhood exposure to reduced indoor air quality associated with the combustion of fossil fuels indoors increases lifetime health risks²⁷.

New Milford does not have data related to indoor air pollutants produced through combustion. However, there are general steps that can be taken to improve indoor air quality and reduce health risks.

²⁴ <https://www.epa.gov/radon/what-epas-action-level-radon-and-what-does-it-mean>

²⁵ <https://www.nj.gov/dep/rpp/radon/download/rtar2015.pdf>

²⁶ <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#commercial-and-residential>

²⁷ <https://ww2.arb.ca.gov/resources/documents/indoor-air-pollution-cooking>

**Environmental Resource Inventory
Borough of New Milford**

These can include replacement of appliances that require burning fossil fuels indoors with electric equivalents, ensuring proper ventilation when combustion occurs indoors (such as a proper range hood, or opening windows and running fans while cooking), and ensuring that smoke and carbon monoxide detectors are properly installed and regularly tested.

7. Flora and Fauna

Healthy populations of flora and fauna require adequate habitat to live. While habitat needs vary among species, a limited number of species are able to adapt to live in a heavily modified built environment. As a result of anthropogenic factors, the global ecosystem is undergoing its sixth mass extinction event.

Habitat loss is a significant driver of extinction and depopulation throughout the country, and in New Jersey.²⁸ Extinction and depopulation of flora and fauna can also occur in areas where habitats are sufficiently fragmented. Fragmented habitats can interrupt territorial behaviors, cause increased predation and other threats as species move from fragment to fragment, and disrupt feeding and mating patterns. Furthermore, some species require “deep” habitats, where the flora and fauna are distinct from those at the edge of habitat fragments, and these species effectively suffer habitat loss even as patches of a particular ecosystem remains.

Habitats are also at risk due to the ongoing modification of the climate as a result of anthropogenic GHG emissions. Climate shifts alter the suitable range of habitats for species resulting in localized losses and migration. These migratory events can result in invasive species outcompeting native species, introduction of novel pathogens, both to flora, fauna, and to human populations, and the collapse of normal ecosystems services.

Aquatic habitats require certain amounts of nutrients to sustain their populations, however, excess nutrients can result in the loss of biodiversity and severe population reductions. As amounts of nitrogen and phosphorus increase in water bodies due to anthropogenic sources, overgrowth of algae can cause deoxygenation of the water and increased turbidity, resulting in the loss of flora and fauna. These changes can also result in negative outcomes for other uses of water bodies, increased algae blooms can impede recreational use of water bodies, cause illness, and degrade water quality.

The NJDEP Landscape Project 3.3 ranks patches of habitat using a numeric system (0 through 5) for the purpose identifying habitat which may be suitable for threatened and endangered species. Habitat identified and rank 3 through 5 are considered environmentally significant by the NJDEP.

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

²⁸ <https://dep.nj.gov/wp-content/uploads/sab/sab-critical-habitat-2013.pdf>

- Rank 0 Species-specific patches that do not contain any species occurrences and do not meet any habitat-specific suitability requirements.

In New Milford, the areas along the Borough's waterways contain areas of habitat suitable for Bald Eagles (*Haliaeetus leucocephalus*) (Rank 1 Habitat), as well as areas where sightings of Bald Eagles have occurred (Rank 4 Habitat)²⁹. At the federal level this species was reclassified from endangered to threatened in 1995, and de-listed as a threatened species in 2007. However, it remains on the endangered species list in New Jersey, and still enjoys other federal protections resulting from the Bald and Golden Eagle Protection Act.

The total area of the Borough which is classified as Rank 1 Habitat is 144 acres, and a further 85 acres is classified as Rank 4 Habitat. Together these constitute the 15.5% of the Borough's area which is considered critical habitat.

