

## **SECTION 2**

### **EXISTING ENVIRONMENTAL CONDITIONS**

The Town is evaluating alternative water resources and wastewater management solutions. Therefore, establishing existing conditions is important in building a foundation to establish specific needs and guide the alternatives analysis. This section discusses existing conditions in North Reading related to the human and natural environment.

#### **2.1 INFRASTRUCTURE AND HUMAN ENVIRONMENT**

This portion of the report presents the Town's existing conditions related to the built human environment including infrastructure, population trends, land use, historical resources, impervious surfaces and stormwater.

North Reading is home to approximately 15,000 people. The Town has two water treatment plants, three water storage tanks, 80 miles of water mains, 750 fire hydrants and 4,600 water service connections and water meters. There are no municipally owned wastewater treatment plants, except for a small treatment facility located at Town's middle and high school. The Town has one high school, one middle school, and three elementary schools. There are about 90 miles of roads, five neighborhood parks, and four community recreational facilities.

The Town is located in Middlesex County. It is bordered on the north by Andover and North Andover, on the west by Wilmington, on the south by Reading, and on the east by Middleton and Lynnfield. The Town is located 16 miles north west of Boston and is accessible by interstates three major interstates, I-93, I-95, and I-495, and local routes such as Route 62 and 28.

##### **2.1.1 Land Use**

The Town has an area of 13.5 square miles, 13.2 square miles is classified as land. North Reading is described as a generally suburban community and approximately 45 percent of the land in residential use. Approximately 16 percent of the land area in the community is town owned; the largest parcels being the area occupied by the Department of Public Works, cemeteries, Hillview Country Club, Eisenhower Pond Park and large tracts of land surrounding Swan Pond. Table 2-1 presents land use based on the Town's Open Space & Recreation Plan (March 2013). Figure 2-1 depicts the land use as it occurs across the Town. "Other" uses, as depicted in Figure 2-1 included cemeteries, nurseries, brush land, transitional land, junkyards, and mining. As shown, much of residential areas in the Town are low to very low density, scattered evenly throughout town. The wetlands and forests layer include forests, forested wetlands, and non-forested wetlands.

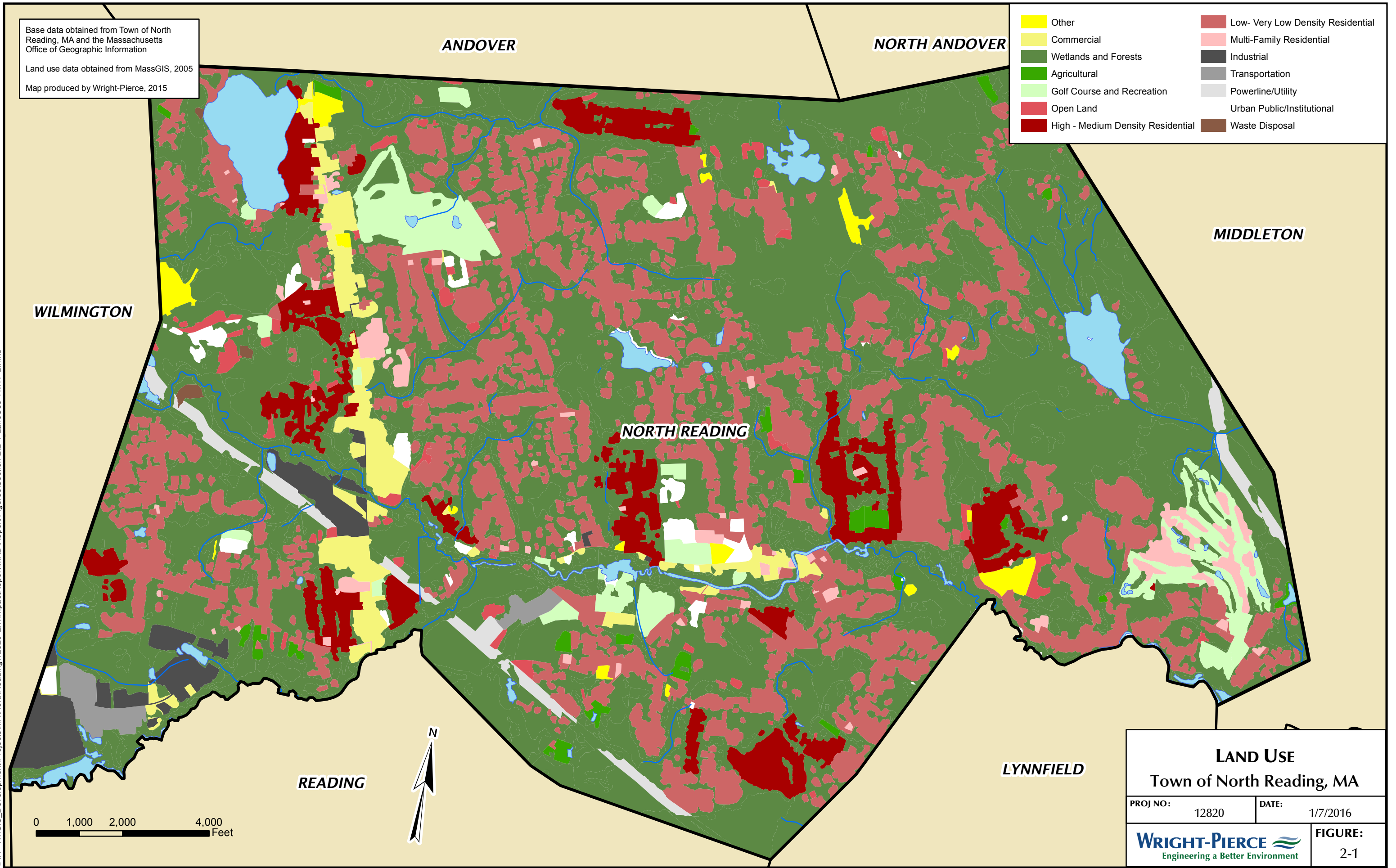
**TABLE 2-1  
LAND USE**

<b>Land Use</b>	<b>Percent of Total</b>
Residential	44.9
Other Public Land	24
Town Owned	16
Other Vacant Land	5.7
Industrial	4.8
Commercial	3.5
Agricultural	0.7
Private Recreation	0.3



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Base data obtained from Town of North Reading, MA and the Massachusetts Office of Geographic Information  
Land use data obtained from MassGIS, 2005  
Map produced by Wright-Pierce, 2015



0 1,000 2,000 4,000  
Feet

Commercial business makes up approximately 8.3 percent of the Town's total land use and is concentrated along Main Street (Route 28) and Park Street (Route 62). Discrete areas along the Interstate 93 corridor are zoned Industrial Office space, specifically Concord Street and Riverpark Drive. Table 2-2 lists the top employers in North Reading as of 2011, including business with more than 100 employees.

**TABLE 2-2  
TOP EMPLOYERS**

<b>Company</b>	<b>Location</b>	<b># of Employees</b>
Teradyne Inc.	River Park Dr.	1,000-4,999
Gerald S Jamgochian & Co.	Park Str.	250-499
Dec Tam Corp.	Concord Str.	100-249
Dynamics Electrical	Concord Str.	100-249
Electrical Dynamics Inc.	Concord Str.	100-249
Kitty's Restaurant and Lounge	Main Str.	100-249
Moynihan Lumber & Hardware	Chestnut Str.	100-249
USPS	Main Str.	100-249
Walmart	Main Str.	100-249
YRC	Concord Str.	100-249

\*MA Executive Office of Labor and Workforce Development (data from Infogroup) as reported in the Town of North Reading Open Space and Recreation Plan (March 2013)

### 2.1.2 Zoning

North Reading's Zoning Bylaws divide the Town into fourteen Zoning Districts, grouped as Residential, Business or Industrial Districts as designated in Table 2-3.

**TABLE 2-3  
ZONING DISTRICTS**

<b>Zoning Districts</b>	<b>Minimum Lot Area Square Feet (sf)</b>	<b>Minimum Continuous Lot Frontage Feet (ft)</b>
Residence A (RA)	40,000	160
Residence R (RR)	40,000	160
Residence B (RB)	20,000	125
Residence C (RC)		
Residence D (RD)	120,000	160
Residence E (RE)	40,000	160
Residence M (RM)	40,000	75
Local Business (LB)	20,000	125

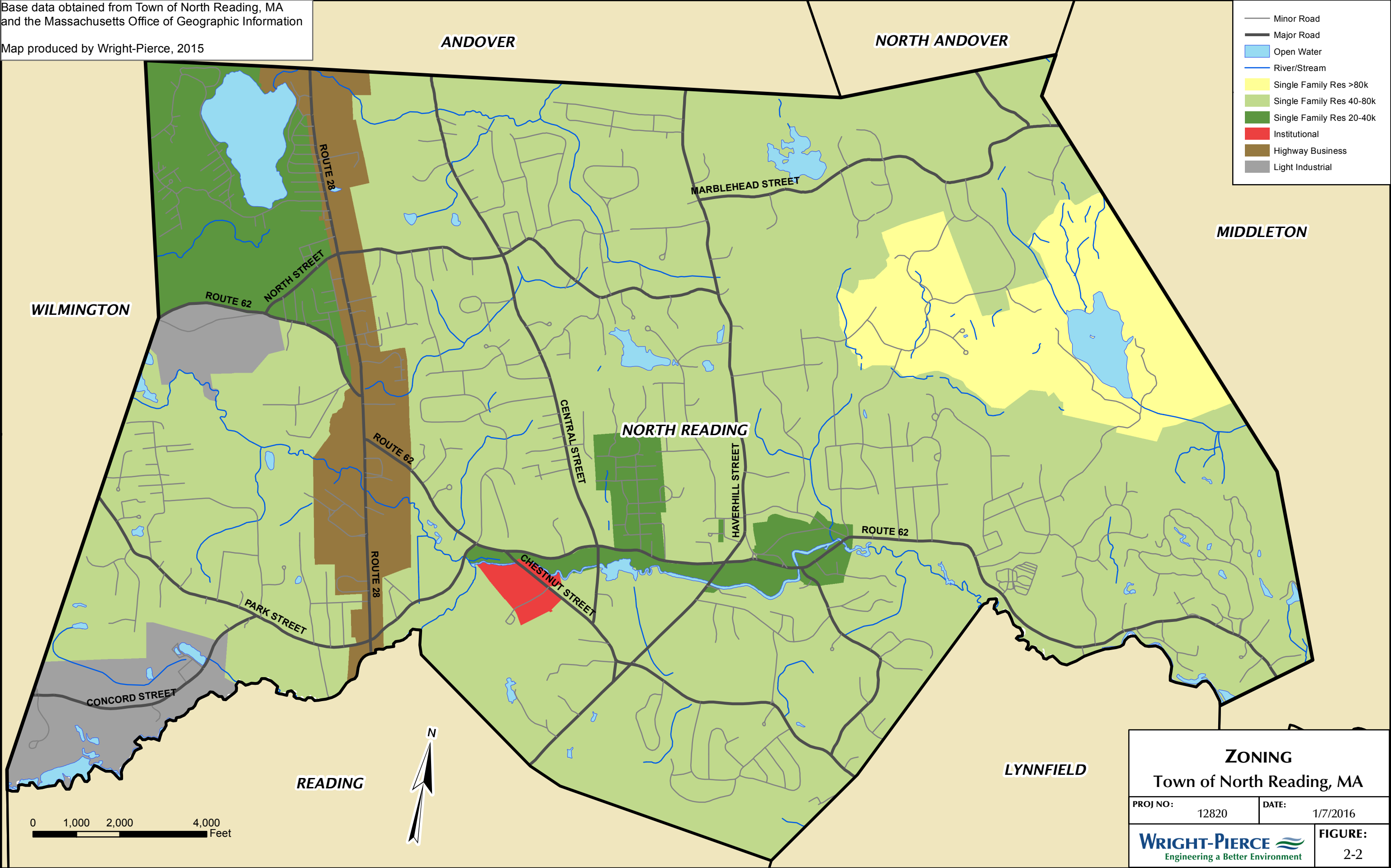
General Business (GB)	20,000	125
Highway Business (HB)	20,000	125
Industrial A (IA)	40,000	160
Industrial B (IB)	40,000	160
Industrial C (IC)	40,000	160
Industrial/Office I/O-1	40,000	200

