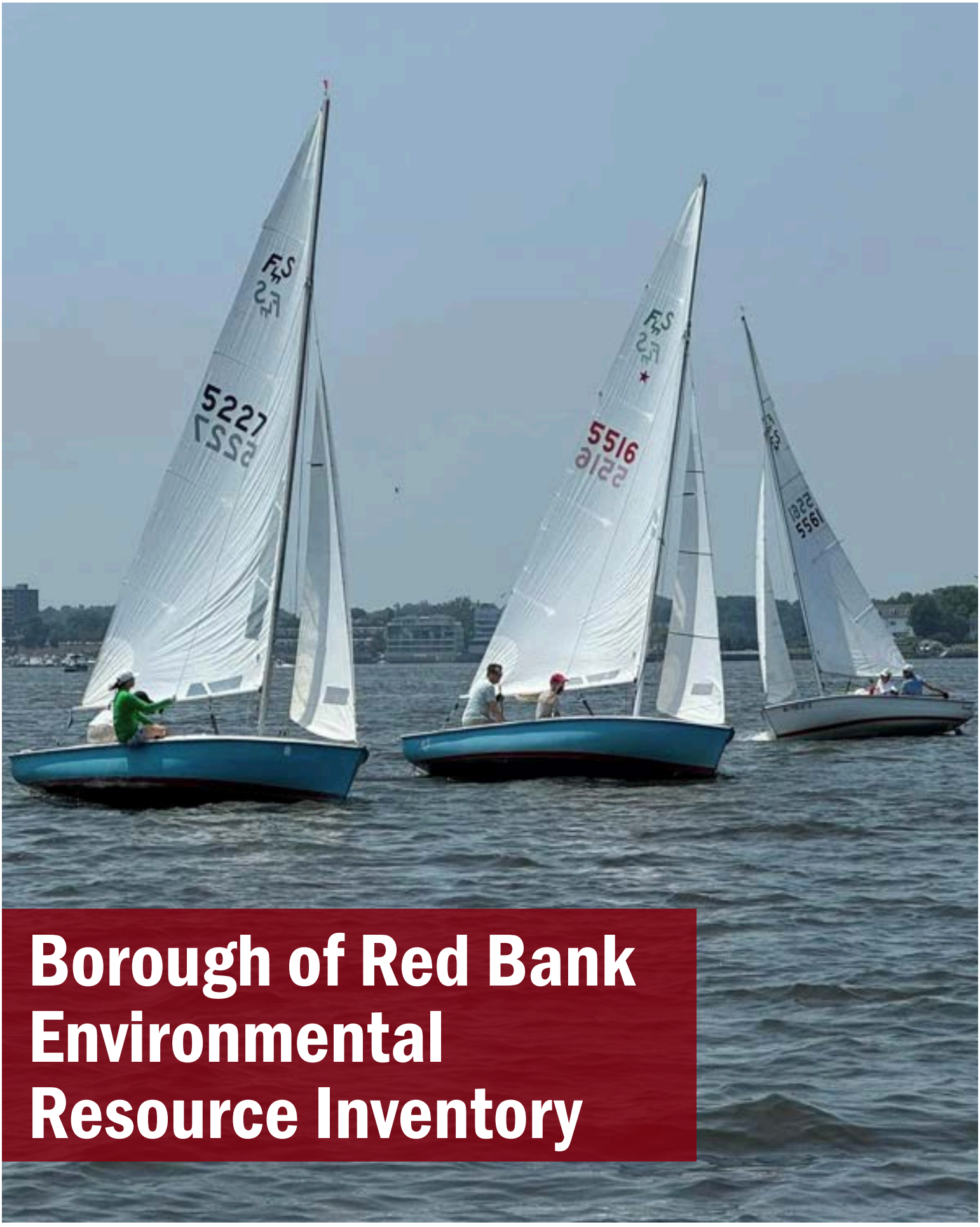

Borough of Red Bank Environmental Resource Inventory

Source: Red Bank Environmental Commission

Borough of Red Bank Environmental Resource Inventory

Prepared for:
Red Bank Environmental Commission

Prepared by:
BFJ Planning
115 Fifth Avenue
New York, NY 10003

Adopted: January 8, 2025

Acknowledgements

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William Portman, Mayor
Kate Triggiano, Deputy Mayor
Kristina Bonatakis
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This original document was appropriately signed and sealed in accordance with Chapter 41, Title 13 of the State Board of Professional Planners.

Susan Favate, AICP, PP – NJ Professional Planner
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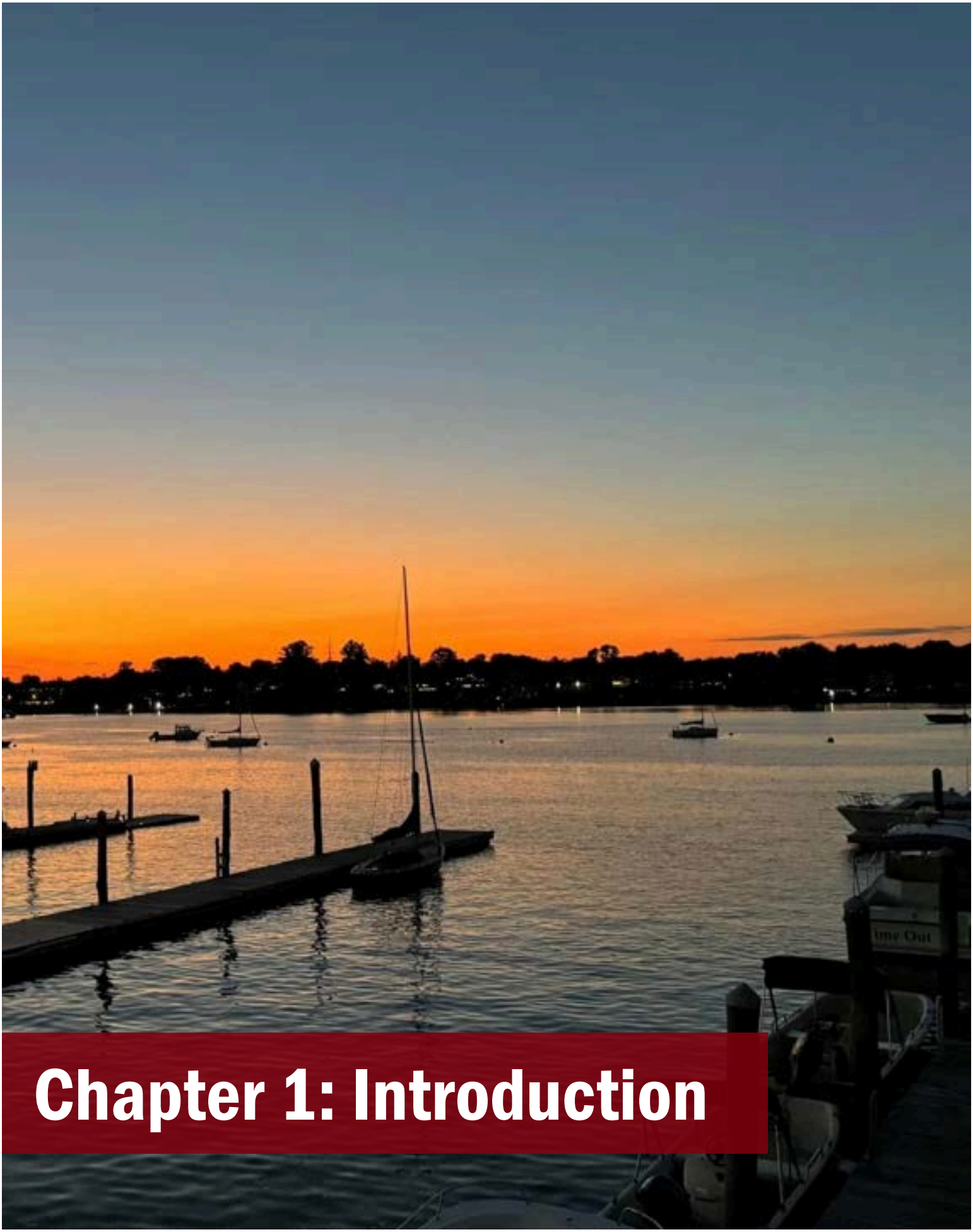


Chapter 1: Introduction

Source: Red Bank Environmental Commission

Introduction

This Environmental Resource Inventory (ERI) was created by BFJ Planning with the support of the Borough of Red Bank's Environmental Commission, and is a comprehensive, objective documentation of natural resources and environmentally significant features within the Borough. Containing text, tables, and maps, this document is intended to enable residents, officials, and governing bodies to more easily identify environmental challenges and prioritize actions necessary to preserve the Borough's natural resources. The information contained in this ERI can be used to promote awareness around sustainability efforts, inform land use planning, and develop resource protection ordinances to safeguard the health and welfare of current and future residents.

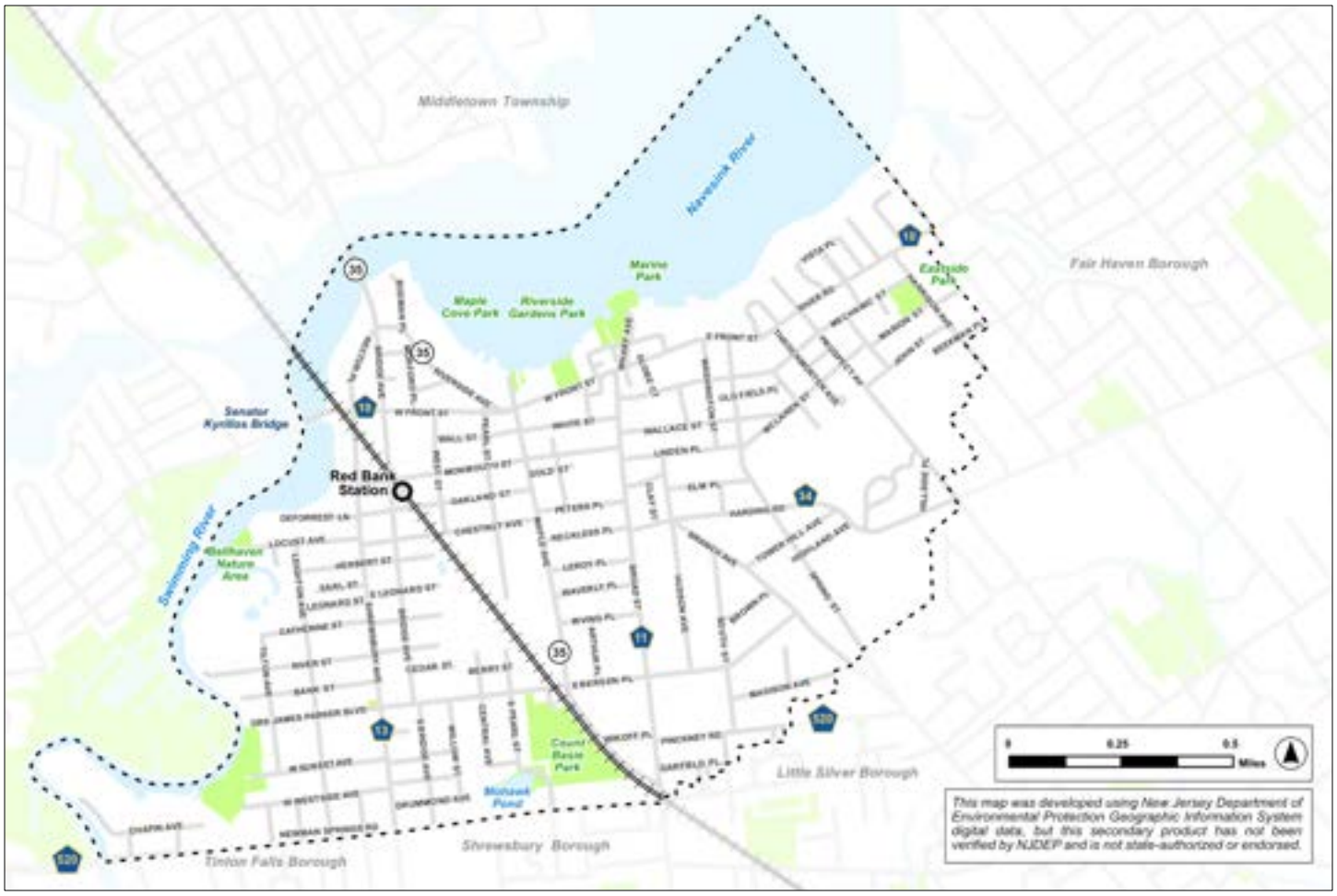
Borough of Red Bank Overview

The Borough of Red Bank, as depicted in **Figure 1.1**, is located on the Navesink River in the northeastern portion of Monmouth County and encompasses 1,383 acres of land area and just over 265 acres of water area. The Borough's northern and western boundaries are formed by the Navesink and Swimming River, respectively; the Borough is bordered to the east by the Borough of Fair Haven, and to the south by the Boroughs of Little Silver, Shrewsbury, and Tinton Falls.

As noted in the 2023 Master Plan, Red Bank is characterized by strong transportation connectivity and is a popular destination from commuters and visitors throughout the region. Regional vehicular access is provided via NJ Route 35 and the Garden State Parkway via Interchange 109 to County Road 520 or County Road 10. The Borough is also served by NJ Transit bus routes 832, 834, and 838, as well as by the New Jersey passenger rail network via the North Jersey Coast Line Station at Red Bank.

Red Bank has seen significant population growth since the adoption of the Borough's 1995 Master Plan, growing nearly 22% from 10,636 residents to 12,939 residents. Notably, from 2010 to 2020, the Borough saw population growth of 6%, far exceeding Monmouth County's growth of just over 2%. To balance smart growth with the protection and enhancement of natural resources, the Borough's residents and leadership outlined objectives and strategies in the Master Plan, including protecting Red Bank's historic and cultural resources, ensuring access to parks, waterfront, transit, and municipal services, and taking steps to mitigate and adapt to the impacts of climate change.

Figure 1.1: Borough of Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Regional Relationships

This ERI, and the Master Plan of which it is an Element, exist within the context of regional plans that address challenges and opportunities relevant to the Borough and its neighboring municipalities, including those pertaining to sustainable land use, natural resource preservation, and hazard mitigation. While a full list of key regional plans is provided in the Master Plan, three of these plans are most relevant to this ERI and are briefly described below:

Monmouth County Master Plan (2016)

The 2016 Monmouth County Master Plan was developed to provide municipalities with a guide to sustainable planning that centers themes of "redevelopment, revitalization, and rediscovery." The Master Plan contains 13 elements ranging from Natural Resources to Economic Development to Resiliency, and has three overarching goals:

1. Promote a comprehensive approach to planning and coordinate these

efforts among all levels of government and with community stakeholders.
2. Promote the protection and conservation of natural and cultural resources to help guarantee long-term sustainability.
3. Promote beneficial development and redevelopment that continues to support Monmouth County as a highly desirable place to live, work, play, and stay.

Two Rivers, One Future: Regional Resilience Adaptation Action Plan (2019)

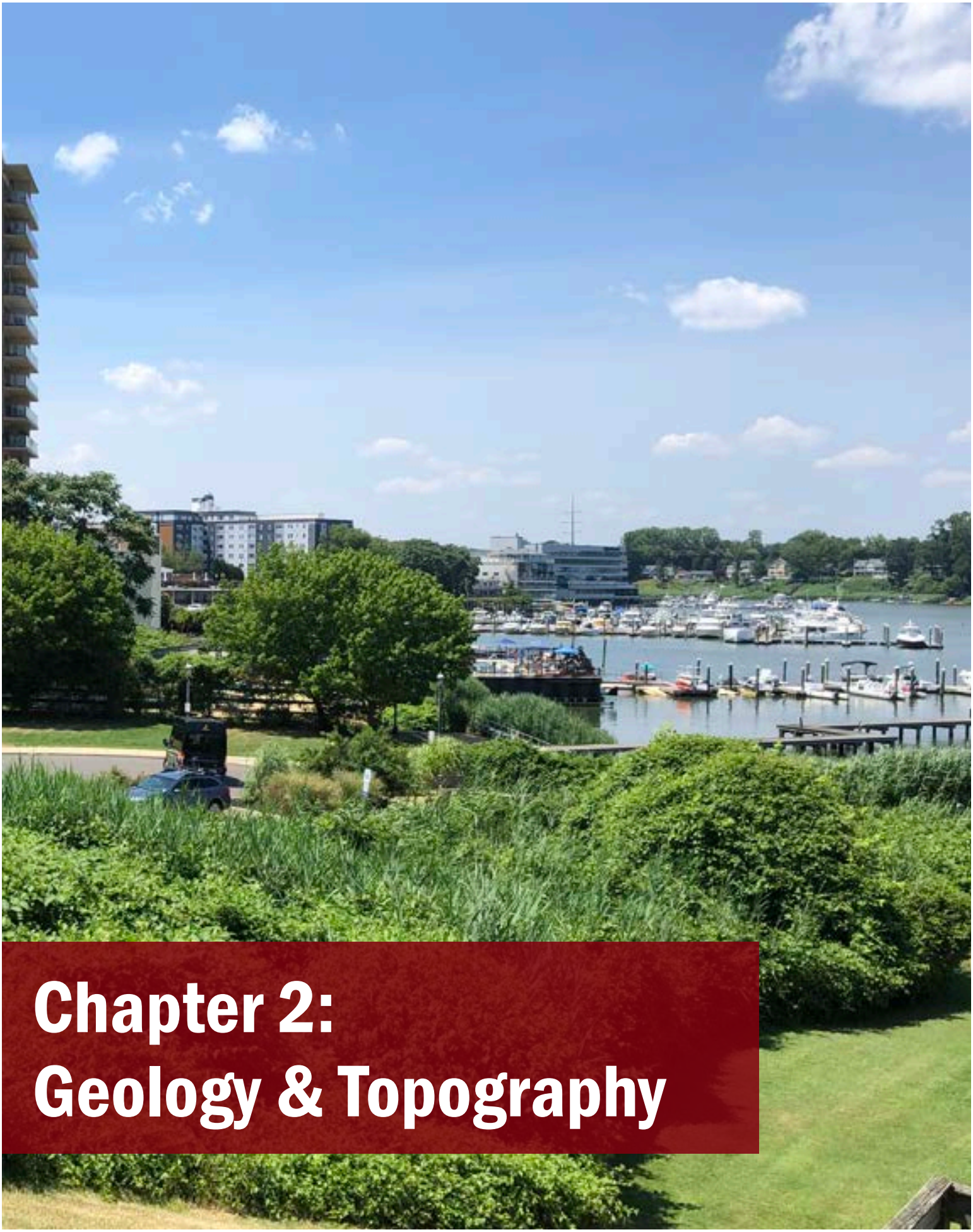
The 2019 Regional Resilience Action Plan serves as a coordinated approach to the future risk of coastal and tidal flooding and permanent inundation in 15 municipalities, including Red Bank. The plan details six strategies for regional resilience:

1. New coastal protection infrastructure
2. Protect critical facilities
3. Harden and plan for the future of water-dependent assets
4. Neighborhood-level adaptation measures
5. Long-term vision and master planning for permanent inundation strategy
6. Development of the Monmouth County Coastal Resilience Committee.

Monmouth County Hazard Mitigation Plan (2021)

In 2021, Monmouth County completed the second five-year update of its Hazard Mitigation Plan, originally developed in 2009. The plan's scope included identifying risks of and vulnerabilities to natural and human-made hazards across the County and proposing actions to build resilience among the County's communities. The plan detailed the following specific hazard mitigation strategies for Red Bank:

- Acquire, elevate, or relocate buildings and infrastructure in flood prone areas, with a focus on repetitive loss (RL) and severe repetitive loss (SRL) properties.
- Construct flood measures (e.g. floodwalls or bulkhead) along the Navesink River
- Implement stormwater management maintenance plan.
- Evaluate water and sewer infrastructure and make improvements as needed.
- Coordinate with Red Bank Primary School on flood mitigation strategies.
- Coordinate with Chapin Hill Nursing Home on mitigation strategies to address flooding, including partnering with the Salvation Army.
- Implement impervious cover reduction action plan.
- Establish a tree trimming program and create a wind shield survey.
- New communication tower at Tower Hill Water Plant.
- Drainage improvements in Marine Park.



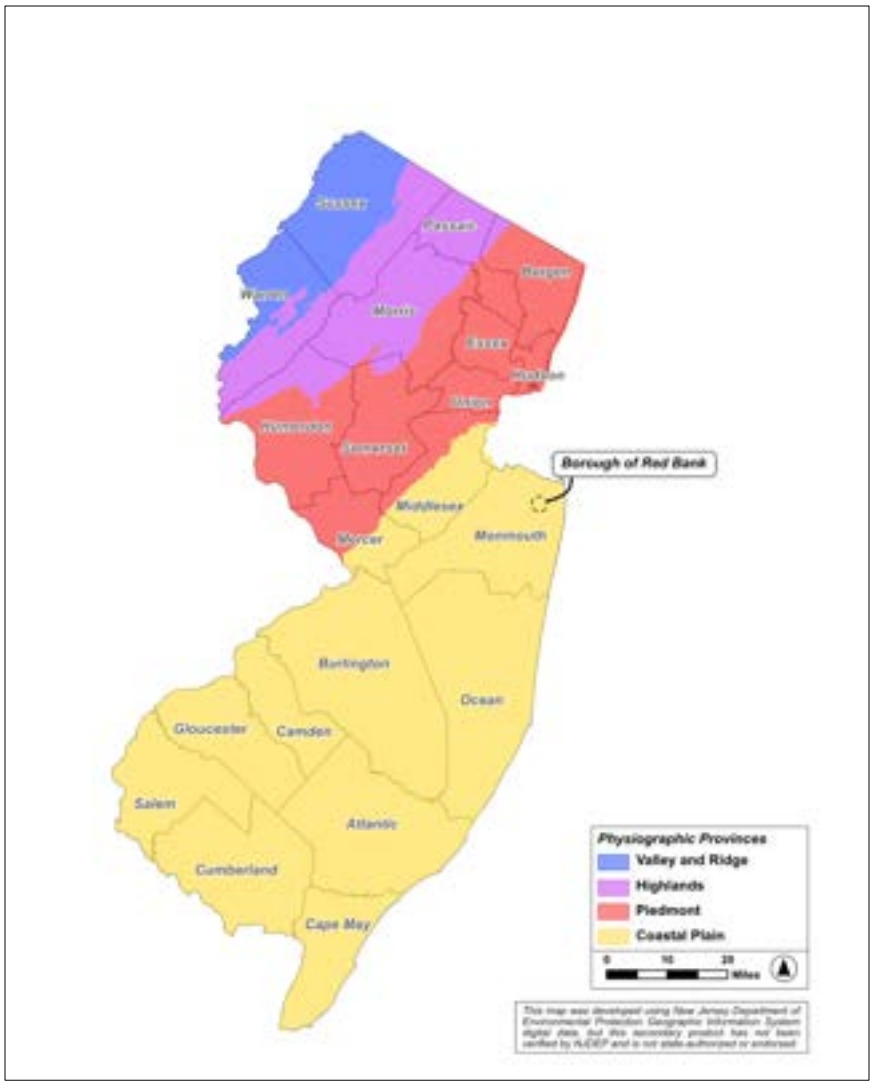
Chapter 2: Geology & Topography

Source: BFJ Planning.

Physiographic Provinces

The United States is divided into eight physiographic regions according to their *geomorphology* – the physical features and processes of landforms that result from geologic processes like erosion, glaciation, and sedimentation. Each physiographic region is subdivided into physiographic provinces according to distinctions in landforms and geology. New Jersey is characterized by four physiographic provinces: Valley and Ridge, Highlands, Piedmont, and Coastal Plain. Red Bank falls within the Coastal Plain Province, the largest of the four in the state, with an area of 4,667 square miles. The Coastal Plain Province is characterized by relatively flat terrain and consists of unconsolidated sedimentary deposits that range in age from 90 to 100 million years old.[1] In the past, Coastal Plain sediments were mined for bog iron, glass sand, foundry sand, ceramic and brick clay, glauconite, and titanium. Today, the Coastal Plain sediments continue to supply glass sand and are mined for sand and gravel construction material.[2] A map of the physiographic provinces in New Jersey can be seen in **Figure 2.1.**[3]

Figure 2.1: Physiographic Provinces of New Jersey



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, BFJ Planning.

Bedrock Geology

Bedrock is the solid layer of rock underneath soil, and includes rocks formed by compaction and cementation of sediments from ancient river, lake, and marine deposits; igneous rocks that formed from cooled and hardened magma; and metamorphic rocks formed from intensely heated and compressed sedimentary and igneous rocks. In New Jersey, bedrock also includes unconsolidated and semi-consolidated Coastal Plain formations consisting of sand, silt, and clay laid down in coastal and marine settings along the margin of the Atlantic Ocean.[4] Red Bank has only two underlying geologic formations. About 96% of the Borough's underlying geology

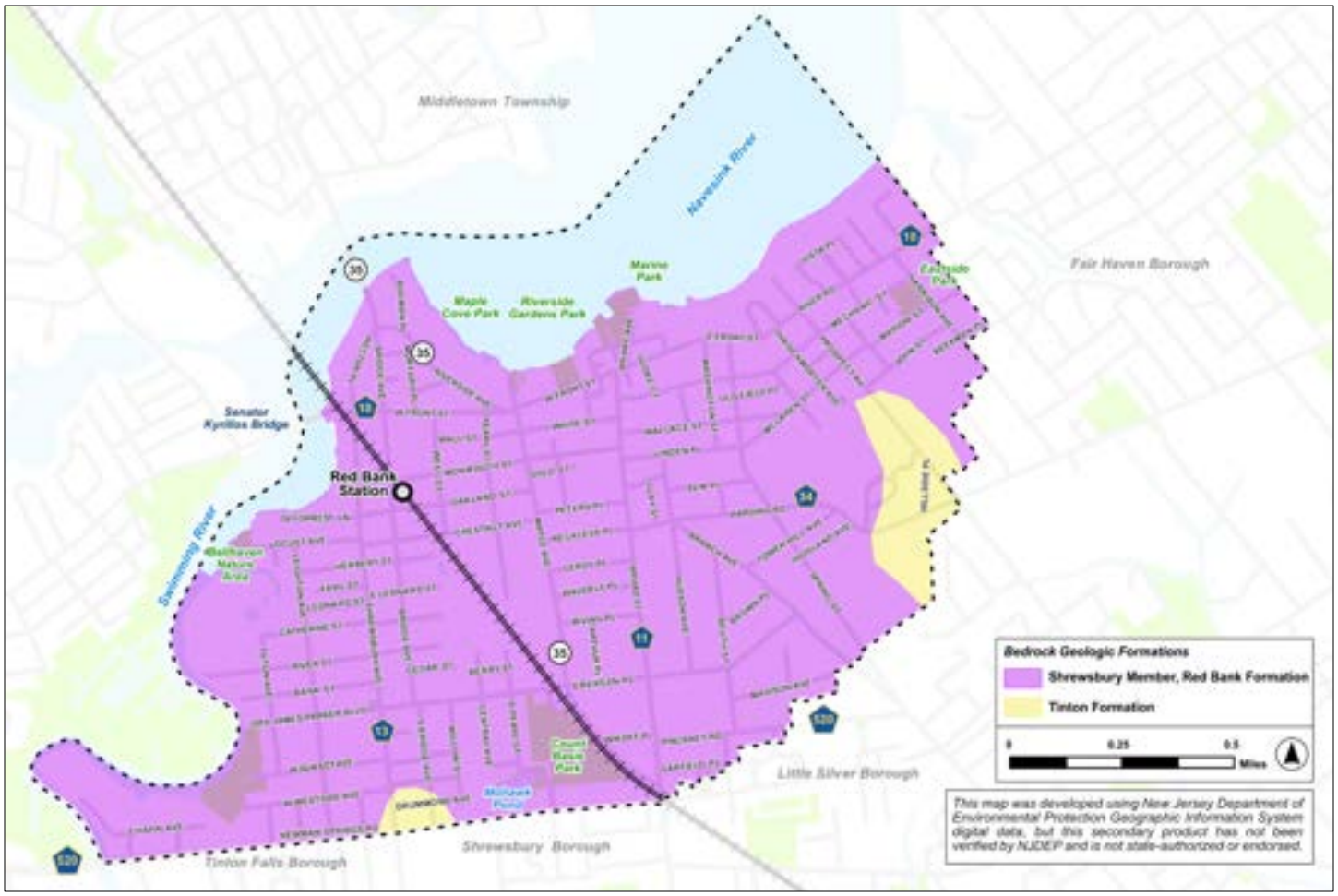
belongs to the Red Bank Formation, specifically the Shrewsbury Member subdivision, which formed during the Late Cretaceous period. The remainder of the Borough's underlying geology (4%) belongs to the Tinton Formation, formed during the same period.[5] **Table 2.1.** describes the characteristics of Red Bank's bedrock geological formations, while **Figure 2.2** illustrates these formations.[6]

Table 2.1: Bedrock Geology of Red Bank

Geologic Name	Lithology (Physical Character)	Acreage within Red Bank	Percentage of Red Bank
Shrewsbury Member	Quartz sand, feldspathic, and slightly glauconitic. Grain size coarser upward, from silty, fine-to-medium sand in lower section to medium-to-coarse sand and some granules in upper section.	1083.5	96%
Tinton Formation	Feldspathic, glauconite quartz sandstone, to feldspathic quartz-glauconite sandstone, clayey, massive-bedded, and poorly sorted.	48.6	4%
	Totals:	**1132.1**	**100%**

Source: NJDEP.

Figure 2.2: Bedrock Geology of Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Surficial Geology

Surficial geologic formations consist of unconsolidated sediments laid down by rivers, glaciers, ocean currents and waves, wind; the movement of soil and rocks on hill slopes that overlie bedrock formations; or by the weathering of bedrock. Surficial deposits are the parent material for soils, which develop as rock is weathered over time from exposure to climatic factors and living organisms. In New Jersey, surficial deposits are generally less than 5 million years old and may be as much as 400 feet thick but are generally less than 25 feet thick over most of the state.[7] More than half of Red Bank (53%) is underlain by Cape May Formation 1, followed by Salt Marsh and Estuarine Deposits (22%), Upper Stream Terrace Deposits (18%), Weathered Coastal Plains Formations (5%), Upper Colluvium (1%), Alluvium (<1%), and Cape May Formation 2 (<1%). **Table 2.2** details the characteristics of Red Bank's surficial geological formations, which are shown in **Figure 2.3.**[8]

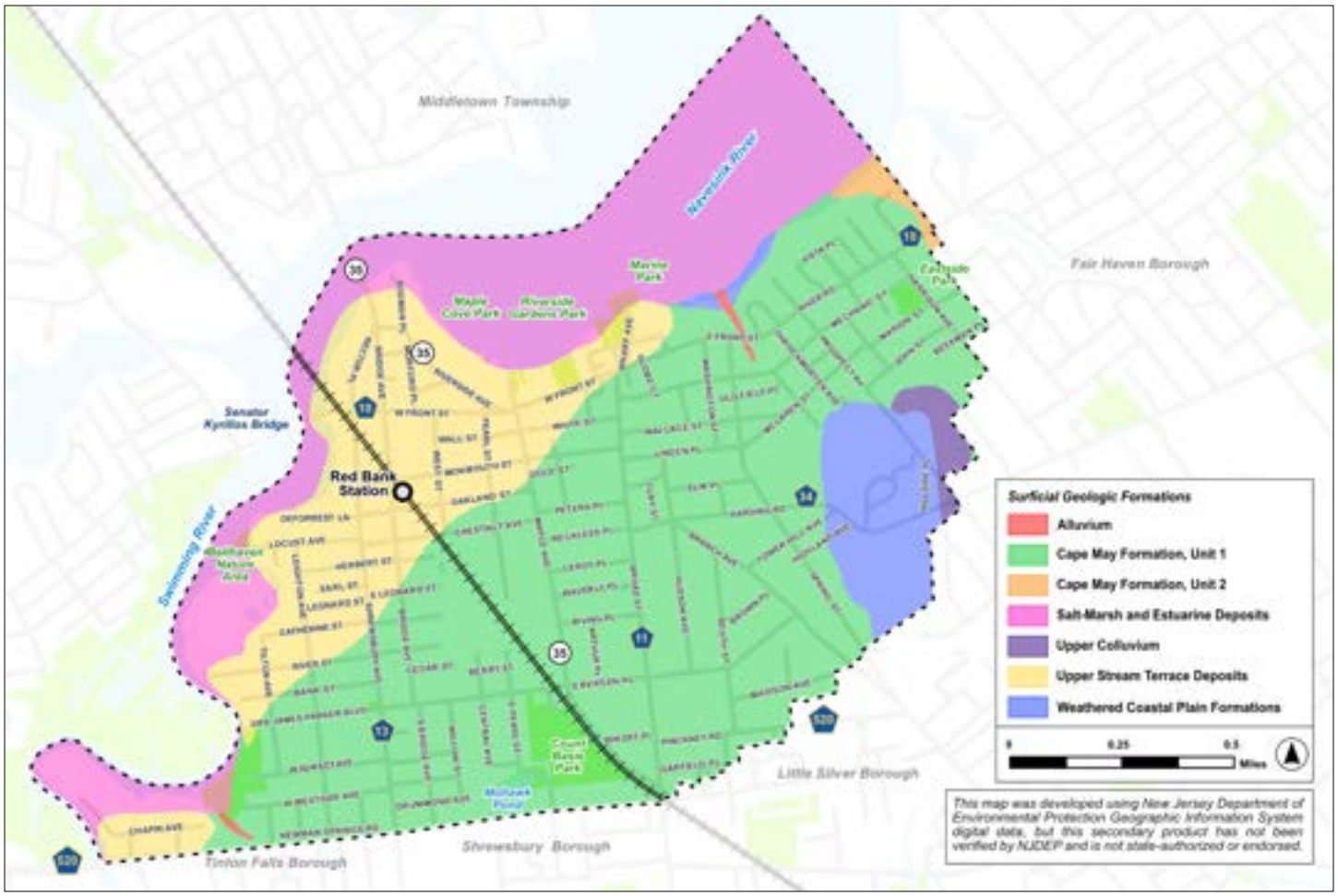
Table 2.2: Surficial Geology of Red Bank

Geologic Name	Lithology (Physical Character)	Geologic Age	Acreage within Red Bank	Percentage of Red Bank
Cape May Formation, Unit 1	Sand, minor silt, clay, and pebble gravel; very pale brown, yellow, reddish yellow. Up to 50 feet thick.	Early to middle Pleistocene	732.9	53%
Upper Stream Terrace Deposits	Sand and pebble gravel, minor silt and cobble gravel; yellow, reddish yellow, yellowish brown. Up to 20 feet thick.	Middle to late Pleistocene	246.3	18%
Alluvium	Sand, gravel, silt, minor clay and peat; reddish brown, yellowish brown, brown, gray. Up to 20 feet thick.	Holocene and late Pleistocene	2.5	<1%
Weathered Coastal Plain Formations	Exposed sand and clay of Coastal Plain bedrock formations. Includes thin, patchy alluvium and colluvium, and pebbles left from erosion of surficial deposits.	Chiefly Pleistocene, locally Miocene and Pliocene.	74.4	5%
Upper Colluvium	Sand, silt, minor clay and pebble gravel; pale brown, yellow, reddish yellow. Up to 20 feet thick.	Middle Pleistocene	12.5	1%
Cape May Formation, Unit 2	Sand, pebble gravel, minor silt, clay, peat, and cobble gravel; very pale brown, yellow, reddish yellow, white, olive yellow, gray. Up to 200 feet thick on the Cape May peninsula, generally less than 50 feet thick elsewhere.	Late Pleistocene	7.6	<1%
Salt-Marsh And Estuarine Deposits	Silt, sand, peat, clay, minor pebble gravel; brown, dark-brown, gray, black. Up to 300 feet thick in the Hudson Valley, 100 feet thick elsewhere.	Holocene	306.3	22%
		Totals:	**1,383**	**100%**

Note on geologic time periods:
- Holocene: 11,700 years ago – present
- Pleistocene: 2.6 million years ago – 11,700 years ago
- Pliocene: 5.3 million years ago – 2.6 million years ago
- Miocene: 23 million years ago – 5.3 million years ago

Sources: NJDEP; University of California Berkeley.

