

5. NATURAL RESOURCES

Natural resources provide many community benefits, both measurable and intangible. Environmental features such as wooded areas and watercourses can create aesthetic appeal which contributes to quality-of-life and strong property values, as well as generating more quantifiable positive impacts such as stormwater management, improved air and water quality, flood mitigation and maintenance of wildlife habitat.

This chapter discusses North Castle's environmental setting and ways to protect and enhance its sensitive natural features. These assets contribute significantly to its residential quality-of-life and to its attraction for visitors and businesses alike. The protection and enhancement of these resources are essential to the preservation of the Town's special community character.

5.1 TOPOGRAPHY

Much of North Castle's development pattern is defined by its topography, which consists mainly of low hills with steep slopes. Topography ranges from a low of approximately 182 feet above sea level to a high of about 758 feet above sea level. Approximately 31% of the Town's land area, or about 2,470 acres, contains steep slopes. Major steeply sloped areas are found near the Town's waterbodies, including the Kensico Reservoir and adjacent water supply lands, as well in low-density residential areas (see Figure 5.1). Some of the Town's highest elevations are in residential areas northwest of Armonk along Whippoorwill Road and east of Byram Lake Reservoir, around Chestnut Ridge Road.

The business areas of Armonk and Banksville are relatively devoid of steep slopes; however, much of North White Plains is characterized by steep hillsides of more than 25%, found

throughout established residential neighborhoods. The hamlet's challenging topography has an impact on its land use and activity. In particular, as Figure 5.2 shows, there are four hills in North White Plains, generally bounded by Lafayette Avenue, McDougal Drive, Palmer Avenue and Overlook Road. This topography creates a series of natural barriers among neighborhoods and businesses along Route 22, the key commercial thoroughfare of the hamlet, hindering both vehicular and pedestrian access.

Generally, development of steep slopes greater than 15% is difficult, though not impossible, due to construction costs and the undesirability of road grades that exceed 10%. In addition, during construction, soil erosion and surface water runoff can increase as a result of clearing vegetation from steep slopes. Slopes of 25% and greater usually present severe restrictions to construction activities. With the exception of North White Plains, most steep slopes in the Town are either undeveloped or are developed with low-density residential uses.

Future development on steep slopes is possible in certain circumstances, with special design considerations and strict monitoring during construction, but such development must comply with North Castle's steep slope law. Section 355-18 of the Town's Zoning Code prohibits disturbance of a steep slope area (25% or greater over a horizontal area measuring at least 25 feet in all directions), hilltop or ridgeline unless a disturbance permit is granted by the Planning Board.