The vast majority of North Reading is zoned for residential use. All residential districts require a minimum open space of 60 percent of the total lot area. One-Family detached dwellings are permitted in all residential districts with exception of Residence M (RM) District, and permitted in Local Business (LB) District. Apartments containing three or fewer independent units, owned and operated by the North Reading Housing Authority are allowed by special permit only in all residential districts with exception of Residence M (RM) District. Multi-family dwelling containing four or more units are only allowed by special permit in Residence M (RM) District only. Figure 2-2 presents an overview of the Town's zoning designations.

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information

Map produced by Wright-Pierce, 2015

- Minor Road
- Major Road
- Open Water
- River/Stream
- Single Family Res >80k
- Single Family Res 40-80k
- Single Family Res 20-40k
- Institutional
- Highway Business
- Light Industrial



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### **2.1.3 Buildout Analysis**

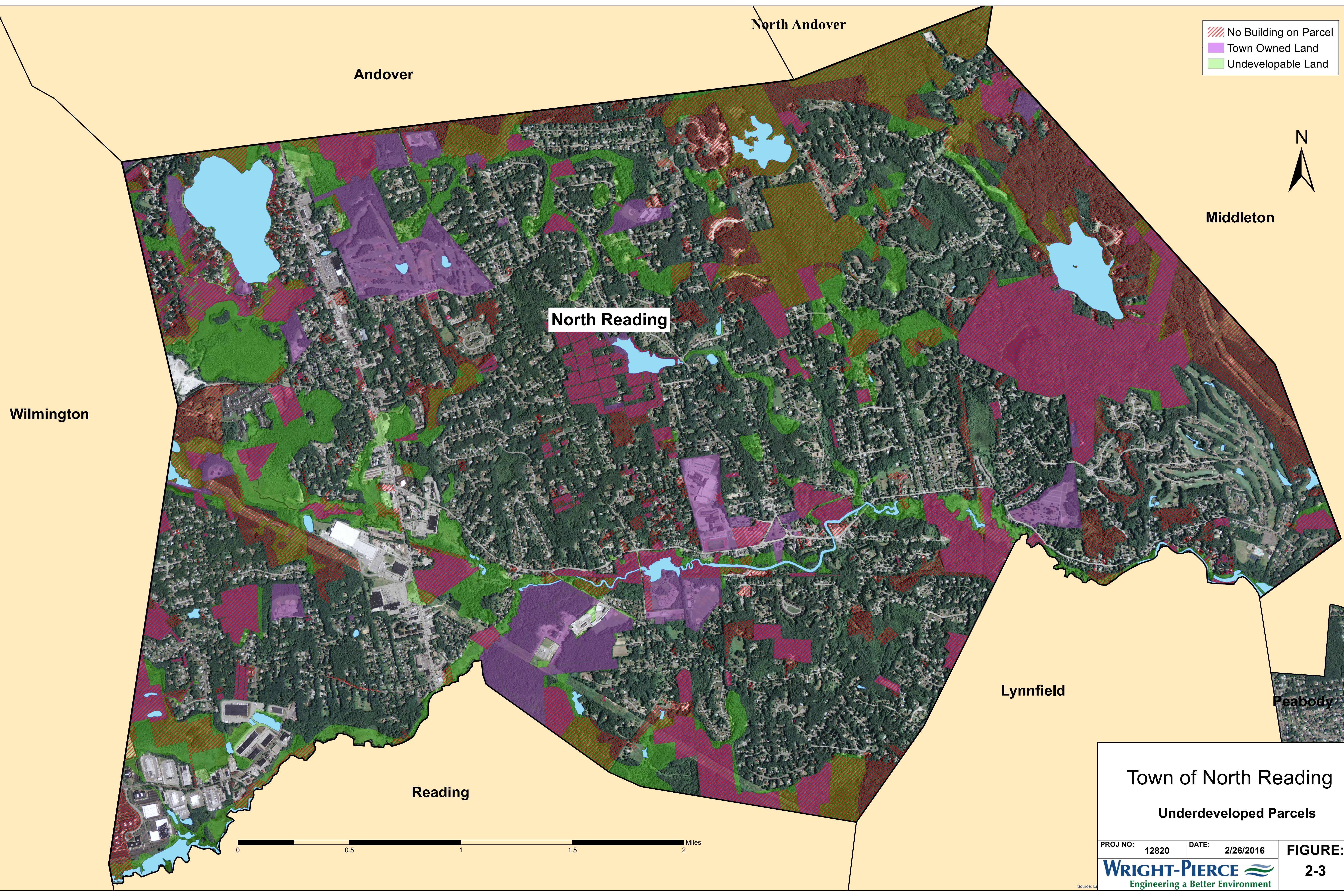
The Water System Master Plan estimated that approximately 1.3 square miles consists of land that could be developed in the future.

Additionally, the 2013 Open Space and Recreation Plan, reported about 232 acres are considered to have development potential. Of those 232 acres, 225 acres are considered potential residential land, while commercial and industrial have the potential for 7 and 12 acres respectively.

Figure 2-3 depicts underdeveloped land in North Reading.



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Town of North Reading  
Underdeveloped Parcels

PROJ NO:	12820	DATE:	2/26/2016	FIGURE:
<b>WRIGHT-PIERCE</b> 				<b>2-3</b>
Engineering a Better Environment				

Source: Esri



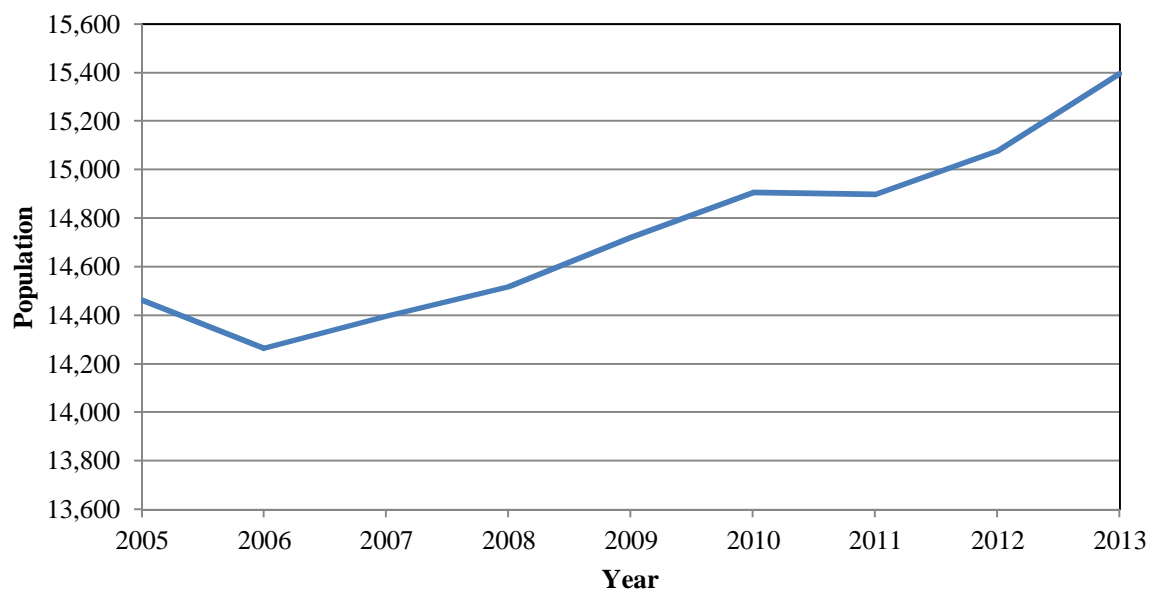
## 2.1.4 Population Demographics

North Reading has seen a moderate population growth with an 8.2 percent increase between 1990 and 2000 and an 8.5 percent increase between 2000 and 2010 based on local census figures. More recent local census data for North Reading is showing growth trends less than historical trends, with a 6.5 percent growth between 2005 and 2013. The US Census Bureau reported the year 2010 population of North Reading to be 14,892 persons. The Town's internal census found the population to track closely with the US Census data at 14,906 persons. The Town's census data is presented in Table 2-4 and Figure 2-4.

**TABLE 2-4**  
**NORTH READING CENSUS DATA**

2005	2006	2007	2008	2009	2010	2011	2012	2013
14,463	14,265	14,396	14,518	14,721	14,906	14,897	15,077	15,397

**FIGURE 2-4**  
**NORTH READING POPULATION TRENDS BASED ON TOWN CENSUS DATA**



Population trends for the Town and neighboring communities based on US Census data is presented in Table 2-5. As shown, North Reading's population growth between 2000 and 2010 is above average. In general, most community's experienced rapid growth during the post-World War II period from 1950's through the 1970's. Thereafter, population growth began to level off

in most communities, likely associated with changes in family demographics, reduced available land for development, improved land-use planning, growth management and stricter development standards which led to more sustained, managed growth over the last 20-30 years. In addition, escalating property values and high housing costs in eastern Massachusetts have also contributed to slower growth and development.