Because New Milford is a developed suburban municipality, the floral composition of the environment is managed, and not subject to natural processes that modify floral composition, including normal succession and population dynamics. This means that the habitat value, ecosystem health, sustainability, and associated benefits of New Milford's floral resources, particularly, by the nature of their long maturation periods, forest resources, must be carefully planned. To this end, New Milford has adopted a Community Forestry Management Plan, which covers the period from January 2019 to December 2023. The Plan's mission statement is "To ensure the health, safety, and sustainability of the Borough of New Milford's community shade tree resources for the environmental, economic, and aesthetic benefits provided to residents and visitors."³⁰ The plan identifies four goals to accomplish this mission, a tree inventory and assessment, identification of hazard trees, plant new appropriate trees, and maintain existing trees in good health.

As a result of work on the first goal, the composition of public trees in New Milford is known. Overall, 3,536 trees from 52 species were inventoried. The most common species is the Norway Maple; New Milford has around 946 trees, or around 27% of the inventory. This species is native to Europe and Western Asia and is considered an invasive species. This tree is being phased out of the Borough, and is not currently being planted. The next most common species were Bradford Pear trees, 19% of the inventory, and Red Maple, 11% of the inventory. Of the inventoried trees, only around 8% of trees were conifers, which includes 13% of tree species inventoried, the remaining 92% of trees were deciduous.

The Plan does note some steps to improve the environmental impact of New Milford's forest resources, notably the planned reduction in Norway Maples mentioned above, but lacks specifics with regards to the ecosystem services, or other benefits expected of the forest resources. Forest resources, even in developed areas can provide habitat, reduce heat island effects, improve air quality, and slow and trap rainwater. In addition to the ecosystem benefits, trees are an important component of the built

²⁹ <https://njdep.maps.arcgis.com/apps/webappviewer/index.html?id=0e6a44098c524ed99bf739953cb4d4c7>

³⁰ New Milford Community Forest Management Plan

**Environmental Resource Inventory
Borough of New Milford**

environment, and can provide indirect benefits to other Borough goals, including climate change adaptation and mitigation efforts. Tree shading can impact the heating and cooling needs of nearby structures and paired with thoughtful site design can reduce energy use. Providing shading from UV radiation and heat exposure is an important component of encouraging active transportation uses and providing comfortable waiting environments for public transportation. Explicit incorporation of these, and other goals into future forest plans may enable the forest resources of New Milford to be more coordinated with, and supportive of, the broader Borough environment.

Description of Wildlife	Date Seen	Location
2 whitetailed deer, running through a yard	9/10/2023	DEO Middle School Marion Avenue New Milford, NJ. 07646
Red tail hawk gliding to sit on a branch	2/26/2023	DEO Middle School Marion Avenue New Milford, NJ. 07646
Blue jay sitting on a tree	2/27/2023	VFW Hall Madison Ave. New Milford, NJ

Wildlife Description (Species, number, behaviors, etc.)	Date	Location
Canada Goose, Killdeer, Belted Kingfisher, Great Crested Flycatcher, European Starling, American Robin, Cedar Waxwing, House Sparrow, Chipping Sparrow	5/22/19	NMHS
Canada Goose, Mourning Dove, Killdeer, Great Blue Heron, Black-crowned Night-Heron (2), Red-tailed Hawk, Red-bellied Woodpecker, Hairy Woodpecker, Warbling Vireo, Blue Jay, European Starling, Gray Catbird, American Robin, House Sparrow, Chipping Sparrow, Baltimore Oriole, Brown-headed Cowbird, Common Grackle	5/25/22	NMHS
Ruby-throated Hummingbird got trapped in a classroom, but was aided in an escape out the window	5/26/22	NMHS
Canada Goose, Mallard, Mourning Dove, Killdeer, Double-crested Cormorant, Red-tailed Hawk, Warbling Vireo, Barn Swallow, Carolina Wren, European Starling, Gray Catbird, American Robin, Cedar Waxwing, House Sparrow, Baltimore Oriole, Common Grackle, Northern Cardinal	6/8/22	NMHS
Canada Goose, Mourning Dove, Blue Jay, American Crow, White-breasted Nuthatch, European Starling, American Robin, House Sparrow, Dark-eyed Junco, Common Grackle	10/19	NMHS
Canada Goose, Mallard, Mourning Dove, Double-crested Cormorant, Belted Kingfisher, Hairy Woodpecker, Blue Jay, Common Raven, Tufted Titmouse, White-breasted Nuthatch, European Starling, American Robin, House Sparrow, American Goldfinch, Dark-eyed Junco, White-throated Sparrow	11/2	NMHS
Mourning Dove, Ring-billed Gull, Blue Jay, European Starling	11/16	NMHS
Blue Jay, Common Raven, European Starling, Dark-eyed Junco	12/14	NMHS
Canada Goose, Blue Jay, Common Raven, European Starling, House Sparrow, Dark-eyed Junco	1/11	NMHS