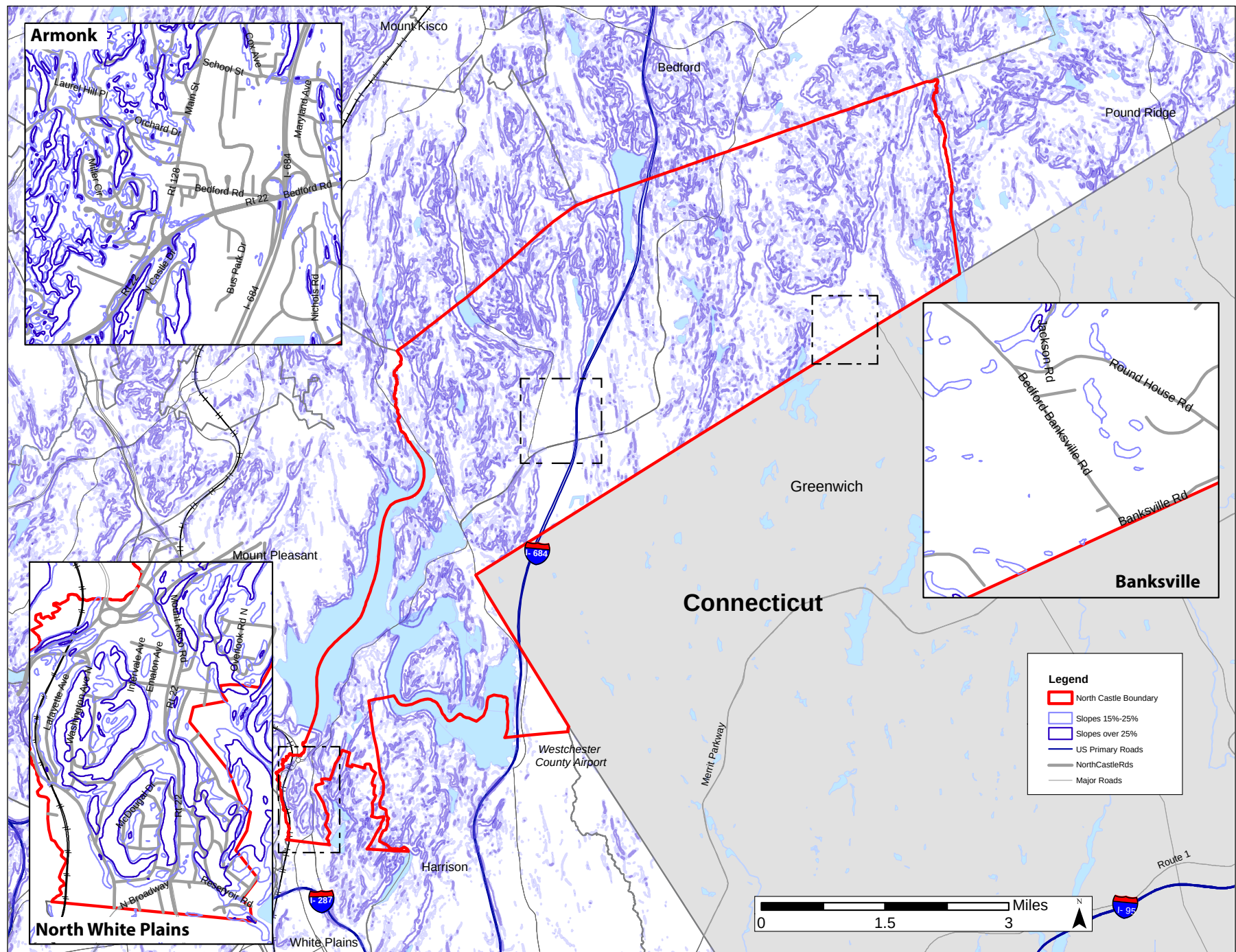


Figure 5.1 Steep Slopes

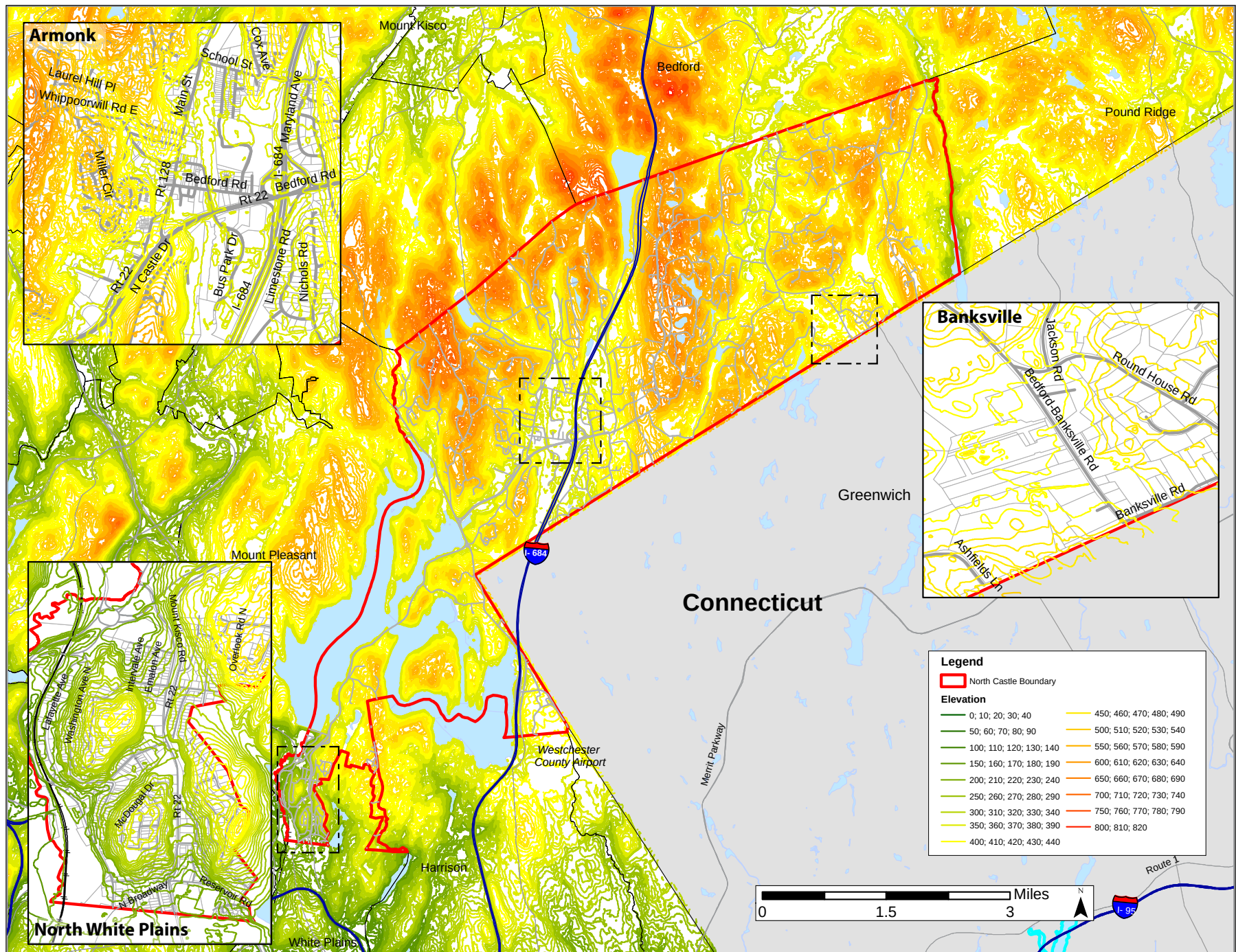


Figure 5.2 Topography

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5.2 FLOODING, WATERCOURSES AND WETLANDS