Figure 2.3: Surficial Geology of Red Bank

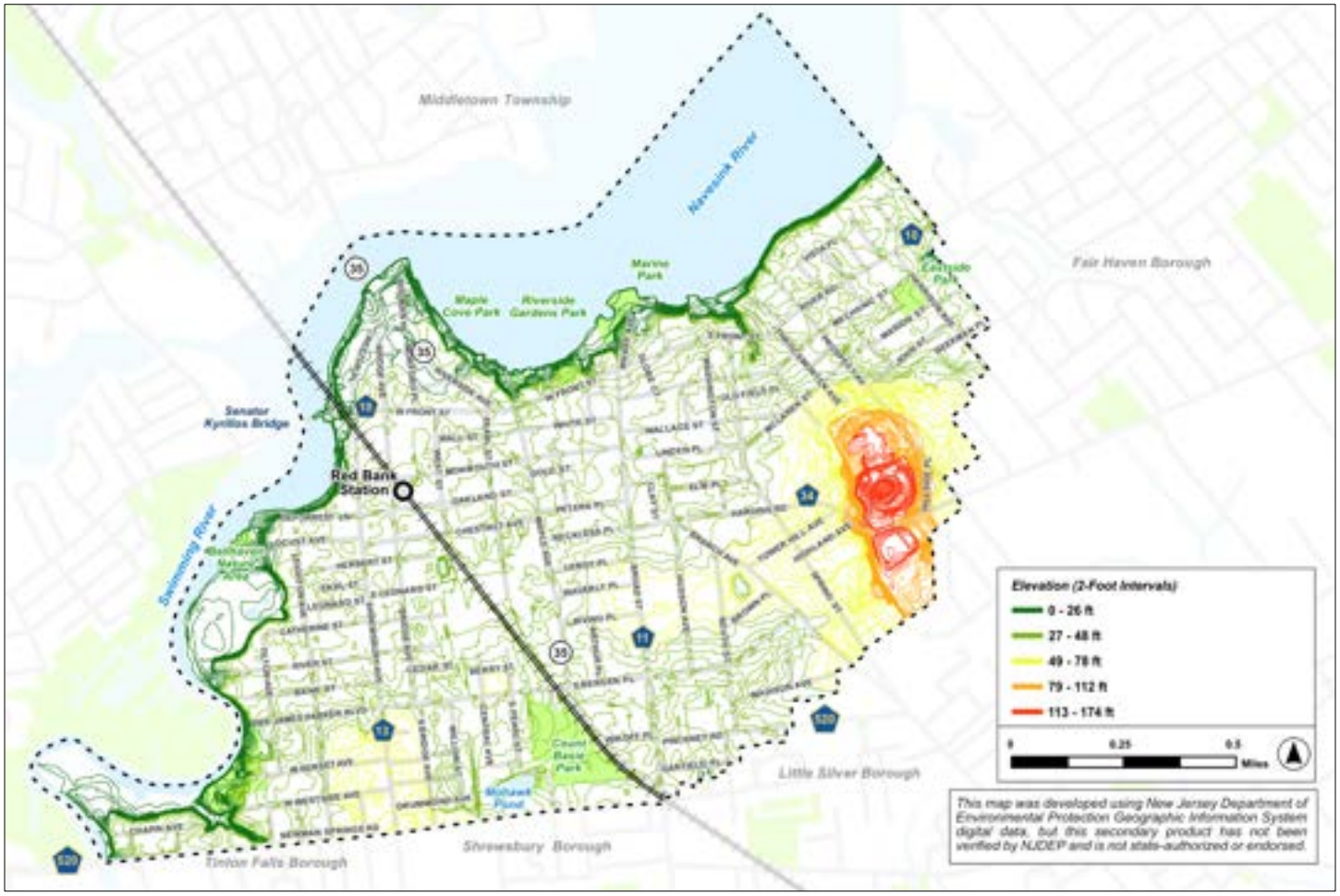


Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Elevation

Red Bank's elevation profile varies from 0 feet above mean sea level along the coast of the Navesink and Swimming Rivers to 174 feet above mean sea level at Hilltop Terrace near the eastern border of the municipality. The majority of the Borough lies between 27 feet above sea level and 48 feet above sea level. **Figure 2.4** depicts the elevation profile of Red Bank, shown with 2-foot contours.[9]

Figure 2.4: Elevation Profile of Red Bank

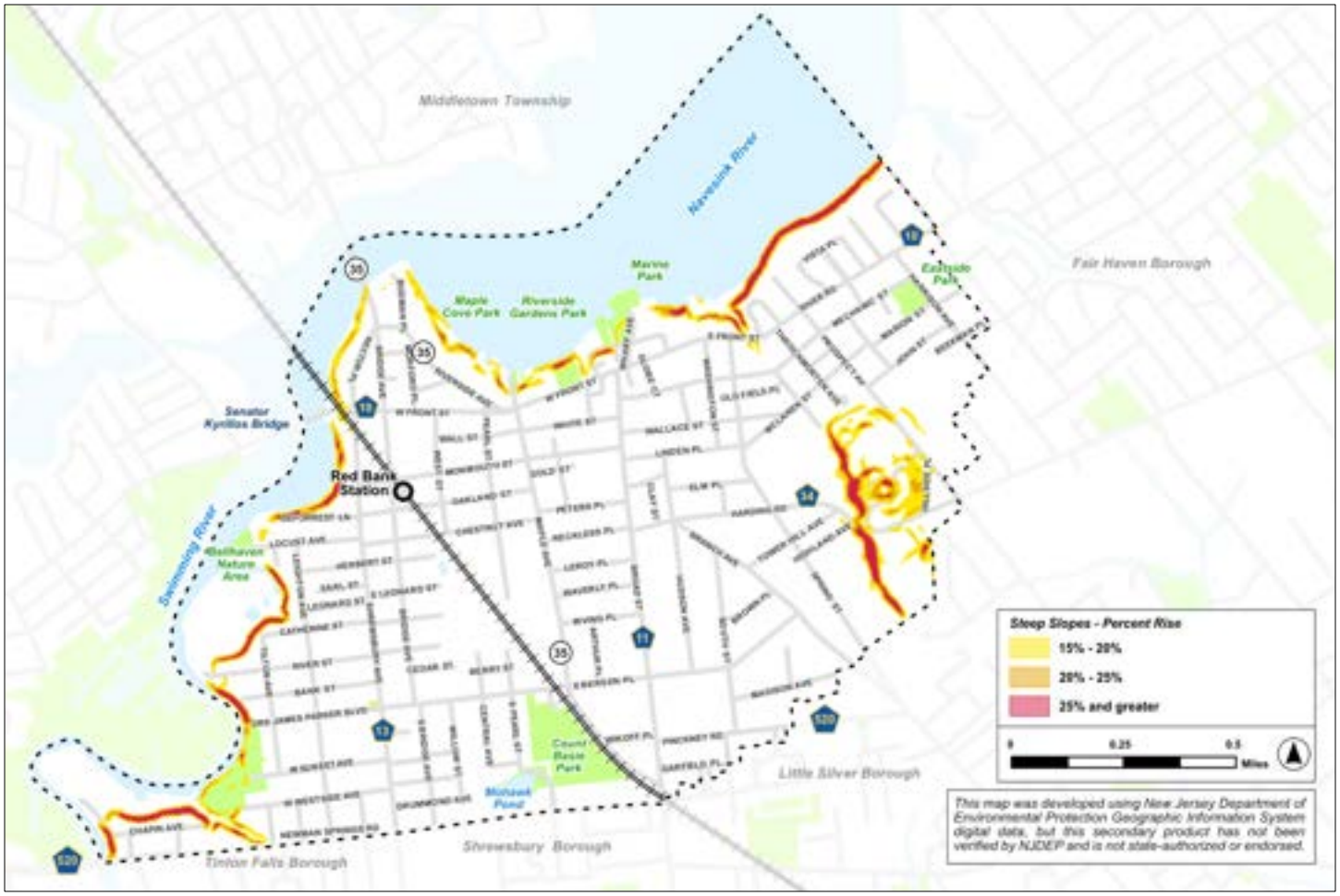


Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Steep Slopes

Steep slopes are defined by NJDEP as any slope equal or greater than 20% as measured over any minimum run of 10 feet, based on contour intervals of 2 feet or less. As discussed in NJDEP's Steep Slope Model Ordinance, the disturbance of steep slopes through development can accelerate erosion processes and soil loss and lead to increased flooding potential. As such, it is widely recognized that the disturbance of steep slopes should be restricted or prevented altogether.[10] Red Bank has not yet adopted a steep slope ordinance, but the Borough's Master Plan acknowledges steep slopes as critical environmental areas and recommends reviewing and strengthening ordinances to protect environmental resources. As seen in **Figure 2.5**, steep slopes in Red Bank can be found around Hilltop Terrace in the east of the municipality, along the coast of the Navesink River, and around wetland areas adjacent to the Swimming River.[11]

Figure 2.5: Steep Slopes in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

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[1] Dalton, Richard. 2003. New Jersey Geological and Water Survey: Information Circular. *Geologic Provinces of New Jersey.* https://www.nj.gov/dep/njgs/enviroed/infocirc/provinces.pdf. Accessed June 2024.

[2] New Jersey Geological and Water Survey (NJGWS). 2016. *Bedrock Geologic Map of New Jersey.* https://www.nj.gov/dep/njgs/enviroed/freedwn/psnjmap.pdf. Accessed June 2024.

[3] NJDEP. *Physiographic Provinces of New Jersey.* GIS Data. https://gisdata-njdep.opendata.arcgis.com/datasets/20377d0dc1fe41f1ab2d9d0897844441/explore. Accessed June 2024.

[4] Stanford, Scott. 2013. New Jersey Geological and Water Survey: Information Circular. *Geologic Maps: Documenting New Jersey's Earth Resources.* https://www.nj.gov/dep/njgs/enviroed/infocirc/mapping.pdf. Accessed June 2024.

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[7] Stanford, Scott. 2013. New Jersey Geological and Water Survey: Information Circular. *Geologic Maps: Documenting New Jersey's Earth Resources.* https://www.nj.gov/dep/njgs/enviroed/infocirc/mapping.pdf. Accessed June 2024.

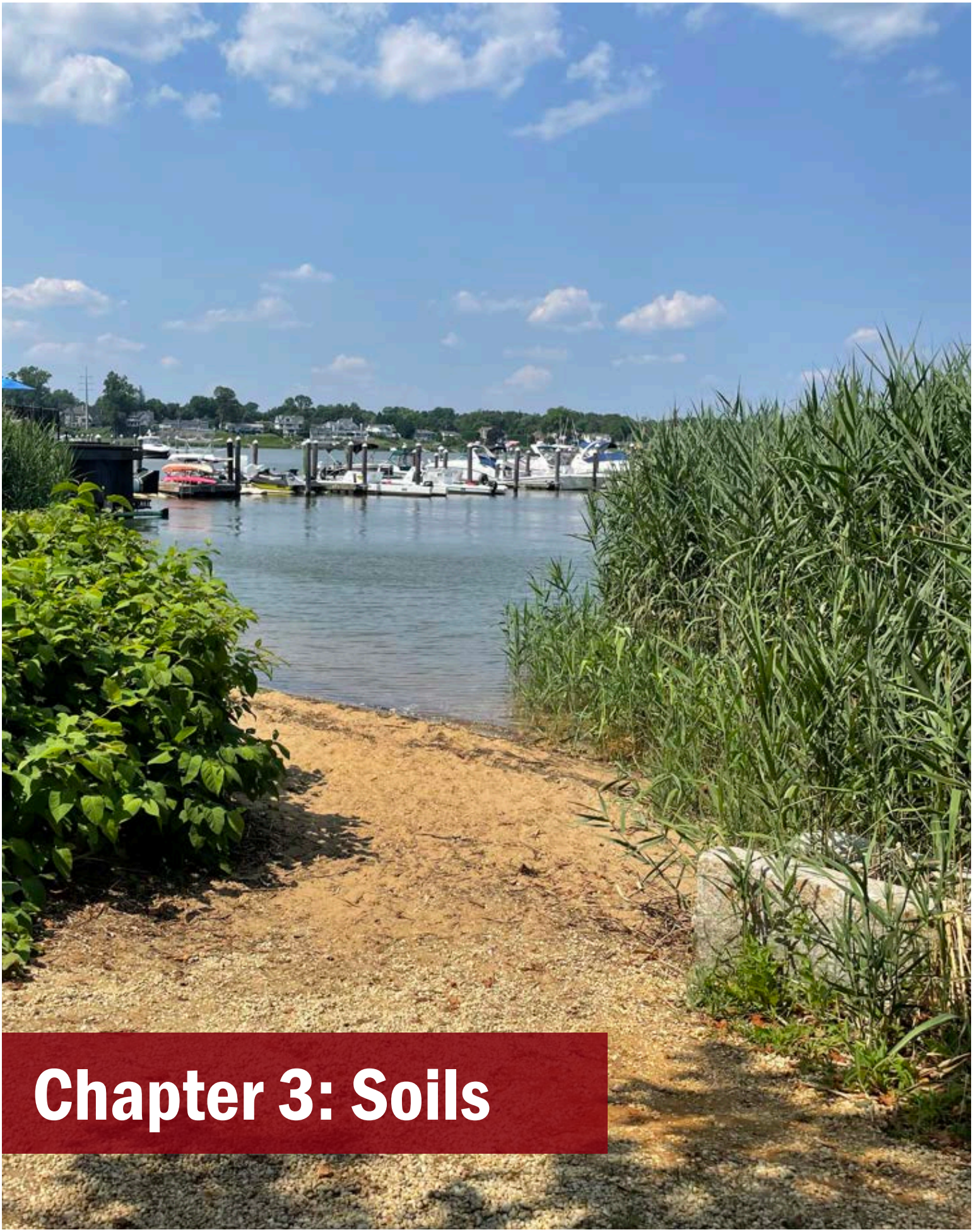
[8] University of California Berkeley. Museum of Paleontology. N.d. *Geologic Time Scale.* https://ucmp.berkeley.edu/help/timeform.php;

New Jersey Department of Environmental Protection (NJDEP). 2016. *Surficial Geologic Map of New Jersey.* https://dep.nj.gov/wp-content/uploads/njgws/enviroed-freedwn/freedwn/psnjsurf.pdf. NJDEP. *Surficial Geology of New Jersey.* GIS Data. https://gisdata-njdep.opendata.arcgis.com/datasets/njdep::surficial-geology-of-new-jersey/about. All accessed June 2024.

[9] Monmouth County. *2 Foot Contours.* GIS Data. https://data-monmouthnj.hub.arcgis.com/datasets/8c7faafbee524234bed84d1591503077_0/explore. Accessed June 2024.

[10] NJDEP. N.d. *Steep Slope Model Ordinance.* https://www.nj.gov/dep/wqmp/docs/steep_slope_model_ordinance20080624.pdf. Accessed July 2024.

[11] Monmouth County. *Steep Slopes.* GIS Data. Requested from Monmouth County GIS Division.



Chapter 3: Soils

Source: BFJ Planning.

Overview

Soil is the unconsolidated mineral or organic matter on the land's surface characterized by one or both of the following: 1) layers that are distinguishable from initial material due to additions, losses, transfers, and transformations of energy and matter or 2) the ability to support rooted plants in a natural environment. Areas are not considered to have soil if the surface is permanently covered by water too deep for the growth of rooted plants.[1]

Soils develop from interactions between the climate, living organisms, and landscape position that influence parent material decomposition over time. Climate determines the amount of water available for weathering minerals and transporting the minerals and elements released; living organisms such as plants supply soils with organic matter and recycled nutrients; landscape position such as the steepness, length, and shape of slopes influences the rate at which water flows into or off the soil.[2]

Soil surveys describe the characteristics of soils in specific areas, classify soils according to a standard taxonomic system, plot soil boundaries on maps, and assess the suitability and limitations of soil types for various land uses.[3] This information can be used to inform urban planning and development by evaluating and predicting the effects of certain actions on the environment. The Natural Resources Conservation Service (NRCS) maintains a Web Soil Survey that contains soil maps and data available for more than 95% of counties in the United States.

Key Terms

Soil Series – a group of soils with profiles that are almost alike, except for differences in the textures of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Soil Map Unit – a delineation on a soil map representing an area dominated by one or more major kinds of soil or miscellaneous areas

Soil Complex – a map unit of two or more kinds of areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping.

Soil Series in Red Bank

There are seven major soil series and nine soil map units (excluding the "water" classification) identified by the NRCS in the Borough. All the soil map units in Red Bank are mapped in **Figure 3.1** and summarized in **Table 3.1.** Brief descriptions of the different soil series present in Red Bank are listed below:

Appoquinimink Series – composed of mucky silt loam, silt loam, and mucky peat; very poorly drained; found in saltwater tidal marshes in estuaries that are continuously saturated and flooded twice daily by tidal waters; used mainly as wetland wildlife or as shellfish and small crustacean habitat.

Transquaking Series – composed of mucky peat, muck, and silty clay; very poorly drained; found in brackish estuarine marshes along tidally influenced rivers and creeks; used mainly as wetland wildlife habitat.

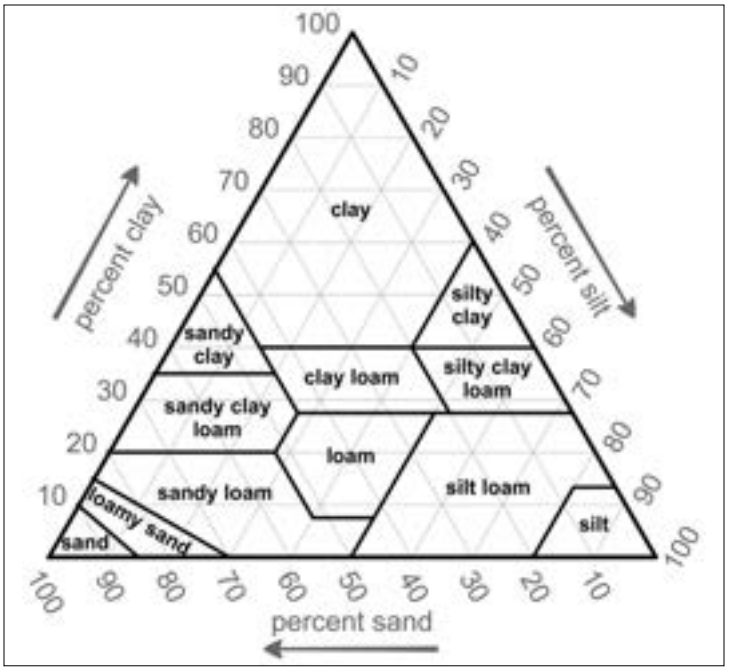
Mispillion Series – composed of mucky peat, muck, and silt loam; very poorly drained; found in salt marshes in estuaries and along tidally influenced rivers; home to wetland wildlife, shellfish, and small crustacean habitat.

Freehold Series – composed of sandy loam, sandy clay loam, and loamy sand; well-drained; found on knolls and hillslopes; generally cleared and used for growing vegetables, fruits, and specialty crops.

Holmdel Series – composed of sandy loam, sandy clay loam, and stratified sand; moderately well- drained; found on flats; historically cleared and used for corn, wheat, soybeans, and other crops.

Humaquepts – composed of loam and sand; poorly drained; found in floodplains. The NRCS does not indicate land uses supported by the Humaquepts series, but it should be noted that development in floodplains is highly regulated to prevent flood damage and promote public safety.

Soil Texture Triangle



Soil Particles	Diameter	Permeability
Clay	<0.002mm	Low
Silt	0.002 – 0.05mm	Medium
Sand	0.05 – 2mm	High

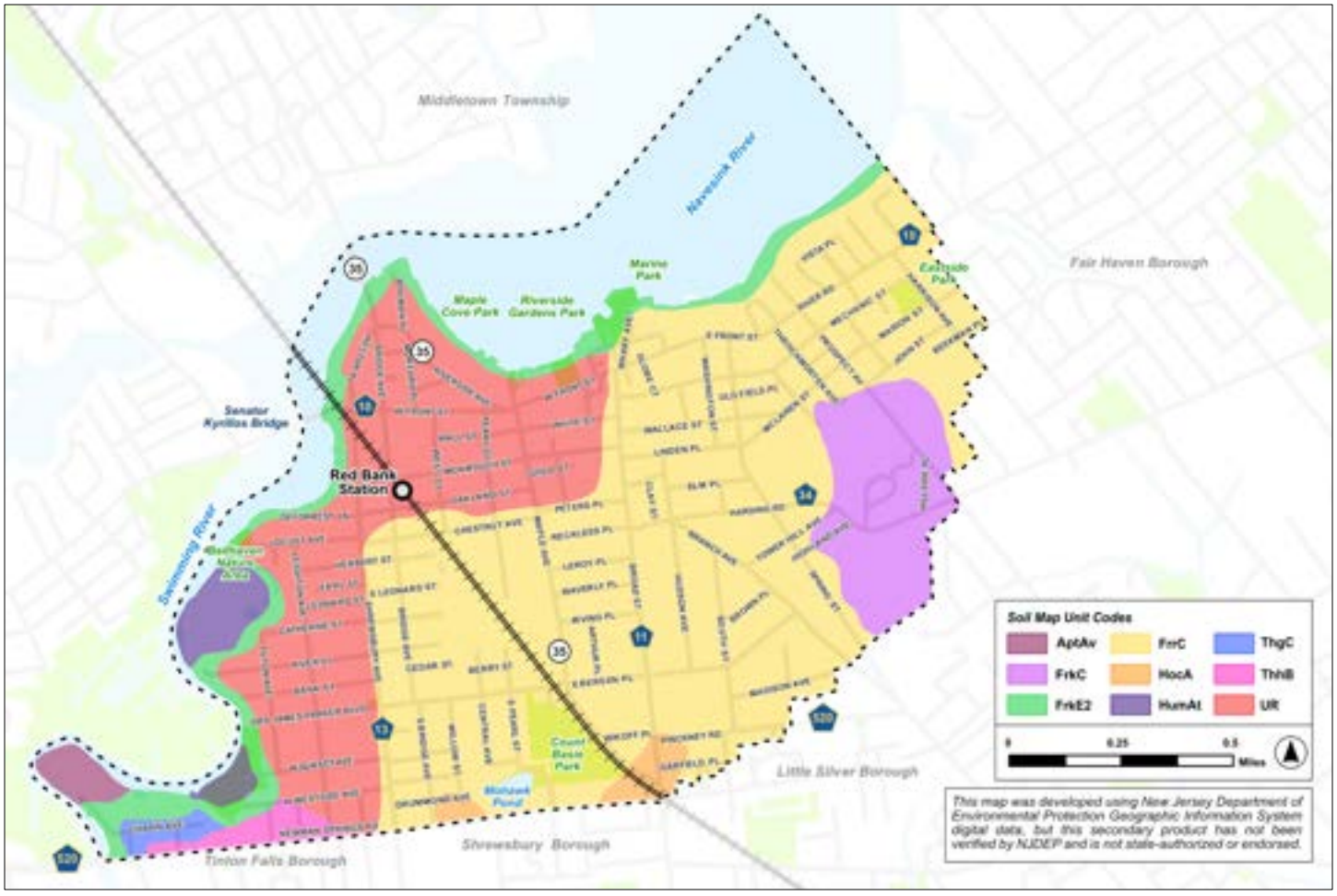
Source: NRCS.[4]

Table 3.1: Soils of Red Bank Summary Table

Map Unit Symbol	Name	Slopes	Acreage within Red Bank	Percentage of Red Bank
AptAv	*Appoquinimink-Transquaking-Mispillion complex*	0% – 1%	10.6	0.8%
FrkC	*Freehold sandy loam*	5% – 10%	82.9	6.0%
FrkE2	*Freehold sandy loam*	15% – 20%	70.4	5.1%
FrrC	*Freehold-Urban land complex*	0% – 10%	639.7	46.3%
HocA	*Holmdel sandy loam*	0% – 2%	15.5	1.1%
HumAt	*Humaquepts*	0% – 3%	25.5	1.8%
ThgC	*Tinton loamy sand*	5% – 10%	8.3	0.6%
ThhB	*Tinton-Urban land complex*	0% – 5%	14.8	1.1%
UR	*Urban land*	-	249.7	18.1%
WATER	*Water*	-	265.4	19.2%
		Totals:	**1,382.8**	**100%**
Note: "Urban land" refers to surfaces covered by pavement, buildings, and other structures underlain by natural soil material.				

Source: NRCS.

Figure 3.1: Soils of Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Soil Characteristics and Limitations

The capacities of soils to support different uses are determined by soils' properties, qualities, and features. Properties are the physical attributes directly observed in the field (e.g., available water capacity); qualities are behavior and performance attributes inferred from soil properties (e.g., natural drainage); and features are attributes that are not directly part of the soil (e.g., depth to restrictive layer). **Table 3.2** displays significant properties, qualities, and features of the soils mapped in Red Bank. **Table 3.3** displays the capacities of the different soils in Red Bank to support various types of building development, while **Table 3.4** displays the capacities of soils in Red Bank to support various recreational uses.

Definitions

Available Water Capacity – quantity of water that the soil can potentially store for use by plants.

Frost Action Potential - likelihood of expansion of the soil caused by the formation of ice and the subsequent collapse of the soil after thawing.

K Factor – indicates the susceptibility of a soil to water erosion and is based primarily on the percentage of silt, sand, and organic matter in a soil, as well as the soil's structure. Values range from 0.02 to 0.69; the higher the value, the more susceptible the soil is to erosion.

Ponding - standing water in a closed depression.

Restrictive Layer - a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil, e.g., bedrock and frozen layers.

Table 3.2: Soil Properties, Qualities, and Features

Map Unit Symbol	K Factor	Available Water Capacity (cm per cm)	Depth to Restrictive Layer (cm)	Depth to Water Table (cm)	Drainage	Flooding	Frost Action Potential	Ponding
AptAv	0.32	0.32	>200	0	Very poorly drained	Very frequent	High	Frequent
FrkC	0.13	0.13	>200	>200	Well drained	None	Moderate	None
FrkE2	0.13	0.13	>200	>200	Well drained	None	Moderate	None
FrrC	0.13	0.13	>200	>200	Well drained	None	Moderate	None
HocA	0.12	0.12	>200	69	Moderately well drained	None	Moderate	None
HumAt	0.12	0.12	>200	15	Poorly drained	Frequent	Moderate	Frequent
ThgC	0.1	0.1	>200	>200	Well drained	None	Moderate	None
ThhB	0.1	0.1	>200	>200	Well drained	None	Moderate	None
UR	-	-	>200	>200	-	-		None
WATER	-	-	>200	>200	-	-	-	None

Source: NRCS.

Definitions

Dwellings – single-family houses of three stories or less.

Small Commercial Buildings – structures less than three stories high that do not have basements.

Shallow Excavations – trenches or holes dug to accommodate uses such as utility lines.

Not limited – the soil is very favorable for the use.

Somewhat limited – soil is moderately favorable for the use; limitations can be overcome or minimized by special planning, design, or installation.

Very limited – the soil is unfavorable for the use; limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures.

Table 3.3: Building Use Limitations

Map Unit Symbol	Dwellings with Basements	Dwellings without Basements	Small Commercial Buildings	Shallow Excavations
AptAv	Very limited	Very limited	Very limited	Very limited
FrkC	Not limited	Not limited	Somewhat limited	Somewhat limited
FrkE2	Very limited	Very limited	Very limited	Very limited
FrrC	Not limited	Not limited	Somewhat Limited	Somewhat limited
HocA	Very limited	Somewhat limited	Somewhat Limited	Very limited
HumAt	Very limited	Very limited	Very limited	Very limited
ThgC	Not limited	Not limited	Very limited	Somewhat limited
ThhB	Not limited	Not limited	Not limited	Somewhat limited
UR	Not rated	Not rated	Not rated	Not rated
WATER	Not rated	Not rated	Not rated	Not rated

Source: NRCS.

Table 3.4: Recreational Use Limitations

Map Unit Symbol	Camp Area	Picnic Area	Paths and Trails	Playground
AptAv	Very limited	Very limited	Very limited	Very limited
FrkC	Somewhat limited	Somewhat limited	Somewhat limited	Very limited
FrkE2	Very limited	Very limited	Somewhat limited	Very limited
FrrC	Somewhat limited	Somewhat limited	Somewhat Limited	Very limited
HocA	Somewhat limited	Somewhat limited	Somewhat Limited	Somewhat limited
HumAt	Very limited	Very limited	Very limited	Very limited
ThgC	Somewhat limited	Somewhat limited	Somewhat limited	Very limited
ThhB	Somewhat limited	Somewhat limited	Somewhat limited	Somewhat Limited
UR	Not rated	Not rated	Not rated	Not rated
WATER	Not rated	Not rated	Not rated	Not rated

Source: NRCS.