Critical Habitat Areas

Rank 1: Species-specific patches that meet habitat-specific suitability requirements such as minimum size criteria for endangered, threatened, or priority wildlife species, but that do not intersect with any confirmed occurrences of such species.

Rank 4: Species-specific patches with one or more occurrences of State Endangered species.

 New Milford Border

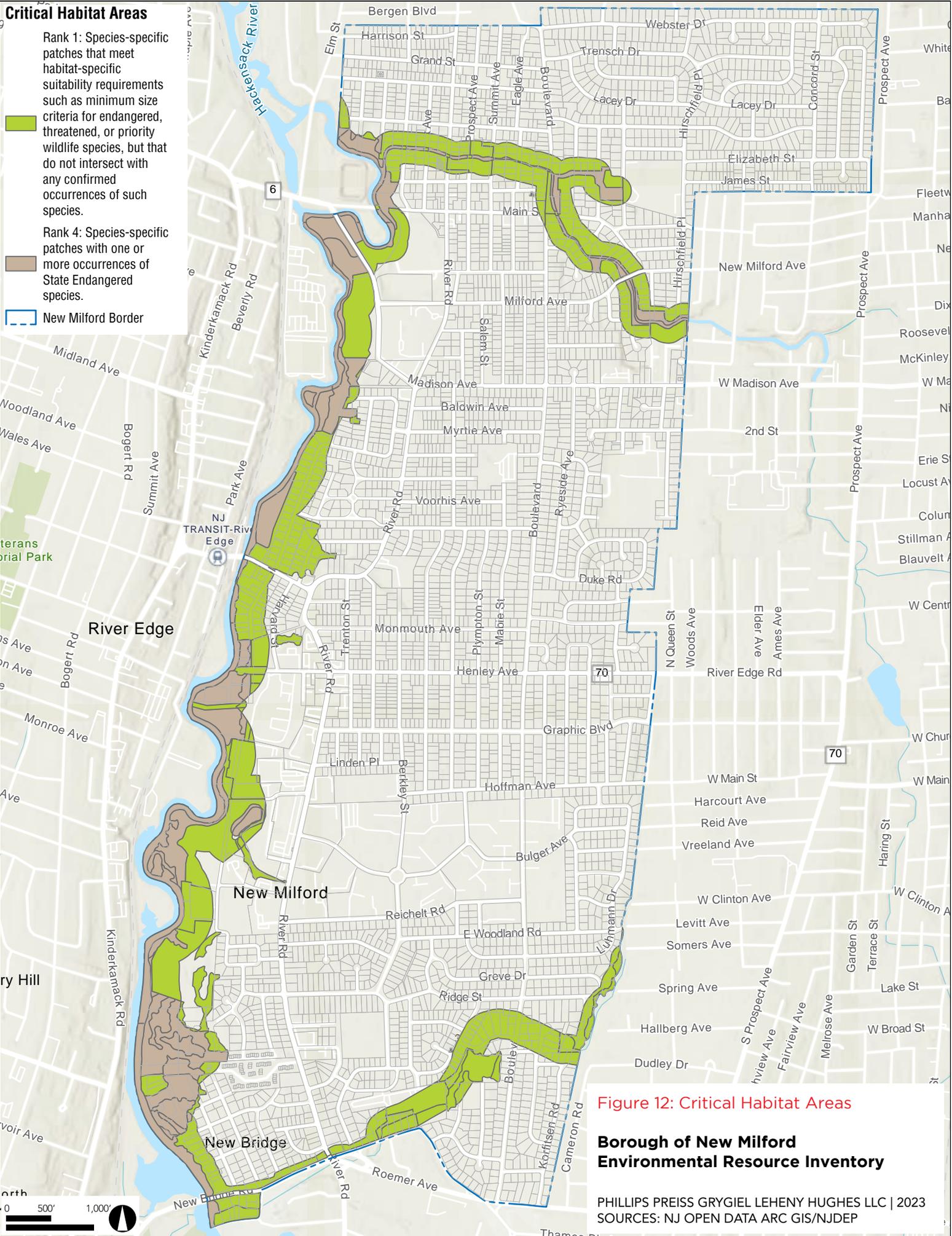


Figure 12: Critical Habitat Areas

Borough of New Milford Environmental Resource Inventory

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 SOURCES: NJ OPEN DATA ARC GIS/NJDEP



8. Land Use

In terms of land use characteristics, New Milford is primarily residential in character, but is also developed with a mix of other land uses. These include multiple commercial areas and scattered businesses, various community facilities and parks and open space areas. While most of the Borough's residential areas are comprised of single-family homes, there is a significant amount of multifamily residential development in New Milford. Two-family homes also exist in some locations.

Since 1986, the NJDEP has mapped land use within the state using digital orthophotography and Land Use/Land Cover (LU/LC) data sets. Areas are delineated using color infrared images. This data is produced at semi-regular intervals, allowing for changes in land use over time to be observed. However, the latest update of this data occurred in 2015, resulting in a significant gap in the temporal resolution of this data set. Land use and land cover in this data set is classified using a Modified Anderson System, which uses several broad categories, and then describes increasingly specific subcategories of land use. The top-level categories used by the NJDEP are Urban or Built-Up Land, Agricultural Land, Forestland, Water, Wetlands, Barren Land, and Managed Wetlands³¹.

An overwhelming majority of New Milford (94.7%) is categorized as Urban or Built-Up Land. This category is characterized by intensive land use where the landscape has been altered by human activities. This category includes areas that are designed to mimic other categories of land use, for example, when a recreation area has sufficient tree cover to meet the criteria for the Forestland category, its intended use and anthropogenic origin lead to it being placed in the Urban category.