Watersheds

Water resources – both natural and manmade – also define much of North Castle’s landscape. The Town is located in four major watersheds: the Bronx River Watershed, Inland Long Island Sound Watershed, Croton River Watershed, and Coastal Long Island Sound Watershed (see Figure 5.3). Most of its land area is within the Bronx River and Inland Long Island Sound watersheds, which comprise 31% and 67%, respectively, of the Town. The Coastal Long Island Sound and Croton River watersheds together make up about 1.2% of land area.

As noted in Chapter 2, there are several recent studies on watershed issues within North Castle and its surrounding area, including the Byram River Watershed Management Plan, the Mianus River Upper Watershed Analysis and the Bronx River Watershed Assessment and Management Plan. Among the plans’ overlapping goals are maintaining high water quality by eliminating non-point sources of pollution (i.e. stormwater runoff), improving habitats and encouraging compatible recreation activities. The plans also call for the adoption and enforcement of ordinances that protect natural features and groundwater quality, and recommend that communities maintain and share data to assist in monitoring capacity of water resources, and undertake education and restoration activities to engage the public. This section summarizes recommendations from each plan.

Byram River Watershed Management Plan (2011)

- Support a process for analyzing data by establishing a baseline and continued monitoring;
- Diminish non-point sources of pollution, including runoff from road de-icing practices; and

- Promote sustainable land-use practices that contribute to ecological health and protect wildlife and landscapes while enhancing the area’s natural resources by encouraging compatible recreational uses.

Mianus River Upper Watershed Analysis (2016)

- Require preparation of water recharge budgets and analysis of off-site drawdown impacts for any proposed larger new wells;
- Distinguish between water withdrawal and consumption when considering new projects;
- Ensure that residential parcels that are developed with individual wells and septic systems meet minimum parcel size criteria to support wells and adequately dilute septic system wastewater discharges;
- Adopt aquifer overlay protection ordinances to provide measures of groundwater quality protection, and ensure they provide protection for bedrock aquifers and for the more limited acreages of surficial geologic aquifers;
- In considering proposed development, undertake additional off-site test and review activities to ensure reliability and persistence of stream flows;
- Reduce road salting practices; and
- Support capacity monitoring or stream gauging measures to further aid the protection of the Mianus River aquifers and the flow of the Mianus River through the Mianus River Gorge.

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Bronx River Watershed Assessment and Management Plan (2007)

- Improve water quality by eliminating illicit discharges, increasing litter prevention and trash cleanup efforts, and reducing sources of sediment loading;
- Enhance in-stream and riparian (waterfront) habitat along the river and its tributaries to sustain a diversity of aquatic insect and fish communities;
- Incorporate the historical aspects of the river and the Bronx River Parkway into overall watershed education and restoration planning;
- Advance local awareness of the Bronx River through pollution prevention education and watershed restoration outreach activities;
- Promote recreational activities like fishing, trail walking, birdwatching and canoeing/kayaking by improving water quality, riparian habitat and passage along the mainstem from the Kensico Reservoir to the Bronx;
- Mitigate negative impacts of stormwater runoff on hydrology and water quality through stormwater retrofits, flood prevention and pervious area restoration;
- Provide information needed to evaluate flood management, habitat and recreational benefits of existing impoundments when determining pond dredging and wetland creation potential;
- Encourage intermunicipal coordination in managing water quality and habitat issues in the Bronx River watershed through the Bronx River Watershed Coalition;

- Identify specific actions to help the County and municipalities meet federal, state and regional regulatory and policy criteria; and
- Integrate water resource activities with public health, regional transportation and greenway planning, and redevelopment projects.

Flooding

All of North Castle's major water resources, as well as portions of Armonk and Banksville, are located within areas of moderate flooding (see Figure 5.4). The Federal Emergency Management Agency (FEMA) has classified these areas as part of the 100-year flood zone. FEMA produces these floodplain maps in order to implement its National Flood Insurance Program (NFIP), which allows property owners in participating communities to purchase flood insurance in exchange for state and community floodplain management regulations that reduce future potential flood damage. If a community adopts and enforces a floodplain management ordinance for new construction in floodplains, the federal government will make insurance available in the community to mitigate flood losses.

The primary source of flooding in North Castle is Wampus Brook. Flooding of the brook has caused property damage in Wampus Brook Park, increased the potential for future flooding at the Hergenhan Recreation Center (the Town's primary emergency shelter) and caused flooding of the sewer plant access road. Other localized areas of known flooding include Virginia Road near Lafayette Avenue, Clove Road and Kaysal Court near the Bronx River, and part of the Public Works yard near Town Hall.