**TABLE 2-5  
POPULATION TRENDS FOR NORTH READING AND  
SIMILAR NEIGHBORING COMMUNITIES**

Town	1950	1960	1970	1980	1990	2000	2010	% Change 2000-2010
North Reading	4,402	8,331	11,264	11,455	12,002	13,837	14,892	7.08%
Andover	12,437	15,878	23,695	26,370	29,151	31,247	33,201	5.89%
Lynnfield	3,927	8,398	10,826	11,267	11,274	11,542	11,596	0.47%
Middleton	2,916	3,718	4,044	4,135	4,921	7,744	8,987	13.83%
North Andover	8,485	10,908	16,284	20,129	22,792	27,202	28,352	4.06%
Reading	14,006	19,259	22,539	22,678	22,539	23,708	24,747	4.20%
Wilmington	7,039	12,475	17,102	17,471	17,651	21,363	22,325	4.31%
							Average	5.69%

### **2.1.5 Planning Initiatives and Open Space**

North Reading is one of 101 communities working with the Metropolitan Area Planning Council (MAPC). The MAPC is a regional planning agency that was created to address state, local, and regional growth issues. MAPC's MetroFuture is an initiative that encourages regional collaboration to meet goals such as improved transportation and Open Space Planning. Through this collaboration, North Reading has identified opportunities to work with North Andover and Wilmington on efforts such as habitat protection, recreational trails development, water resource protection and protection of land surrounding the Ipswich River.

The Town also completed Open Space and Recreation Plans in 2013, 2007, 1995 and 1987. These Open Space Plans provide inventory of current land use in order to guide future planning efforts. The goal of an Open Space Plan is not only to protect natural resources but protect community common spaces and allow for recreational opportunities.



### **2.1.6 Stormwater**

The Town actively manages Stormwater and seeks methods to improve its system. The Town is regulated under the NPDES Phase II Stormwater Program Automatically Designated Municipal Separate Storm Sewer System (MS4) Areas. Phase II, issued in 1999, requires regulated small MS4s in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by the permitting authority, to obtain NPDES permit coverage for their stormwater discharges

In September 2013, North Reading completed Phase 1 of a Drainage Infrastructure Mapping Project with the assistance of New England Civil Engineering Corp (NECE). This report inventoried drainage infrastructure and identified several areas of potential illicit wastewater contamination in the drainage system. Observations of bacteria growth as well as wastewater and laundry odors were observed in some locations.

### **2.1.7 Impervious Surfaces**

About 16.13% (2.18 square miles) of North Reading's land area is covered by impervious surface (U.S. EPA Map 2010). Impervious surfaces are concentrated along major roadways (Route 28, Route 62, southwest corner of North Reading near I-93) as shown in Figure 2-5.

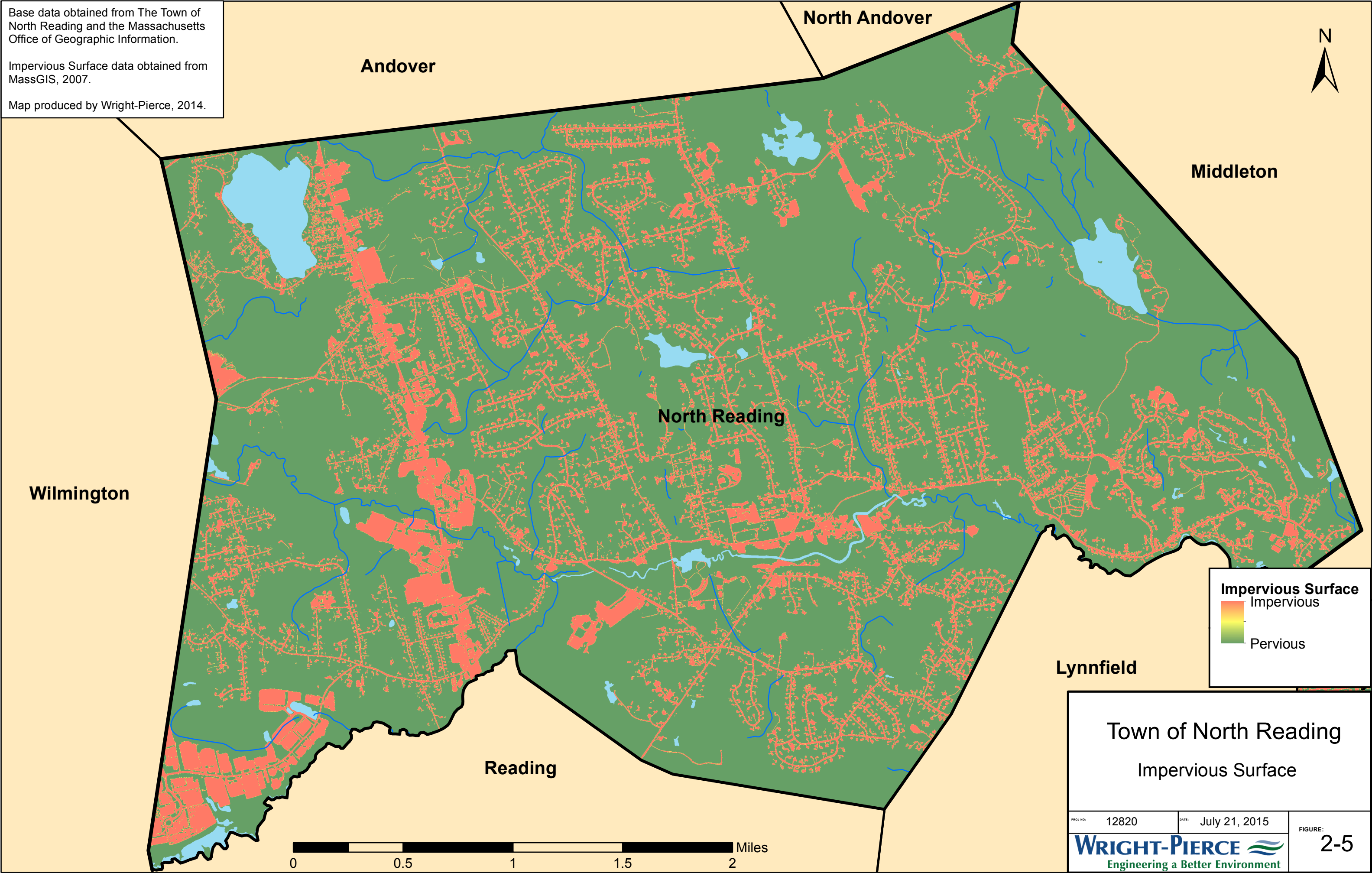
### **2.1.8 Historical and Archaeological Sites**

One main goal of North Reading's Open Space and Recreation Plan is to protect the historical character and rural heritage of the town. Zoning overlays in the "center village" require review for exterior architectural changes. West Village and Saddler's neck are also considered historic districts as shown in Figure 2-6.

Base data obtained from The Town of North Reading and the Massachusetts Office of Geographic Information.

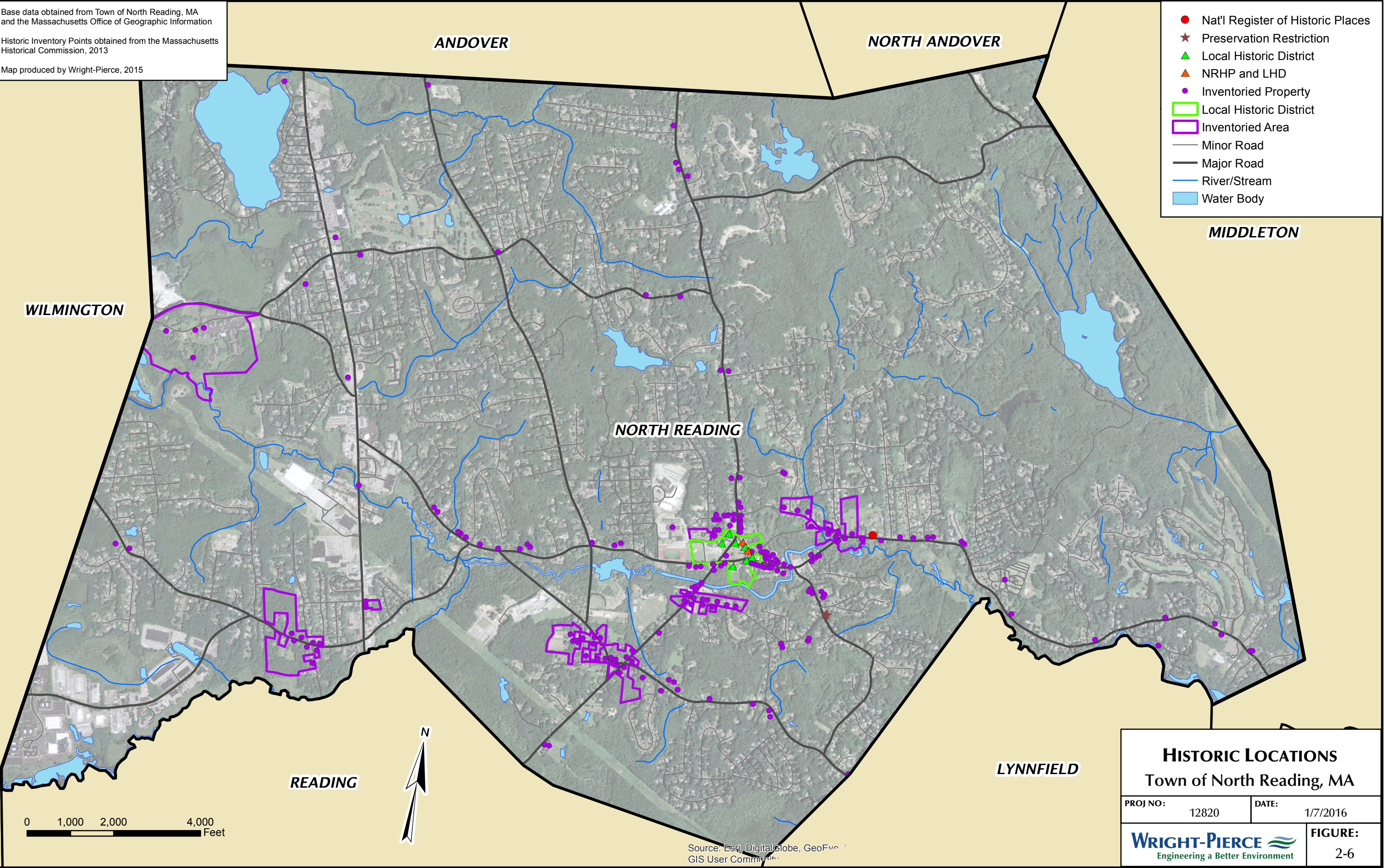
Impervious Surface data obtained from MassGIS, 2007.