Other top-level categories present in New Milford include Forestland (1.94%), Water (1.6%), and Wetland (1.3%).

The detailed land use classification by the NJDEP further breaks down the generalized categories. The primary land use in New Milford determined through this method is Medium Density Single Unit Residential, which covers 84 percent of the Borough. High Density or Multiple Dwelling Unit (4.7%) and Commercial/Services (2.9%) are the next most extensive categories of land use.

The 2014 Master Plan Update describes nine types of land use in the Borough;

- Single-Family Residential
- Single-Family Cluster Residential
- Multi-Family Residential
- Commercial
- Professional Office
- Utility
- Open Space
- Farmland Preservation

³¹ <https://www.nj.gov/dep/gis/digidownload/metadata/lulc15/anderson2015.html>

**Environmental Resource Inventory
Borough of New Milford**

- Public Use

The majority of the Borough is designated for Single-Family Residential. Commercial designations are located primarily along River Road, Main Street between Boulevard and River Road, and on Madison Avenue at the Borough's eastern border. The majority of the Borough's open space areas are located adjacent to the Borough's waterways, with significant open space designated along the Hackensack River.

The land use pattern exhibited by the Borough of New Milford is known to encourage high production of GHG emissions, and other harmful particulates, both through primary effects, including inefficient localized fossil fuel-based heating of detached dwelling units (in New Milford only 234 housing units heat with electricity), and secondary effects, such as those caused by high rates of personal vehicle usage (Most New Milford residents drive to work, and most of those drive alone). These land use-derived environmental impacts negatively affect both the local environment and the global climate.