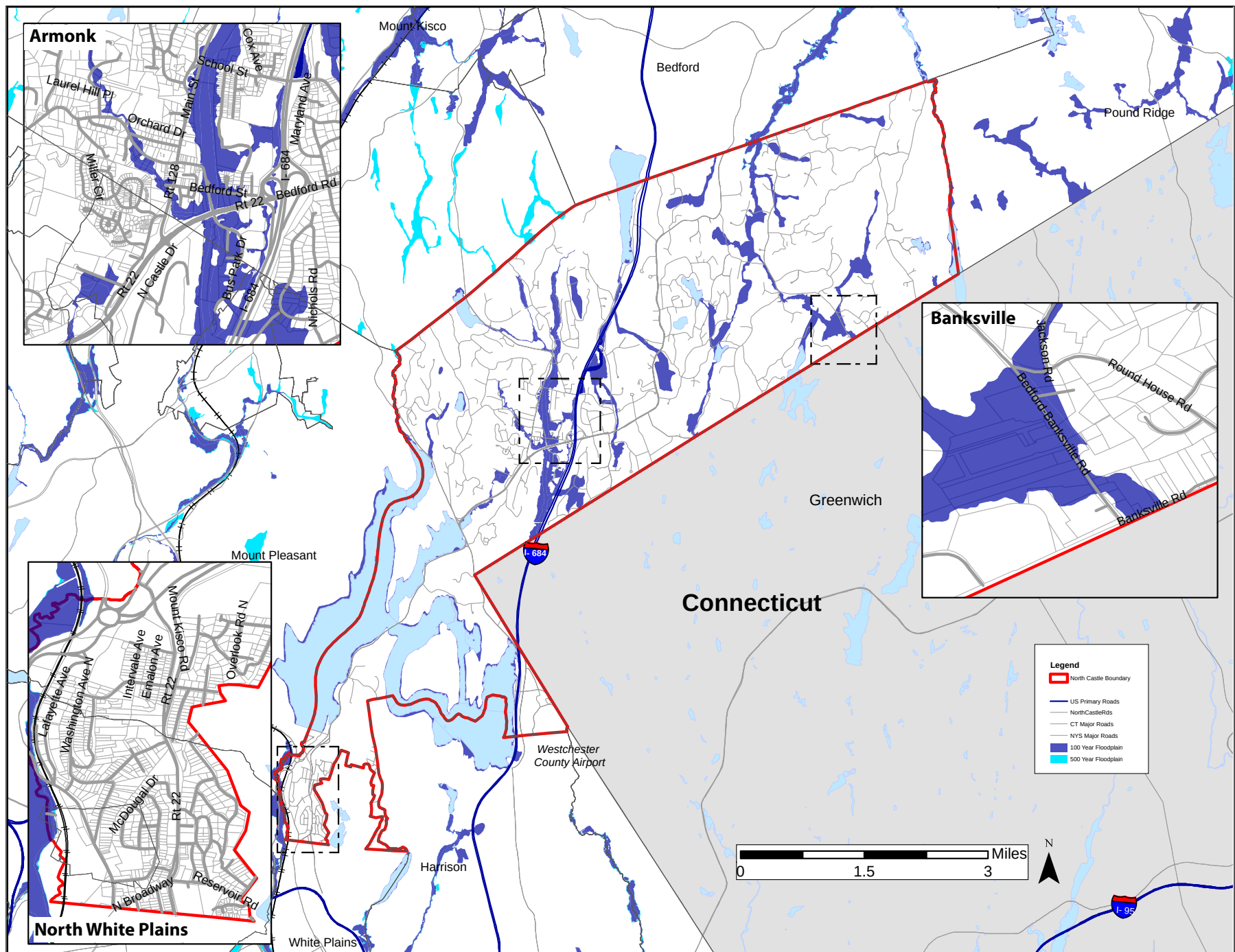


Figure 5.4 Floodplains

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Chapter 177 of the Town Code establishes standards for construction within areas of special flood hazard, which are defined as the land in the floodplain subject to a 1% or greater chance of flooding in any given year (commonly referred to as the base floodplain or 100-year floodplain).

Wetlands

Wetlands act as natural storage basins for floodwaters and aid in groundwater recharge; they also provide wildlife habitat and contribute to natural and scenic beauty. There are three levels of wetland recognition: local, state and national.

Section 340 of the Town Code defines wetlands as “those areas that have a predominance of hydric soils and/or are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.” This definition encompasses wetlands designated by the New York State Department of Environmental Conservation (NYSDEC), and watercourses and waterbodies. Based on the *Soil Survey of Putnam and Westchester Counties*, published by the U.S. Department of Agriculture’s Natural Resources Conservation Service, the Town has about 2,023 acres of mapped hydric soils. Not all hydric soils are wetlands, and the survey is not meant to replace detailed site planning.

The Town’s wetlands regulations control construction-related activities within 100 feet of a wetland, waterbody or watercourse, unless there is an area of slope in excess of 25%, in which case the buffer area is expanded to 150 feet or all of the steeply sloped area (whichever is less).

At a State level, wetlands over 12.4 acres in size are mapped and regulated by the NYSDEC. A total of 71 of these areas are distributed throughout North Castle, comprising 897 acres.