References: Soils

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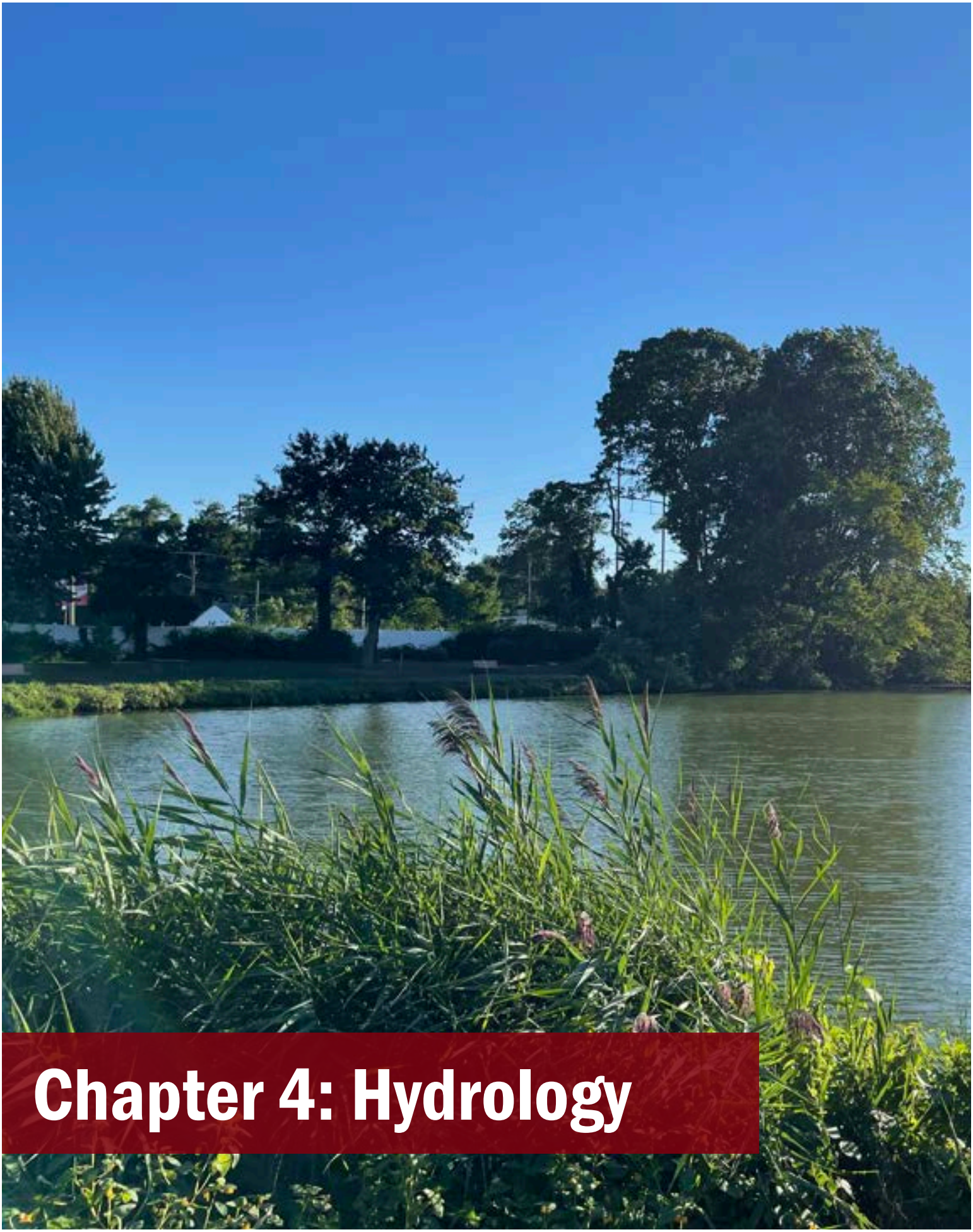


Chapter 4: Hydrology

Source: BFJ Planning.

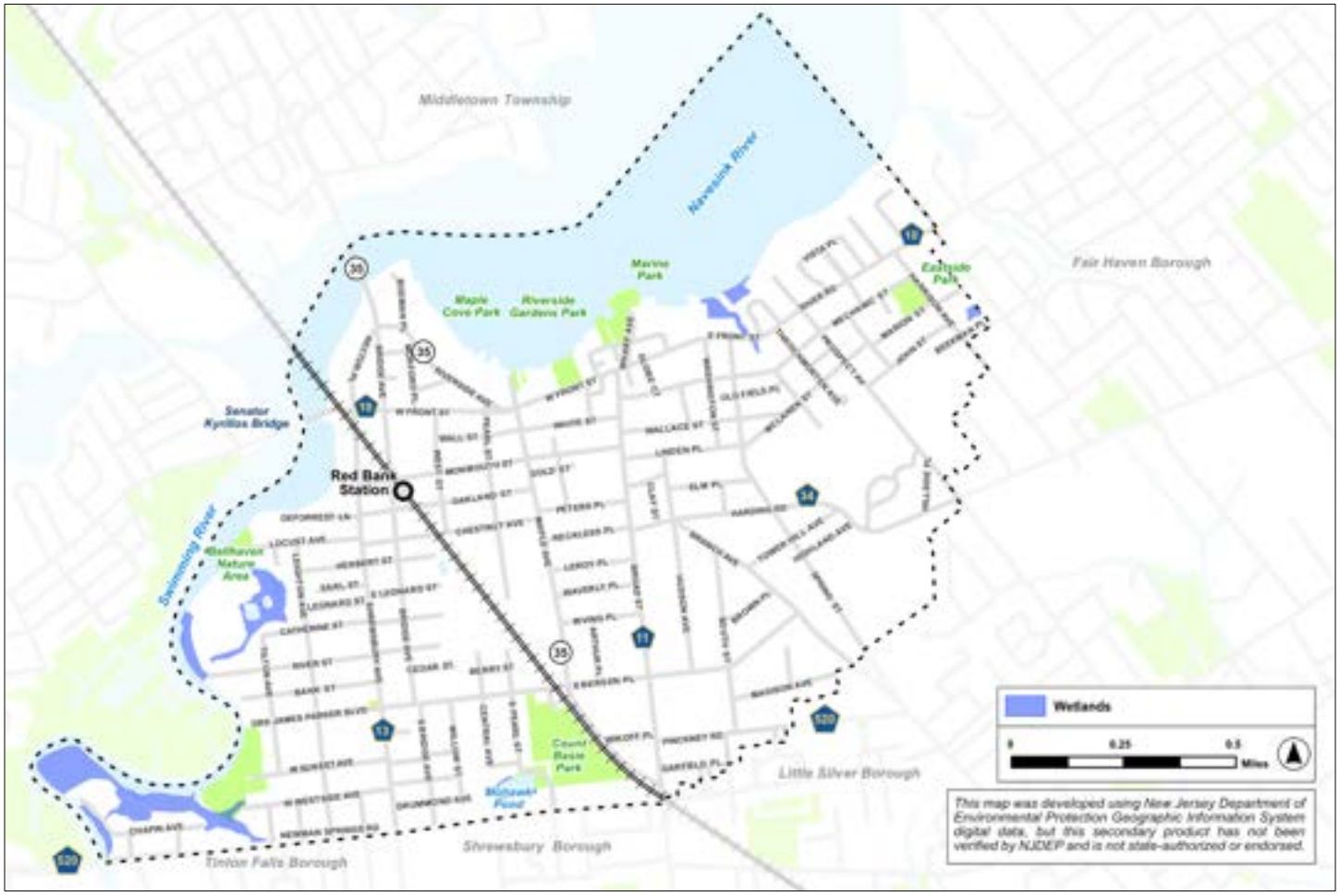
Wetlands

Wetlands are areas where the water table is usually at or near the surface or where the land is covered by shallow water. Red Bank is home to 28 acres of both coastal and inland wetlands. Coastal wetlands in Red Bank include phragmites dominate coastal wetlands, high vegetation tidal marsh wetlands, and low vegetation tidal marsh wetlands. Inland wetlands in Red Bank include deciduous wooded wetlands and deciduous scrub/shrub wetlands.[1] Discussion of the different types of wetlands in Red Bank and the vegetation typically present within them can be found in **Chapter 6: Vegetation & Wildlife.**

Vernal pools are depressional wetlands that are covered by shallow water for variable periods from winter to spring but may be completely dry for most of the summer and fall. They are found in gently sloping plains of grassland, are devoid of breeding fish populations, and provide habitat to many species of amphibians, insects, reptiles, and plants.[2] New Jersey has not identified any vernal pools within Red Bank.

Figure 4.1 depicts the extent of wetlands in Red Bank.[3]

Figure 4.1: Wetlands in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Watersheds

Watersheds are areas of land and surface water bodies that channel rainfall, snowmelt, and runoff into bodies of water such as rivers, lakes, streams, or bays. The United States Geological Survey (USGS) developed the hydrologic unit code (HUC) numbering system to provide a common coding system for state and federal agencies to identify and delineate between watersheds. The hierarchical system starts with the largest possible watersheds and divides and subdivides them into successively smaller areas. For example, HUC-11 watersheds (identified by 11-digit codes) are further subdivided into HUC-14 sub-watersheds (identified by 14-digit codes). HUC-14 sub-watersheds are the smallest delineation identified by the USGS. New Jersey contains 152 HUC-11 watersheds and 969 HUC-14 watersheds. Red Bank falls within two HUC-11 watersheds and three HUC-14 sub-watersheds, as listed in **Table 4.1** and shown in **Figure 4.2**[3]

Watershed Management Areas

In 1996, New Jersey began implementing a "watershed management approach" to maintain the physical, chemical, and biological integrity of the State's waters. In this approach, the State of New Jersey divided the State into 20 Watershed Management Areas (WMAs), each coinciding with the HUC-11 hydrologic units as defined and delineated by the USGS. The Borough of Red Bank falls within WMA 12, the Monmouth Watershed Management Area, which spans 56 municipalities.[4]

Swimming River

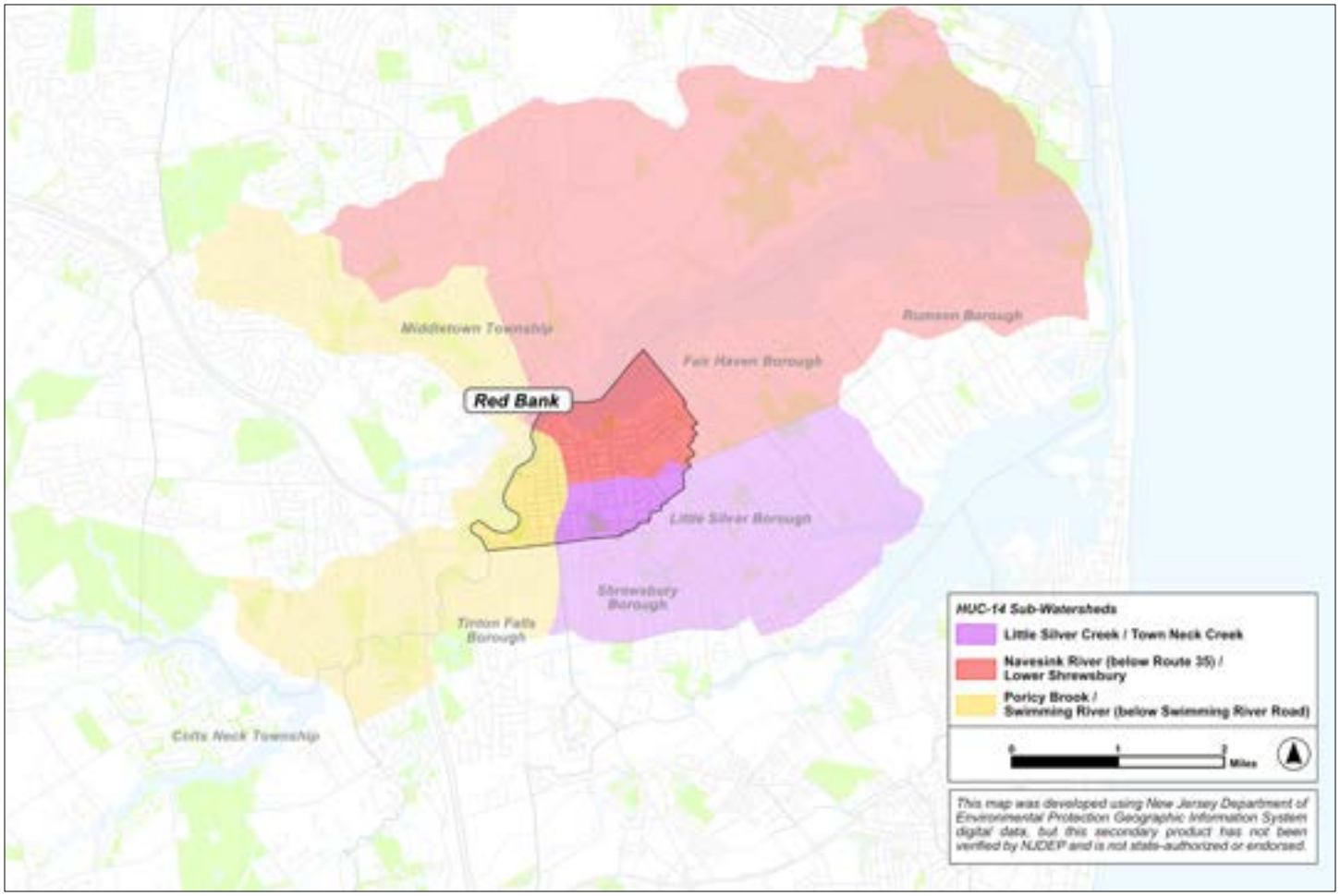
Source: Red Bank Environmental Commission

Table 4.1: Watersheds in Red Bank

HUC-11 Watershed	HUC-14 Sub-Watershed	Acreage within Red Bank	Percentage of Red Bank
Shrewsbury River (above Navesink River) (02030104080)	Little Silver Creek / Town Neck Creek (02030104080010)	344.3	25%
Navesink River / Lower Shrewsbury River (02030104070)	Navesink River (below Route 35) / Lower Shrewsbury (02030104070110)	716.4	52%
	Poricy Brook / Swimming River (below Swimming River Road) (02030104070100)	322.1	23%
	Totals:	**1,383**	**100%**

Source: NJDEP.

Figure 4.2: HUC-14 Sub-Watersheds in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Water Quality

Surface Water Quality Standards

New Jersey's Administrative Code (N.J.A.C.) defines surface water as water at or above the land's surface that is neither groundwater nor contained within the *unsaturated zone* (the subsurface volume between the surface and the top of the water table), including the ocean and its tributaries, all springs, streams, rivers, lakes, ponds, wetlands, and artificial waterbodies.[5] The Surface Water Quality Standards (SWQS) in the code are intended to protect the quality of surface waters in the State by establishing designated uses, classifying surface waters based on those uses, and setting water quality criteria that protect the designated uses for each water classification. Red Bank's surface waters fall into three classifications:

1. General freshwater-non-trout/saline estuarine waters (FW2-NT/SE1)
2. Saline estuarine waters (SE1)
3. Category 1 saline estuarine waters (SE1C1**)**

Waterways classified as FW2-NT/SE1 are characterized by an interface between salt water (SE1) and fresh water (FW2-NT). Designated uses in FW2 waters are:

- Maintenance, migration and propagation of the natural and established biota
- Primary contact recreation
- Industrial and agricultural water supply
- Public potable water supply after conventional filtration and disinfection

Designated uses in SE1 waters are:

- Shellfish harvesting
- Maintenance, migration and propagation of the natural and established biota
- Primary contact recreation

Definitions and Abbreviations

Category One waters (C1) – waters designated for purposes of implementing anti-degradation policies to protect against changes in water quality based on ecological, recreational, water supply, or fishery resource significance to protect their aesthetic value and ecological integrity.

Fresh waters – waters having salinities of less than or equal to 3.5 parts per thousand at mean high tide.

FW1 – surface water classification applied to fresh waters designated to be set aside for posterity and not subjected to any man-made wastewater discharges or increases in runoff from human activity.

FW2 – surface water classification applied to fresh waters not designated as FW1.

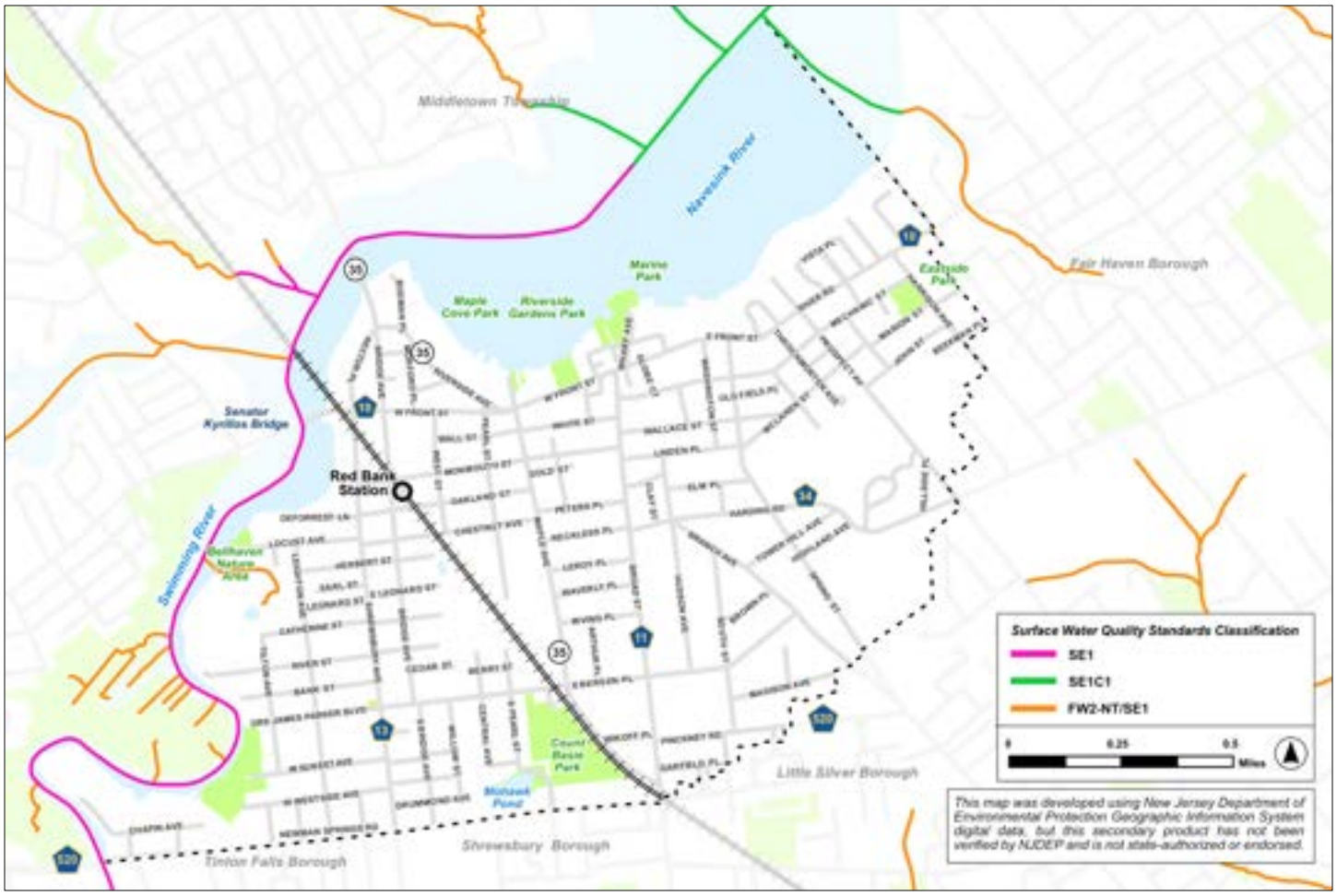
Non-trout waters (NT) – fresh waters that have not been designated as trout production or trout maintenance due to their physical, chemical, or biological characteristics, but are suitable for a wide variety of other fish species.

Primary contact recreation – water-related activities that involve significant ingestion risks, e.g., wading, swimming, surfing, and water skiing.

Saline waters – waters having salinities greater than 3.5 parts per thousand at mean high tide.

SE – surface water classification applied to saline waters of estuaries.

Figure 4.3: Surface Water Quality Standards in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Water Quality Impairments

The Clean Water Act mandates that states produce a biennial *Water Quality Inventory Report* and a biennial *List of Water Quality Limited Segments* to compile information about the quality of their surface waters. The Water Quality Inventory Report describes the status of principal surface waters in terms of overall water quality and support of designated uses, while the List of Water Quality Limited Segments includes waters that are not attaining water quality standards. Since 2001, the U.S. Environmental Protection Agency (EPA) has recommended that states merge these two documents to produce an *Integrated Report*. New Jersey submitted its first Integrated Report in 2002, describing the attainment of the designated uses of waterbodies specified in its SWQS. Surface waters are grouped into assessment units based on HUC-14 delineations. NJDEP evaluates these assessment units according to water quality parameters associated with each designated use to determine if their waters are attaining their SWQS. **Table 4.2** describes each designated use and displays the major parameters used to assess them. **Table 4.3** displays the designated uses of waterbodies within Red Bank's HUC-14 sub-watersheds and their attainment status.

Table 4.2: Designated Uses and Associated Parameters

Designated Use	Description	Major Parameters
Aquatic Life (General)	Can these waters support a healthy ecosystem?	Biological data, temperature, turbidity, *total suspended solids* (TSS), pH, *dissolved oxygen* (DO), *total phosphorous* (TP)
Aquatic Life (Trout)	Can species of trout survive or reproduce in these waters?	Biological data, temperature, turbidity, *total suspended solids* (TSS), pH, *dissolved oxygen* (DO), *total phosphorous* (TP)
Fish Consumption	Can we eat fish from these waters?	Dioxin, dieldrin, chlordane, DDx, mercury, PCB
Water Supply	Can we use these waters as sources for drinking water?	Nitrate, mercury, Lead, *total dissolved solids* (TDS), arsenic
Recreation (Primary)	Can we swim, surf, or do other submergible activities in these waters?	*E. coli,* Enterococcus
Recreation (Secondary)	Can we boat, wade, or jet ski in these waters?	Fecal coliform
Shellfish Harvest	Can we eat clams, oysters or mussels from these waters?	Fecal coliform

Source: NJDEP.

Table 4.3: Attainment Status of Designated Uses for Red Bank's HUC-14 Sub-Watersheds

Assessment Unit (HUC-14 Sub-Watershed)	Designated Use*				
	Aquatic Life (General)	Fish Consumption	Water Supply	Recreation (Primary)	Shellfish Harvest
Little Silver Creek / Town Neck Creek	Insufficient Data	Non-support	N/A	Non-support	Non-support
Navesink River (below Route 35) / Lower Shrewsbury	Non-support	Non-support	Non-support	Non-support	Non-support
Poricy Brook / Swimming River (below Swimming River Road)	Non-support	Non-support	Full Support	Non-support	Non-support
*Excludes "aquatic life (trout)" and "recreation (secondary)" which do not apply to any of the HUC-14 watersheds in Red Bank.					

Source: NJDEP.

To ensure confidence in identifying water quality issues and health, NJDEP is conservative in its assessment methods; a "non-support" determination for a designated use may be the result of a single parameter exceeding criteria at one of many water quality monitoring sites, and does not necessarily indicate that pollution levels pose a significant danger to humans or wildlife.[7]

Total Maximum Daily Loads

Waters that do not meet the applicable standards or support the designated use(s) require development of a *total maximum daily load* (TMDL) for the pollutant(s) causing the impairment. A TMDL calculates the maximum amount of a pollutant allowed to enter a waterbody so that it will meet water quality standards for that pollutant. **Table 4.4** displays the HUC-14 sub-watershed names, the designated uses specified in SWQS that are not being attained, the water quality parameters causing them to not support their designated uses, and and the priority level assigned to the development of a TMDL, or the year a TMDL was completed.[8]

Table 4.4: Impaired Waters and Associated Parameters and TMDL Priority

Assessment Unit (HUC-14 Sub-Watershed)	Designated Use	Parameters	TMDL Priority or Date Completed
Little Silver Creek / Town Neck Creek	Fish Consumption	Chlordane in fish tissue	Low
		DDT in fish tissue	Low
		Dieldrin in fish tissue	Low
		Dioxin in fish tissue	Low
		Heptachlor in fish tissue	Low
		PCBs in fish tissue	Low
	Recreation (Primary)	Enterococcus	TMDL completed in 2006
	Shellfish Harvest	Total coliform	TMDL completed in 2006
Navesink River (below Route 35) / Lower Shrewsbury	Aquatic Life	Biological – cause unknown	Low
		Dissolved oxygen	Low
		PH	Medium
	Fish Consumption	DDT in fish tissue	Low
		PCBs in fish tissue	Medium
	Public Water Supply	Arsenic	Low
	Recreation (Primary)	Enterococcus	TMDL completed in 2006
		E. coli	TMDL completed in 2006
	Shellfish Harvest	Total coliform	TMDL completed in 2006
Poricy Brook / Swimming River (below Swimming River Road)	Aquatic Life	Dissolved oxygen	Medium
	Fish Consumption	DDT in fish tissue	Low
		PCBs in fish tissue	Low
	Recreation (Primary)	Enterococcus	TMDL completed in 2006
		E. coli	TMDL completed in 2006
	Shellfish Harvest	Total coliform	TMDL completed in 2006

Note on TMDL priority levels:
High priority –TMDL will be completed within the next two years.
Medium priority –TMDL will be completed in the near future, but not within the next two years.
Low priority – TMDL is not expected to be completed in the near future.

Source: NJDEP.

TMDL priority rankings are based on a number of environmental, social, and political factors, including the severity and spatial extent of impairment, the nature of the designated use not being supported, and the degree of public support for addressing particular assessment units. In some instances, TMDLs are ranked as low priority because their development is not an effective means to advance water quality improvement. This is the case when legacy pollutants lingering in the environment long after their production has ceased cause a designated use to not be supported; parameters associated with fish consumption fall into this category.

NJDEP works with municipalities to respond to emergencies posing significant threats to the health of waterbodies. On July 11, 2024 a sewer main break caused untreated wastewater to enter Red Bank's storm drains, which then discharged the sewage into the Navesink River. NJDEP was notified of the event and evaluated the extent of the contamination, issuing a statement after determining it was safe to resume river activities.[9]

Groundwater

Aquifers

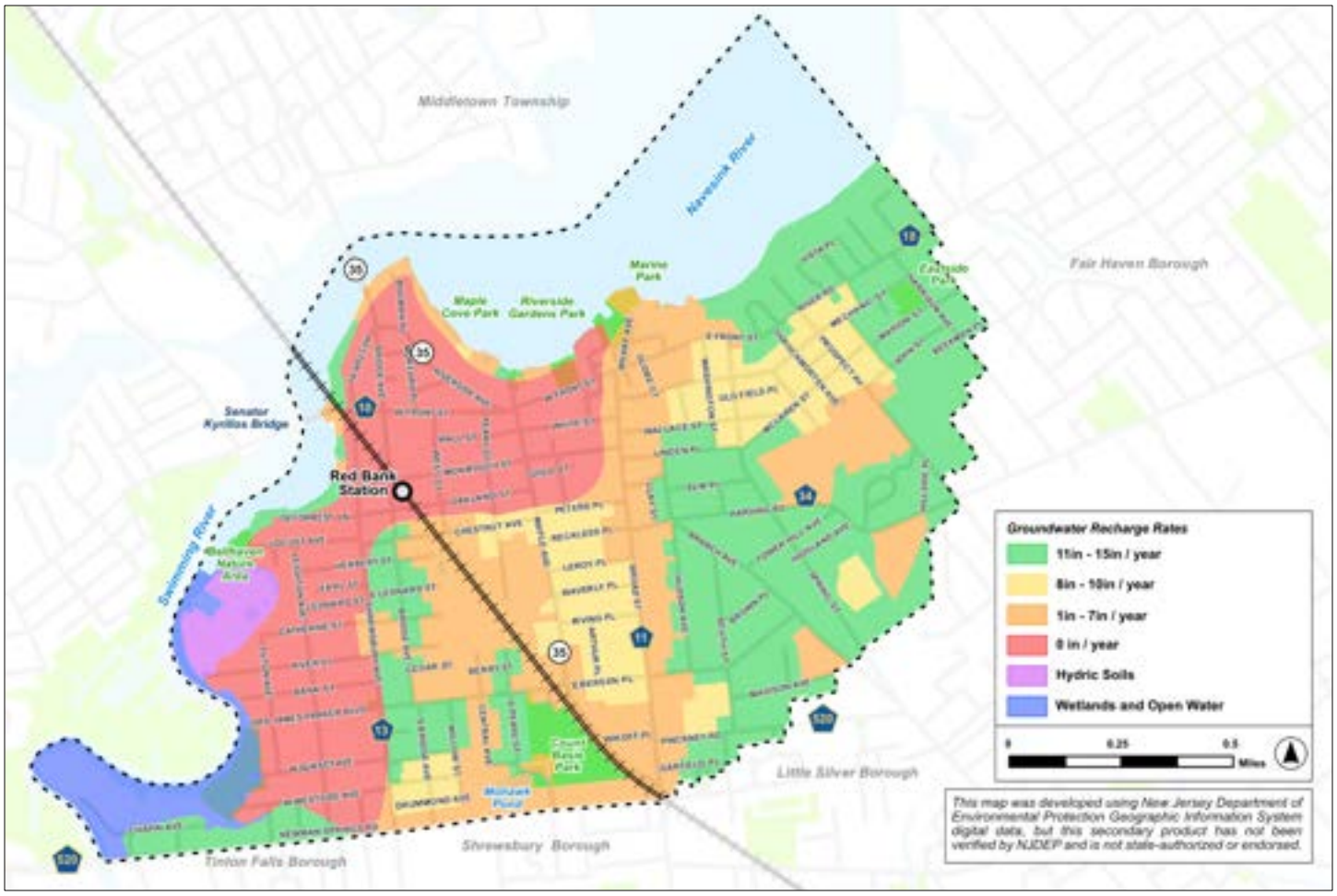
An *aquifer* is an underground layer of rock, sand or gravel capable of storing water within cracks and pore spaces, or between grains.[10] Aquifers are typically categorized as either "confined" or "unconfined" depending on their geometry and relationship to topography. Confined aquifers are aquifers below the land surface that are under increased pressure due to the presence of permeable material both above and below them. Unconfined aquifers are aquifers whose upper water surface extends to the land surface and are thus at atmospheric pressure.[11] Red Bank's public wells draw their water from the Raritan Aquifer Formation, and the borough is underlain by the composite confining unit of the Tinton Formation and the composite confining unit aquifer (or localized water-table aquifer) of the Shrewsbury Member. Composite confining units are composed of silt and clay with localized confining sand lenses, while composite confining unit aquifers are composed of massive quartz sand outcrops.[12]

Groundwater Recharge

Groundwater recharge is defined as the volume of water that infiltrates downward from the land surface into the soil. Precipitation in the form of rain, snow, hail, or sleet that does not become surface runoff seeps into the soil, where some of it is returned to the atmosphere through evapotranspiration – the loss of water from a land area through transpiration from plants and evaporation from the soil. The leftover water that seeps further into the soil and reaches the saturated zone becomes groundwater.[13] The rate of groundwater recharge is expressed as the number of inches of precipitation per year that reach the saturated zone.