Land Use / Land Cover 2015

TYPE15

- AGRICULTURE
- BARREN LAND
- FOREST
- URBAN
- WATER
- WETLANDS
- New Milford Border

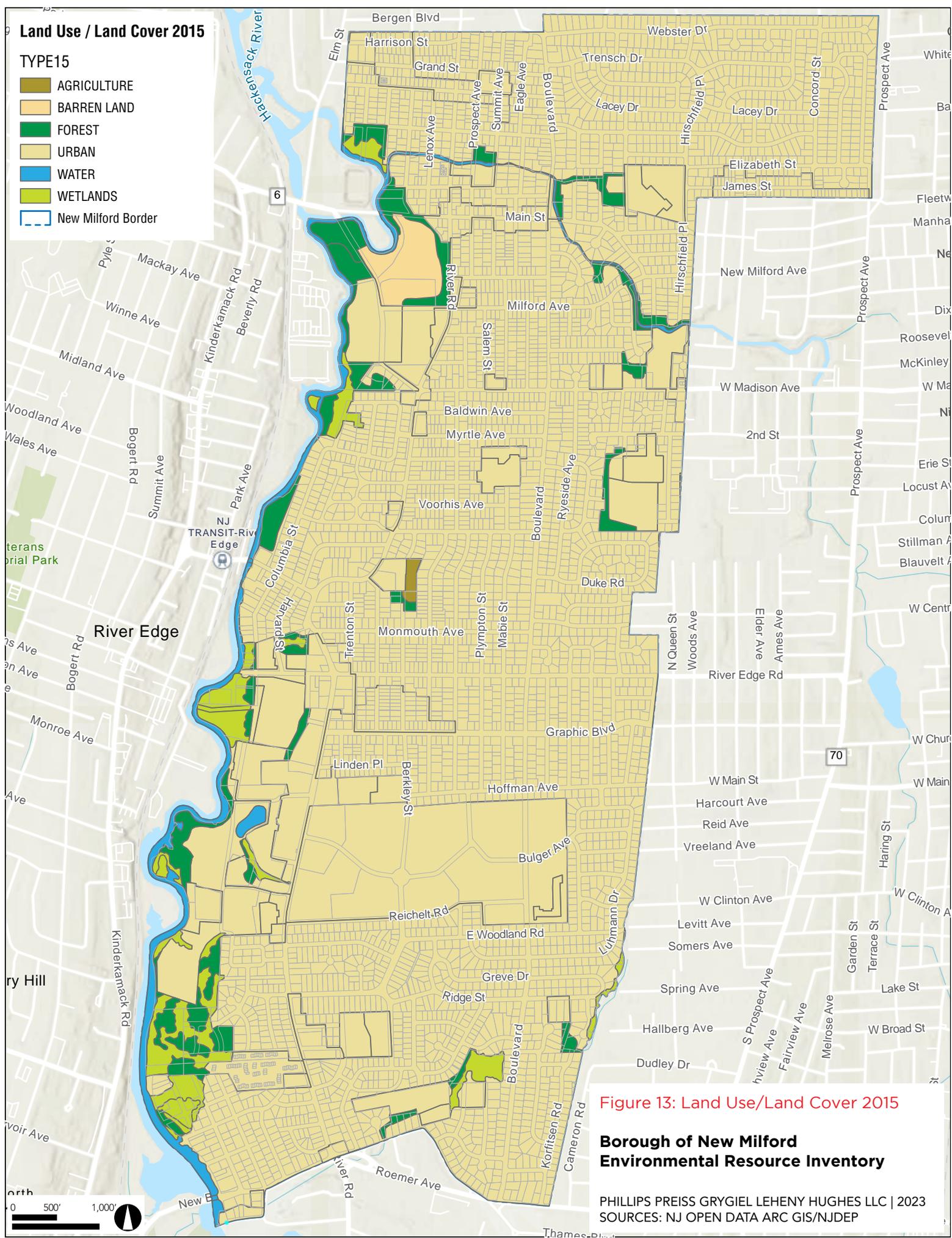


Figure 13: Land Use/Land Cover 2015

Borough of New Milford Environmental Resource Inventory

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SOURCES: NJ OPEN DATA ARC GIS/NJDEP