Map produced by Wright-Pierce, 2014.





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Source: Esri, DigitalGlobe, GeoEye,   
GIS User Community



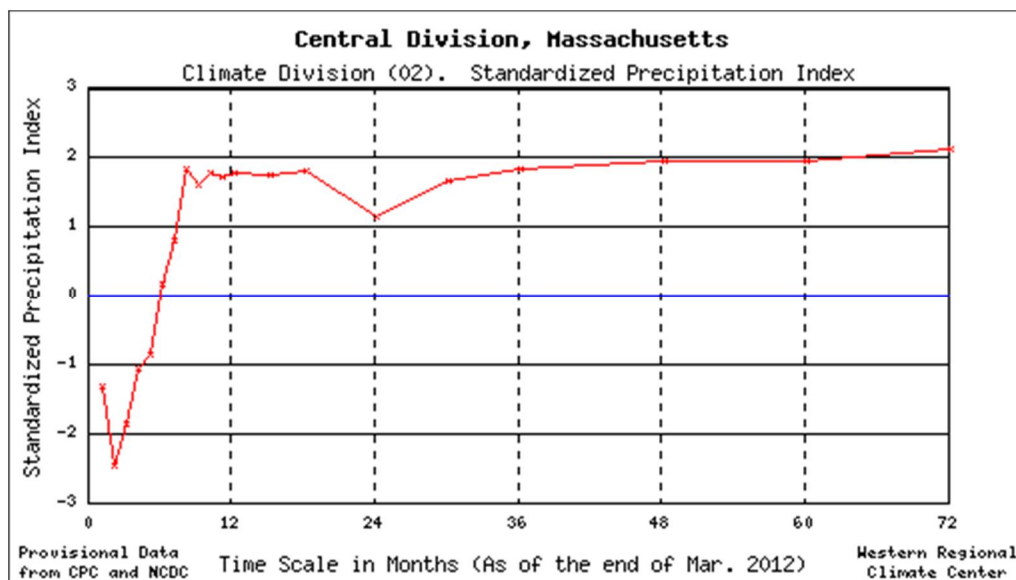
## 2.2 NATURAL ENVIRONMENT

The portion of the report presents existing environmental conditions including climate, geology, soils, topography, hydrogeological conditions, water resources, water quality, wetlands, endangered species, flooding, air quality and hazards.

### 2.2.1 Climate

The National Climatic Data Center provides Monthly Summary Observations. The nearest station to North Reading is in Middleton, MA. Based on data obtained from 1981-2010, the average monthly temperature in January and July is 27.9° F and 72.9° F respectively. These reports also indicate a normal annual precipitation of 47.94 inches. Precipitation is monitored and recorded on a routine basis to determine the average precipitation. The average is compared to the current data to determine whether the precipitation is above or below the average amount. Each state has a customized standardized precipitation index. An example of the Massachusetts Index is shown in Figure 2-7.

**FIGURE 2-7**  
**STATE STANDARDIZED PRECIPITATION INDEX**



The Massachusetts Standardized Precipitation Index, shown above, illustrates the SPI for the past 72 months with the end date of March 2012 as the final point on the index. When the index is negative it signifies drought conditions whereas the positive is wet conditions using probability. The value of zero is the median. The SPI is completely determined upon precipitation. This index accurately illustrates points on a graph for what the index would be for each month of the year and is consistently updated to provide the most accurate results. These results aid in monitoring patterns and allow the Town to compare the current data with the historical average.

### 2.2.2 Soils

A USDA NRCS Soil Survey was conducted for Middlesex County, which contains North Reading. From this survey information regarding soil types and drainage capacity were obtained. About 64 percent of the soil in North Reading is considered Excessively Drained to Moderately well drained, while the remaining soils fall into Poorly Drained or other categories. These soil types are listed in detail in Table 2-6 and are depicted in Figure 2-8.

### 2.2.3 Topography

North Reading's Open Space & Recreation Plan describes the Town's landscape as "generally flat to gently rolling". The highest elevation is 230 feet above mean sea level on the United States Geological Survey (USGS) datum. Average elevation is approximately 100 feet. Figure 2-9 shows a USGS Topography map of the Town.

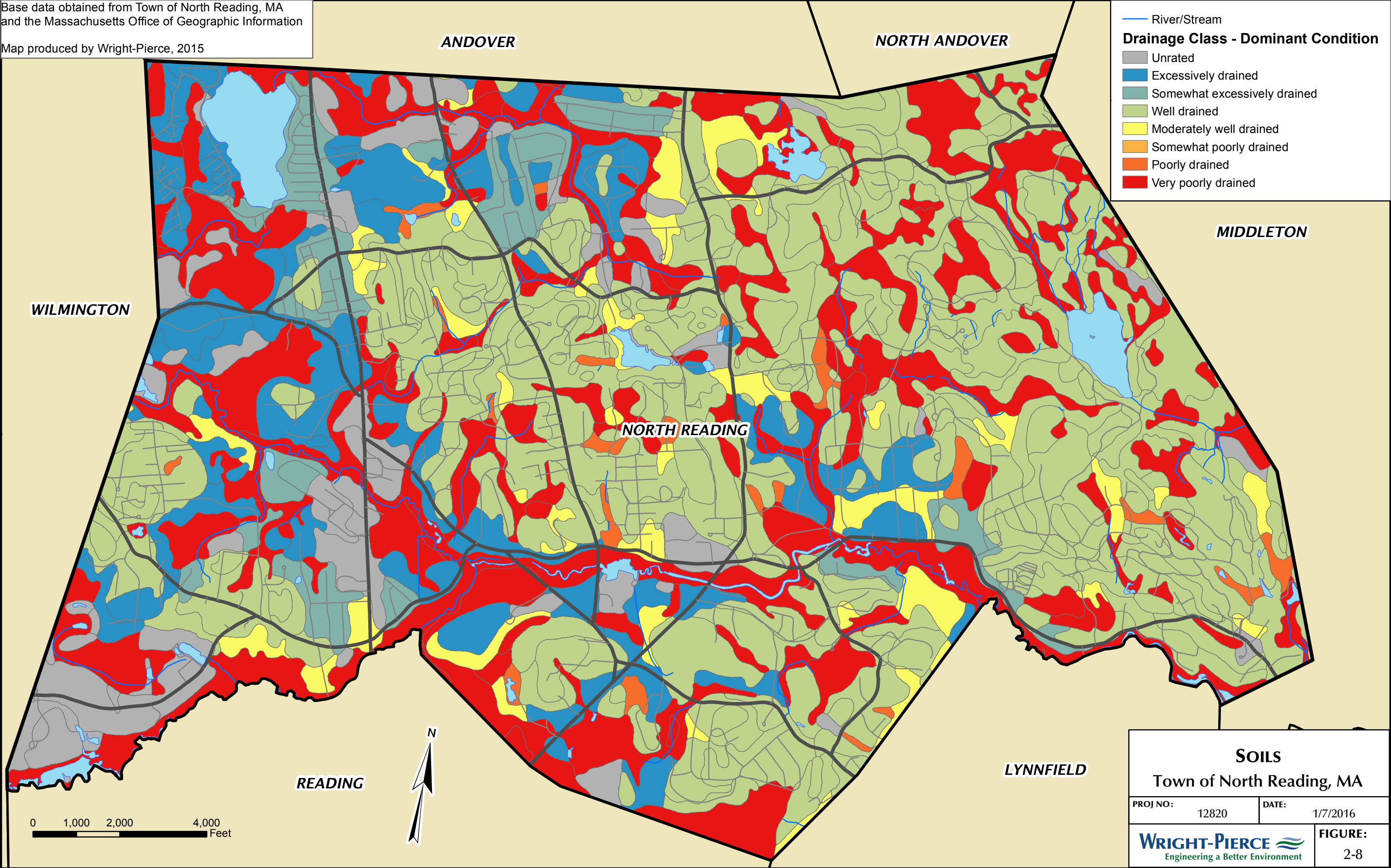
**TABLE 2-6  
SOIL CLASSIFICATION BY DRAINAGE**

<b>Soil Association (% of Town)</b>	<b>Depth to Water Table (Inches)</b>	<b>Description</b>
Excessively Drained (11)	>80	Hinckley Loamy, Windsor Loamy
Somewhat Excessively Drained (5)	>80	Merrimac Fine Sandy Loam, Merrimac-urban Land Complex
Well Drained (43)	18-21, 18-24	Montauk Fine Sandy Loam, Paxton Fine Sandy Loam, Paxton-Urban Land Complex
	>80	Charlton-Hollis-Rock Outcrop Complex, Hollis-Rock Outcrop-Charlton Complex, Charlton Fine Sandy Loam, Narragansett Silt Loam, Canton Fine Sandy Loam
Moderately Well Drained (5)	18-36	Deerfield Loamy, Sudbury Fine Sandy Loam, Woodbridge Fine Sandy Loam, Scituate Fine Sandy Loam
Poorly Drained (1.3)	6-18	Wareham Loamy Fine Sand, Raynham Silt Loam, Ridgebury Fine Sandy Loam
Very Poorly Drained (25)	0-6, 6-12	Saco Mucky Silt Loam, Birdsall Mucky Silt Loam, Swansea Muck, Freetown Muck, Scarboro Mucky Fine, Whitman Fine Sandy Loam
Udorthents (4)	N/A	N/A