Factors such as climatic conditions, soil permeability, vegetation, and land cover impact groundwater recharge rates. Land development that replaces permeable soils with impervious surfaces such as concrete or asphalt can significantly decrease the amount of precipitation that reaches the saturated zone, in turn adversely impacting the supply of groundwater that feeds streams, wetlands, and water supply wells. In Red Bank, as seen in **Figure 4.4**, the lowest rates of groundwater recharge occur in areas with a significant amount of developed land, while higher rates of recharge occur in relatively less-developed, more vegetated areas. Since hydric soils and wetlands are already heavily saturated, their recharge rates are not calculated. **Table 4.5** summarizes Red Bank's land area by its rates of groundwater recharge rates.[14]

Figure 4.4: Groundwater Recharge Rates in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Table 4.5: Land Area in Red Bank by Groundwater Recharge Rates

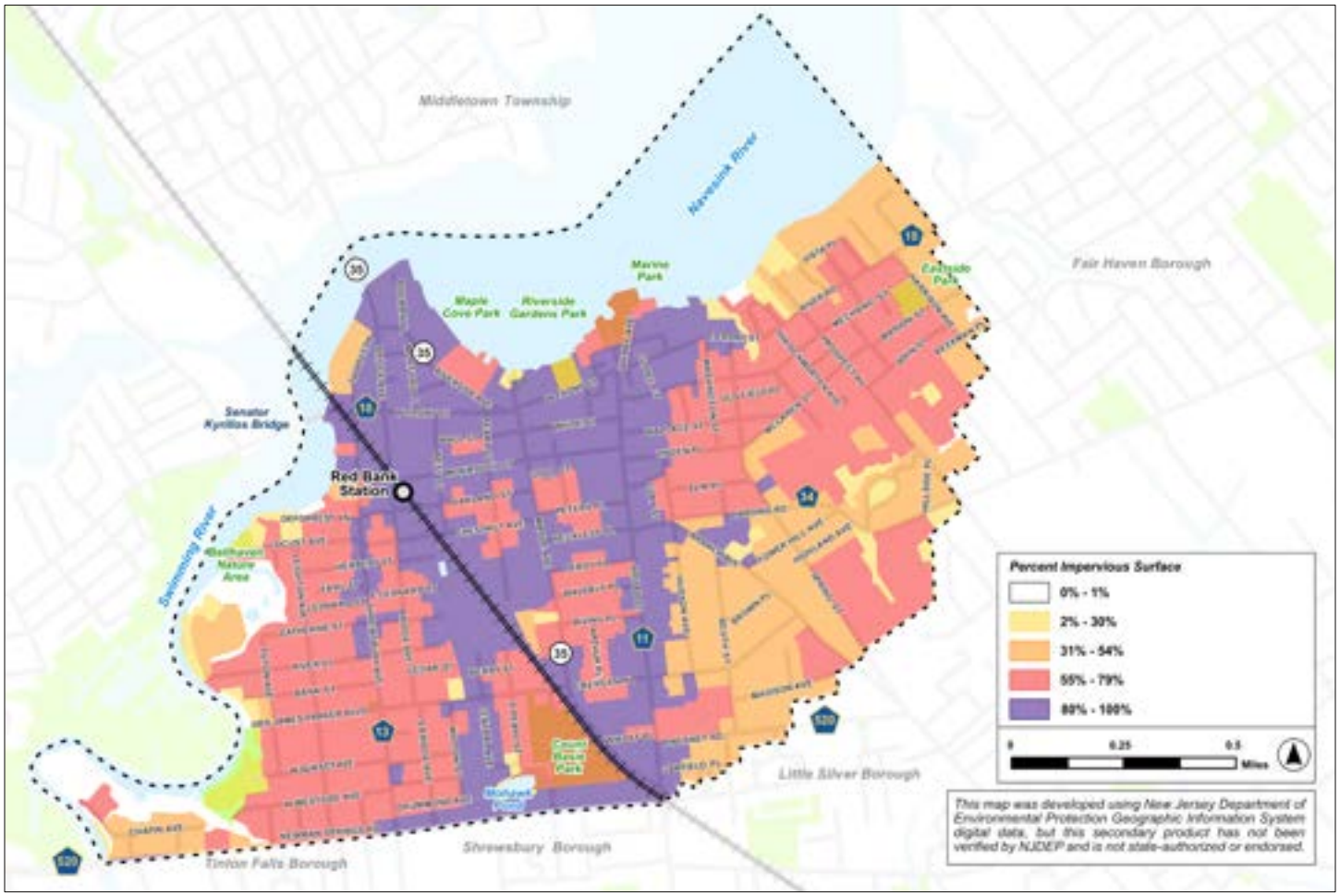
Groundwater Recharge Rate	Acreage in Red Bank	Percentage of Red Bank
0in / year	263.9	23.3%
1in – 7in / year	270.1	23.9%
8in – 10in / year	134.9	34.5%
11in – 15in / year	390.8	11.9%
Hydric soil – no recharge calculated	20.7	1.8%
Wetlands and open water – no recharge calculated	51.7	4.6%
Totals:	**1,132**	**100%**

Source: NJDEP.

Stormwater Runoff & Impervious Surfaces

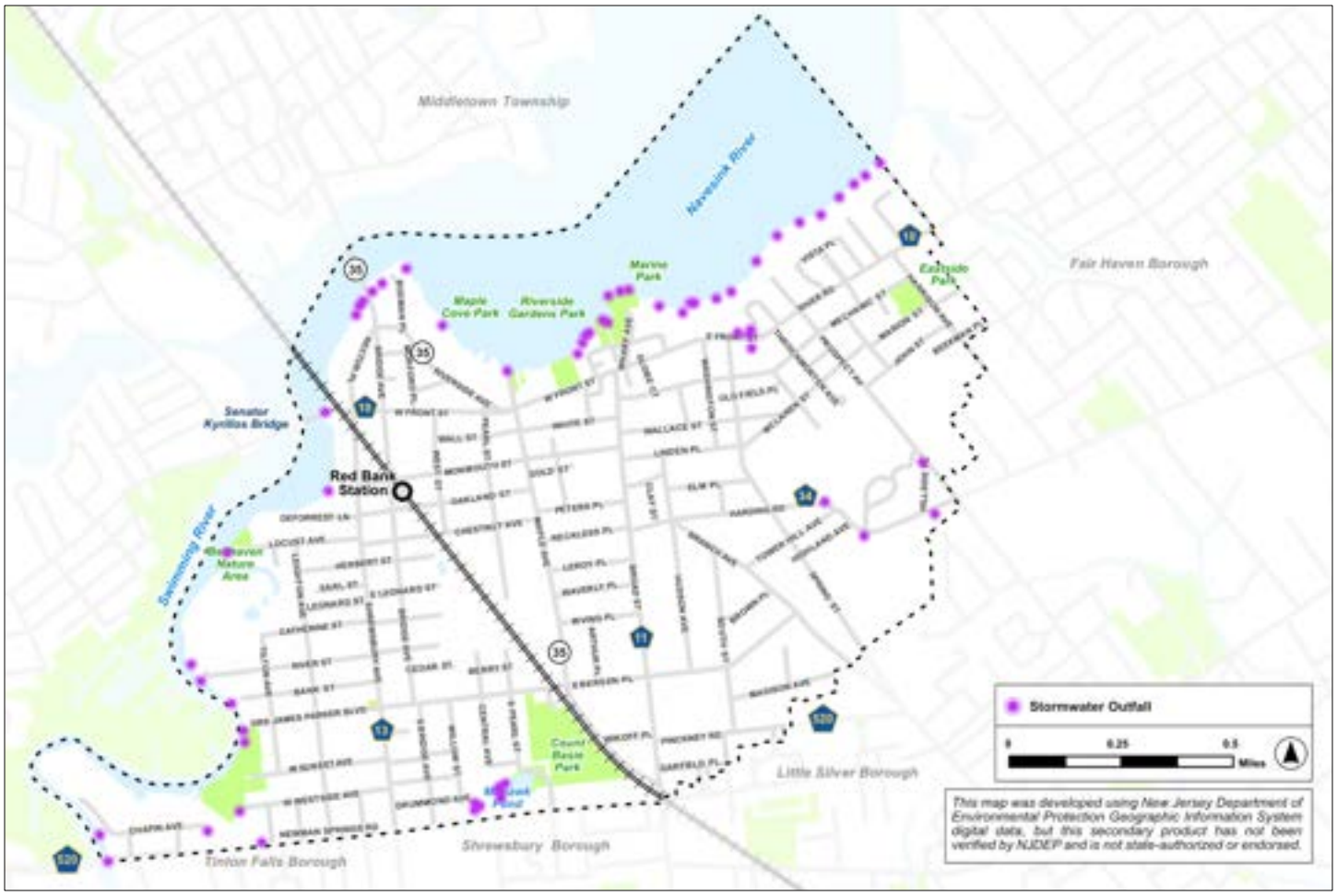
Stormwater runoff results from precipitation that does not soak into the ground, and instead flows over land and impervious surfaces until it is deposited into storm drains or waterbodies. Stormwater runoff can pose significant hazards to Red Bank's natural resources and infrastructure by carrying pollutants it picks up on the land surface into waterbodies, accelerating soil erosion, and causing flooding and damage to infrastructure such as roads and bridges. Impervious surfaces that do not allow water to penetrate the ground can exacerbate these issues by directing water that would normally enter the ground into storm drains and waterbodies. **Figure 4.5.** depicts areas of Red Bank according to impervious land cover, with much of the downtown and immediate surrounding area having high percentages of impervious surfaces. **Figure 4.6** depicts the locations of stormwater outfalls within Red Bank, where runoff isdischarged into local waterbodies.

Figure 4.5: Impervious Surfaces in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Figure 4.6: Stormwater Outfalls in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

A number of strategies to reduce impervious surface coverage in Red Bank and mitigate the negative effects of stormwater have been identified. *The Impervious Cover Reduction Action Plan*, prepared in 2017 by the Rutgers Cooperative Extension Water Resources Program, analyzed the potential effectiveness of various green infrastructure practices and proposed 17 potential intervention sites.[15] In addition, the *Borough of Red Bank Master Plan* recommends reducing impervious surfaces and employing green infrastructure techniques by increasing tree cover and enhancing tree preservation efforts; implementing landscaping projects at municipal sites and facilities; and revising the Borough's zoning code to introduce a maximum impervious coverage regulation and require commercial properties to include landscaped areas.[16] Finally, the Borough's Stormwater Management Ordinance acknowledges the hazards posed by stormwater runoff and establishes minimum requirements and controls – including those pertaining to green infrastructure, best management practices, and nonstructural management strategies – for major development projects to mitigate runoff's negative effects.[17]

Bioswale at the White Street Parking Lot

Source: Red Bank Environmental Commission

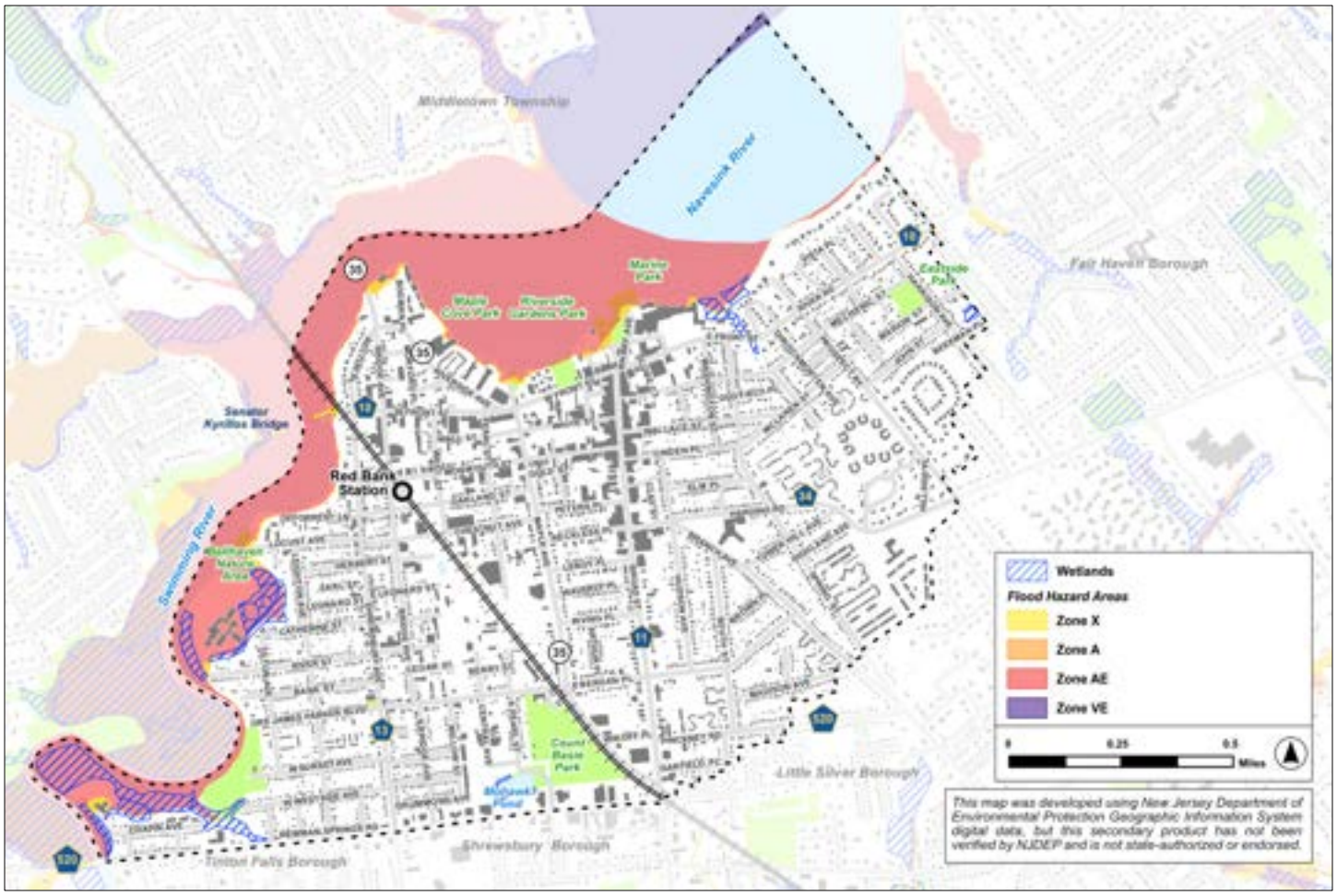
Flood Hazards

Red Bank has about 4 miles of waterfront along the Navesink and Swimming Rivers, each of which is associated with environmentally sensitive features such as wetlands and Special Flood Hazard Areas (SFHAs). SFHAs within the Borough include areas A, AE and VE, as seen in **Figure 4.7.**

SFHA A exhibits a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Since detailed analyses are not performed by FEMA for such areas, no depths or base flood elevations are shown within these zones. SFHA AE encompasses the base floodplain and has base flood elevations indicated on FEMA and National Flood Insurance Program (NFIP) mapping. SFHA VE represents coastal areas with a 1% or greater chance of flooding and an additional hazard associated with wave action from storms. Land area in area X is subject to minimal flood hazard. Significant portions of Red Bank's northern and western river shorelines lie within SFHAs, posing risks to the Borough's resources and infrastructure. Along the northern shore, Marine, Riverside Gardens, and Maple Cove Parks lie within the floodplain. On the western shoreline, vulnerable areas include the Bellhaven Nature Area, along with Red Bank Primary School and the Red Bank Center for Rehabilitation and Healing, a nursing facility.

It should be noted that SFHAs do not depict the potential extent of inland flooding that may occur after rain overwhelms existing drainage infrastructure. Factors such as impervious surface coverage, topography, and water table depth can cause stormwater from severe rains to collect in low-lying areas and flow into below-grade spaces such as basements and garages. While inland flooding can be difficult to predict, Red Bank residents have noted several areas of concern that tend to flood after heavy rain, including along Willow Street and East Bergen Place, as well as along Chestnut Street near the Red Bank Department of Public Works.

Figure 4.7: Special Flood Hazard Areas in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), FEMA, BFJ Planning.

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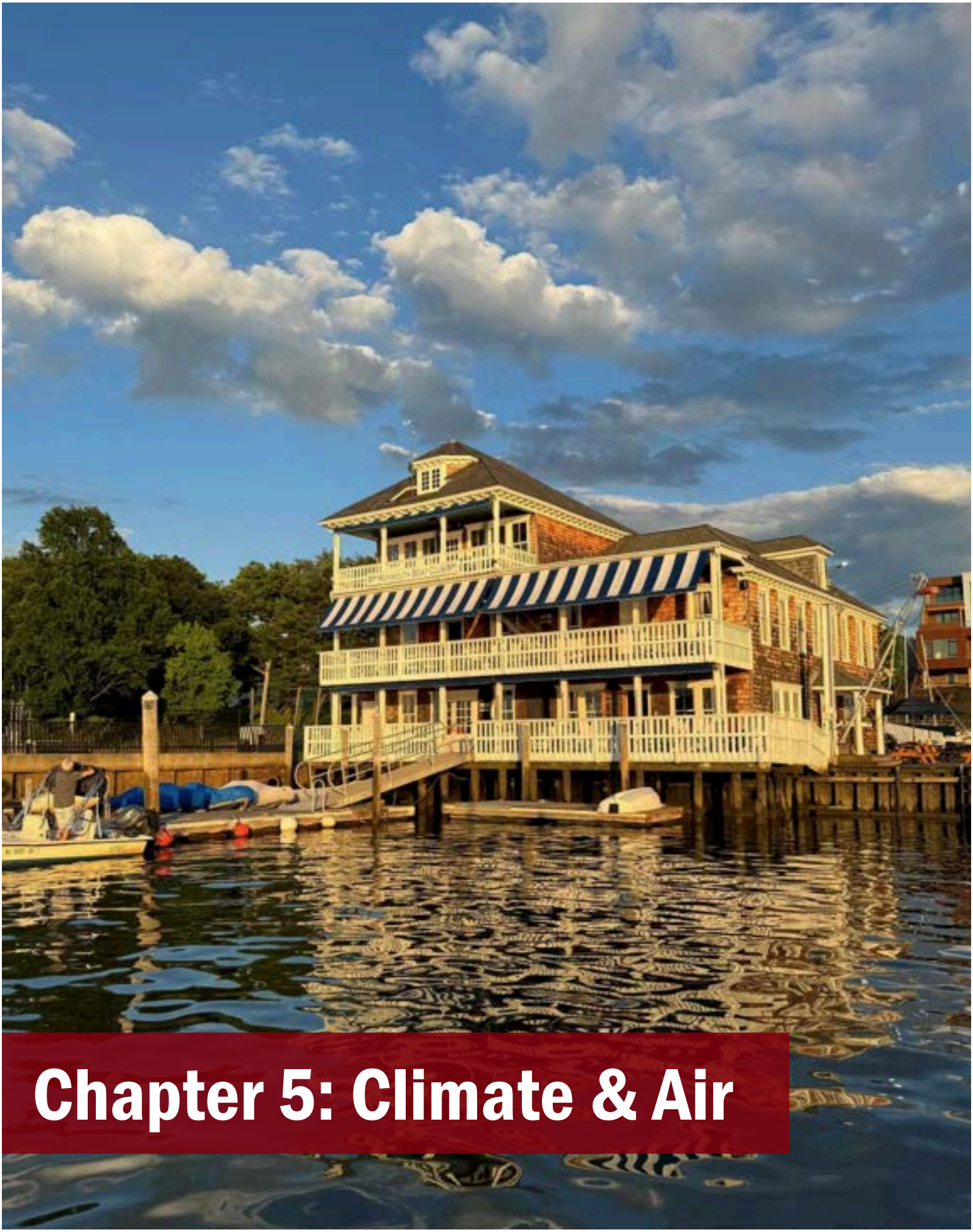


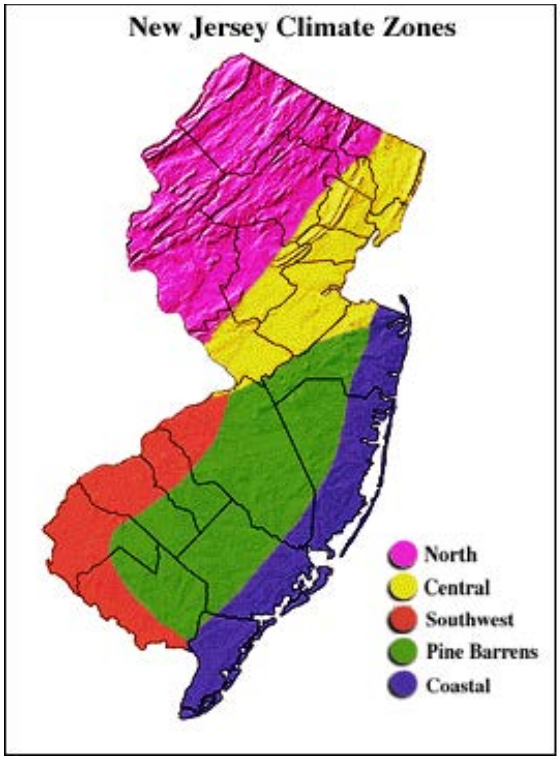
Chapter 5: Climate & Air

Source: Red Bank Environmental Commission

Climate Zones

New Jersey is divided into five climate zones: Northern, Central, Pine Barrens, Southwest, and Coastal, pictured in **Figure 5.1**. Red Bank falls within the Coastal Zone, which experiences more gradual seasonal temperature fluctuations due to the Atlantic Ocean's high heat capacity relative to the land surface. In autumn and early winter, the Coastal Zone experiences warmer temperatures than interior regions of the State. During spring and summer, the Coastal Zone remains relatively cool due to the ocean breezes that occur when heated air rises from the land, allowing cooler air at the ocean surface to spread inland.[1]

Figure 5.1: New Jersey Climate Zones

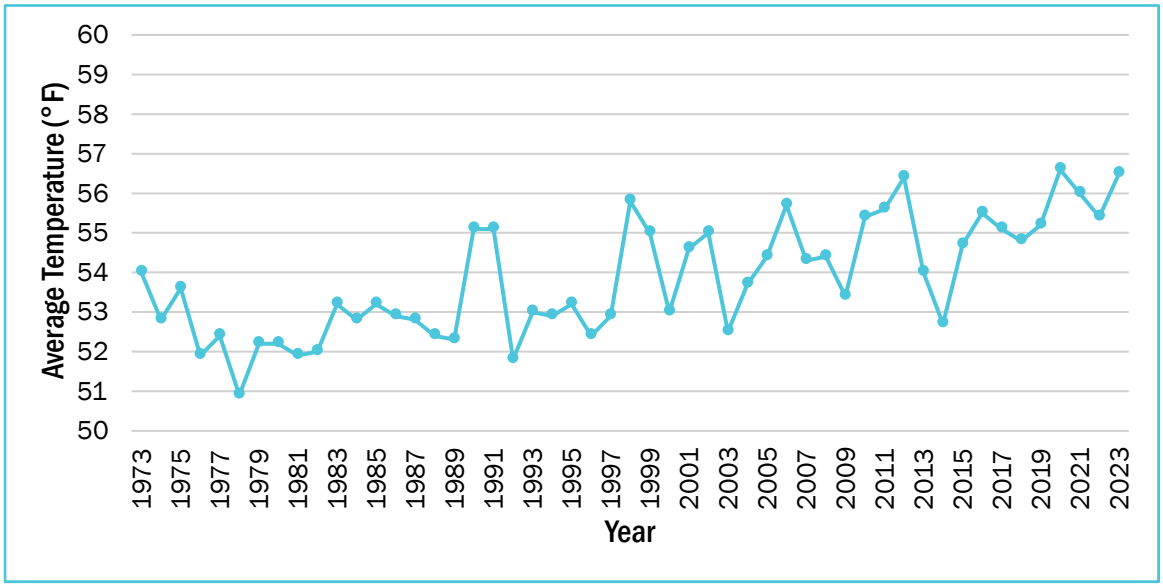


Source: Office of the New Jersey State Climatologist[2]

Temperature & Precipitation

Temperature and precipitation data is gathered from monitoring stations throughout New Jersey and used to calculate averages at the county level. **Chart 5.1** depicts the annual average temperature in Monmouth County over the past 50 years.[3]

Chart 5.1: Monmouth County Average Annual Temperature (1973 – 2023)



Source: Office of the New Jersey State Climatologist.

The average annual temperature in Monmouth County has risen by 2.5°F between 1973 and 2023, from 54°F to 56.5°F. Within the past 12 years, Monmouth County has experienced its four highest annual average temperatures since record keeping began in 1895: 2012 (56.4°F), 2020 (56.6°F), 2021 (56°F), 2023 (56.5°F). Examining average monthly temperatures reveals a similar trend, with 10 months having experienced their highest average temperatures since 1895 within the past 14 years, as seen in **Table 5.1.**[4]

Table 5.1: Highest Recorded Average Temperatures in Monmouth County

Month	Highest Recorded Average Temperature	Year
January	42.7°F	2023
February	40.8°F	2017
March	49.8°F	2012
April	55.8°F	2010
May	65.9°F	1991
June	74.6°F	2010
July	80.1°F	2020
August	78.6°F	2022
September	71.5°F	2015
October	63.0°F	2007
November	50.7°F	2015
December	49.2°F	2015

Source: Office of the New Jersey State Climatologist.

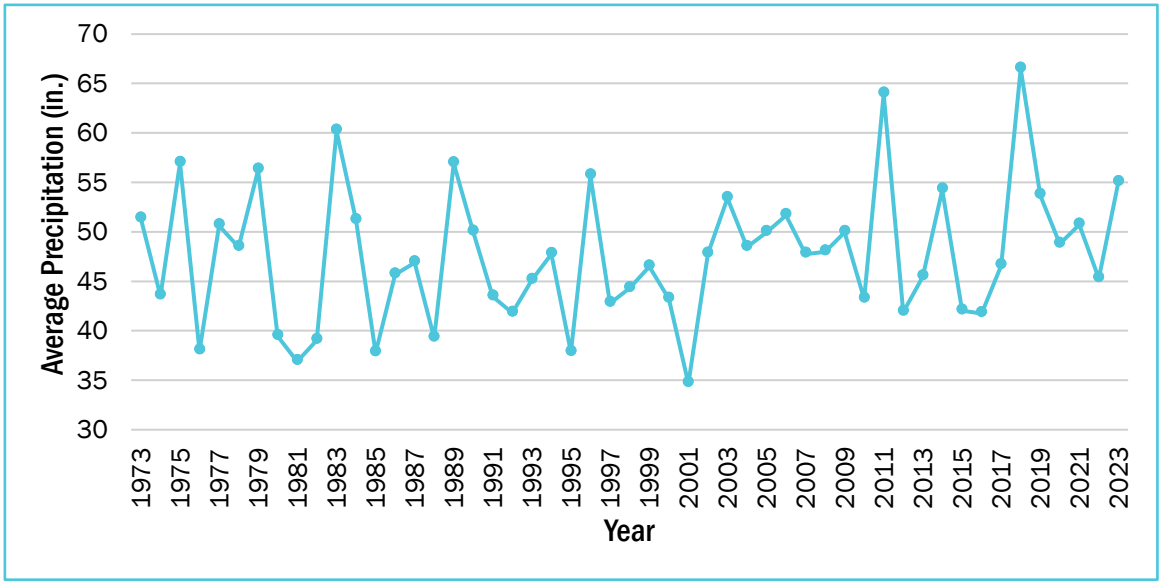
Rising temperatures in Monmouth County and New Jersey are part of the larger global trend of a rapidly warming climate; the National Oceanic and Atmospheric Administration (NOAA) ranked 2023 as the warmest year in its global temperature record and the fifth warmest year on record in the United States.[5] [6] While natural climate variability can be a contributing factor, there is strong evidence that rising temperatures are the result of increasing concentrations of atmospheric carbon dioxide (CO_2) and other greenhouse gases from the emissions of human activities. Continued greenhouse gas emissions at or above current rates are expected to cause further warming and alter the global climate system, likely inducing greater changes than those observed during the 20th century.

Climate change is also expected to exacerbate the intensity of rainfall events and extend the duration of droughts. The amount of precipitation that may fall is dependent on the amount of water vapor available in the atmosphere and other necessary weather conditions. As air temperatures increase, so will the saturation of water vapor in the atmosphere (for every 1.8°F increase in air temperature, the atmosphere can hold up to approximately 7% more moisture). More moisture in the atmosphere provides the means for storms to be more intense and increases the chances of extreme rainfall events.[7]

Chart 5.2 shows annual precipitation totals for Monmouth County over the past 50 years. In 2018, both New Jersey and the County received more precipitation than any other year since 1895. Unlike 2011 – the second wettest year for the State because of Tropical Storm Lee and Hurricane Irene – 2018 saw heavy rains spread out over the entire year due to climate change and weather patterns that kept the atmosphere on the East Coast wet with warmer air.[8] According to 30-year averages from 1991 to 2020, February is the driest month in Monmouth County with an average total precipitation of 2.94 inches, while July is the wettest month with an average total precipitation of 4.57 inches.[9]

Without proper planning and preparation, more rainfall in Red Bank will result in significant increases in stormwater runoff, which poses pollution, flooding, and erosion hazards for the Borough. As discussed in **Chapter 4: Hydrology**, Red Bank's impervious cover exacerbates stormwater runoff and its associated negative impacts and must be mitigated through effective stormwater management practices and reductions in the amount of impervious surfaces in the Borough.

Chart 5.2: Monmouth County Total Annual Precipitation (1973 – 2023)

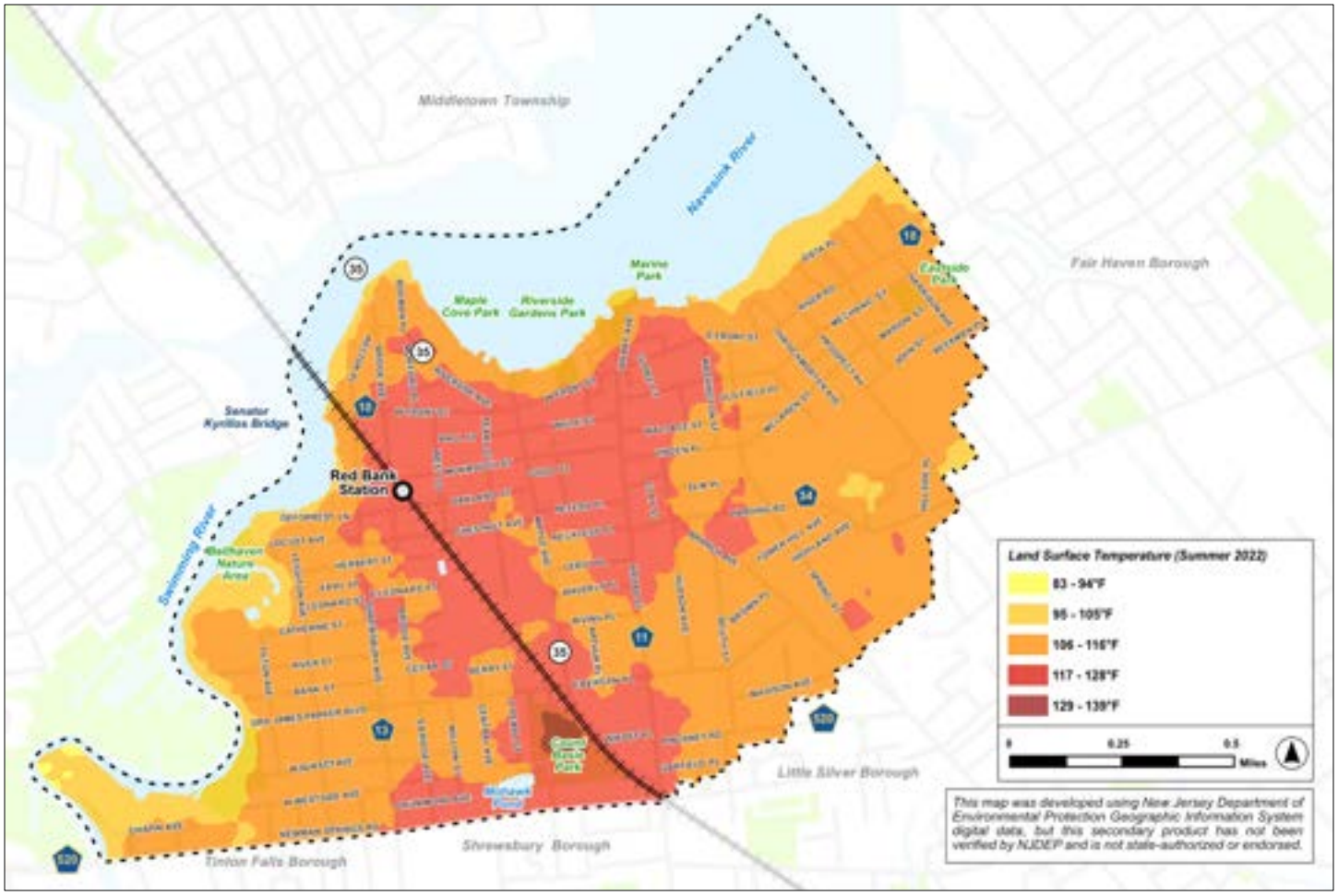


Source: Office of the New Jersey State Climatologist.

Heat Island Effect

Red Bank has a relatively large urban footprint with concentrations of buildings, roads, and other infrastructure that absorb and re-emit the sun's heat more than natural landscapes. This is known as the "heat island effect," in which pockets of land have relatively higher temperatures than their surrounding areas.[10] The heat island effect in Red Bank is depicted in **Figure 5.2**, which maps the recorded land surface temperature of the Borough during the summer of 2022.