Smaller wetlands have been identified in the Town by the National Wetland Inventory (NWI), a non-regulatory mapping system prepared by the U.S. Fish and Wildlife Service. NWI-mapped wetlands total about 2,229 acres, including freshwater ponds, swamps, marshes, lakes and rivers.

5.3 SOILS

The physical properties of soils have a direct impact on development, based on their ability to absorb stormwater runoff, filter out pollutants carried by runoff, support structures and sustain plant and animal life. Other key characteristics include the rate of water percolation, stability and erosion potential. Considering the engineering properties of soils present on a site is an integral part of site design. Figure 5.5 shows the general pattern of soils in the Town, based on the following hydrologic group definitions:

- **A** – High infiltration rate, low runoff potential when thoroughly wet; very deep, well-drained to excessively drained; sands or gravelly sands; high rate of water transmission.
- **B** – Moderate infiltration rate, moderate runoff potential when thoroughly wet; moderately deep or deep; moderately well-drained to well-drained; moderately fine to moderately coarse; moderate rate of water transmission.

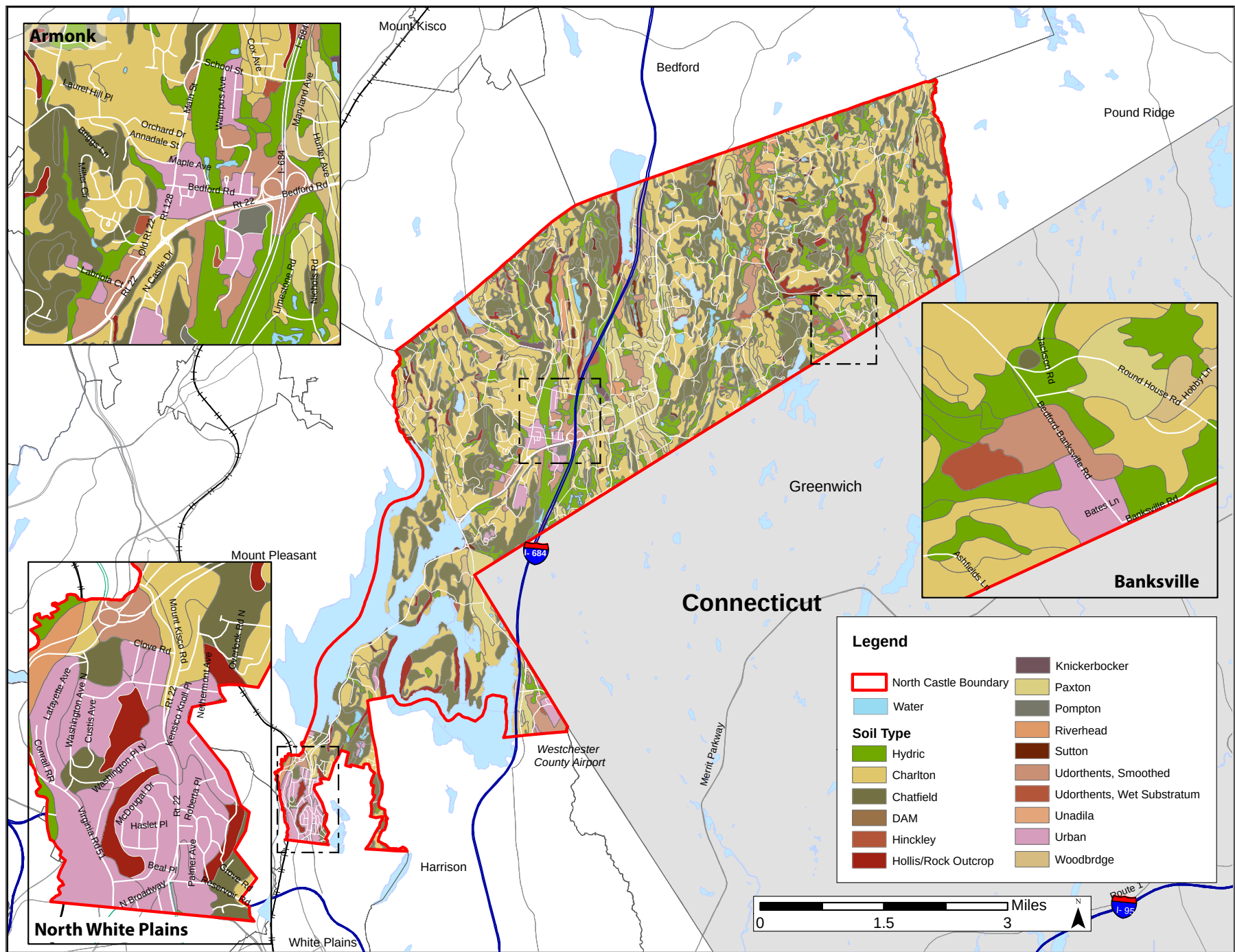


Figure 5.5 Soils

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- **C** – Slow infiltration rate, slow runoff potential when thoroughly wet; has layer that impedes downward movement of water; moderately fine to fine; slow rate of water transmission.
- **D** – Very slow infiltration rate, high runoff potential when thoroughly wet; has permanent high water table; claypan or clay layer at or near the surface, or shallow over nearly impervious layer; clayey soil that has high shrink-swell potential; very slow rate of water transmission.