\*Soil data and descriptions from MassGIS

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information

Map produced by Wright-Pierce, 2015



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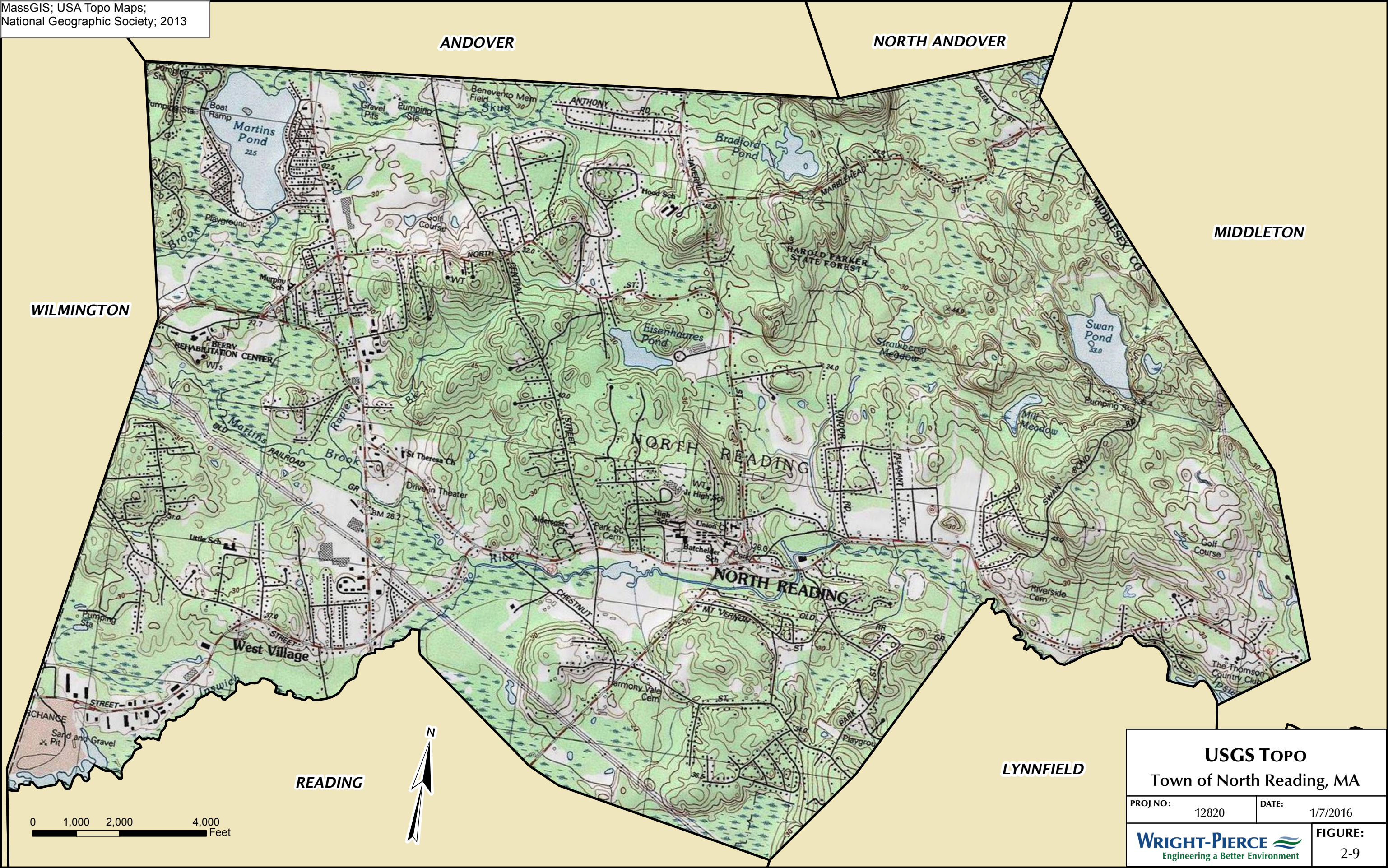
**SOILS**  
Town of North Reading, MA

PROJ NO: 12820      DATE: 1/7/2016

**WRIGHT-PIERCE**   
Engineering a Better Environment

FIGURE:  
2-8





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<b>USGS TOPO</b>	
Town of North Reading, MA	
PROJ NO: 12820	DATE: 1/7/2016
<b>WRIGHT-PIERCE</b> Engineering a Better Environment	<b>FIGURE:</b> 2-9



## **2.2.4 Hydrologic Conditions and Water Resources**

North Reading is located within the Ipswich River Basin which has been categorized as a “stressed basin” by the Massachusetts Water Resources Commission (MWRC) and in 2003; the Ipswich River was named one of the America’s most endangered rivers. As a result of the water withdrawals and the creation of large areas of impervious surfaces the River had periods of limited or no flow observations in sections. The impervious surfaces contributed to flooding events can occur during periods of heavy rain and snowmelt and decreased flows occur during dry periods. It is estimated more than 330,000 people rely on the river for drinking water.

## **2.2.5 Surficial Geology**

Bedrock in the Town was characterized using information obtained from the MassGIS and USGS and is depicted in Figure 2-10. Bedrock in North Reading is approximately 58 percent granite, 41 percent mafic rocks and 1 percent metamorphic rocks. Till bedrock, specifically Thin Till, covers almost the entirety of North Reading, with small areas of Bedrock Outcrop scattered throughout. Shallow bedrock is concentrated in the northeast corner of the Town spanning towards North Andover and Middleton and scattered in the middle. North Reading’s post glacial deposit, overlying the bedrock is largely characterized by swamp deposits, distributed evenly throughout the Town. Also overlying the bedrock is glacial stratified deposits. Of these glacial stratified deposits the largest land area is covered by coarse and glaciomarine fine deposits. Glaciolacustrine fine is concentrated in the western side of the Town.

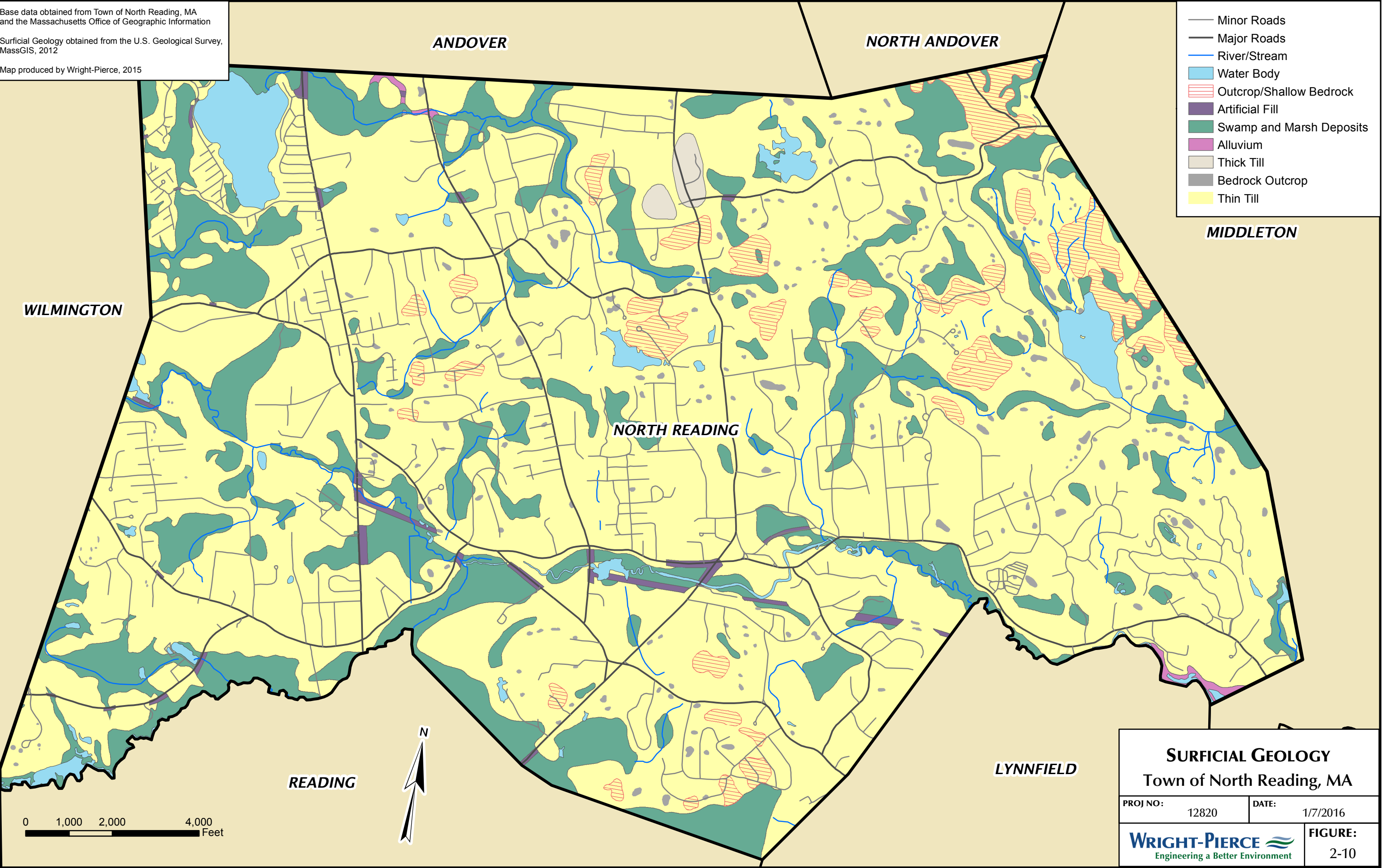


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Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information

Surficial Geology obtained from the U.S. Geological Survey,  
MassGIS, 2012

Map produced by Wright-Pierce, 2015



### **2.2.6 Water Quality**

According to the Town's Open Space and Recreation Plan "water in North Reading is generally of good quality". The Ipswich River is considered fishable and swimmable, as well as a potential source of drinking water. However, many of the Town's surface waters are considered impacted and are listed on the State's 303(d) list of impaired waters. These have been identified with poorly performing subsurface disposal systems.

North Reading treats drinking water from its groundwater sources for iron and manganese, common naturally occurring compounds in groundwater. These compounds do not pose a threat to human health, but are considered nuisance contaminants. Therefore, iron and manganese are regulated under Secondary Drinking Water Regulations with Secondary Maximum Contaminant Levels at 0.3 and 0.05 mg/l. More information on raw water quality is presented in Section 4.

Surface waters include Martins Pond, Eisenhaures Pond, Bradford Pond and Swan Pond. Water quality studies have been completed in Martins Pond, located in the Northwest corner of North Reading. This area is zoned as "Residence B" and "Highway Business". In 2002, Phosphorous levels in Martins Pond were found to be 1000 times higher than any other recorded level in the Massachusetts area. These levels were found at the inlet and outlet of Martins Pond. Furthermore Martins Pond is routinely listed on DEP's Massachusetts Integrated List of waters as impaired due to turbidity, noxious aquatic plants, metals and exotic species. No uses were assessed for Eisenhaures, Swan, and Bradford Pond. Water bodies are depicted in Figure 2-11.