Land Use / Land Cover 2015

- ALTERED LANDS
- ARTIFICIAL LAKES
- ATHLETIC FIELDS (SCHOOLS)
- BRIDGE OVER WATER
- COMMERCIAL/SERVICES
- CROPLAND AND PASTURELAND
- DECIDUOUS BRUSH/SHRUBLAND
- DECIDUOUS FOREST (10-50% CROWN CLOSURE)
- DECIDUOUS FOREST (>50% CROWN CLOSURE)
- DECIDUOUS SCRUB/SHRUB WETLANDS
- DECIDUOUS WOODED WETLANDS
- OTHER URBAN OR BUILT-UP LAND
- PHRAGMITES DOMINATE COASTAL WETLANDS
- PHRAGMITES DOMINATE INTERIOR WETLANDS
- RECREATIONAL LAND
- RESIDENTIAL, HIGH DENSITY OR MULTIPLE DWELLING
- RESIDENTIAL, SINGLE UNIT, LOW DENSITY
- RESIDENTIAL, SINGLE UNIT, MEDIUM DENSITY
- STREAMS AND CANALS
- TIDAL RIVERS, INLAND BAYS, AND OTHER TIDAL WATERS
- TRANSPORTATION/COMMUNICATION/UTILITIES
- UPLAND RIGHTS-OF-WAY UNDEVELOPED
- WETLAND RIGHTS-OF-WAY
- New Milford Border