Figure 5.2: Land Surface Temperatures in Red Bank (Summer 2022)



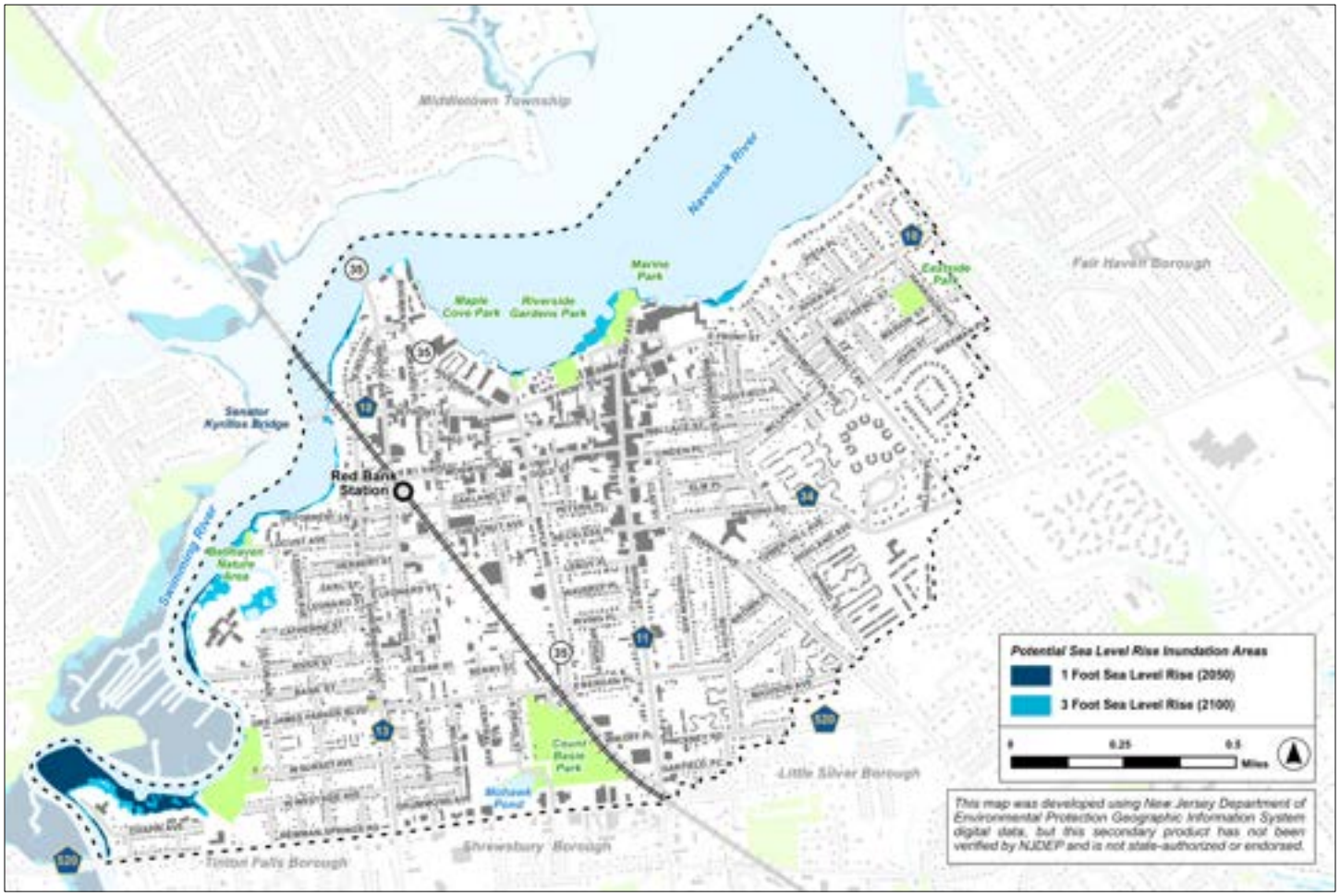
Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

As seen in **Figure 5.2**, land surface temperatures are higher in places with significant amounts of urban development, specifically the downtown area and directly adjacent to the railroad tracks. Both the Red Bank Senior Center and the Red Bank Public Library have been identified by the NJDEP as locations where people at risk of heat-related illnesses can cool off during hot days. Strategies to combat urban heat islands include increasing tree and vegetative cover, installing green roofs, installing reflective roofs and pavements, and using development and conservation strategies that help protect the natural environment.

Sea Level Rise

Red Bank's topography and steep slopes offer a certain degree of protection against rising sea levels and associated floodwater inundation. As discussed in **Chapter 2: Geology & Topography**, the majority of Red Bank's waterfront land areas have a relatively steep grade that tapers down to the waterfront, and most buildings exist at or near the top of the slope. However, as weather becomes more severe due to climate change and as sea level rise continues, floodwaters are anticipated to affect more inland areas, as seen in **Figure 5.3**, Potential flooding with a 1-foot sea level rise would be limited Red Bank's western waterfront, primarily affecting the Borough's wetlands and tidal marshes; potential flooding would have slightly more significant impacts, affecting Marine and Riverside Gardens Parks along the northern waterfront, and causing inland flooding near Red Bank Primary School.

Figure 5.3: Potential Sea Level Rise Inundation Areas in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), National Oceanic and Atmospheric Administration (NOAA), BFJ Planning.

Air Quality

The Clean Air Act requires the U.S. EPA to set National Ambient Air Quality Standards (NAAQS) for criteria pollutants at levels that are deemed protective of human health and the environment. The six criteria pollutants monitored by the U.S. EPA are listed and briefly described below:

Ground-Level Ozone (O_3) – Ozone occurs naturally in the upper atmosphere where it protects the earth from ultraviolet rays from the sun but can have serious adverse human health effects at ground-level. Ground-level ozone is formed when pollutants such as those emitted from vehicles, power plants, and chemical factories react in the presence of sunlight. The resulting ozone can irritate and cause severe damage to peoples' respiratory tracts, particularly for children and people with pre-existing medical conditions such as asthma, emphysema, and heart disease.

Particulate Matter ($PM_{2.5}$ and PM_{10}) – Particulate matter is a mixture of organic and inorganic substances in the atmosphere – liquid or solid – and can either be naturally occurring (e.g., wind-blown dust or sea salt) or the result of human activity (e.g., particles from fossil fuel combustion). Depending on its size, particulate matter can pose significant health risks, specifically through its ability to enter respiratory tracts and bloodstreams.

Nitrogen Dioxide (NO_2) – Nitrogen dioxide is a highly reactive gas formed in the air through the oxidation of gases emitted from the combustion of fossil fuels. Short-term exposure to nitrogen dioxide can cause respiratory irritation, tiredness, and nausea, while long-term exposure can cause permanent lung damage.

Sulfur Dioxide (SO_2) – Sulfur dioxide is a colorless gas with a bad odor that is formed when fuels containing sulfur (e.g., coal, oil, and gasoline) are burned. Sulfur dioxide causes irritation of the mucous membranes and can cause difficulty breathing, especially for children, the elderly, and people with pre-existing respiratory conditions.

Carbon Monoxide (CO) – Carbon monoxide is a colorless, odorless gas that is emitted from internal combustion engines in vehicles, generators, and other similar mobile sources. Exposure to high concentrations of carbon monoxide can lead to headaches and nausea, and exposure to high concentrations in enclosed spaces can be life-threatening.

Lead – Lead that is emitted into the air can be inhaled or ingested and lead to significant health problems such as brain damage (particularly in children), cardiovascular disease, decreased kidney function, and a weakened immune system.[11]

Real-time sampling instruments at air monitoring sites throughout New Jersey continuously collect, analyze, and transmit air pollution data to a centralized computer system throughout the day. The data is used to formulate the *Air Quality Index* (AQI), accessible at the U.S. EPA's AirNow website (www.airnow.gov), which allows people to view air quality forecasts and take necessary precautions. The closest air monitoring station to Red Bank is at Monmouth University in West Long Branch. **Figure 5.4** displays the six divisions of health concern within the AQI.

Figure 5.4: Air Quality Index Guide

AQI Basics for Ozone and Particle Pollution

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Source: AirNow.[12]

According to the 2022 New Jersey Air Quality Report (the most recent report available), in 2022 the State had nine days on which there was an exceedance of either the ozone or fine particulate matter ($PM_{2.5}$) National NAAQS. Seven days were "Unhealthy for Sensitive Groups" and one day was "Unhealthy" for ozone. Additionally, while particulate matter levels in New Jersey are usually good to moderate, a July 2022 wildfire in the Pine Barrens caused the $PM_{2.5}$ concentration to reach the "Unhealthy" level at a single air monitoring station.[13]

References: Climate & Air

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[12] U.S. EPA. N.d. *Air Quality Index Basics.* https://www.airnow.gov/aqi/aqi-basics/. Accessed July 2024.

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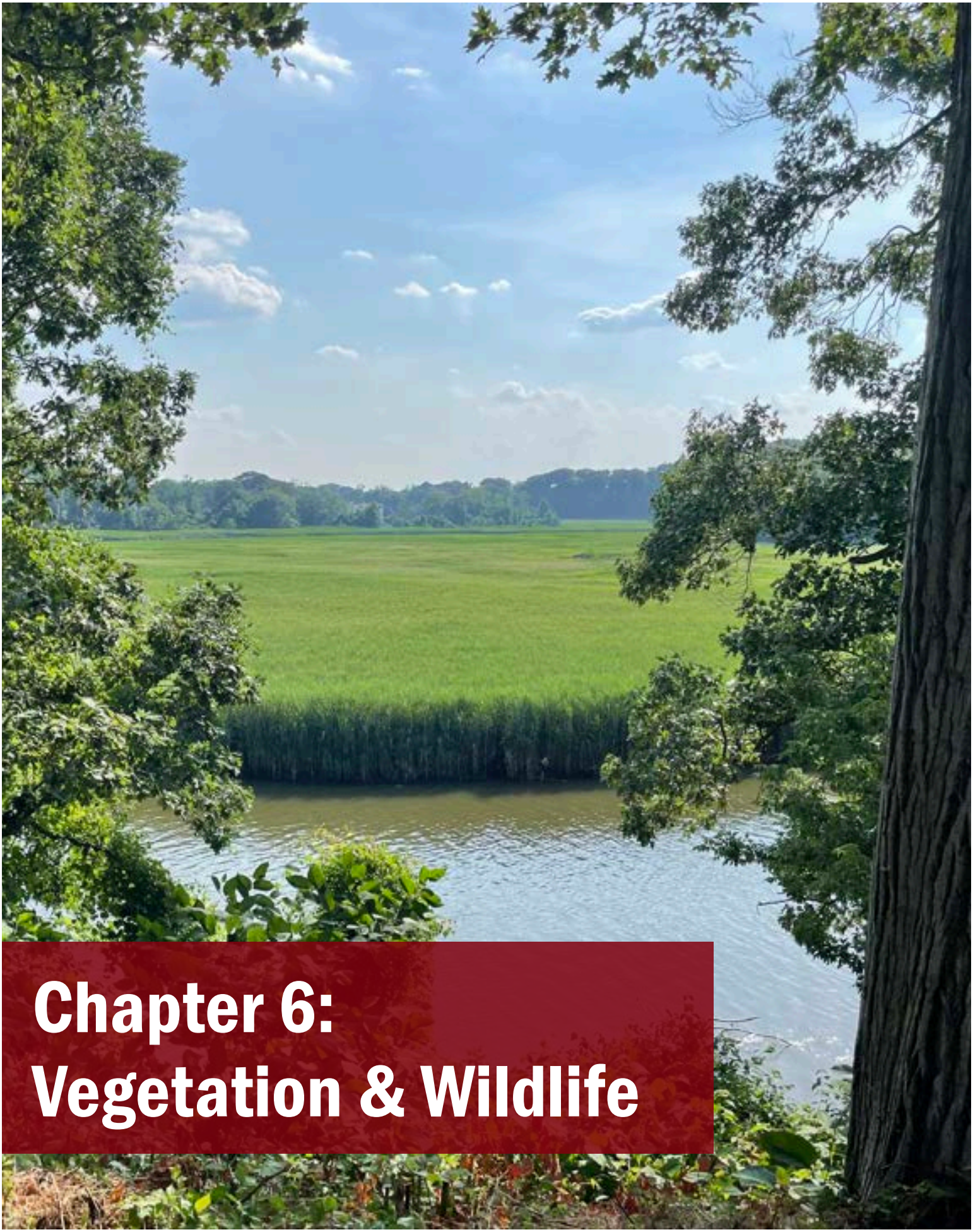


Chapter 6: Vegetation & Wildlife

Source: BFJ Planning.

Vegetative Species within Red Bank

Vegetation in Red Bank includes various species of trees, shrubs, and grasses found in the Borough's woodlands, wetlands, and residential areas (e.g., lawns and gardens). Lists of the different vegetative species potentially found in Red Bank can be seen in **Tables 6.1, 6.2, 6.3, and 6.4.** There are no known threatened or endangered vegetative species known to exist in the Borough.[1]

Table 6.1: Trees Potentially within Red Bank

Source: Borough of Red Bank.

Trees	
Common Name	**Scientific Name**
Red Maple	Acer rubrum
Tree of Heaven	*Ailanthus altissima*
Mimosa	*Albizia julibrissin*
Gray Birch	*Betula populifolia*
Flowering Dogwoods	*Comus ssp.*
American Beech	*Fagus grandifolia*
American Holly	*Ilex opaca*
Eastern Red Cedar	*Juniperus virginiana*
Sweetgum	*Liquidambar styraciflua*
Apples & Crabapples	*Malus ssp.*
Norway Spruce	*Picea abies*
Austrian Pine	*Pinus nigra*
White Pine	*Pinus strobus*
American Sycamore	*Platanus occidentalis*
Large-Toothed Poplar	*Populus grandidentata*
Wild Cherry	*Prunus cerasus*
Black Cherry	*Prunus serotina*
White Oak	*Quercus alba*
Northern Red Oak	*Quercus rubra*
Black Oak	*Quercus velutina*
Black Locust	*Robinia pseudoacacia*
Willow	*Mix ssp.*
Eastern Hemlock	*Tsuga canadensis*

Red Maples at Count Basie Park

Source: Red Bank Environmental Commission

White Oak

Source: The Morton Arboretum

Table 6.2: Vines and Briars Potentially within Red Bank

Vines and Briars	
Common Name	**Scientific Name**
Trumpet Creeper	*Campsis radicans*
Trailing Arbutus	*Epigaea repens*
Ivy-leaved Morning-glory	*Ipomea hederacea*
Common Morning-glory	*Ipomea purpurea*
Japanese Honeysuckle	*Lonicera japonica*
Virginia Creeper	*Parthenocissus quinquefolia*
Brambles	*Rubus ssp.*
Briars	*Smilax ssp.*
Poison Ivy	*Toxicodendron radicans*
Grapes	*Vitis ssp.*
Chinese Wisteria	*Wisteria sinensis*

Source: Borough of Red Bank.

Table 6.3: Shrubs Potentially within Red Bank

Shrubs	
Common Name	**Scientific Name**
Groundsel-bush	*Baccharis halimifolia*
Sweet Pepperbush	*Clethra alnifolia*
Silky Dogwood	*Corns amomum*
Forsythia	*Euonymus alata*
Inkberry	*Ilex glabra*
Winterberry	*Ilex verticillata*
High-tide Bush	*Iva frutescens*
Junipers	*Juniperus ssp.*
Privet	*Ligustrum ssp.*
Spicebush	*Lindera benzoin*
Bayberry	*Myrica pensylvanica*
Azaleas	*Rhododendron ssp.*
Dwarf (Winged) Sumac	*Rhus copallinum*
Wild Roses	*Rosa ssp.*
Multiflora Rose	*Rosa multiflora*
Elderberry	*Sambucus canadensis*
Common Lilac	*Syringa vulgaris*
American Yew	*Taxus canadensis*
Arrowwood	*Viburnum dentatum*

Source: Borough of Red Bank.

Table 6.4: Grasses, Ground Covers, and Wildflowers Potentially within Red Bank

Grasses, Ground Covers, and Wildflowers	
Common Name	**Scientific Name**
Smooth Crabgrass	*Digitaria ischaemum*
Fragrant Goldenrods	*Euthamia ssp.*
Avens	*Geum ssp.*
Jewelweed	*Impatiens capensis*
Rushes	*Juncus ssp.*
Poorman's Pepper Grass	*Lepidium virginicum*
Purple Loosestrife	*Lythrum salicaria*
Switch Grass	*Panicum virgatum*
Timothy	*Phleum pratense*
Common Reed	*Phragmites australis*
Pokeweed	*Phytolacca americana*
Clearweed	*Pilea pumila*
Plantains	*Plantago ssp.*
May apple	*Podophyllum peltatum*
Smartweeds	*Polygonurn ssp.*
Japanese Knotweed	*Polygonum cuspidatum*
Bracken	*Pteridium aquilinum*
Foxtails	*Setaria ssp.*
Goldenrods	*Solidago ssp.*
Skunk Cabbage	*Sympiocarpus foetidus*
Common Dandelion	*Taraxacum officinale*
New York Fern	*Thelypteris noveboracensis*
Marsh Fern	*Thelypteris thelypteroides*
Clovers	*Trifolium ssp.*
Common Vetch	*Vicia sativa*
Violets	*Viola ssp.*
Turf Grasses	various species

Source: Borough of Red Bank.

Forested Land Classifications

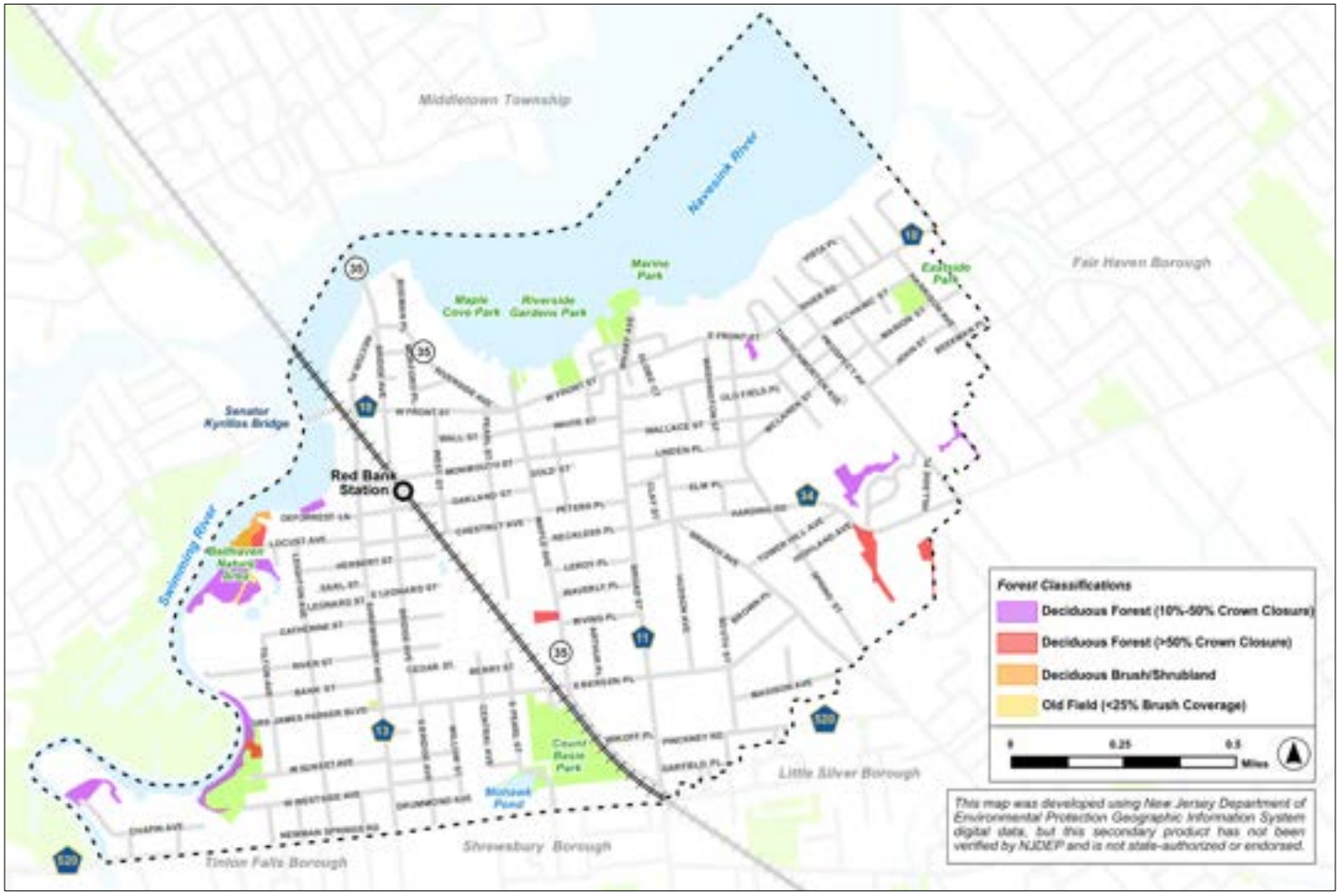
Red Bank is primarily characterized by urban development, with only 2% of the Borough – or 23 acres – classified as forested land according to land cover data gathered by NJDEP. These forested areas are subdivided into four classifications, listed in **Table 6.5** and mapped in **Figure 6.1.**[2]

Table 6.5: Forested Land Classifications in Red Bank

Classification	Acreage within Red Bank	Percentage of Red Bank's Forested Areas
Deciduous Forest (10% - 50% Crown Closure)	14.5	61.8%
Deciduous Forest (>50% Crown Closure)	6.0	25.5%
Deciduous Brush/Shrubland	1.7	7.4%
Old Field (<25% Brush Covered)	1.3	5.4%
Totals:	**23.4**	**100%**
Note: *Crown closure*, also known as canopy closure, is the percentage of a forest area occupied by the vertical projections of tree crowns and is used to measure forest density.		

Source: NJDEP.

Figure 6.1: Forested Land Classifications in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Since 2002, the Borough has lost 4.9 acres of forested land to development such as the building of residential properties and the construction of transportation and utilities infrastructure. While there is relatively little forested land remaining in Red Bank, segments of forest along the Swimming River are still able to provide essential habitat to threatened and endangered species, as further discussed later in this chapter.

Red Bank Shade Tree Committee

The Borough's Shade Tree Committee, established in 2004, recognizes the importance of trees and tree canopy to human and environmental health and works to promote planting and preservation by identifying opportunities for tree planting, assisting in obtaining grants and other resources for shade tree purposes, and reviewing applications pending before the Planning Board or Board of Adjustment. The Committee publishes annual accomplishment reports, maintains an online inventory of trees within the Borough, and in 2016 prepared and released a Community Forestry Management Plan identifying goals and objectives, including expanding the Borough's tree canopy coverage.

Red Bank's public tree inventory, last updated in December 2024, is depicted in **Figure 6.2**, along with sites identified by the Borough as potential locations for new tree plantings.

The inventory documents 1,821 individual trees located throughout the Borough. The most common species in the inventory is Red Maple, with 227 trees, followed by London Planetree, with 152 trees. Large concentrations of trees are located along Hilltop Terrace, Leighton Avenue, Bridge Avenue, and McLaren Street, while Sunset Avenue and East Bergen Place have been identified as areas where tree planting should be prioritized.

Figure 6.2: Red Bank Tree Inventory

Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), Borough of Red Bank, BFJ Planning.

Wetlands Classifications

As described in **Chapter 4: Hydrology**, Red Bank is home to 28 acres of wetlands, divided into five different classifications, briefly described below and listed in **Table 6.6** and depicted in **Figure 6.3**

Deciduous scrub/shrub wetlands – composed primarily of young samplings of deciduous tree species and woody shrubs.

Deciduous wooded wetlands – dominated by deciduous trees normally associated with watercourses, edges of marshes, and isolated wetlands, including red maple, black willow, and others.

Phragmites/dominate coastal wetlands – contain herbaceous vegetation dominated by the common reed.

Saline marsh (low marsh) – contains herbaceous vegetation dominated by saltmarsh cordgrass (*Spartina alternifloria*) where the height is less than one foot and is primarily flooded throughout.

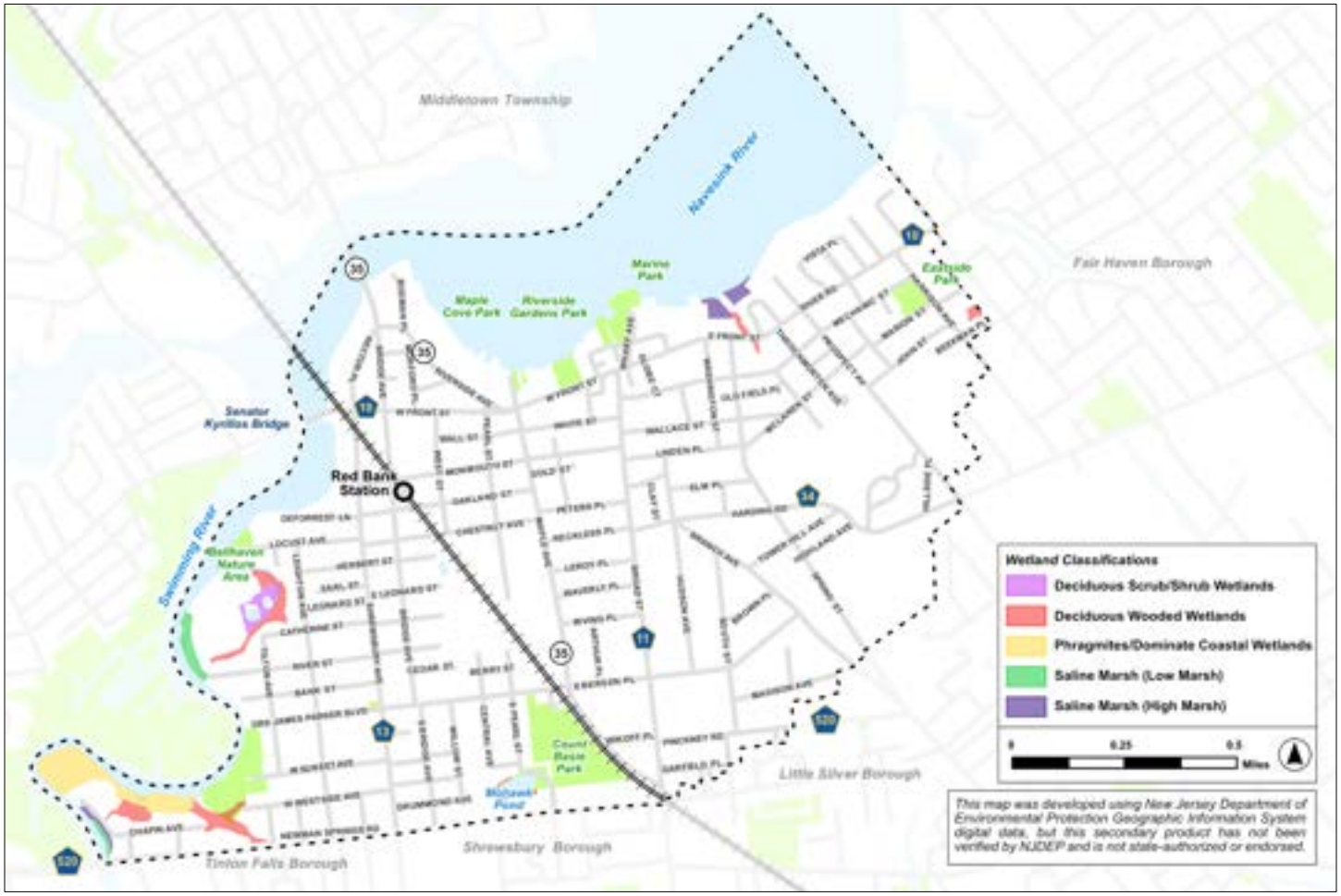
Saline marsh (high marsh) – contains herbaceous vegetation dominated by salt hay (*Spartina patens*) where the height is between one and three feet.[3]

Table 6.6: Wetlands Classifications in Red Bank

Classification	Acreage within Red Bank	Percentage of Red Bank's Wetlands
Deciduous Scrub/Shrub Wetlands	2.5	8.9%
Deciduous Wooded Wetlands	10.5	37.5%
Phragmites/Dominate Coastal Wetlands	10.1	36.1%
Saline Marsh (Low Marsh Vegetation)	2.1	7.5%
Saline Marsh (High Marsh Vegetation)	2.7	9.6%
Totals:	**28**	**100%**

Source: NJDEP.

Figure 6.3: Wetlands Classifications in Red Bank



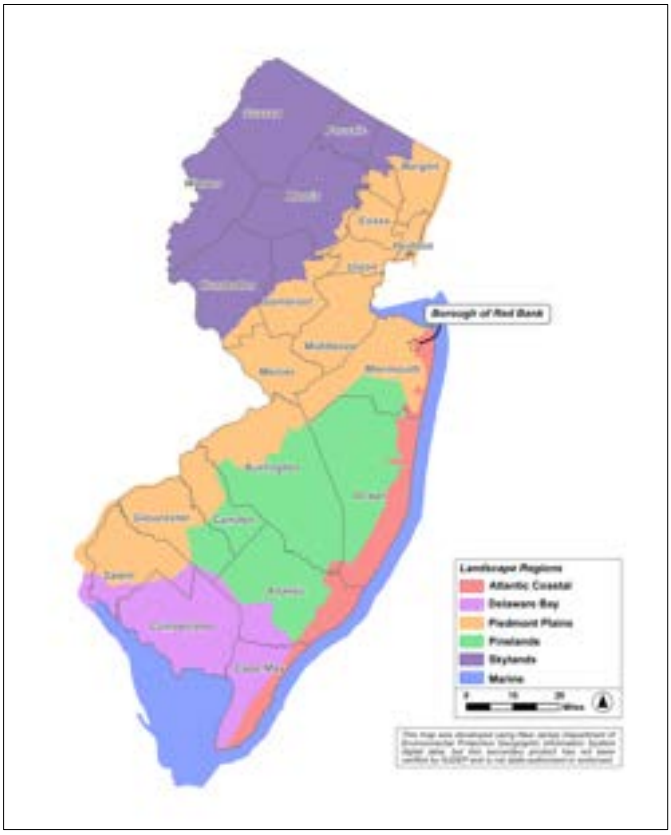
Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Landscape Regions and Conservation Focal Areas

Landscape Regions

New Jersey is divided into six landscape regions: Atlantic Coastal, Delaware Bay, Piedmont/Inner Coastal Plain, Pinelands, Skylands, and Marine (which is exclusively aquatic), depicted in **Figure 6.4**. The first five landscapes are each characterized by similar landforms, soils, vegetation, and hydrology that support distinctive habitat and species mixes. Red Bank falls within two landscape regions, described below:

Figure 6.4: Landscape Regions of New Jersey



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, BFJ Planning.

Atlantic Coastal Landscape: encompasses parts of Monmouth, Ocean, Cape May, and Atlantic counties. Atlantic Coast beaches and marshes are productive habitats that support important populations of colonial nesting birds and endangered beach-nesting birds. Coastal habitats also support most of the state's ospreys, peregrine falcons, northern harriers and northern diamondback terrapins, as well as large concentrations of migrating birds and wintering waterfowl.

Piedmont Plains Landscape: encompasses all or parts of Burlington, Camden, Gloucester, Salem, Mercer, Middlesex, Monmouth, Hunterdon, Somerset, Union, Essex, Hudson, Passaic, and Bergen counties. Characterized by farmed areas, extensive grasslands, fragmented woodlands and productive tidal marshes, the Piedmont Plains are home to imperiled species such as the endangered upland sandpiper and raptors such as the American kestrel and barred owl.[4]

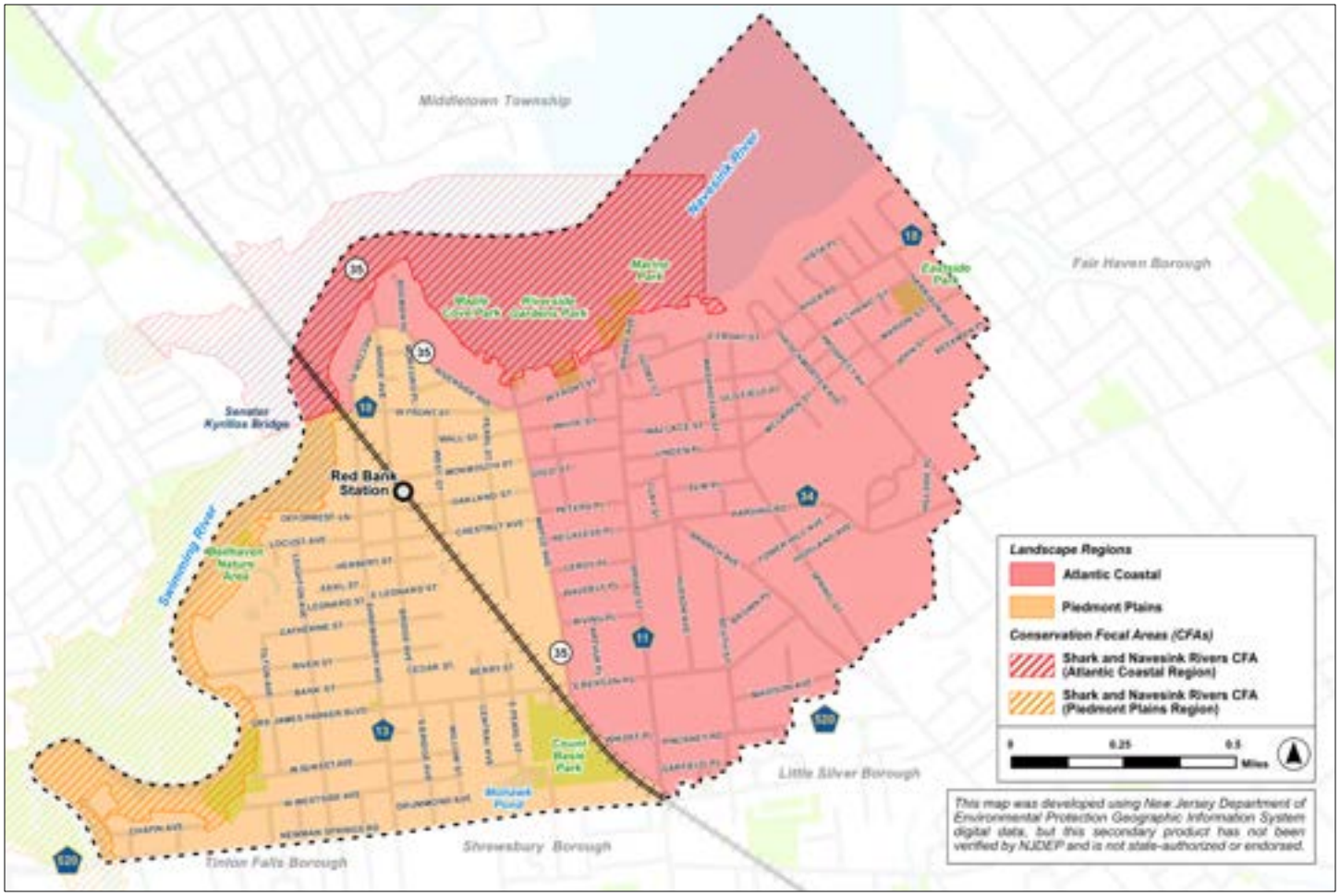
Conservation Focal Areas

Within New Jersey's landscape regions, Conservation Focal Areas (CFAs) are identified as specific geographic areas that are home to the State's highest-value habitats and present important opportunities for effective conservation. CFAs were identified by NJDEP using conservation-relevant metrics, each related to one of the following categories: 1) landscape condition/ecological integrity 2) wildlife habitats 3) biological diversity 4) existing conservation infrastructure and 5) negative human influences.