As illustrated in Figure 5.5, the predominant soil types in North Castle are Charlton (hydrologic group B) and Chatfield (group B/C), moderately drained soils with a moderate-to-slow infiltration rate. Portions of hydric soils surrounding waterbodies have very slow infiltration rate and greater runoff potential, with implications for stormwater management.

5.4 STORMWATER MANAGEMENT AND DRAINAGE

Land development often eliminates natural features that moderate stormwater runoff and exposes soil to erosion. Runoff also carries soil and other pollutants into streams, lakes, rivers and estuaries. In severe storms, bank erosion, flooding, road washouts and flooded basements are a direct result of uncontrolled stormwater runoff.

New York State requires urbanized communities, including the Town, to establish Phase II stormwater management programs to control stormwater on developed sites. This requirement means that the quantity, rate and quality of runoff should not change significantly between pre- and post-development.

The State's Phase II regulations are limited to areas over one acre, but the Town has enacted a more stringent regulation, requiring a Stormwater Pollution Prevention Plan (SWPPP) for development activities involving at least 5,000 square feet.

A leading contributor to stormwater runoff is impervious surface, or any material that prevents infiltration of water into the soil. Roads, rooftops, parking lots, driveways, sidewalks and other paved areas all fall into this category. As shown in Figure 5.6, about 1,462 acres, or 9% of North Castle's total land area, is covered with impervious surfaces. Some 75% of that amount is coverage from roadways, parking areas and sidewalks, with the other 25% consisting of buildings and structures.

In addition to generating stormwater runoff that can lead to contamination of water bodies and groundwater, large paved areas can also contribute to the "urban heat island" effect, in which a developed area may be significantly warmer than surrounding rural areas due to a prevalence of dark surfaces that absorb more heat. There are several ways that municipalities can reduce impervious coverage, including regulatory changes to control the amount of lot coverage, design of parking areas to incorporate landscaped areas and use of permeable pavements that allow water to infiltrate.