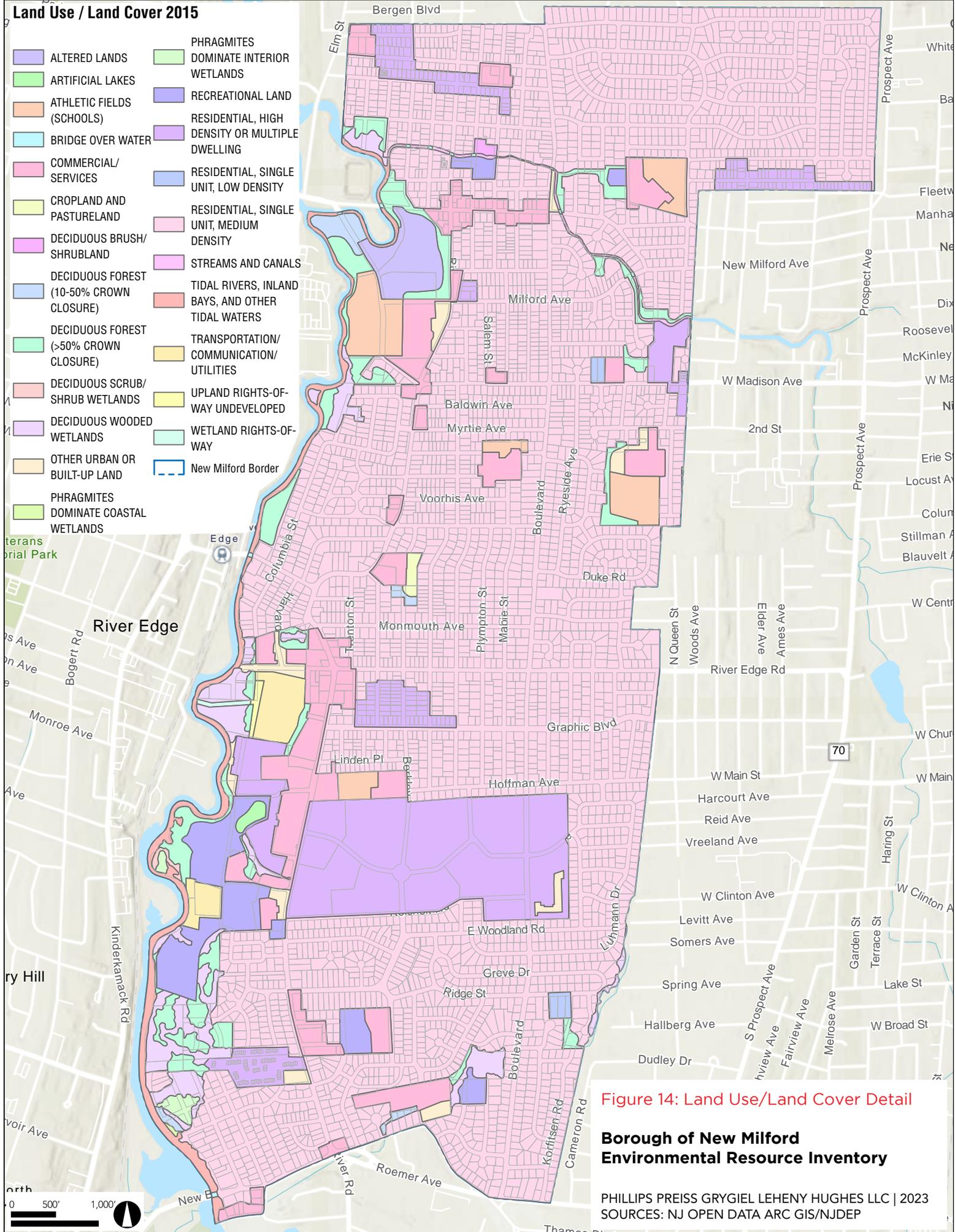


Figure 14: Land Use/Land Cover Detail

**Borough of New Milford
Environmental Resource Inventory**

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SOURCES: NJ OPEN DATA ARC GIS/NJDEP

9. Known Contaminated Sites / Point Source Pollution

The Known Contaminated Sites (KCS) List for New Jersey includes those sites and properties within the state where contamination of soil or groundwater has been confirmed at levels equal to or greater than applicable standards. The KCS list was produced in response to the Brownfield and Contaminated Site remediation act (N.J.S.A. 58:10B-1 et seq.) which required the preparation of a list of sites affected by hazardous substances. Sites included may pursue a range of remedial actions, ranging from simple to highly complex cleanups. Complex contamination at a site may result from a mix of source contaminants, resulting effects to both soil and groundwater.

In 2009 the Site Remediation Reform Act (N.J.S.A. 58:10C-1 et seq.) was enacted to speed up the remediation process. Active KCS are rated with B, C1, C2, C3, or D depending on the severity of the contamination. Sites with documented groundwater contamination may also contain a Classification Exception Area (CEA), an institutional control prohibiting the use of groundwater for a defined period of time.

- B: Remedial level associated with emergency response, simple removal activities of contaminants usually no impact to soil or groundwater.
- C1: Remedial levels are associated with simple sites, one or two contaminants localized to soil and the immediate spill or discharge area.
- C2: Remedial levels are associated with more complicated contaminant discharges such as multiple site spills and discharges, or more than one contaminated, with both soil and groundwater impacted or threatened.
- C3: Remedial levels are associated with highly complex and threatening sites. These sites can have multiple contaminants, some at high concentrations with unknown sources continuing to impact soils, groundwater, and possible surface waters and potable water resources. These sites are dangerous for direct contact with contaminated soils.
- D: Same conditions as C3 except that D levels are also usually designated Federal “Superfund sites”.

New Milford contains seven Known Contaminated Sites. These sites are detailed in the table below, along with their current status, remedial level, and CEA status. Of the sites in the Borough, there are four sites with ongoing CEA status. There is one remedial level D site, located at 330 River Road.

PI NAME	ADDRESS	PI NUMBER	STATUS	LEVEL	CEA STATUS
NEW MILFORD SHELL	720 722 RIVER RD	001369	Active	C2	Ongoing
NEW MILFORD MOBIL	1150 RIVER RD	012750	Active		
DELTA	201 HENLEY AVE	003137	Active - RAP*		Ongoing
NEW MILFORD HS	330 RIVER RD	012922	Active	D	Ongoing
PSE&G TRANSFORMER	70 CANTERBURY LN	720916	Active	B	
1033 RIVER ROAD	1033B 1045 RIVER RD	673872	Active	C2	Ongoing
251 RIVER ROAD	251 RIVER RD	438606	Active	C1	

(PI: Program Interest, CEA: Classification Exception Area, RAP: Remedial Action Permit)