Red Bank contains part of one CFA: the Shark and Navesink Rivers Watershed CFA, which is divided between the Piedmont/Inner Coastal Plain and Atlantic Coastal

Landscapes. This CFA consists of three riparian networks of streams and rivers, and their associated wetlands, forests, and farms. The mouth of the Navesink River is tidal and contains both salt marsh and freshwater tidal marsh; very little of the Shark River in this CFA is tidal. Water quality in the Shark and Navesink Rivers Watershed CFA is moderately to severely impaired due to pollution from runoff. Most of the high and low salt marshes at the mouth of the Navesink River are dominated by Phragmites, which has resulted in a monoculture of poor habitat. The Swimming River portion of the Navesink is mostly surrounded by development and impervious surfaces, except for some County parks. Because of the extensive development in this CFA, most areas are of poor quality and are affected by fragmentation.[5] A map depicting the Landscape regions and CFAs within Red Bank can be seen in **Figure 6.5.**[6]

Figure 6.5: Landscape Regions and Conservation Focal Areas in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Species-Based Habitats

In the NJDEP's *Landscape Project Version 3.3,* documented wildlife locations were combined with land use and land cover data to identify patches of land that may provide suitable habitat for imperiled and special concern species in New Jersey. To delineate these patches, *species occurrence areas* (SOAs) — geographic areas representing habitat indicating the presence of a species population — were overlaid onto land use and cover classes associated with habitat needs of different species. The patches were assigned rankings on a scale from one to five, which are briefly explained below:

Rank 1 – assigned to patches that meet habitat-specific suitability requirements for endangered, threatened or special concern wildlife species, but that do not intersect with any confirmed occurrences of such species. Rank 1 designation is used for planning purposes, such as targeting areas for future wildlife surveys.

Rank 2 – assigned to patches containing one or more occurrences of species considered to be species of special concern.

Rank 3 – assigned to patches containing one or more occurrences of State threatened species.

Rank 4 – assigned to patches with one or more occurrences of State endangered species.

Rank 5 – assigned to patches containing one or more occurrences of wildlife listed as endangered and threatened pursuant to the Federal Endangered Species Act of 1973.

Key Terms and Definitions

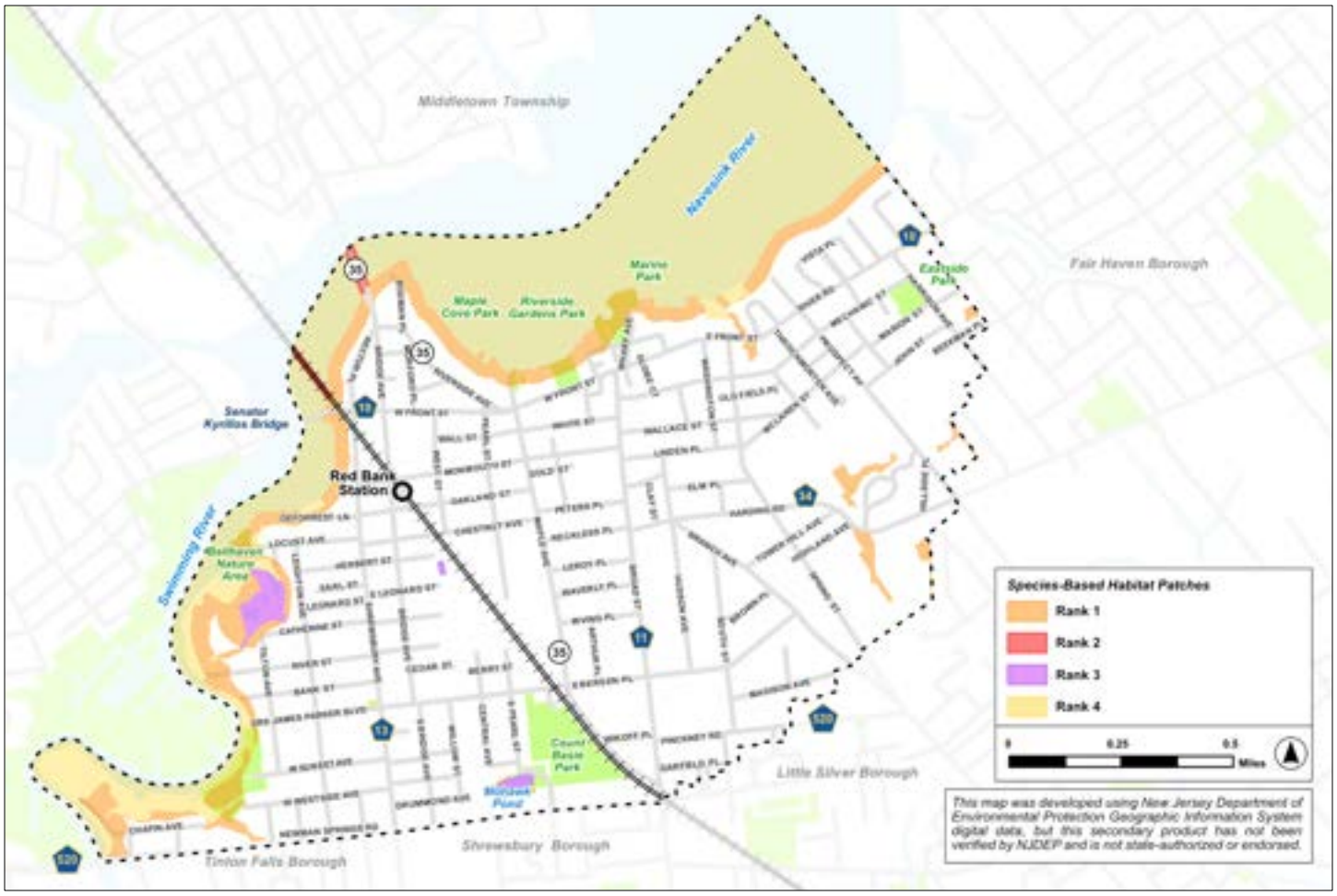
Endangered species – those whose prospects for survival in New Jersey are in immediate danger because of a loss or change in habitat, over-exploitation, predation, competition, disease, disturbance or contamination. Assistance is needed to prevent future extinction in New Jersey.

Threatened species – those who may become endangered if conditions surrounding them begin to or continue to deteriorate.

Species of special concern – those who warrant special attention because of some evidence of decline, inherent vulnerability to environmental deterioration, or habitat modification that would result in their becoming a threatened species.[7]

A map depicting the distribution of patches of habitat with the potential to support threatened and endangered species can be seen in **Figure 6.6.**[8]

Figure 6.6: Species-Based Habitat Patches in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Rare Wildlife Species in Red Bank

Upon request, the NJDEP Natural Heritage Program provides custom reports with information about rare species and ecological communities located at specific sites. A request form was submitted to NJDEP for the purpose of identifying rare wildlife species in Red Bank, and the following information is based on the agency's response. There are five rare wildlife species that may be found in Red Bank – all of them bird species. There are two State endangered species: the Bald Eagle and the Black Skimmer; two State threatened species: the Black-crowned Night-heron and the Osprey; and one species of special concern: the Common Tern. **Table 6.7** lists these species and their respective statuses, as described in more detail below the table.[9]

Table 6.7: Rare Wildlife Species in Red Bank (as of 6/24/24)

Common Name	Species-Based Habitat Rank	State Protection Status	State Rank
Bald Eagle	4	State Endangered	S1B, S2N
Black Skimmer	4	State Endangered	S1B, S1N
Black-crowned Night-heron	3	State Threatened	S2B, S3N
Common Tern	2	Special Concern	S3B, S4N
Osprey	3	State Threatened	S2B, S4N

Note on State Rank codes:

- **S1** – Critically imperiled in New Jersey (5 or fewer occurrences).
- **S2** – Imperiled in New Jersey (6 to 20 occurrences observed).
- **S3** – Rare in New Jersey (21 to 100 occurrences).
- **S4** – Apparently secure in New Jersey (many occurrences).
- **B** – Population number refers to the breeding population of the bird
- **N** – Population number refers to the non-breeding population of the bird.

Source: NJDEP.

Bald Eagle

Source: Cornell Lab of Ornithology.

Bald Eagles reside in New Jersey year-round – usually remaining in their nest areas – but are sensitive to human disturbance and will abandon nest sites if people encroach on them during the nesting season. A massive decline in the Bald Eagle population began with their persecution because of their perceived predatory relationship to game and farm animals. This decline was worsened by the impacts of widespread use of DDT from the mid-1940s until it was banned in 1972, which thinned Bald Eagles' eggshells and made them susceptible to breaking during incubation. While the federal government removed the Bald Eagle from its list of Endangered Species in 2007 after a nationwide resurgence of its population, the species' New Jersey status remains State-endangered for the breeding season and State-threatened for the non-breeding season.[11]

Black Skimmer

Black Skimmers nest on open sandy beaches, inlets, sandbars, offshore islands, and dredge disposal islands that are sparsely vegetated and contain shell fragments. They forage in shallow-water tidal creeks, inlets, and ponds. Egg collecting and hunting decimated the Black Skimmer population in New Jersey by the early 1900s, but their numbers rebounded after protection was afforded by the Migratory Bird Treaty Act of 1918. By the late 1970s, the Black Skimmer population had once again declined due to habitat loss, and the species was listed as an endangered species in New Jersey. While the Black Skimmer population is secure globally, it is still imperiled in the State and closely monitored due to it being under threat from human disturbance, tidal flooding, and predation.[12]

Source: Cornell Lab of Ornithology.

Black-crowned Night-heron

Black-crowned Night-herons (nest, roost, and forage in forests, scrub/shrub, marshes, and ponds. While the bird was a common breeding species along the New Jersey coast, during the late 1880s, Black-crowned Night-herons were frequently shot at nesting and roosting sites for their plumes and as food. Populations quickly recovered after the banning of plume sales, but the destruction of coastal maritime dune forests to accommodate development along the Atlantic shore greatly reduced their habitat, and, consequently, their populations declined again during the 1940s and 1950s. Contaminants such as PCBs and DDT caused further reductions of the population, affecting the species' growth, metabolism, reproduction, and behavior, and lowering their productivity due to the breakage of thin-shelled eggs. Like both the Bald Eagle and the Black Skimmer, the Black-crowned Night-heron population is secure globally but remains imperiled in New Jersey.[13]

Source: Cornell Lab of Ornithology.

Common Tern

Common Terns nest on islands, barrier beaches, and salt marshes, foraging over both salt and freshwater. The Common Tern population began to decline during the 18th and 19th centuries, because of the collection of their eggs for food, but the decline was accelerated in the late 19th century due to hunting for use of their feathers in hat making. Like the Black Skimmer, the Common Tern rebounded after the Migratory Bird Treaty Act of 1918, but has since fluctuated due to exposure to contaminants such as DDT and PCBs, habitat degradation, and their displacement by gulls.[14]

Source: Cornell Lab of Ornithology.

Osprey

The Osprey is a piscivorous (primarily fish-eating) species and is associated with bodies of water that support adequate fish populations, inhabiting coastal rivers, marshes, bays, and inlets as well as inland rivers, lakes, and reservoirs. The Osprey was an abundant breeding species along the New Jersey coast in the 1800s, but habitat loss, eradication of nest trees, egg collecting, and shooting resulted in the significant decline of the population through the 1940s. The introduction of DDT further decimated the population by reducing reproductive productivity. In 1979 the New Jersey Endangered and Nongame Species Program (ENSP) began transplanting healthy eggs from Chesapeake Bay into New Jersey nests and erecting human-made nesting platforms to support a growing population. The Osprey population has since recovered but is still classified as threatened in New Jersey.[15]

Source: Cornell Lab of Ornithology.

References: Vegetation & Wildlife

[1] Borough of Red Bank. 1997. *Environmental Resource Inventory.*

[2] NJDEP. 2020. *Land Use/Land Cover of New Jersey.* GIS Data. https://gisdata-njdep.opendata.arcgis.com/datasets/2deaaa3cadd94166bdbff92a44ade284_5/explore. Accessed June 2024.

[3] *Ibid.*

[4] NJDEP. 2017. *Landscape Project Version 3.3.* https://www.nj.gov/dep/fgw/ensp/landscape/lp_report_3_3.pdf. Accessed July 2024.

[5] NJDEP. 2018. *New Jersey Wildlife Action Plan*. https://www.nj.gov/dep/fgw/ensp/wap/pdf/wap_plan18.pdf. Accessed July 2024.

[6] NJDEP. N.d. *Conservation Focal Areas.* GIS Data. https://njdep.maps.arcgis.com/apps/webappviewer/index.html?id=6cfaff80df6548bebf6369afda4a88bf. Accessed July 2024.

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[7] NJDEP. N.d. *New Jersey's Endangered, Threatened, and Special Concern Species.* https://dep.nj.gov/njfw/wildlife/endangered-threatened-and-special-concern-species/. Accessed July 2024.

[8] NJDEP. 2017. *Landscape Project Version 3.3.* https://www.nj.gov/dep/fgw/ensp/landscape/lp_report_3_3.pdf. Accessed July 2024.

[9] NJDEP. 2024. Natural Heritage Program Data Request.

[10] NJDEP. 2010. *Explanations of codes used in Natural Heritage reports.* https://www.nj.gov/dep/parksandforests/natural/docs/nhpcodes_2010.pdf. Accessed July 2024.

[11] NJDEP. 2023. *New Jersey Bald Eagle Project.* https://drive.google.com/file/d/1fhNEWxQoClbHprcPXNOmcOf02wgDUXbh/view. Accessed July 2024.

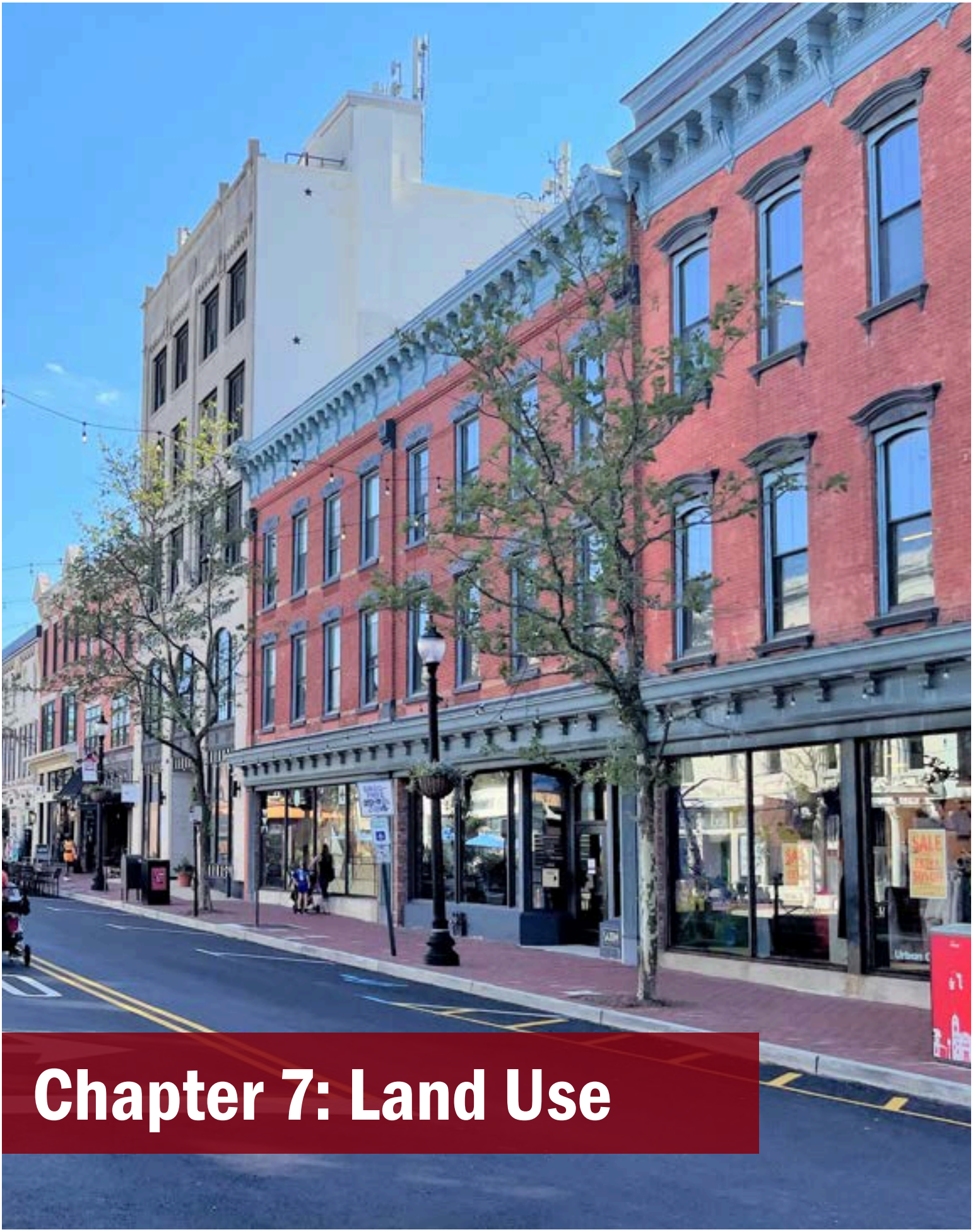
[12] NJDEP. N.d. *Black Skimmer, Rynchops niger.* https://www.nj.gov/dep/fgw/ensp/pdf/end-thrtened/blkskimmer.pdf. Accessed July 2024.

[13] NJDEP. N.d. *Black-crowned Night-heron, Nycticorax nycticorax.* https://www.nj.gov/dep/fgw/ensp/pdf/end-thrtened/bcnightheron.pdf. Accessed July 2024.

[14] Cornell Lab. N.d. *Common Tern. https://www.allaboutbirds.org/guide/Common_Tern/overview.* Accessed August 2024.

[15] Conserve Wildlife Foundation of New Jersey. N.d. *Osprey, Pandion haliaetus*. https://www.nj.gov/pinelands/about/events/handouts/handouts/osprey%20info%20sheet.pdf. Accessed July 2024

Chapter 7: Land Use



Source: BFJ Planning.

Land Use Cover in Red Bank

The NJDEP maps land cover using digital orthophotography (known as Land Use/Land Cover or LU/LC data). Areas are delineated using color infrared imaging. Nearly all of the Borough of Red Bank is designated by the NJDEP as urban. Per the Anderson Land Use Classification System, upon which the NJDEP categorizes land use cover:

Urban land is characterized by intensive land use where the landscape has been altered by human activities. Although structures are usually present, this category is not restricted to traditional urban areas. Urban categories can include (alone or in combination) residential; commercial and service; industrial; transportation, communication, and utilities; and recreational uses. Included with each of the above land uses are associated lands, buildings, parking lots, access roads, and other appurtenances, unless they are specifically excluded.

Table 7.1 presents a breakdown of the five different land use types found within the Borough and a comparison of the land use/land cover in 2002 and 2020. **Figure 7.1** illustrates the current land use cover. Urban land makes up about 76% of Red Bank, reflecting its built-out nature and predominance of residential and commercial development. This figure has remained fairly stable over time. However, since 2002, the Borough has lost over 17% of its forest cover (just under 5 acres), with a corresponding increase in barren land and urban land due to development, along with minor fluctuations in wetlands and water. The NJDEP defines the land cover types as follows:

Urban Land – Characterized by intensive land use where the landscape has been altered by human activities. This category can include residential, commercial, industrial, transportation/utility, and recreational uses.

Water – Areas that are periodically water-covered.

Forest – Lands covered by woody vegetation other than wetlands.

Wetlands – Areas that are inundated or saturated by surface or ground waters at a frequency and duration sufficient to support vegetation adapted for life in saturated soil conditions.

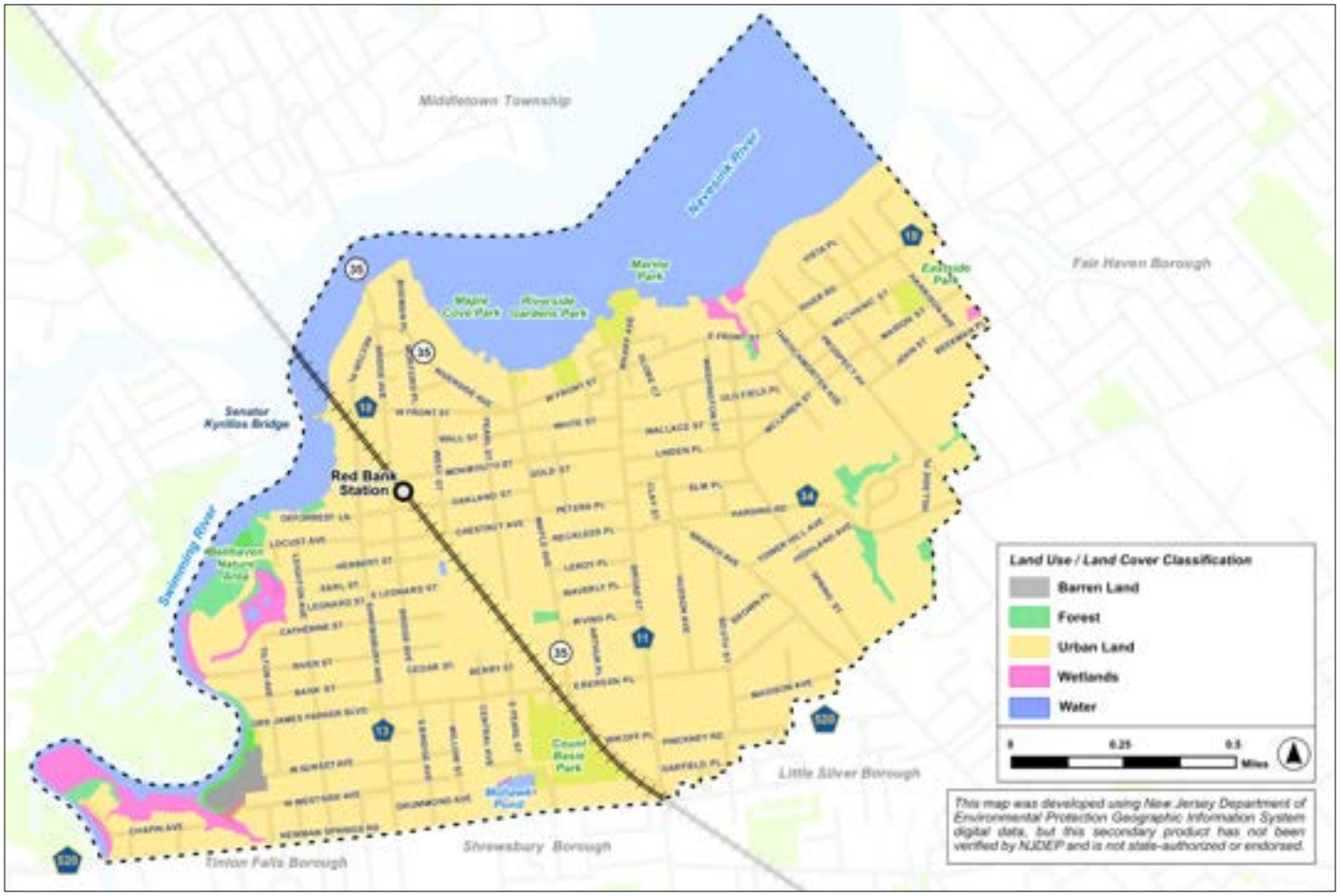
Barren Land – Characterized by thin soil, sand, or rocks and a lack of vegetative cover in a non-urban setting. All barren land in Red Bank consists of "altered lands," or lands outside of an urban setting that have been changed due to man's activities other than for mining, and is associated with the Sunset Avenue landfill. The Borough's long-term plans to establish a park on all or a portion of this site create the opportunity to reclaim some of this land as recreational (a sub-category of urban land).

Table 7.1: Land Use/Land Cover (2002 to 2020)

Type	Acreage			% Change (2002 - 2020)
	2002	2012	2020	
Barren	5.6	6.5	6.0	7.19%
Forest	28.3	23.8	23.4	-17.26%
Urban	1,050.4	1,051.7	1052.7	0.22%
Water	271.5	271.6	272.6	0.40%
Wetlands	26.8	28.9	27.9	4.19%
*Note: Data pre-2002 were not available				

Source: NJDEP.

Figure 7.1: Land Use Cover in Red Bank (2020)



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Areas classified as "Urban Land" contain both pervious surfaces (e.g., lawns, vegetated areas, and soil patches) and impervious surfaces (e.g., buildings, roads, parking lots, and sidewalks). **Figure 7.2** depicts the extent of impervious surfaces within areas categorized as "Urban Land" in Red Bank.

Figure 7.2: Impervious Surfaces in Red Bank

Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Existing Land Use

Figure 7.3 illustrates Red Bank's current land use pattern, as of the adoption of the Master Plan in 2023. The Borough has a total land area of approximately 1,120 acres, excluding underwater lands. Below is a summary of each of the Borough's land use categories.

Residential

The vast majority of land in the Borough is dedicated to residential use, and single-family homes make up the largest percentage of this use. However, multifamily residences are scattered throughout Red Bank. In addition, although not detailed on the map, mixed-use development is concentrated in the downtown and around the train station.

Commercial, Retail, and Office

The historic commercial center of Red Bank lies along Broad Street, between Front Street and Harding Road, attracting visitors from throughout the Borough and the region. Monmouth Street and Shrewsbury Avenue act as major commercial corridors, with neighborhood-oriented retail uses to serve everyday needs. At the southern end of Red Bank, Newman Springs Road (County Route 520) is characterized by highway commercial uses such as auto body shops, car dealers, and gas stations with larger building footprints and surface parking lots. Offices are generally located along the previously mentioned commercial corridors.

Industrial

Remnants of industrial manufacturing facilities and warehouses are limited to few properties such as Globe Petroleum at the northern end of Central Avenue, Seals Eastern at the southern end of Pearl Street, and the JCP&L Red Bank Electrical Substation at the southern end of Central Avenue. Red Bank has seen successful examples of the adaptive reuse of former factories and warehouses, such as the transformation of The Galleria from a textile factory to multi-use spaces for offices, restaurants, and retail shops, and the Anderson Building's transition from a warehouse to retail and office spaces.

Municipal and Civic Facilities

Community facilities, houses of worship, medical centers, municipal facilities, nonprofit organizations, and schools are located throughout the Borough. These facilities are primarily situated along the commercial corridors, except for the Red Bank Primary and Middle Schools, among others. Red Bank is home to two nonprofit performing arts organizations, Count Basie Center for the Arts and Two River Theater, which attract residents and regional visitors into the downtown.

Parks and Open Spaces

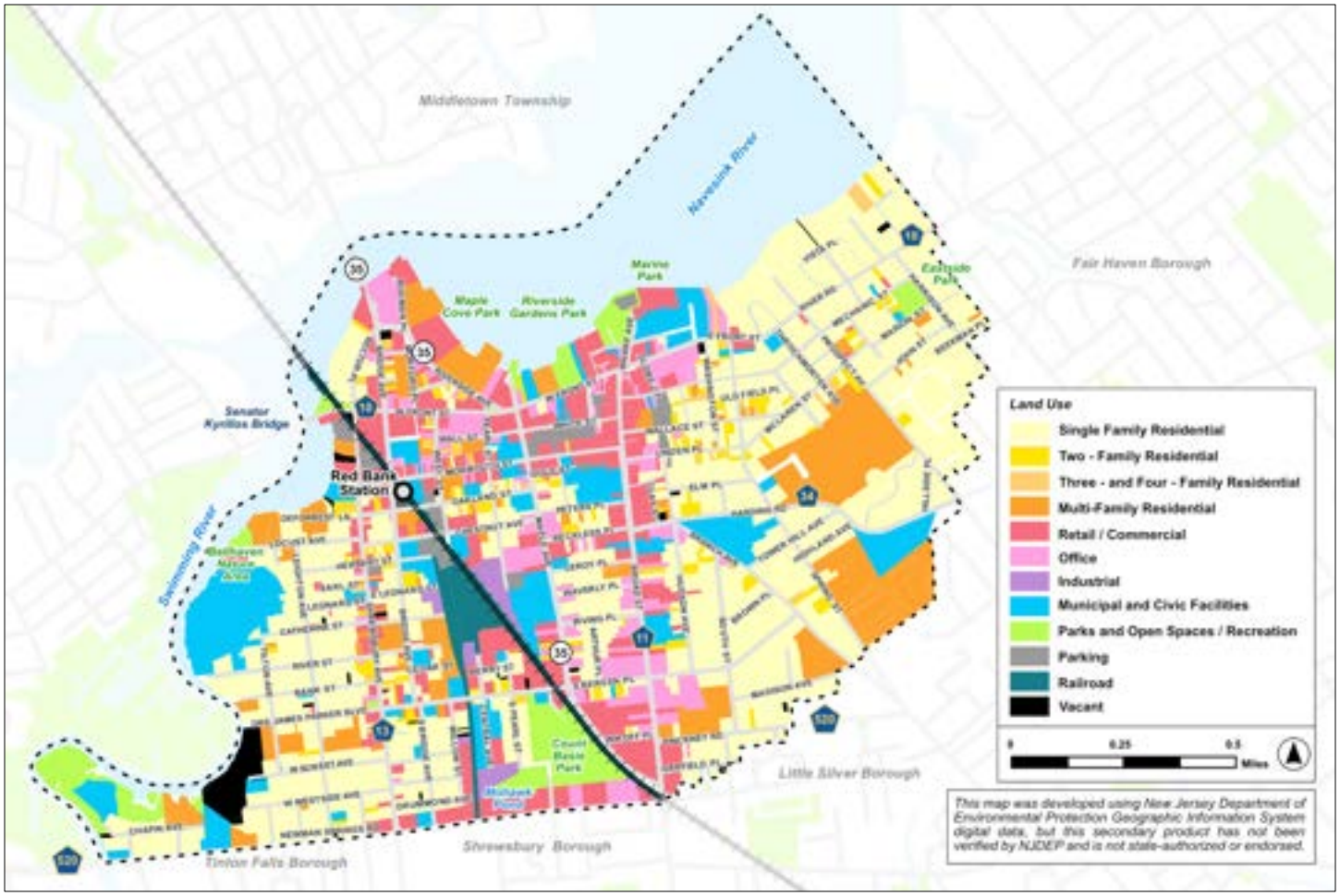
With the Borough mostly developed, there are limited amounts of parks and open spaces available. Johnny Jazz Park and the waterfront parks are smaller parks with programming for passive recreation or – in the case of Maple Cove Park – active water-related recreation. Meanwhile, Count Basie Park and East Side Park provide active

recreational opportunities for all ages, such as baseball, football, and soccer fields and tennis courts.

Parking, Railroad, and Vacant Land

Parking, railroad, and vacant land make up the smallest percentage of land area in the Borough. Parking comprises the surface parking lots managed by the Borough, NJ Transit, and other private property owners. Railroad dedicated uses are found along the railroad tracks. The NJ Transit Red Bank Yard located west of the railroad tracks from Herbert Street to Newman Springs Road has a railyard storage areas and a railroad track that continues south into the Borough of Shrewsbury. Lastly, vacant land makes up a small portion as the Borough is largely fully developed. The Borough has been working to remediate the vacant property (formerly the Sunset Avenue landfill) at the end of West Sunset Avenue into a park.

Figure 7.3: Existing Land Use in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Proposed Land Use

Red Bank's overall land use is not anticipated to change significantly from current conditions. As a largely built-out community, most potential development is in the form of infill development of previously built sites. The primary area of greatest development potential is around the train station, where a redevelopment planning process is underway that is likely to result in mixed-use development to replace a portion of the surface parking lots around the station. The Master Plan also recommends promoting infill development along Monmouth and Front Streets, which could result in more intensive development along those corridors; however, they are already developed with existing uses. Within Red Bank's residential areas, the Master Plan recommends consideration for the introduction of accessory dwelling units (ADUs) and small multifamily uses (up to 4 units) in certain residential zones. With the exception of the train station redevelopment, the Borough has not yet implemented any of these development recommendations.