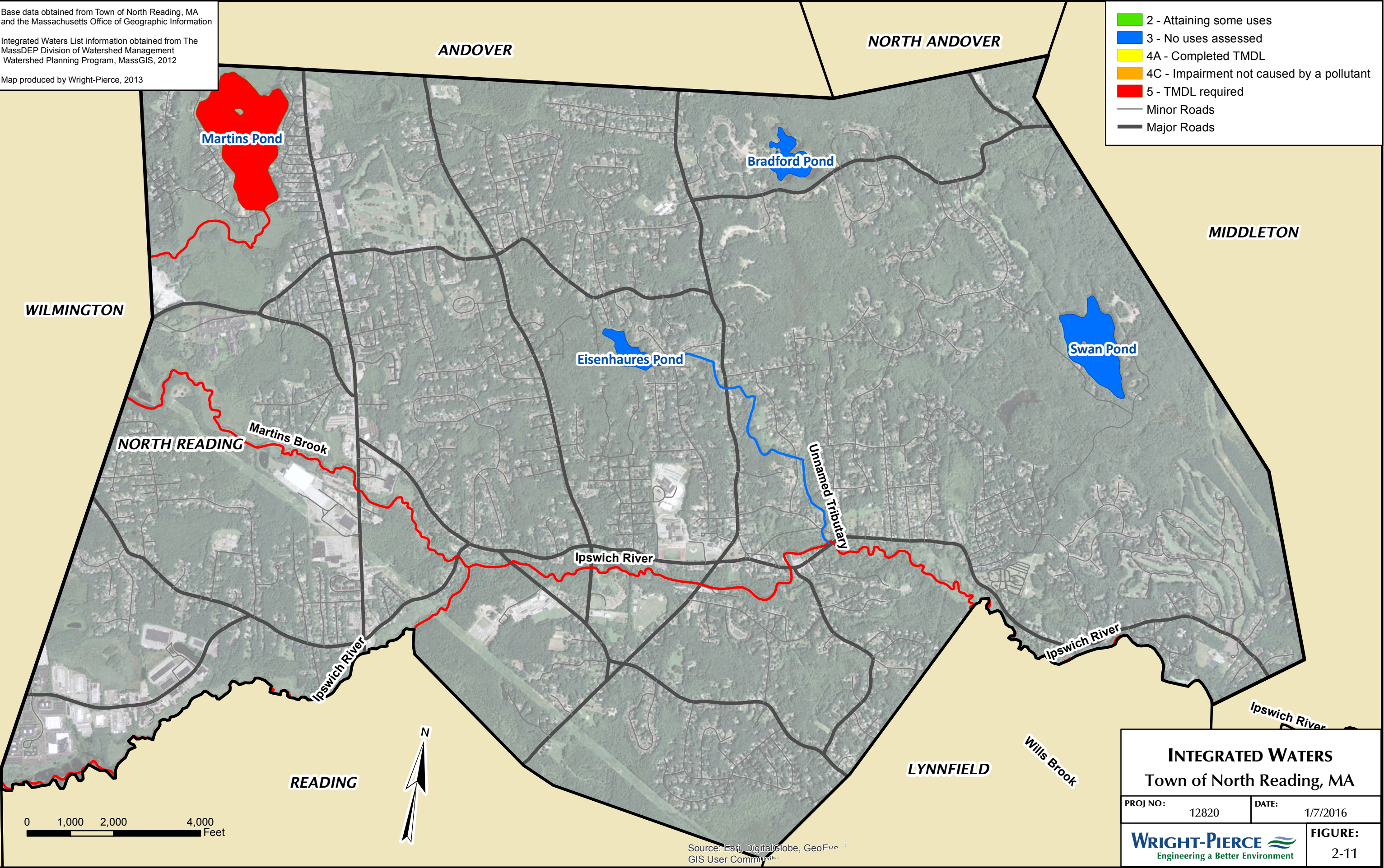
### **2.2.7 Wetlands**

Wetlands cover about 34 percent of the Town's land area, as shown in Figure 2-12. The majority of wetlands are deciduous red maple swamps, distributed evenly throughout the Town. In the Northeast Corner of the Town is an 18 acre deep marsh. North Reading is active in protecting its wetlands from developmental impacts and invasive plant species. The Conservation Commission is responsible for upholding the Wetlands Protection Act and bylaws including:

- A 12-foot no disturb zone around wetlands
- No more than 22 percent of the 100 buffer by covered by impervious surface
- No more than 75 percent of area be altered significantly from its natural state



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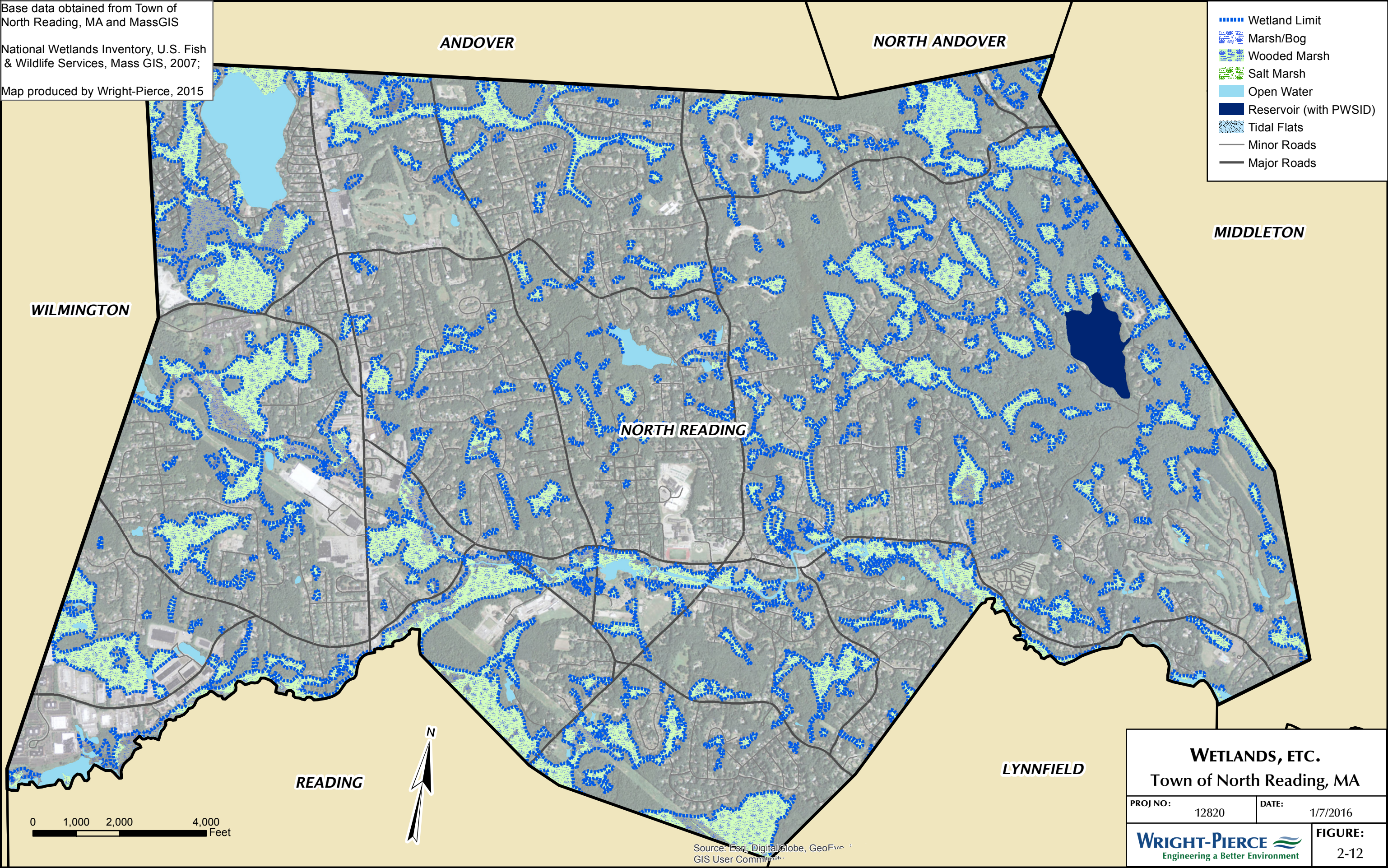


Base data obtained from Town of North Reading, MA and MassGIS

National Wetlands Inventory, U.S. Fish & Wildlife Services, Mass GIS, 2007;

Map produced by Wright-Pierce, 2015

- Wetland Limit
- Marsh/Bog
- Wooded Marsh
- Salt Marsh
- Open Water
- Reservoir (with PWSID)
- Tidal Flats
- Minor Roads
- Major Roads



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Source: Esri, DigitalGlobe, GeoEye,   
 GIS User Community



### 2.2.8 Endangered Species

Five endangered wildlife species and two rare plant species are known to exist in North Reading, according to the records of the Massachusetts Natural Heritage and Endangered Species Program, as listed in Table 2-7.

**TABLE 2-7  
RARE AND ENDANGERED SPECIES**

<b>Taxonomic Group</b>	<b>Common Name</b>	<b>Status</b>	<b>Year Last Observed</b>
Reptile	Blanding's Turtle	Threatened	1861
Reptile	Wood Turtle	Special Concern	1998
Reptile	Eastern Box Turtle	Special Concern	2010
Dragonfly/Damselfly	Spine-crowned Clubtail	Special Concern	1904
Dragonfly/Damselfly	Umber Shadowdragon	Special Concern	1904
Vascular Plant	Tiny Cow-lily	Endangered	1908
Vascular Plant	Adder's-tongue Fern	Threatened	1913

Estimated and Priority Habitats of Rare Wildlife were obtained from the Massachusetts Natural Heritage Atlas 13<sup>th</sup> edition (October 2008). From this information two Estimated Habitats of Rare Wildlife were identified as shown in Figure 2-13. These sites were also listed as Priority Habitats of Rare Wildlife and are listed below:

- EH527 (PH602) is located in the Northeast Corner of North Reading and intersects with North Andover. The site is approximately 122 acres.
- EH574 (PH 649) is in the Southern part of North Reading and intersects with Lynnfield. The site is approximately 100 acres. This site also contains two of the 22 vernal pools in North Reading. The majority of the vernal pools lie in the eastern side of North Reading, spanning from the center of the town towards the Middleton border.