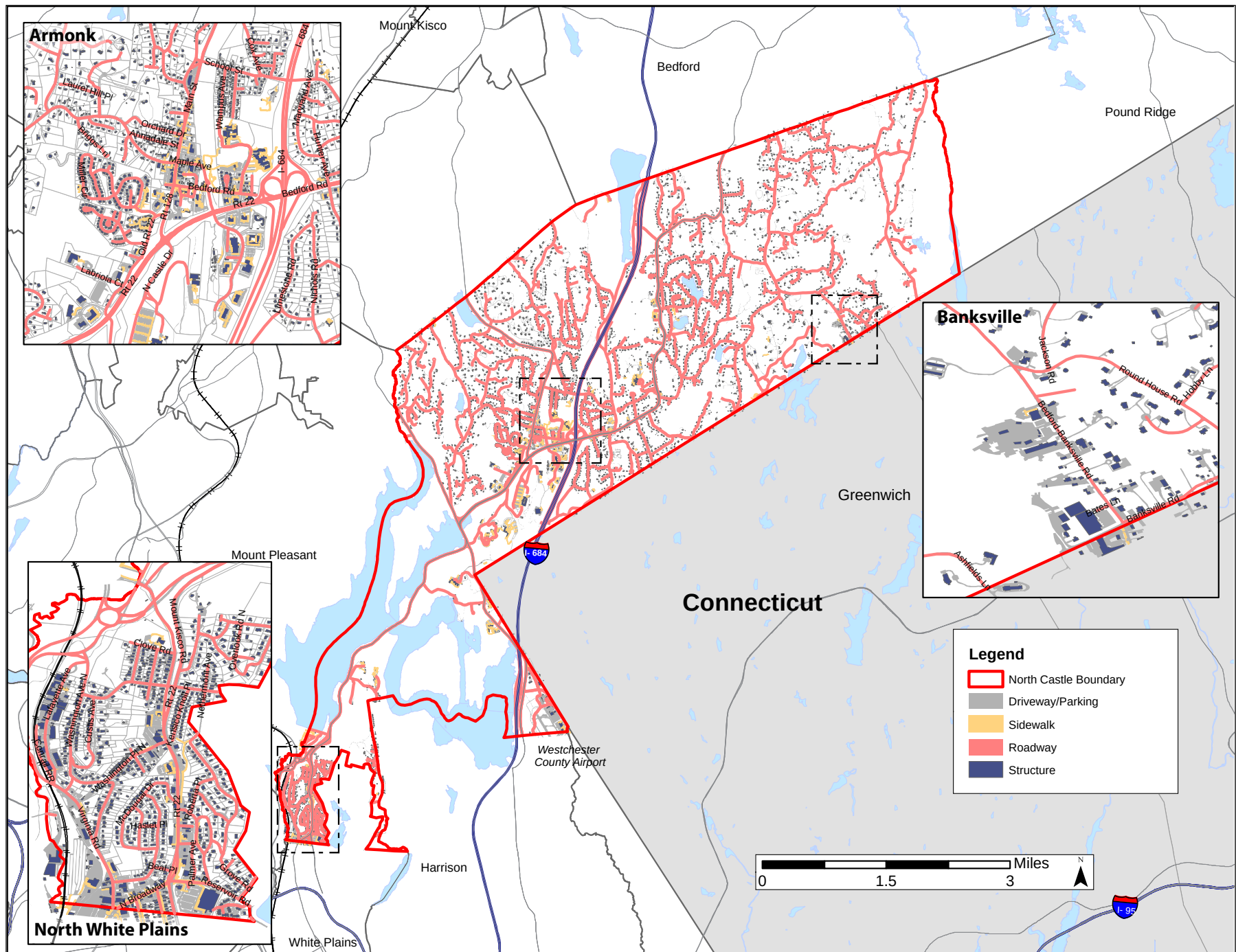


Figure 5.6 Impervious Surfaces

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5.5 CRITICAL ENVIRONMENTAL AREAS

A Critical Environmental Area (CEA) is a State-, County- or locally designated geographic area with exceptional or unique environmental character. Five Westchester County-designated CEAs are in North Castle: the area within the 60 Ldn noise contour of the Westchester County Airport,¹ Byram Lake, the Mianus River/Mianus River Gorge Preserve, County-designated watershed properties, and County and State parklands (Bronx River Parkway Reservation, Cranberry Lake Preserve, Kensico Dam Plaza, Silver Lake Park and Wampus Pond Park).

Development proposed in a CEA requires a more rigorous review than other areas. The potential impact of any Type I or Unlisted Action on the environmental characteristics of the CEA is a relevant area of environmental concern and must be evaluated under the State Environmental Quality Review Act (SEQRA).

5.6 TREES

Mature trees are an important part of North Castle's community character, provide habitat areas for a variety of wildlife and also play a critical role in stormwater management. In many ways, they can be considered natural green infrastructure.

The Town has adopted ordinances, in Chapter 308 of its Code, to protect trees on public and private land. These regulations require permits for tree removal within a property's regulated setback zone or landscape buffer zone, in wetland areas. Permits are also required for the removal of significant trees, those with a diameter of 24 inches or greater at 4.5 feet. Prior

approval by the town is required for the removal of public street trees. Removal of a tree is permitted by right under actual or ongoing emergency conditions. Tree removal without a required permit can result in fees and other penalties.

5.7 WATER, AIR, NOISE AND LIGHT POLLUTION

Water Quality

Water quality is a major issue for North Castle, as nearly 20% of the Town's land is comprised of water supply uses. The Kensico Reservoir is part of the New York City water supply system, under the jurisdiction of the New York City Department of Environmental Protection (NYCDEP). The Town is one of 12 municipalities that make up the Northern Westchester Watershed Committee (NWWC), which acts as an advisory committee for protection of the New York City Watershed.

All waters in New York are assigned a letter classification denoting their best use. Classifications AA or A are assigned to waters used as a source of drinking water, swimming and other recreation or fishing, while Classification B indicates a best usage for swimming and other recreation. Classification C is for waters supporting fishing, and Classification D is appropriate for fishing, but not for supporting fish propagation. As of 2017, the NYSDEC classified the Kensico, Byram Lake and Mianus Reservoirs as AA. Converse Lake, which extends into portions of Banksville, also was designated AA. The Kensico River Tributaries are classified A and the Byram River (upper and minor tributaries) and Wampus Lake are classified B. The Bronx

¹ According to the Westchester County Airport, Ldn, also known as Day/Night Average Noise Level (DNL), represents the average noise exposure over a 24-hour period as a day-night average sound level. The Federal Aviation Administration (FAA) has developed a metric which integrates the DNL metric to depict noise exposure levels from an aircraft around an airport into noise contours of equal DNL.

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River (upper and tributaries) and Wampus River and its tributaries received a C classification. Chapter 7 discusses the Town's drinking water infrastructure in more detail.

Air Quality

Poor air quality can cause a range of health issues, including respiratory illness and asthma. Air pollution can also cause haze and smog; reduce visibility; damage buildings; and harm water bodies, plants and wildlife. Traffic, which can include impacts on air quality, was cited as a major concern in North White Plains.

Air pollution can stem from point (stationary) sources, such as power plants; area (non-point) sources, or the cumulative impact of small individual sources; mobile sources, such as automobiles; and biogenic sources that occur naturally in vegetation. The most significant sources of carbon monoxide emissions, by far, are single-occupancy vehicles.

A potential source of negative air quality impacts for North Castle is traffic congestion on major roadways, notably I-684 and NYS Route 22. Stop-and-go traffic can create as much as four-to-five times the air pollution as traffic that flows smoothly. Two potential improvements to this situation are 1) the gradual introduction of hybrid and electric vehicles, and 2) capacity improvements to relieve traffic congestion (see Chapter 6). The Westchester County Airport, located partially in the Town, is also a considerable source of air pollution. The Town should continue to work with Westchester County, or a potential future private owner, on air, noise and other impacts from the airport.