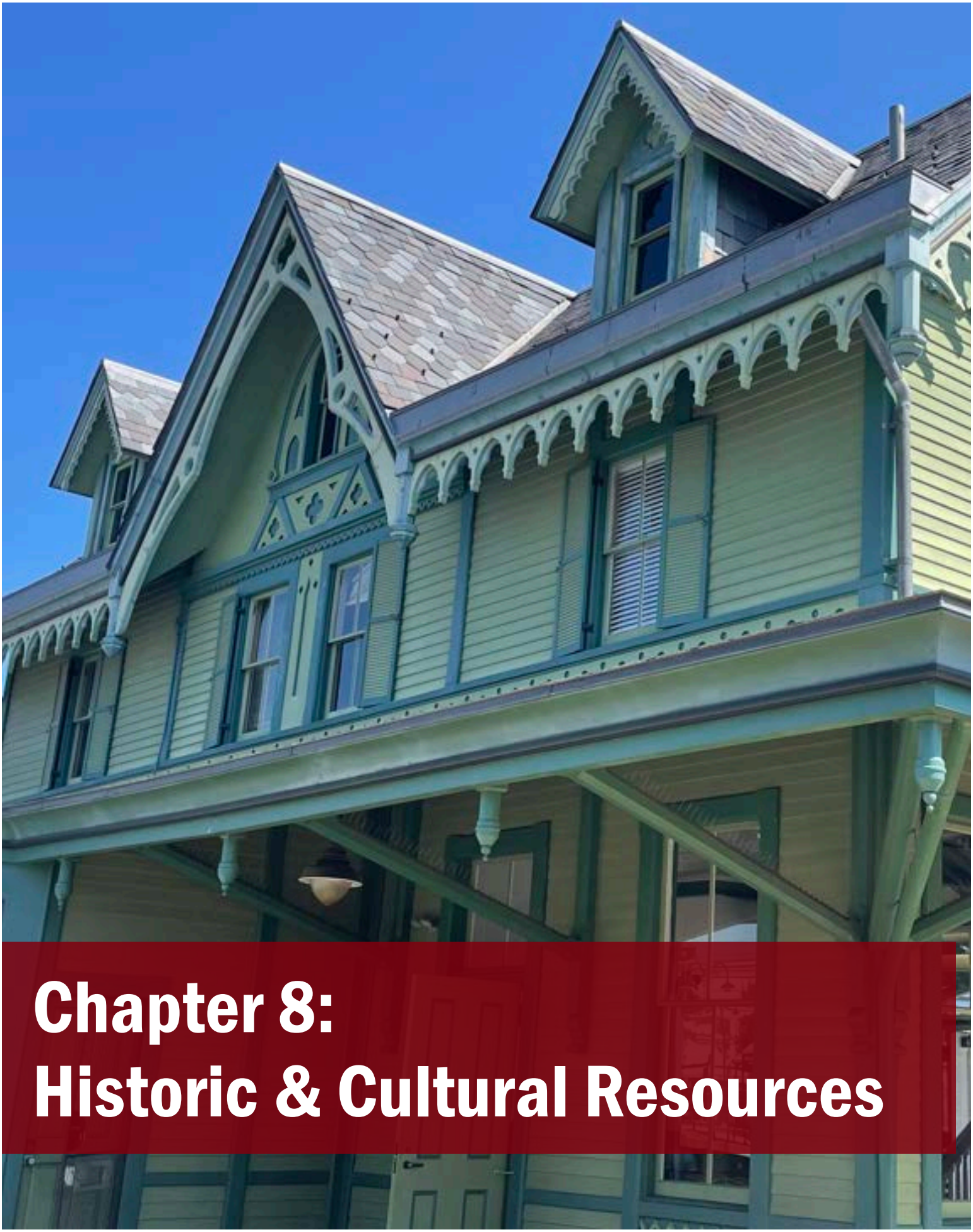
References: Land Use

[1] New Jersey Department of Environmental Protection. 2020 Land Use/Land Cover Update and Impervious Surface Mapping Project. https://www.arcgis.com/home/item.

[2] New Jersey Department of Environmental Protection. 2020 Land Use/Land Cover Classification. Modified Anderson System. nj.gov/dep/gis/digidownload/metadata/lulc20/anderson2020.htm.

[3] Red Bank Master Plan, 2023.

[4] *Ibid*; *Non-Condemnation Area in Need of Redevelopment Study*, March 2024



Chapter 8: Historic & Cultural Resources

Source: BFJ Planning.

Historical Development Patterns

European settlement of the area now known as Red Bank began in 1665, when seven Englishmen from Gravesend, New York purchased land from the Navesink Native Americans. The first commercial development occurred in the late 1600s with the opening of Joseph Price's Bank Tavern, located in the vicinity of today's Marine Park. This area became the heart of the community, as the hub for transport of farm goods such as wheat and produce to New York City, and the invention of the steamboat further strengthened the riverfront area as a bustling port community. From this core, commercial development spread south along Broad Street, with residential growth occurring nearby along Mechanic, Mount, Spring, Wallace, and Washington Streets.

In 1875, the New York and Long Branch Railroad built the Red Bank station, later purchased by the Central Railroad of New Jersey, followed by NJ Transit. This infrastructure greatly expanded Red Bank's connectivity to the region, especially New York City, which was further expanded with the construction of the Garden State Parkway in the mid-20th century. The Borough's strategic location on the peninsula between the Shrewsbury and Navesink Rivers makes it a prime destination for visitors from throughout the region, who patronize its shopping, dining, and cultural opportunities.

Historical Resources

Locally Designated Historic Districts and Landmarks

Red Bank has designated two local historic districts for protection from demolition:[1]

Broad Street Historic District: Broad Street between Front Street and Harding Road

Washington Street Historic District: Washington Street between Front Street and Wallace Street.

Red Bank's Inventory of Historic Resources, found in the 2009 Historic Preservation Master Plan Element, identifies 204 locally designated historic sites. These resources are under the jurisdiction of the Borough's Historic Preservation Ordinance and the HPC, which advises the Planning Board and the Board of Adjustment on applications, advocates for preservation activities, develops recommendations for historic preservation ordinances, and explores potential funding opportunities and incentives. This list, which was last updated in 2008, generally includes properties in the downtown core, including along Broad Street, Maple Avenue, Washington Street, Spring Street, Irving Place, Wallace Street, Monmouth Street, Mechanic Street, and Front Street. Beyond the downtown core, locally identified historic sites include houses of worship, the Red Bank Armory, and the original train station building. Section 490-

55 of Red Bank's municipal code, most recently updated in February 2024, provides for the regulation of historic resources as well as the process for designation of additional resources.

State and National Registers of Historic Places

Red Bank also has historic asset deemed significant by the State and National Registers of Historic Places. While some state and national listings are also locally designated, others are not, and therefore do not fall under the jurisdiction of the HPC. The Borough has nine listings in the State and/or National Registers as well as one national landmark, the T. Thomas Fortune House. **Table 8.1** provides the complete listing of all buildings and sites on the State and National Registers, as well as their date of designation. **Figure 8.1** depicts the local historic districts as well as the sites listed on the National and State Registers.

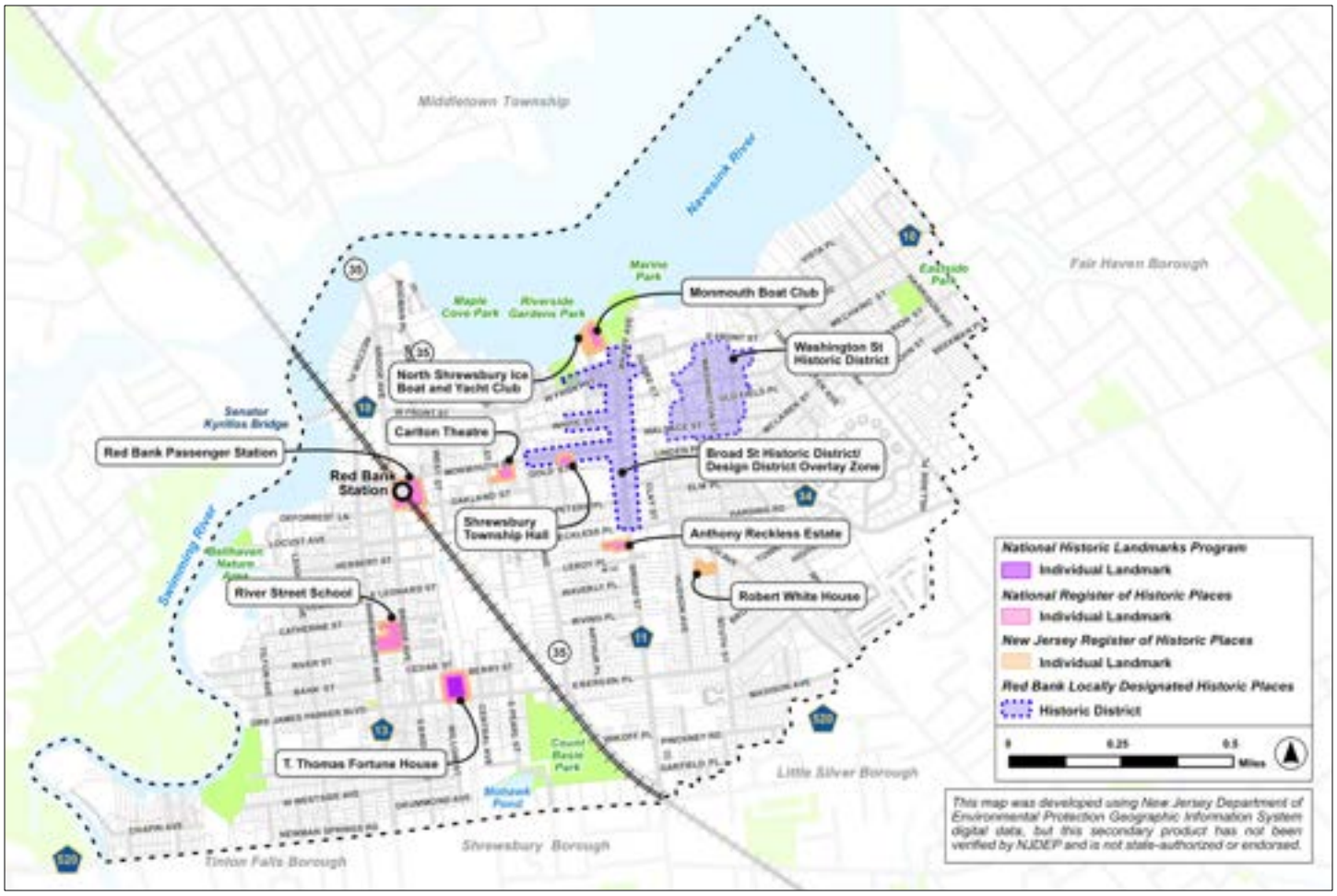
Table 8.1: State/National Historic Sites in Red Bank

Name	Location	Designation
Carlton Theatre	99 Monmouth Street	NR: 12/18/2009; SR: 5/20/2009
T. Thomas Fortune House	94 West Bergen Place	NHL: 12/8/1976; NR: 12/8/1976; SR: 8/16/1979
Monmouth Boat Club	Union Street	NR: 8/16/1994; SR: 5/20/1994
North Shrewsbury Ice Boat & Yacht Club	9 Union Street	NR: 10/31/2019; SR: 1/10/2008
Anthony Reckless Estate	164 Broad Street	NR: 6/3/1982; SR: 2/22/1982
Red Bank Passenger Station	Bridge and Monmouth streets	NR: 5/28/1976; SR: 1/7/1976
River Street School	60 River Street	NR: 4/14/1995; SR: 3/3/1995
Shrewsbury Township Hall	51 Monmouth Street	NR: 12/8/1980; SR: 10/10/1980
Robert White House	20 South Street	NR: 3/7/2012; SR: 10/18/2010
Note: SR= State Register; NR = National Register; NHL = National Historic Landmark		

Source: Red Bank Historic Preservation Plan Element, 2009.[2]

Sites listed on the State and National registers receive a variety of benefits. Listing on the State Register gives property owners access to matching grants and low-interest loans from the New Jersey Historic Trust for rehabilitation, while listing on the National Register provides access to 20% federal income tax credits for eligible substantial rehabilitations. Both the New Jersey Register law and the National Historic Preservation Act provide for review when an action by a public agency (municipal, county, state or federal agency respectively) could cause damage to the listed or eligible resource.

Figure 8.1: Locally Designated and State/National Historic Districts and Sites



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), Red Bank 2009 Historic Preservation Plan Element, BFJ Planning.

Arts and Cultural Resources

Red Bank is a key arts and cultural destination in Monmouth County, attracting residents and visitors from throughout the region. The Borough's many attractions – such as its art galleries, shopping and dining, special events, performances at the Count Basie Center for the Arts and the Two River Theater, and waterfront parks – all combine to drive visitors.

The Count Basie Center, in particular, has invested significantly in recent years to broaden its offerings. In 2020, the center completed a $28 million expansion that added a second performance space accommodating hundreds more patrons. The project also included upgrades to the lobby, concession stands, restrooms, elevators, HVAC system, back-house theater infrastructure, new classrooms and studios, and other concert amenities.[3] In addition to its main campus on Monmouth Street, the Count Basie Center has a complex on Chestnut Street with support facilities – including space for music instruction, rehearsal, and scenery/costume production –

for Phoenix Productions, the community theater company that merged with the Count Basie Center in 2021.[4] The Count Basie Center also operates Basie Center Cinemas at the former Bowtie Cinemas on White Street.

In addition to brick-and-mortar arts and cultural resources, Red Bank's River Center, Visitors Center, and Business Alliance are active organizations that collaborate with the Borough to create activities and events in the downtown area.

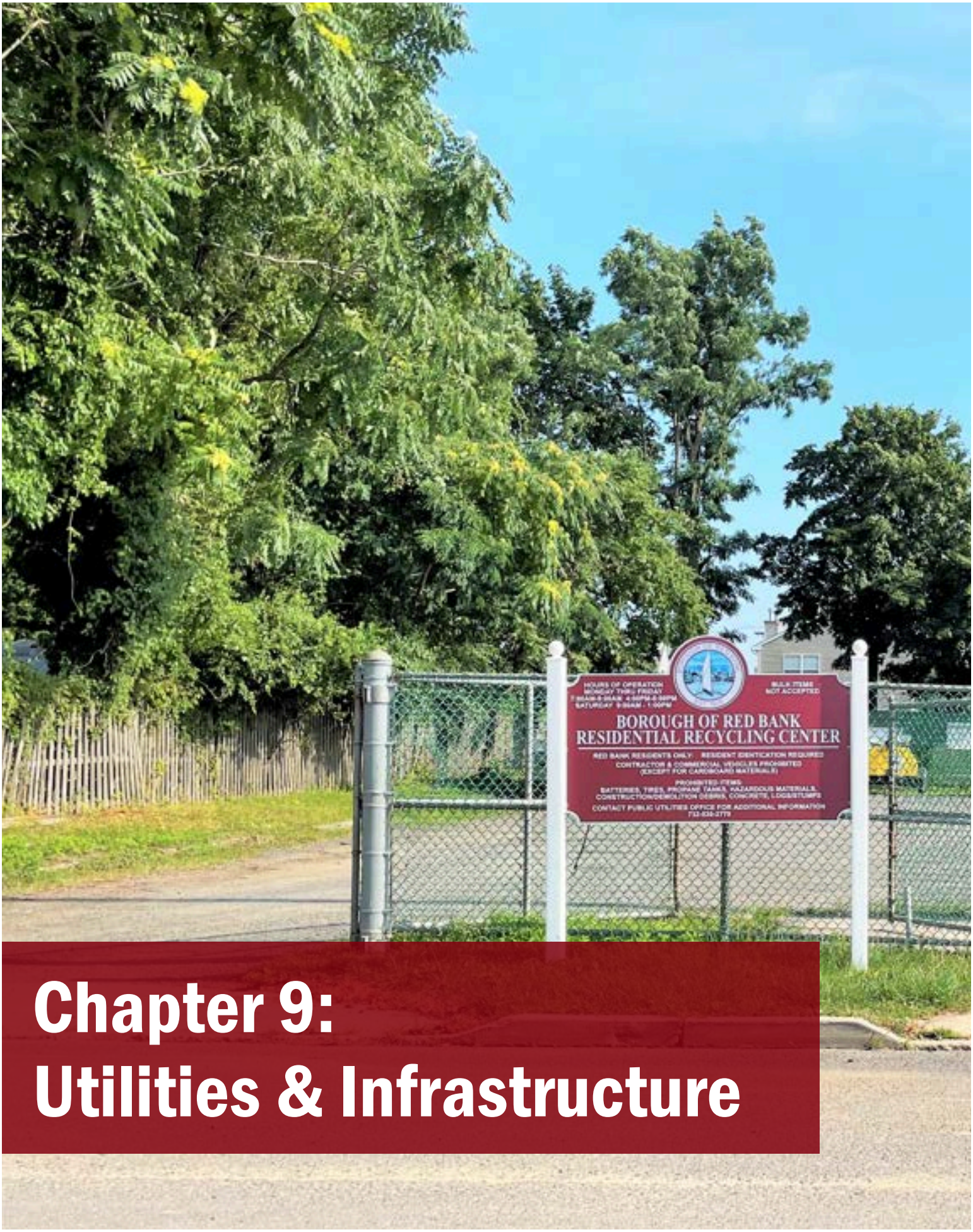
References: Historic & Cultural Resources

[1] Red Bank Master Plan, 2023.

[2] Borough of Red Bank Historic Preservation Commission. Historic Preservation Plan Element, 2009.

[3] Larcara, Jacqueline. “Count Basie Center Hits the High Notes.” *New Jersey Monthly*, June 16, 2020. https://njmonthly.com/articles/arts-entertainment/count-basie-center-expansion/

[4] Borough of Red Bank. N*on-Condemnation Area in Need of Redevelopment Study*, March 2024



Chapter 9: Utilities & Infrastructure

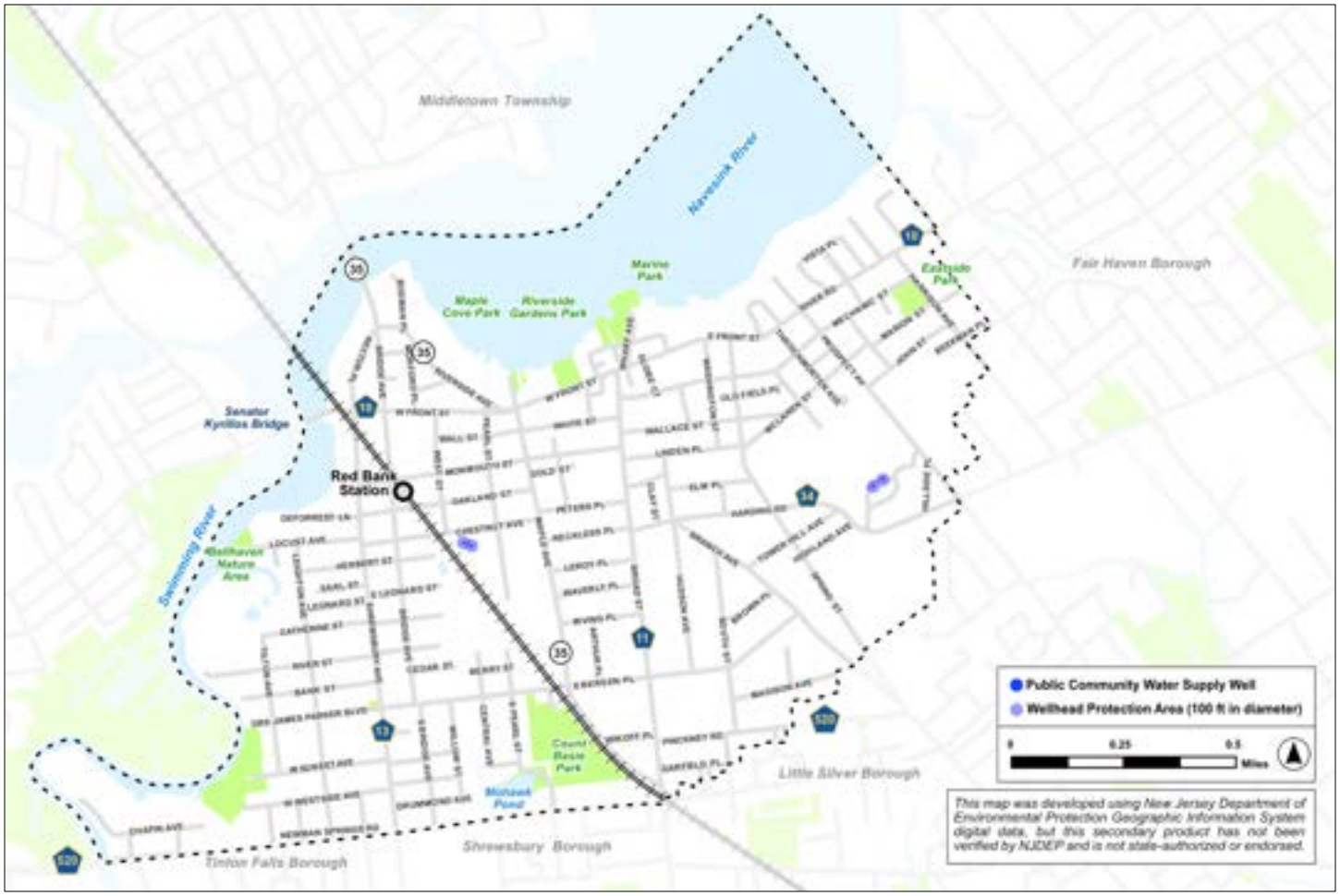
Source: BFJ Planning.

Public Water Supply and Wellhead Protection

Red Bank's ground water supply is obtained from four wells, seen in **Figure 9.1** Well #6 and #8 are located at the Borough's Public Works Department on Chestnut Street and are 700 feet deep. Wells #5 and #7 are in the Tower Hill area of Red Bank and are 780 feet deep. During off-peak months (December–April), the Borough is required to purchase treated water from the New Jersey American Water Company, which obtains its supply from the Swimming River Reservoir.[1]

The NDEP delineates Wellhead Protection Areas to identify the horizontal extent of groundwater captured by a well pumping at a specific rate over two-, five-, and 12-year periods of time for unconfined wells, and a 50-foot radius for confined wells (all the wells in the Borough are confined). This information is used to define the sources of water to a public supply well to undertake appropriate monitoring and assess potential contamination.[2]

Figure 9.1: Public Wells in Red Bank

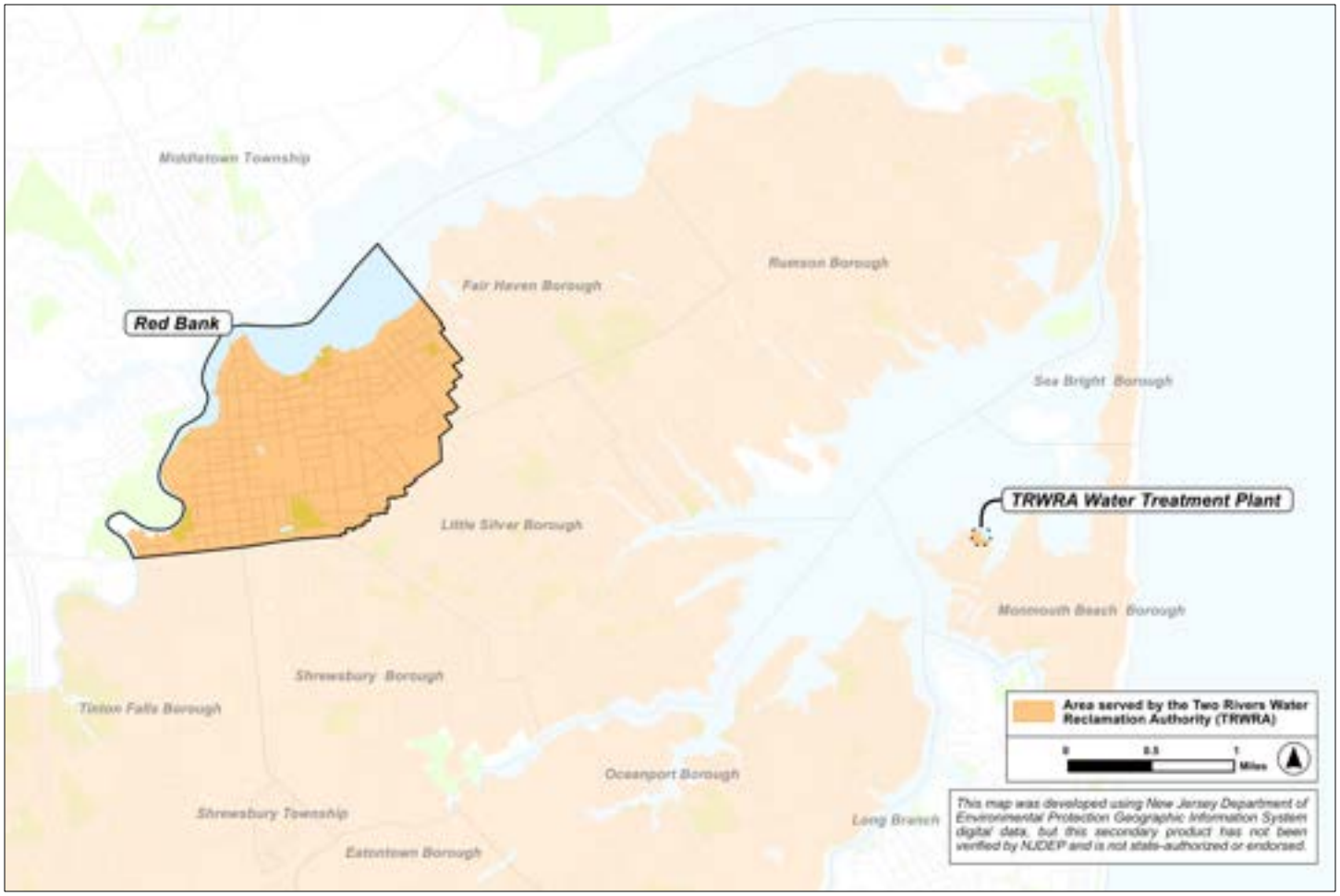


Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Sanitary Sewers and Wastewater

Red Bank's sanitary sewer systems are owned and operated by the Two Rivers Water Reclamation Authority (TRWRA), which provides wastewater treatment for Red Bank and several other neighboring communities, including Fair Haven, Little Silver, Shrewsbury, and Tinton Falls. Originally established in 1965 as the Northeast Monmouth County Regional Sewerage Authority, the TRWRA currently serves 39,000 households and 90,000 residents, and treats over 11 million gallons of wastewater per day at its water reclamation plant in Monmouth Beach.[3] **Figure 9.2** depicts the area served by the TRWRA and the location of the Authority's water treatment plant.

Figure 9.2: Two Rivers Water Reclamation Authority Sewer Service Area



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Solid Waste

Solid waste hauling and disposal for single-family residential uses in Red Bank is handled by a third-party commercial waste hauler under contract to the Borough, while commercial and multi-family uses generally contract with individual commercial haulers. According to 2021 NJDEP data – the most recent information available – Red Bank generated 60,313 tons of solid waste during the year, a figure that includes 24,932 tons of municipal solid waste and 35,381 tons of non-municipal solid waste.

Key Terms and Definitions

Municipal solid waste – refers to common household, office, and retail waste; includes packaging, mixed paper, plastic containers, food waste, furniture, appliances, and grass/tree trimmings.

Non-Municipal solid waste – refers to construction, industrial, and hazardous waste; includes concrete and asphalt, scrap metal, and contaminated soil.

Municipal solid waste (MSW), i.e., "trash" or "garbage," generated by Red Bank residents in 2021 amounted to 24,932 tons – 41% of the Borough's total generated solid waste. Of these 24,932 tons of MSW, 7,480 tons – about 30% – were recycled, a rate that was lower than Monmouth County's 52% MSW recycle rate for the same year. Apart from 2017, Red Bank's MSW recycle rate has been consistently significantly lower than Monmouth County's, as seen in **Table 9.1.**[4]

Table 9.1: Solid Waste Generation and Recycling Rates in Red Bank

Year	Red Bank MSW (Tons)	Red Bank Total Generated Solid Waste (Tons)	Red Bank MSW Recycle Rate	Monmouth County MSW Recycle Rate
2017	31,910	69,468	56%	47%
2018	18,635	47,512	28%	47%
2019	18,129	48,946	27%	47%
2020	19,902	51,908	36%	47%
2021	24,932	60,313	30%	52%
Note: pre-2017 data for solid waste generation are not available at the municipal level.				

Source: NJDEP.

Plastic Film Recycling Program

Plastic film can include everyday items such as grocery bags, food packaging, and shrink wrap, and must be recycled separately from typical household recycling due to its ability to clog machines not equipped to process it. In 2021, Red Bank entered into an agreement with S.C. Johnson & Sons, under which the company would sponsor and cover all monetary costs of a pilot program for curbside plastic film recycling in the Borough. Residents were given free receptacles for plastic film that were collected by the Borough's Department of Public Utilities on the first Wednesday of each month, then transported to Tinton Falls for recycling. 4,320 pounds of material were collected during the pilot program, which began in November 2021 and ended in December 2022. The Borough continued collections between January 2023 and December 2023, during which time 4,600 pounds of material were collected. In addition to household receptacles for plastic film, there is a plastic film bin located at the Recycling Center at 110 West Sunset Avenue available to all residents.

Energy Usage

Red Bank's electricity and natural gas are provided by Jersey Central Power and Light (JCP&L) and New Jersey Natural Gas (NJNG), respectively. **Table 9.2** displays the total amounts of electricity and natural gas used by Red Bank's residential and commercial sectors from 2018 to 2021, the most recent data year available.[5]

Table 9.2: Energy Usage Rates in Red Bank

Year	Electricity (kWh)		Natural Gas (thm)	
	Residential	*Commercial/Industrial*	*Residential*	*Commercial/Industrial*
2018	37,586,260	117,248,264	3,081,849	3,302,198
2019	36,155,648	115,326,640	2,982,139	3,261,483
2020	36,956,944	108,561,360	2,683,563	2,763,938
2021	38,909,032	109,604,688	2,804,451	3,606,792

Source: NJDEP.

Throughout much of the downtown core of the Red Bank – specifically along Broad and Monmouth Streets – utility lines are buried. However, residents have noted an excess of low-hanging utility lines in areas throughout the rest of the Borough that pose both practical and aesthetic concerns to people and wildlife. "Undergrounding" refers to the practice of placing utility lines – such as those carrying electricity and telecommunications – below the surface rather than overhead on poles or towers. Advantages associated with this practice include enhanced public safety, improved aesthetics, better reliability in the face of severe weather events and accidents, and lower maintenance costs. Challenges posed by undergrounding include substantial upfront costs associated with excavation and installation, as well as potential spatial limitations due to existing infrastructure. New development and significant redevelopment of sites creates the opportunity to place utilities underground as part of site infrastructure work.