Base data obtained from Town of North Reading, MA and MassGIS

NHESP Estimated Habitats of Rare Wildlife and Species obtained from the Mass Natural Heritage Atlas, Mass GIS, 2008; Vernal Pools obtained from the Natural Heritage and Endangered Species Program, MassGIS, 2009;

Map produced by Wright-Pierce, 2015

Vernal Pool

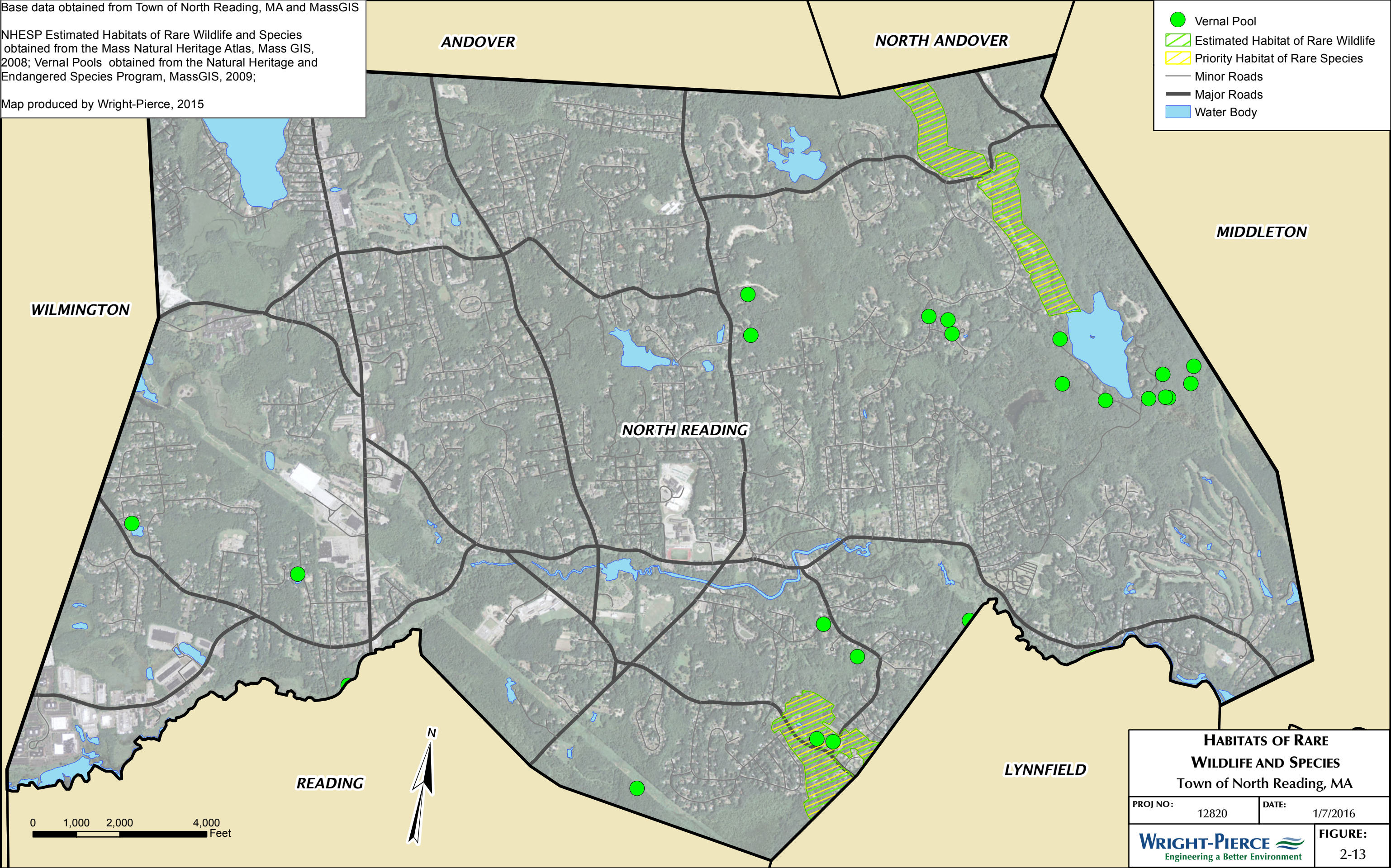
Estimated Habitat of Rare Wildlife

Priority Habitat of Rare Species

Minor Roads

Major Roads

Water Body



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### 2.2.9 Floodplains

Floodplains were characterized using data obtained from the Federal Emergency Management Agency (FEMA). Floodplains fall into four zone categories, shown in Figure 2-14.

- **AE zone** are an area inundated by 100-year flooding, for which BFEs (Base Flood Elevations) have been determined. This type of floodplain is the most frequent in North Reading covering approximately 12 percent of the Town's total land area. This area is located along the Ipswich River and Martins Brook, running adjacent to Route 62 and Park Street. This 100-year flood zone is also concentrated to the direct North and South of Martins Pond, as well as to the West of Martin's Pond. The West and East sides of Martins Pond are zoned for residential development, therefore lying very close to the floodzone. These areas also coincide with many of the National Wetlands Inventory Freshwater Forested/Shrub Wetland and Freshwater Emergent Wetland areas in North Reading. The majority of these areas lie in Single Family Residential Zoned areas.
- **A Zones** are areas inundated by 100-year flooding, for which no BFEs have been determined. This type of floodplain is the second most frequent in North Reading and covers approximately 9% of the Town's total land area. This floodplain is distributed throughout North Reading and not concentrated in any particular area. These areas coincide with many of the National Wetlands Inventory Freshwater Forested/Shrub Wetland areas in North Reading.
- **X500 Zones** are areas either inundated by 500-year flooding, 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or areas protected by levees from 100-year flooding. This type of floodplain covers approximately 4.4% of North Reading's land area. This type of floodplain is scattered throughout North Reading, but also concentrated along the outskirts of the 100-year floodzone along the Ipswich River and Martin's Brook.
- **D Zones** are areas of undetermined but possible flood hazards. This area covers approximately 2.7% of North Reading's total land area. This area is isolated to the Northeast corner of the Town, with a portion of the area completely surrounding Bradford Pond.

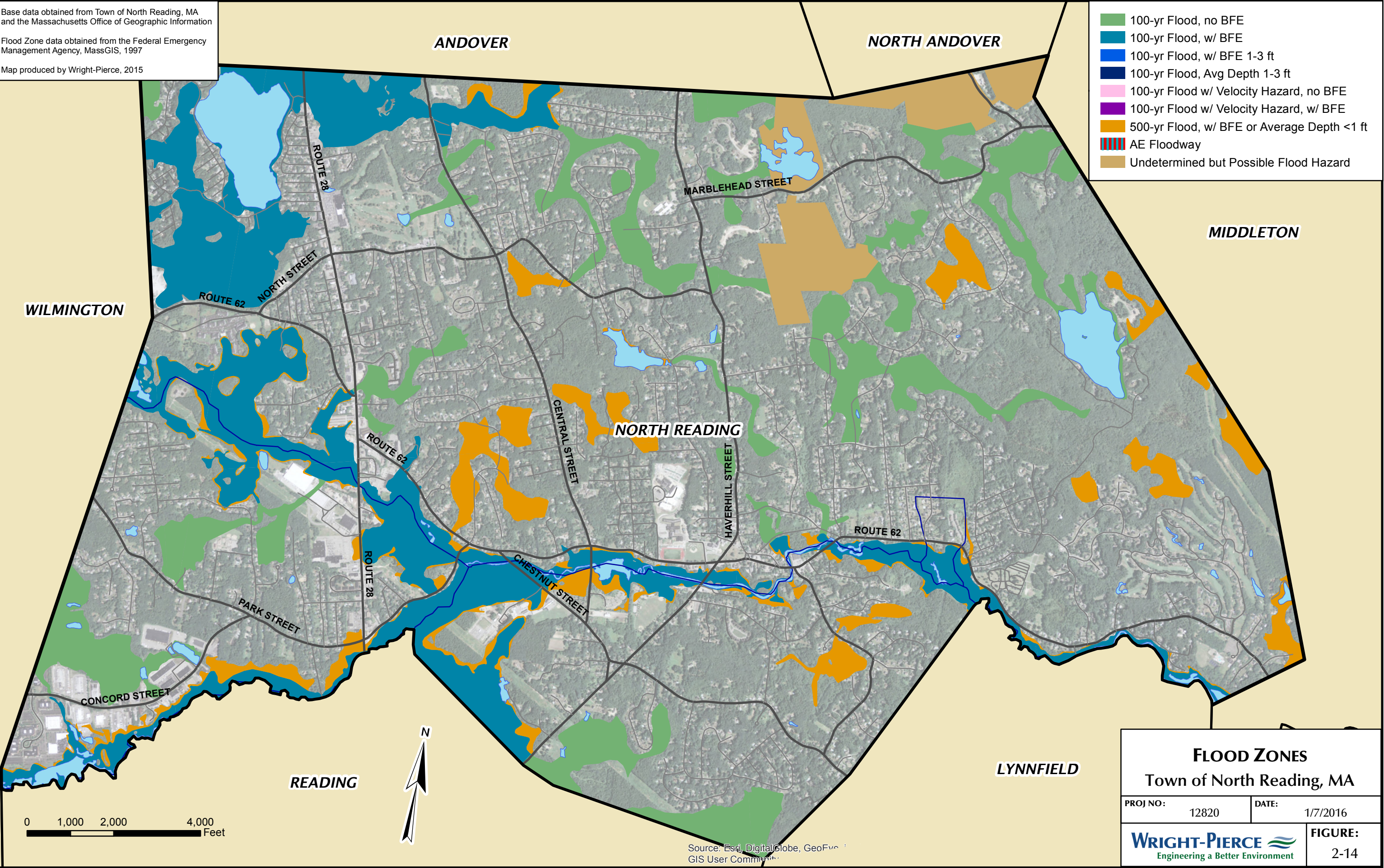


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Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information

Flood Zone data obtained from the Federal Emergency  
Management Agency, MassGIS, 1997

Map produced by Wright-Pierce, 2015





### 2.2.10 Air Quality

The Clean Air Act sets guidelines for states to meet National Ambient Air Quality Standards. These guidelines outline criteria pollutants which include carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. Massachusetts is currently categorized as achieving attainment or unclassifiable/attainment for carbon monoxide, lead, nitrogen dioxide, PM<sub>10</sub> and ozone. New standards have been set for sulfur dioxide and PM<sub>2.5</sub>, therefore Massachusetts is awaiting status on these criteria pollutants. MassDEP's Air Assessment Branch operates 28 outdoor air quality monitoring stations throughout the state. The closest monitoring stations to North Reading include locations in Lawrence and Lynn.

MassDEP publishes an annual report with the information obtained from these monitoring stations. Information from the Massachusetts 2013 Annual Air Quality Report on each criteria pollutant is summarized below:

- Ozone- 14 exceedances during 6 days for the 8-hour zone standard. Two of the ozone exceedance of the 8-hour ozone standard of 0.075 ppm occurred in Lynn. But no violations.
- Sulfur Dioxide- Sulfur dioxide is monitored at six locations in Massachusetts. The long term trend of the 1-hour 99<sup>th</sup> percentile for each of the monitoring sites in Massachusetts has been downwards (reporting from 1985 -2013), and the as of the 2013 report, the state was meeting the 1-hour standards (75 ppb).
- Nitrogen dioxide- As of June 2013, MassDEP operates 11 NO<sub>2</sub> sites, including a location in Lynn. Overall, the trend for NO<sub>2</sub> since 1985 has been downward and stable since about 2004. Massachusetts is below the annual standard of 53 ppb.
- Carbon monoxide- MassDEP operated seven CO monitoring sites in 2013. CO monitoring since 1985 shows that Massachusetts has been well below the 1-hour and 8-hour standards.
- Particulate matter- MassDEP operated six PM<sub>10</sub> sites in 2013. Monitoring at these sites revealed an overall downward trend since 1997 in the annual arithmetic mean well below the 150 µg/m<sup>3</sup> 24-hour standard. MassDEP also operated 17 FRM PM<sub>2.5</sub> sites and 12 BAMs PM<sub>2.5</sub> sites during 2013.
- Lead- MassDEP monitors lead on particulates at two sites in Boston and Springfield. The study showed that all samples were below the standard of 15 µg/m<sup>3</sup>.