In 2007, the Town Board established the Sustainable North Castle Committee. A task force for the Committee drafted an Action Plan for Energy, Transportation and Land Use in 2008. North Castle became a Climate Smart Community in 2009, adopting a pledge to reduce greenhouse gas (GHG) emissions

and prepare for the potential effects of climate change. The Town completed a GHG inventory in 2010 as part of the Mid-Hudson's Regional GHG Inventory. North Castle is also a member of Sustainable Westchester, a consortium of local governments that facilitates effective sustainability initiatives.

Noise Pollution

Noise can be defined as undesirable or unwanted sound that interferes with quality-of-life, and can also cause hearing loss and have an adverse effect on mental health. Environmental noise is considered with regard to several factors, including level – which relates to perceived loudness of a noise – but also its character, duration, time of day and frequency of occurrence.

Chapter 210 of the Town Code regulates activities that may result in adverse noise impacts, including the playing of instruments or bands, outdoor dining and sidewalk cafes, and the operation of tools used in building construction or repair or lawn and garden maintenance.

Light Pollution

Light pollution is excessive or obtrusive artificial light. While it is most often associated with heavily populated areas with significant development, even relatively small amounts in more rural or low-density areas can create problems. Light pollution can generally be grouped into the following categories, although some sources of light may fall into more than one category:

- *Light trespass* occurs when unwanted light enters one's property, such as when a strong light enters the window of one's home from the outside;
- *Over-illumination* is the excessive use of light;

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- *Glare* can range from being blinding to causing temporary visual impairment to producing discomfort;
- *Light clutter* refers to excessive groupings of lights; and
- *Skyglow* is the effect that can be seen over populated areas, and results from the combination of all light sources in an area reflected into the sky.

Adverse effects of light pollution include energy waste, impacts on public health and disruption of plant and animal ecosystems. One of the most effective ways to reduce light pollution is by using full cutoff lighting fixtures that prevent light from shining in unwanted areas and may allow lower wattage lamps to be used. Use of these fixtures should be appropriate to the area of the Town and the level of activity.

5.8 HAZARD MITIGATION

With recent weather events such as Hurricanes Irene and Sandy, there is a major focus in the New York metropolitan region on the need to plan for hazardous events. During both of these weather events – as well during severe storms in March 2010 – North Castle experienced extensive flooding, wind damage and power outages. The most significant impacts were felt during Hurricane Sandy, when 98% of the Town’s residents lost power and more than half of its roads were closed in the immediate aftermath. Full power was not restored for 15 days, and the Town’s water and sewer treatment plants had to operate under generator power for the duration of the outage.

North Castle participates in the Westchester County Hazard Mitigation Plan, adopted in 2015. The plan establishes a set of 17 County-wide mitigation strategies to deal with the potential

impacts of emergency and disaster-related events. For North Castle, the County’s plan identified threats from flooding, severe storms and wildfire as posing the greatest hazard risks. High-priority actions to address these concerns include:

- Supporting non-structural flood hazard mitigation alternatives for at-risk properties within the floodplain;
- Installing interior drainage in the basement of the Hergenhan Recreation Center (the Town’s emergency shelter) to alleviate flooding;
- Installing generators for the H.C. Crittenden Middle School, North Castle Highway Department, North White Plains Community Center and Town Hall Annex;
- Performing a comprehensive flood mitigation evaluation of the Wampus Brook watershed;
- Replacing the School Street culvert at Wampus Brook with a bridge;
- Installing a drainage system to control stormwater at the end of Leatherman Court;
- Trimming trees near Wampus Brook Park and along Route 22;
- Performing stump and tree removal and spillway maintenance to Long Pond Dam; and
- Obtaining a replacement generator for Town Hall.

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5.9 ISSUES AND OPPORTUNITIES

North Castle's existing environmental regulations are doing a good job of protecting the local environment. However, there are some areas where targeted improvements may be made to promote even stronger stewardship of natural resources and support sustainability initiatives.

5.9.1 Stormwater Management

- Explore ways to encourage homeowners to install stormwater management measures on their properties, including education and possible incentives.

5.9.2 Sustainability

- Consider undertaking a comprehensive sustainability plan, working with Sustainable North Castle and building on their efforts, to develop a green action plan, including measures such as:
 - Revising zoning and subdivision regulations to include incentives/provisions for green buildings and infrastructure.
 - Retrofitting municipal facilities to incorporate green building measures.
 - Passing legislation to facilitate green residential projects.
 - Conducting energy audits as needed for Town facilities.
 - Exploring long-term environmental and financial benefits of LED street lighting.

- Provide regulations for residential lighting and revise commercial lighting standards to be in line with Dark Sky recommendations.
- Replacing cars and trucks in the Town's fleet with high-efficiency options.

5.9.3 Hazard Mitigation

- Implement priority action items identified for North Castle in the County's Hazard Mitigation Plan.

5.10 RECOMMENDATIONS

TBD – based on discussion of issues and opportunities and public input.