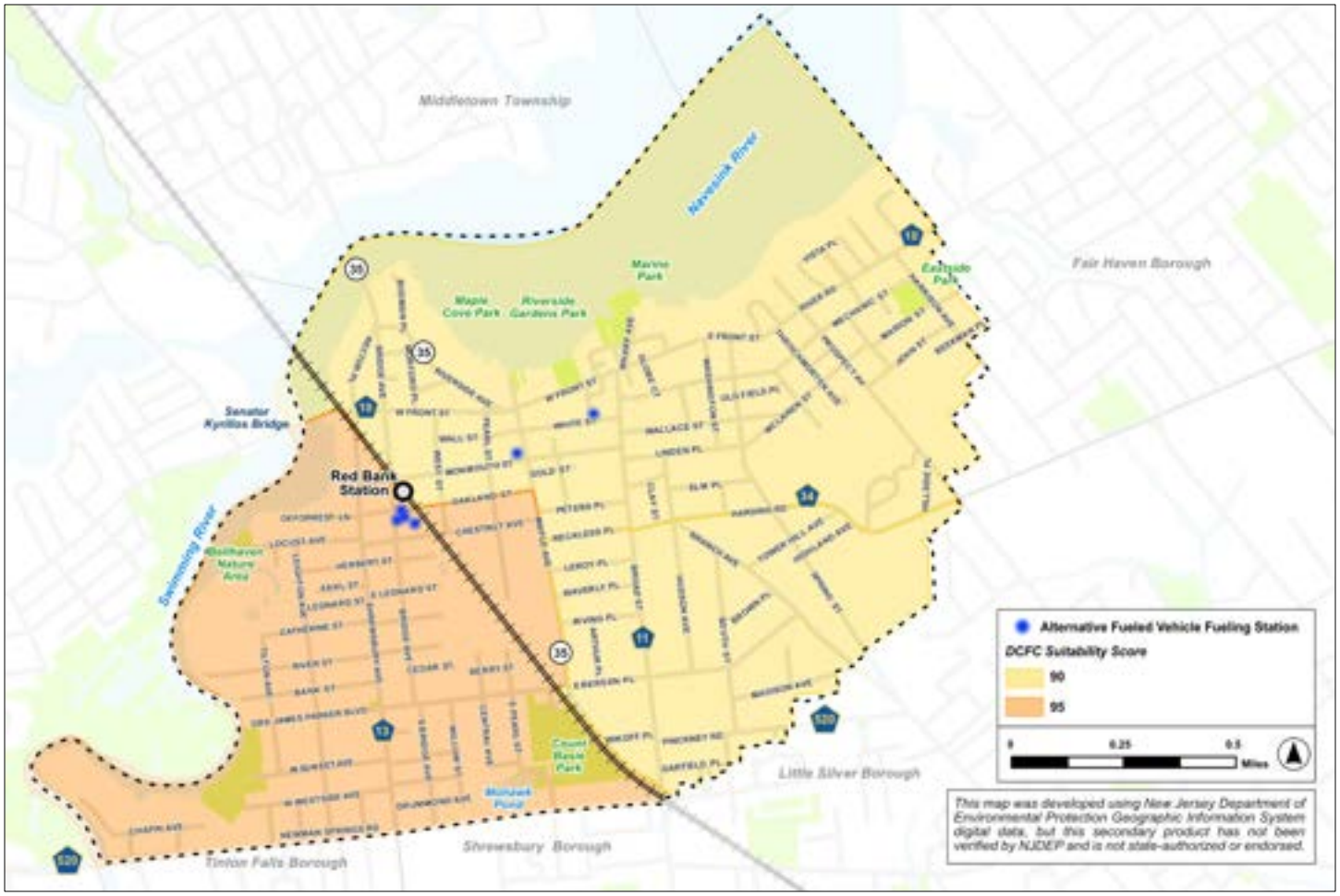
Electric Vehicle Charging

In 2019, the NJDEP, the New Jersey Board of Public Utilities (NJBPU) and the New Jersey Economic Development Authority (NJEDA) entered into a memorandum of understanding (MoU) to establish the New Jersey Partnership to Plug-In. This Partnership serves to advance New Jersey's vehicle electrification goals by encouraging communication and coordination of efforts across state agencies to build out the necessary infrastructure to support electric vehicles (EVs).

In accordance with the MoU, the NJDEP developed mapping to inform the strategic placement of EV charging infrastructure in New Jersey. This mapping depicts current EV charging stations, as well as data about census tracts' suitability for direct current fast charging (DCFC) infrastructure, the quickest and most powerful type of EV charging available. Suitability scores range from 0 to 100, and are based on metrics important for DCFC infrastructure, including proximity to existing charging stations,

commercial activity, and demographic data. **Figure 9.3** depicts the six level 2 EV charging stations currently available for public use in Red Bank, along with the DCFC suitability scores for the three census tracts within the Borough.[6] The figure shows that the Borough generally has high suitability for DCFC infrastructure; however, the increased electrification of buildings and more residents choosing to purchase electrical vehicles with in-home charging systems will place growing demands on Red Bank's electrical system. This is a potential issue throughout New Jersey and the region and will require ongoing investment in the electrical grid.

Figure 9.3: Public EV Charging Infrastructure and DCFC Suitability Scores in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

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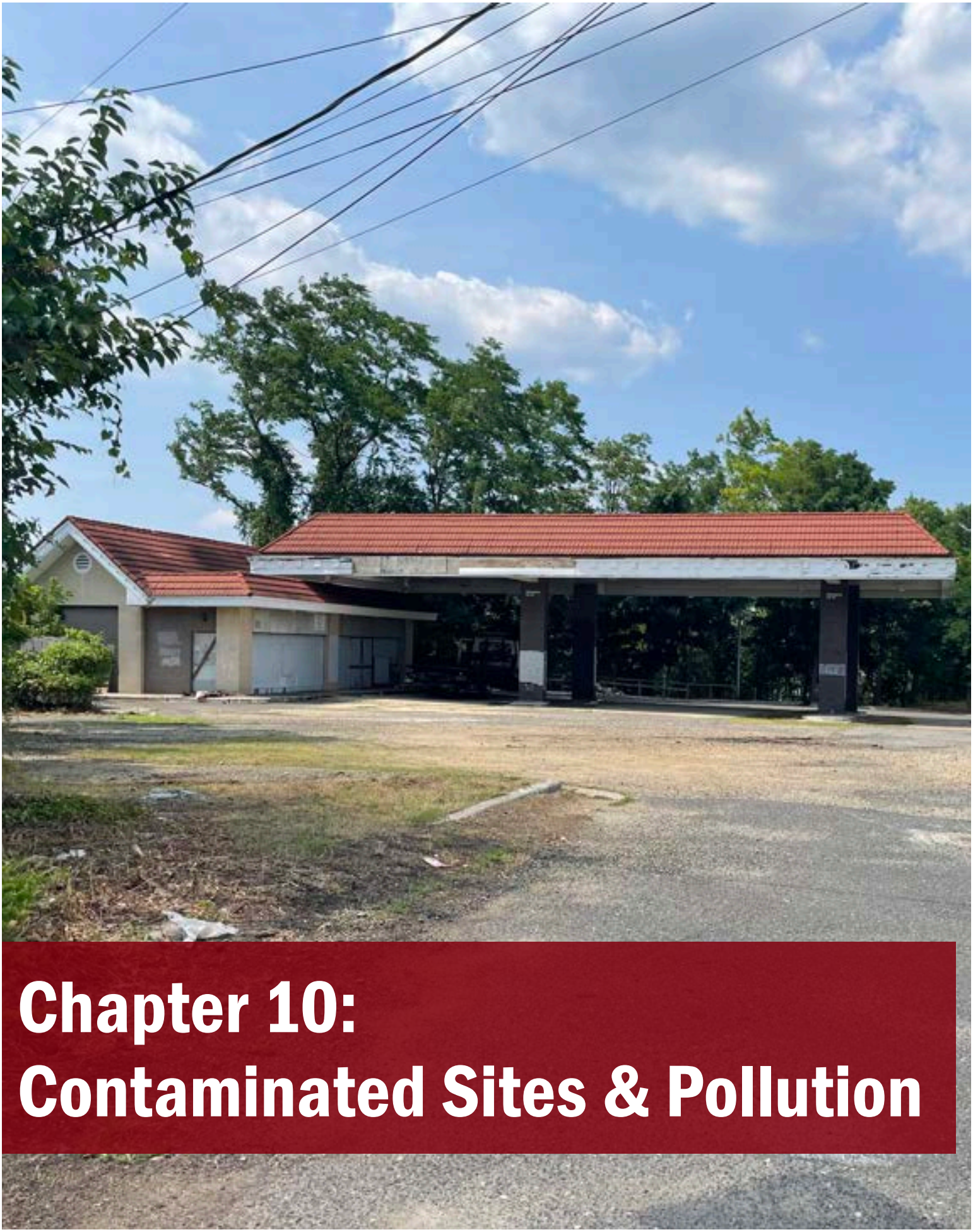


Chapter 10: Contaminated Sites & Pollution

Source: BFJ Planning.

Active Sites with Confirmed Contamination

Sites and properties within New Jersey where contamination of soil or groundwater has been confirmed at levels equal to or greater than applicable standards are included in the Known Contaminated Sites List (KCSL). Depending on their level of contamination, remediation activities for sites included in the KCSL can range from simple soil removals to complex cleanups.[1] Sites are considered to be remediated once a Remedial Action Report (RAR) documenting that all applicable standards have been achieved has been submitted and a Response Action Outcome (RAO) has been issued. The list is updated daily and can be accessed through NJDEP DataMiner (https://njems.nj.gov/DataMiner).

As of July 30, 2024, there are 36 active sites with confirmed contamination in Red Bank, including manufacturing and industrial facilities, gas stations, and residential properties, all with varying levels of contamination. Of these 36 sites, six have submitted an RAR and are awaiting issuance of an RAO; 16 have yet to submit an RAR (five sites are past their due date); six are subject to RAPs, meaning an RAR is not applicable; and four do not have information listed in NJDEP DataMiner, possibly due to data error. Table 10.1 lists descriptions for the remedial levels assigned to contaminated sites, Table 10.2. lists the various active sites with known contamination within Red Bank, their respective remedial levels, and the status of their respective RARs.[2] [3]

Table 10.1: Remedial Levels

Remedial Level	Description
A	An emergency action taken to stabilize an environmental or health threatening situation from the sudden release of hazardous substances.
B	Single-phase remedial action in response to a single contaminant category affecting only soils. Does not include ground water investigation or remediation.
C1	A remedial action which does not involve formal design where the source is known. May include the potential for ground water contamination.
C2	A remedial action which consists of a formal engineering design phase and is in response to a known source or release. Usually involves cases where ground water contamination has been confirmed.
C3	A multi-phased remedial action in response to an unknown and/or uncontrolled source or discharge to the soils and/or ground water.
D	A multi-phased remedial action in response to multiple, unknown and/or uncontrolled sources affecting multiple mediums, including known contamination of ground water.

Source: NJDEP.

Table 10.2: Active Sites with Confirmed Contamination in Red Bank (as of 7/30/2024)

Program Interest No.	Place Name	Address	Remedial Level*	RAR Status**
007890	101 107 Oakland Street	101 Oakland St	C2	Due 1/24/2029
679612	361 Shrewsbury Avenue	361 Shrewsbury Ave	C2	-
666591	74 John Street	74 John St	C2	-
G000038105	94 West Bergen Place	94 Drs James Parker Blvd	C2	Received 1/7/2022
503598	Arch Cleaners	45 Bridge Ave	C2	Due 5/6/2022
014918	Bridge Ave Gas	187 Riverside Ave	C2	Due 11/24/2028
G000059898	Central Concrete Corporation	17 Central Ave	C2	Received 6/30/2022
002056	Chevy Cleaner	214 Bridge Ave	C2	Due 2/28/2024
573625	Count Basie Fields	11 Henry St	C1	Due 5/6/2018
008684	Exxon	220 Newman Springs Rd	N/A	N/A
002524	(Former) Anthony's Cleaners / The Ten Company	29 35 Monmouth St	C2	Due 5/6/2025
002649	Globe Petroleum Inc	9 Central Ave	C2	Received 12/6/2016
008815	Harding Getty	28 To 32 Harding Rd	C2	Received 9/29/2023
1050680	Marion St & Harrison Ave Gw Contamination	Marion St & Harrison Ave	C3	-
835626	Marion Street Soil Contamination	Marion St & Harrison Ave	B	Due 12/22/2021
006002	Maurice Schwartz & Sons Inc	141 W Front St	N/A	N/A
009803	Mobil Oil Corp 15-C7m	192 Riverside Ave	N/A	N/A
010285	Rassas Buick	395 Broad St	N/A	N/A
032080	Ray Springberg & Leonard Martelli	257 Maple Ave	B	Due 3/27/2019
007930	Rbank Capital	80 Rector Pl	D	Due 7/7/2027
610498	Red Bank Boro Count Basie Park	Drs James Parker Blvd	N/A	N/A
003177	Red Bank Boro Water Dept	75 Chestnut St	C2	-
002522	Red Bank Citgo	254 Maple Ave	C2	Received 5/5/2023
G000005531	Red Bank Coal Gas (Jcp&L)	Bodman Pl	C3	Due 5/6/2026
G000000565	Red Bank Incinerator	Sunset Ave	C3	Due 5/6/2029
846542	Red Bank Primary School	222 River St	C2	Due 7/26/2027
561137	Red Bank Salvation Army After School	172-180 Newman Springs Rd	N/A	N/A
011088	Red Bank Shell	390 Shrewsbury Ave	C2	Due 9/10/2030
907074	Riverview Towers Apartment Corp	28 Riverside Avenue	C2	N/A
261712	Riverwalk Commons	16 32 W Front St	C3	Received 5/6/2024
005086	Seals Eastern Inc	134 Pearl St	C2	Due 5/6/2026
017108	The Atrium @ Navesink Harbor	40 Riverside Ave	N/A	N/A
754906	The Rue Family Partnership Properties***	94 96 98 102 E Front St	N/A	Due 12/4/2029
004581	Waynes American	170 Newman Spring Rd E	C2	N/A
002189	Welsh Farms	110 Front St E	N/A	N/A

*Sites for which a remedial level is not provided by NJDEP are sites where remedial action has been completed, but soil and/or groundwater contamination remains. These sites are subject to Remedial Action Permits (RAPs), which establish long-term remedial actions that must occur for the site to comply with regulations.

** "N/A" indicates that the site is subject to a RAP, and thus an RAR is not applicable; "-" indicates that information from NJDEP is not available, possibly due to data error.

*** This site is listed as having neither a RAP nor a remedial level. Further information from the NJDEP is not available.

Source: NJDEP.

Classification Exception Areas

Classification Exception Areas (CEAs) are controls established in areas where groundwater contamination has been identified. CEAs are intended to provide notice that an aquifer's designated uses will be suspended in a localized area due to the exceedance of New Jersey's Ground Water Quality Standards (GWQS) by one or more contaminants. Some 20 of the active sites with confirmed contamination listed in **Table 10.2** are also designated as CEAs. These sites are listed in **Table 10.3**, along with detailed information about the date, extent, and length of the respective established CEAs. Both active sites with confirmed contamination and CEAs in Red Bank are mapped in **Figure 10.1.**[4]

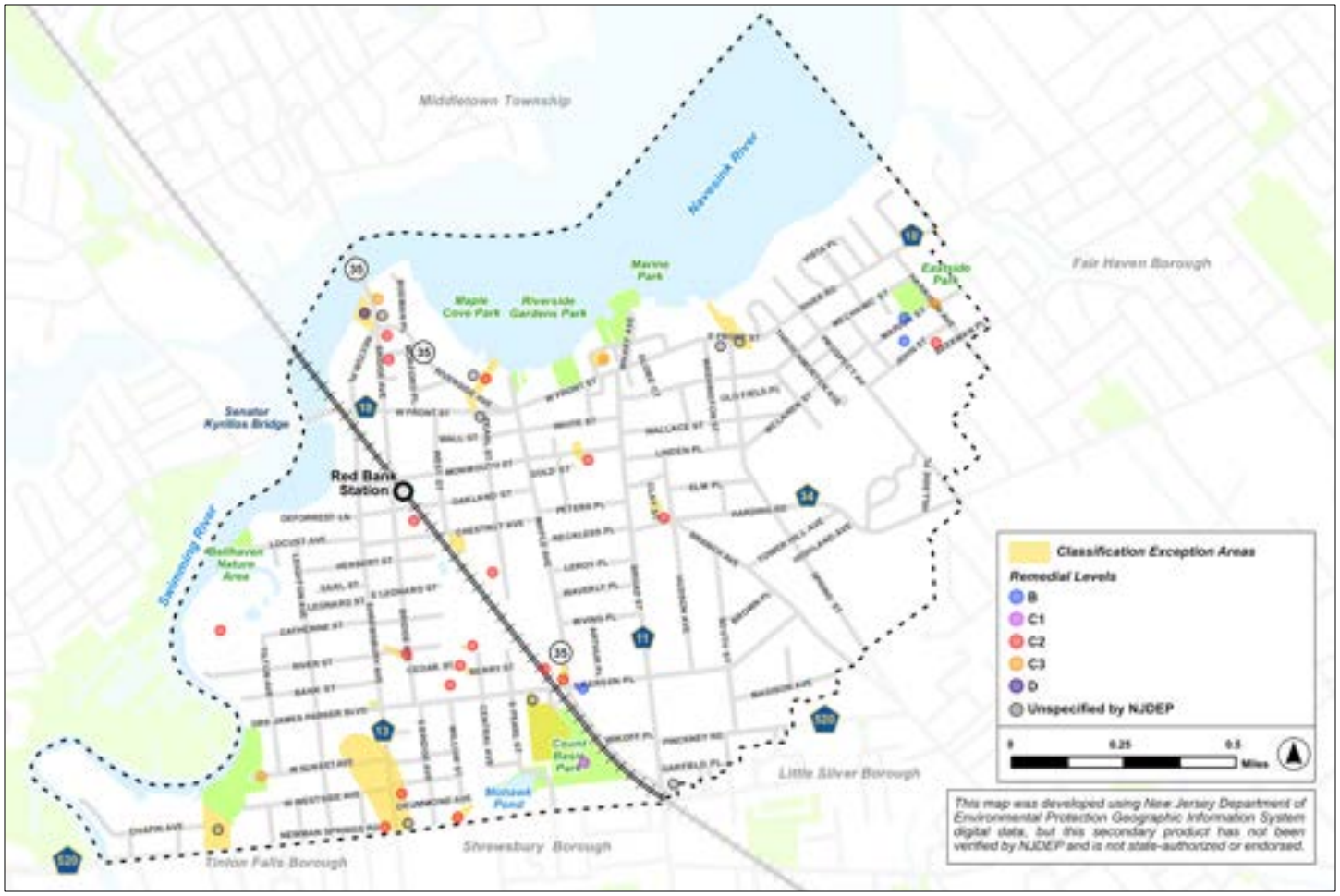
Table 10.3: Classification Exception Areas in Red Bank (as of 7/30/2024)

Site ID	Place Name	Address	Date Established	Depth (ft)	Duration (yrs)
36218	Anthony's Cleaners (Former) / The Ten Co	29 35 Monmouth St	12/20/2019	60	8
4123	Central Concrete Corp	17 Central Ave	8/4/2021	18	Indeterminate
4149	Chevy Cleaner	214 Bridge Ave	12/12/2019	23	Indeterminate
4141	Exxon Station #3-5150	220 Newman Springs Rd	3/30/2006	95	19
36910	Globe Petroleum Inc	9 Central Ave	1/29/2019	23	60
4127	Harding Getty	28 To 32 Harding Rd	11/22/2019	30	Indeterminate
66457	JCP&L – Red Bank Coal Gas	Bodman Place	9/26/2018	32	Indeterminate
124131	Maurice Schwartz & Sons Inc (Former)	141 W Front St	11/30/2011	24	8
46740	Mobil Station #15-C7M(Former)	192 Riverside Ave	1/6/2009	20	28
431858	Monmouth Daycare Playground	Drs James Parker Blvd	3/27/2019	10	Indeterminate
4152	Rassas Buick	395 Broad St	6/12/2023	14.7	6
4126	Rbank Capital	80 Rector Pl	4/13/2023	28	Indeterminate
42325	Red Bank Citgo	Maple Ave & W Bergen St	5/13/1997	40	Indeterminate
4153	Red Bank Department of Public Works Garage*	75 Chestnut St	7/12/1999	25	Indeterminate
83286	Red Bank Salvation Army After School	172-180 Newman Springs Rd	8/30/2022	50	Indeterminate
4135	Riverview Towers Apartment Corp	28 Riverside Ave	5/3/2023	10	Indeterminate
167474	Riverwalk Commons	16 32 W Front St	1/15/2020	30	Indeterminate
4139	Texaco Station #13-005-0045	390 Shrewsbury Ave	10/29/2001	50	Indeterminate
43096	Waynes American	170 Newman Spring Rd E	9/28/2016	50	26
4146	Welsh Farms / Globe Petroleum	110 E Front St	7/9/1997	75	30

*Note that while two of Red Bank's public wells are located near this site, they are both 700 feet deep and draw water from a confined aquifer and are thus unaffected by the CEA in place.

Source: NJDEP.

Figure 10.1: Active Sites with Confirmed Contamination and Classified Exception Areas in Red Bank (as of 7/30/2024)

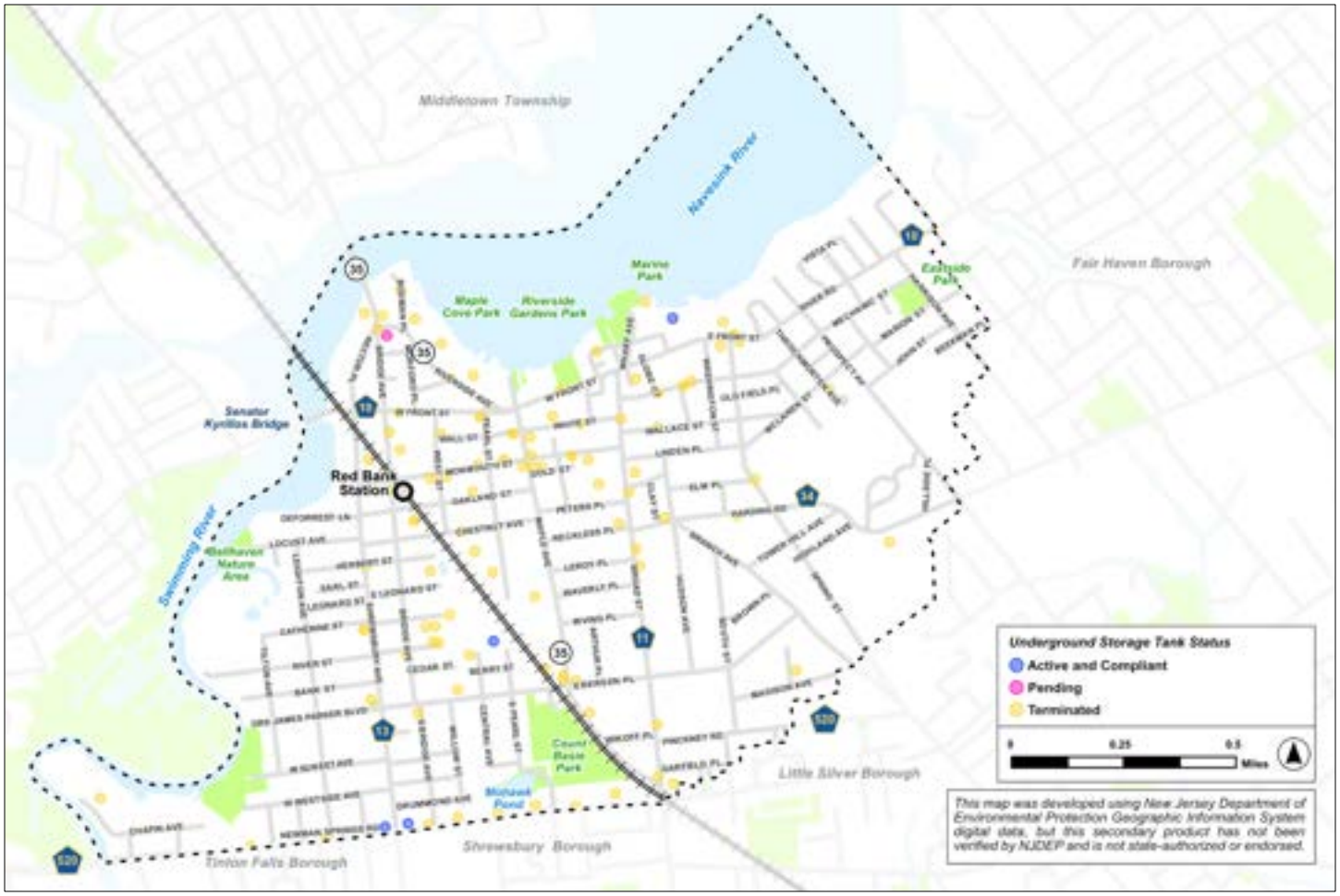


Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Underground Storage Tanks

As defined by NJDEP, *underground storage tanks* (USTs) are tanks used to contain accumulations of hazardous substances, the volumes of which are 10% or more beneath the surface of the ground. NJDEP manages USTs by registering sites, issuing permits, and regularly monitoring for leaks to prevent groundwater contamination. Of the 105 USTs within Red Bank, 100 have been closed and are no longer active, 4 are listed as active and in compliance with NJDEP regulations, and 1 is listed as "pending," meaning its registration is being processed by NJDEP. USTs in Red Bank are mapped in **Figure 10.2.**[5 6]

Figure 10.2: Underground Storage Tanks in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), BFJ Planning.

Point and Nonpoint Source Pollution

Point Source Pollution

Point source pollution is defined as any discernible, confined, and discrete conveyance, such as a pipe, ditch, or tunnel, from which pollutants are or may be discharged. The New Jersey Pollutant Discharge Elimination System (NJPDES) regulates the discharge of pollutants through the issuance of permits limiting the concentration and mass of the pollutants discharged. Like the KCSL, the list of active NJPDES permits is updated daily and can be accessed through NJDEP DataMiner (https://njems.nj.gov/DataMiner).

As of August 6, 2024, there are seven facilities in Red Bank with NJPDES permits, one of which – Red Bank Recycling Auto Wreckers Inc. – has expired permits. **Table 10.4** lists facilities in Red Bank with NJPDES permits and **Table 10.5**, following the figures, provides an explanation for the permit categories.[7]

Table 10.4: NJPDES Active Permits in Red Bank

Facility Name	Street Address	Permit Expiration Date	Discharge Category
Seals Eastern Inc	134 Pearl St	01/31/28	5G2
Sb-Irw Llc	1 Marine Park	01/31/28	5G2
Monmouth Armed Forces Reserve Clb-25 H&S Co	338 Newman Springs Rd	01/31/28	5G2
Red Bank Recycling Auto Wreckers Inc	64 Central Ave	09/30/18	SM2
Red Bank Boro	90 Monmouth St	12/31/27	R9
The Anderson Building	220 Monmouth Street	02/28/27	5G3
The Atlantic Club – Red Bank	325 Maple Ave	01/31/29	B6

Note on NJPDES discharge categories:

5G2 – Basic Industrial Stormwater General Permit: available to regulated industrial facilities that have eliminated or can eliminate within 6 months of authorization, all exposure of industrial materials or activities to stormwater discharges.

SM2 – Scrap Metal Processing/Auto Recycling Stormwater General Permit: authorizes the discharge of stormwater from facilities involved in either the recycling of scrap metal materials or the recycling of both scrap metal materials and used vehicle parts.

T1 – Sanitary Subsurface Disposal: authorizes the discharge of sanitary sewage from facilities to a subsurface disposal (i.e. septic) system.

R9 – MS4 Tier A Municipal Stormwater General Permit: authorizes the discharge of stormwater from small municipal separate storm sewers. Tier A municipalities are generally located within the more densely populated regions of New Jersey or along or near the coast.

5G3 – Construction Activities Stormwater General Permit: authorizes point source discharges from certain construction activities. Regulated entities must develop a soil erosion and sediment plan to eliminate the flow of contaminated rainwater into streams and rivers.

B6 – Swimming Discharge General Permit: authorizes the discharge from the draining of pool water and/or filter backwash from any municipal, commercial, non-residential or community swimming pools to eligible surface waters of the State. This general permit is not intended for swimming pool discharges from residential homes and does not authorize the discharge into those waters classified as FW1.

Source: NJDEP.

Nonpoint Source Pollution

Whereas point source pollution stems from a single identifiable source, nonpoint source pollution describes diffuse contamination resulting from everyday activities and can include pollutants such as fertilizers, motor oil, gasoline, and bacteria from pet waste. These pollutants are spread through the environment by stormwater runoff, which picks them up and deposits them into surface and groundwaters.

As discussed in **Chapter 4: Hydrology**, Red Bank's Stormwater Management Ordinance seeks to mitigate hazards posed by stormwater runoff – including nonpoint source pollution – by requiring major new developments to submit a stormwater plan including maps, descriptions of stormwater management facilities, and a maintenance and repair plan.

Noise Pollution

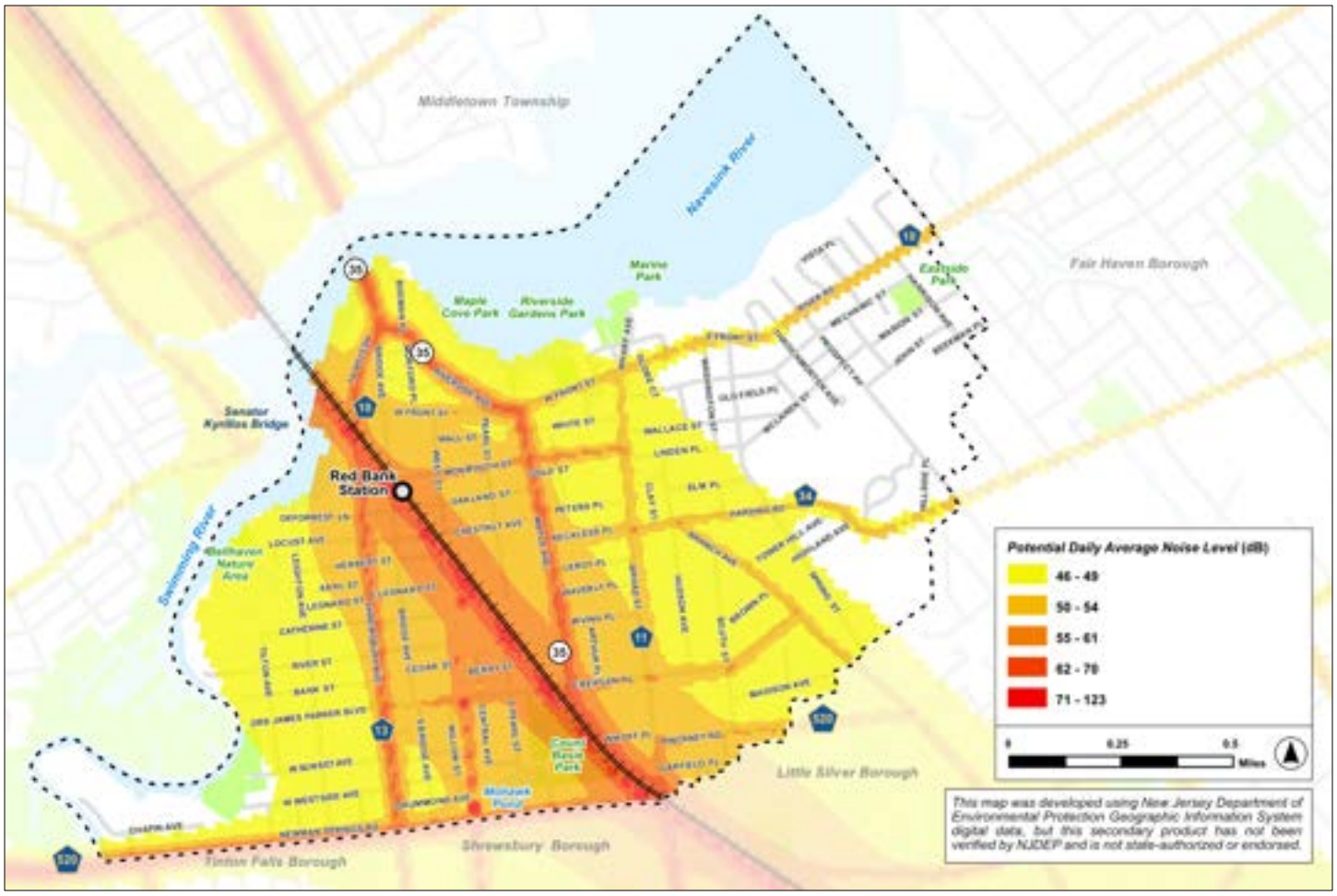
Because Red Bank has a significant amount of urban development, it sees relatively high levels of noise pollution – unwanted or excessive sound that impairs human health and quality of life. While noise pollution can stem from sources including animals and construction, a primary source is transportation-related noise resulting from airports, roads, and railways.

To track noise pollution as demand for various modes of transportation increases, the U.S. Department of Transportation (USDOT) developed a National Transportation Noise Map (NTNM) depicting data representing potential noise levels across the United States for an average day of a specified year. It must be noted that this data is based on simplified noise modeling and operates on a series of assumptions related to factors such weather, ground type, and terrain. As such, while the NTNM can track general trends in transportation-related noise, it should not be used to evaluate noise levels in individual locations or at specific times and should not be used for regulatory purposes.[8]

NTNM data is mapped to Red Bank in **Figure 10.3.** As depicted in the map, transportation-related noise is most significant directly adjacent to the railroad track, as well as along County Routes 10, 13 and 520, and New Jersey Route 35.

Red Bank's Master Plan recommends working with the Federal Railroad Administration (FRA) to establish a Quiet Zone in the Borough. Quiet Zones must be at least ½ mile in length and have at least one public highway-rail grade crossing equipped with automatic flashing lights and gates to reduce the risk of collisions; additional safety improvements may include medians and lane closures.[9] New Jersey communities that have established Quiet Zones include Montclair, Westfield, Hillsborough, Somerville, and Woodbridge.[10]

Figure 10.3: Transportation-Related Noise in Red Bank



Sources: Monmouth County, USGS, NJ Transit, NJDEP, NJDOT, OpenStreetMap (OSM) Road Network (Exported from Urban Footprint), USDOT, BFJ Planning.

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