### 2.2.11 Environmental Hazards

Environmental hazards in the Town of North Reading were identified as sites where releases of hazardous material have occurred, or locations where there is a potential for hazardous materials to be released. This search included such resources as the National Priority List, CERCLIS Database, MassDEP Reportable Release Sites, Underground Storage Tanks, MassGIS, and the Environmental Response Notification System. Figure 2-15 summarizes these hazardous.

Environmental Hazards are important to quantify as they may impact aquifers and water resources. The Town has a defined Aquifer Protection District to protect public health by preventing contamination of groundwater resources providing public water supply. The Aquifer

Protection District is established as an overlay district and includes the Town's well fields and surrounding drainage basins. Uses of this district for landfills, junkyards, snow removal storage, non-sanitary wastewater, facilities that generate hazardous waste, chemical storage and animal manure storage are prohibited unless defined containment is achieved. Special permits to use land in an Aquifer Protection District must go through the special permit granting authority. The Aquifer Protection District is shown on the Environmental Hazards Map Figure 2-15 as well as Zone II wellhead protection areas.

#### ***2.2.11.1 Reportable Release Sites***

A search of the MassDEP Reportable Release Sites was conducted in November 2015. The search showed 113 releases reported, many of which occurred in the same location. Of those 113 releases, 28 of them occurred within Zone II sites. Table 2-8 summarizes these locations. The table shows release tracking numbers and spill identification numbers, type of contaminants, and media affected if known. Seven sites have been designated as no significant risk therefore, no remedial action was taken. Response Action Outcome (RAO) class is also listed with definitions as follows:

- A1: A permanent solution has been achieved and contamination has been reduced to background.
- A2: A permanent solution has been achieved but contamination has not been reduced to background
- A3: A permanent solution has been achieved and an Activity Use and Limitation has been implemented
- PN: Permanent Solution with No Conditions
- B1: Remedial actions have not been conducted because a level of No Significant Risk exists
- C1: A temporary cleanup

**TABLE 2-8**  
**REPORTABLE RELEASE SITES**

Address	Delete RTN	Site Name	Delete Reporting Category	Notification Date	Compliance Status, Phase	Delete Date	RAO Class	Chemical Type
14 Meade Street	3-0032817	No Location Aid	Two Hr	4/15/2015	Unclassified	4/15/2015		Oil
23 Concord St	3-0016752	No Location Aid	120 Dy	4/28/1998	RAO	4/20/1999	A2	Oil
35 Concord St	3-0018713	Exit 39 Off I 93	Two Hr	9/6/1999	RAO	11/12/1999	A1	Oil
	3-0022324	No Location Aid	Two Hr	11/19/2002	RAO	3/19/2003	A1	Oil
5 Hallberg Park	3-0002804	Chf Products Inc	None	1/15/1990	RAO, Phase IV	9/19/2011	PN	
	3-0026178	No Location Aid	Two Hr	8/10/2006	TIER1D	7/7/2008		Hazardous Material
60 Concord St	3-0000692	Msm Industries	None	10/4/1989	RAO, Phase V	10/2/2013	C1	
66 Concord St	3-0015477	No Location Aid	120 Dy	8/27/1997	RAO	8/27/1997	B1	Hazardous Material
70 Concord St	3-0002584	Sterling Supply Corp Fmr	None	1/15/1990	TIERI	10/1/1993		
80 Concord St	3-0022112	No Location Aid	Two Hr	9/17/2002	RAO	11/15/2002	A1	Hazardous Material
	3-0023502	No Location Aid	Two Hr	1/13/2004	RAO	2/25/2004	A1	Oil
	3-0017390	Yellow Freight System Inc	72 Hr	10/8/1998	RAO, Phase V	11/30/2009	A2	Hazardous Material
	3-0033103	Ups Freight Terminal	Two Hr	8/23/2015	PSNC	10/21/2015	PN	Oil
84 Concord St	3-0002276	Lily Truck Leasing Corp	None	1/15/1990	RAO	7/16/2002	A2	Oil
	3-0028941	No Location Aid	72 Hr	12/7/2009	RAO	10/1/2010	B1	Oil
87 Concord St	3-0010722	Fmr Bard Medsystems Now Baxter	120 Dy	12/15/1993	DPS	10/25/1995		Hazardous Material

90 Concord St	3-0018024	New England Motor Freight	120 Dy	2/23/1999	DPS	4/13/1999		Hazardous Material
	3-0027006	New England Motor Freight	Two Hr	6/18/2007	RAO	8/22/2007	A1	Hazardous Material
	3-0028088	New England Motor Freight	Two Hr	10/21/2008	RAO	12/29/2008	A2	
	3-0028858	New England Motor Freight Inc	Two Hr	11/2/2009	RAO	12/9/2009	A1	Hazardous Material
	3-0002277	St Johnsbury Trucking	None	1/15/1990	RAO, Phase III	2/9/1999	A2	
95 Concord St	3-0012907	Near Loading Dock	Two Hr	9/9/1995	RAO	1/19/1996	A2	Hazardous Material
	3-0020647	Roadway Express Loading Dock	Two Hr	4/30/2001	RAO	6/29/2001	A1	Hazardous Material
	3-0002363	Yrc Inc Fmr Roadway Express	None	1/15/1990	REMOPS, Phase V	2/16/2007		Oil
	3-0031080	Yrc Freight	Two Hr	9/4/2012	RAO	11/2/2012	A1	Hazardous Material
	3-0033079	Yrc Freight Trucking Terminal	Two Hr	8/10/2015	PSNC	10/8/2015	PN	Hazardous Material
Lowell Rd	3-0000599	John Berry Rehab Center	None	1/15/1987	LSPNFA	8/4/1995		
	3-0003557	John Berry Rehab Center	None	4/15/1991	RAO, Phase IV	8/7/2007	A2	Oil
Park & Chestnut St	3-0025781	No Location Aid	Two Hr	3/31/2006	RAO	4/9/2007	A1	Oil

Figure 2-15 shows the location of three of these reportable releases that have been Tier Classified. These include the Sterling Supply Corp (Tier 1A), Service Pumping & Drain Co (Tier 1D) and an unnamed property (Tier 1D) located on Boxwood Road. Sterling Supply Corp and Service Pumping & Drain Co are both located in Zone II.

The applicable tier classifications are as follows.

**TIER I:**

(a) there is evidence of groundwater contamination with oil and/or hazardous material at concentrations equal to or exceeding the applicable RCGW-1 Reportable Concentration set

Tier ID ("default") disposal site if any of the following apply:

(a) an Responsible Party, Potentially Responsible Party or Other Person for such disposal site fails to submit to MassDEP one of the following by the applicable deadline in 310 CMR 40.0501:

1. a Permanent Solution Statement; or
2. a Tier Classification Submittal; or

(b) the person undertaking response actions is in noncompliance with M.G.L. c. 21E, 310 CMR 40.0000 or any other applicable requirement, and MassDEP reclassifies the disposal site as a Tier ID disposal site pursuant to 310 CMR 40.0583

***2.2.11.2 Comprehensive Environmental Response, Compensation, and Liability Information System***

The CERCLIS Search allows you to retrieve Superfund data. A search of both active and achieved sites was conducted. Currently, there are no superfund sites on the National Priority List in North Reading. Active Sites include MSM Industries and Sterling Supply CORP (Now Contour Chemical CO). Both have been marked as low priority for further assessment, but are located in Zone II protection areas. Archived sites include the John Berry Rehabilitation Center, Val-Ken Machine/Pacetti Corp, and YRC Freight. These are also all located in Zone IIs. Many of these locations, with the exception of the John Berry Rehabilitation Center, are located along a highly commercial and industrial area on Concord Street, bordering the Ipswich River. These sites, with the exception of Pacetti Corp, are also listed on the Reportable Releases table.

***2.2.11.3 Spills and Accidents Database (Environmental Response Notification System)***

The Spills and Accidents database (formerly the Environmental Response Notification System) contains data on toxic chemical spills and other accidents reported to the National Response Center. A search of this database turned up 14 incidents in North Reading during the search period 1982-2014, 7 occurring after 2000. These incidents involve UPS and YRC Freight, along the industrial area of North Reading in a Zone II. These incidents involve storage tank spills. There were four incidents where responsible parties were not identified. Three incidents occurred at the Roadway Express (located in a Zone II), one of which involving a suspected release of bromine.

***2.2.11.4 Underground Storage Tanks***

There are 11 Underground Storage Tanks listed with the MassDEP. There are five along Route 28, three along Concord Street, one on Central Street, one at the intersection of Park Street and Sylvia Road, and one on the south east corner of the Town. Storage tanks include four gasoline tanks, five diesel tanks, one waste oil tank and one fuel oil tank. Three are located in a Zone II

protection area and three located in the Aquifer Protection District. Underground storage tanks are shown on Figure 2-15.

#### ***2.2.11.5 Landfills***

There are no landfills located in North Reading, however the Wilmington Dump, though inactive, is located approximately 0.3 km from the North Reading border (in a Zone II). This is an unlined MSW dump. North Reading has a composting center located off of Chestnut Street.



Base data and Environmental Hazards obtained from  
Town of North Reading, MA and the Massachusetts  
Office of Geographic Information  
  
Map produced by Wright-Pierce, 2015

ANDOVER

NORTH ANDOVER

- Municipal Solid Waste
- NWI Rivers and Streams
- Water Body
- AUL Site
- Registered Compost Site
- Underground Storage Tank
- Tier I Reportable Release
- Tier1D Reportable Release
- Major Road
- Zone II
- Aquifer Protection District

MIDDLETON

WILMINGTON

NORTH READING

LYNNFIELD

READING

0 1,000 2,000 4,000  
Feet



Source: Esri, DigitalGlobe, GeoEye  
GIS User Community

ENVIRONMENTAL HAZARDS  
Town of North Reading, MA

PROJ NO: 12820 DATE: 1/7/2016

WRIGHT-PIERCE  
Engineering a Better Environment

FIGURE:  
2-15

TAH: W:\GIS\_Development\Projects\MA\NorthReading\12820-EnvImpactReport\MXD\Report Figures\Section 2\2-15-Environmental Hazards-11x17-L.mxd