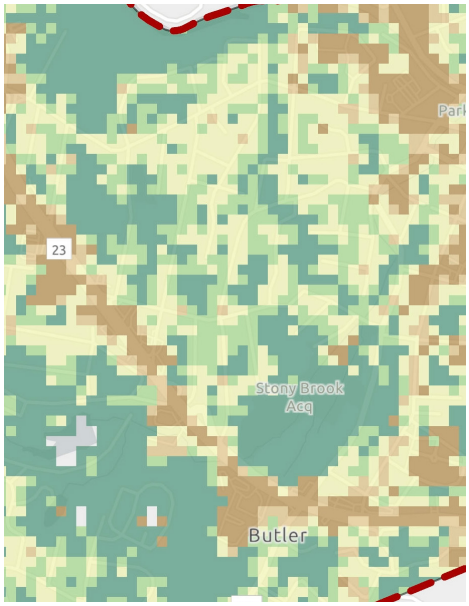
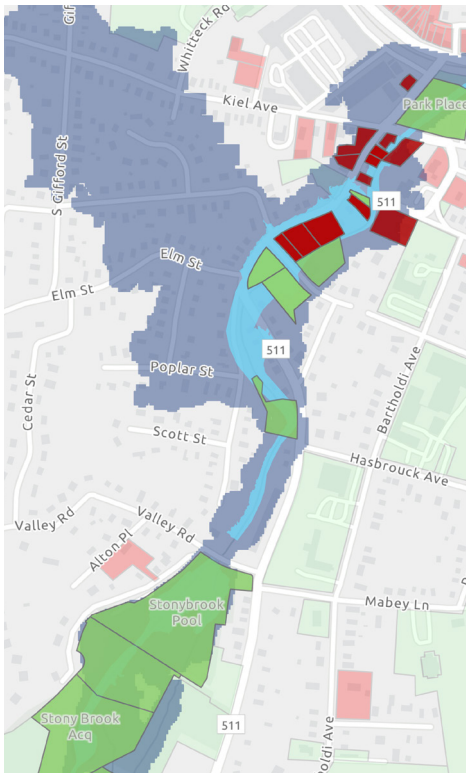






September 2026

Climate Change-Related Hazard Vulnerability Assessment

Borough of Butler

RUTGERS–NEW BRUNSWICK
New Jersey Climate Change Resource Center

RESILIENT NJ

This Climate Change-Related Hazard Vulnerability Assessment (CCRHVA) was prepared by the NJ Climate Change Resource Center in collaboration with the Borough of Butler and was funded by the New Jersey Department of Environmental Protection through the American Rescue Plan Act. This analysis was conducted in the summer and fall of 2025 and relies upon the best available data and local plans at that time. The version of CCRHVA adopted by the Borough may be different than this document based on updated data and local plans, which may occur through their local master plan update process.

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I. Introduction

The New Jersey (NJ) Municipal Land Use Law (MLUL) requires New Jersey municipalities to include a Climate Change-Related Hazard Vulnerability Assessment (CCRHVA) in the Land Use Element of the Municipal Master Plan. The New Jersey Climate Change Resource Center (NJCCRC) at Rutgers University, with funding from the New Jersey Department of Environmental Protection (NJDEP), developed this CCRHVA in coordination with the Borough of Butler in accordance with the requirements of the MLUL, including the following components:

- Analysis of current and future threats to, and vulnerabilities of, the municipality associated with climate change-related natural hazards, including, but not limited to increased temperatures, drought, flooding, hurricanes, and sea-level rise (Section III);
- A build-out analysis of future residential, commercial, industrial, and other development in the municipality, and an assessment of the threats and vulnerabilities related to that development (Section IV);
- Identification of critical facilities, utilities, roadways, and other infrastructure that is necessary for evacuation purposes and for sustaining quality of life during a natural disaster, to be maintained at all times in an operational state (Section V);
- Analysis of the potential impact of natural hazards on relevant components and elements of the master plan (Section VI);
- A specific policy statement on the consistency, coordination, and integration of the climate change-related hazard vulnerability assessment with any existing or proposed natural hazard mitigation plan, floodplain management plan, comprehensive emergency management plan, emergency response plan, post-disaster recovery plan, or capital improvement plan (Section VII).

Butler Borough is located in Morris County, New Jersey. It is bordered by Kinnelon to the west, Pequannock to the south, Riverdale to the east, and Bloomingdale and West Milford to the north. The borough spans 2.089 square miles and is almost entirely developed with most land use devoted to residential single-family detached structures. Route 23 runs through Butler as the borough's main traffic artery, passing through its commercial core and connecting the borough to surrounding communities. Much of Butler's commercial base is along Route 23, consisting of grocers and shopping centers.

The 2020 update of Morris County's Hazard Mitigation Plan identified flooding as a major hazard for Butler, as approximately 2.53% of its land is waterbodies.[1] This CCRHVA builds on those findings, examines additional hazards, and provides considerations to reduce future hazard risk. Additional details about Butler are included in Appendix A.

[1] DMA 2000 Hazard Mitigation Plan Update – Morris County, New Jersey (July 2020).

II. Methodology

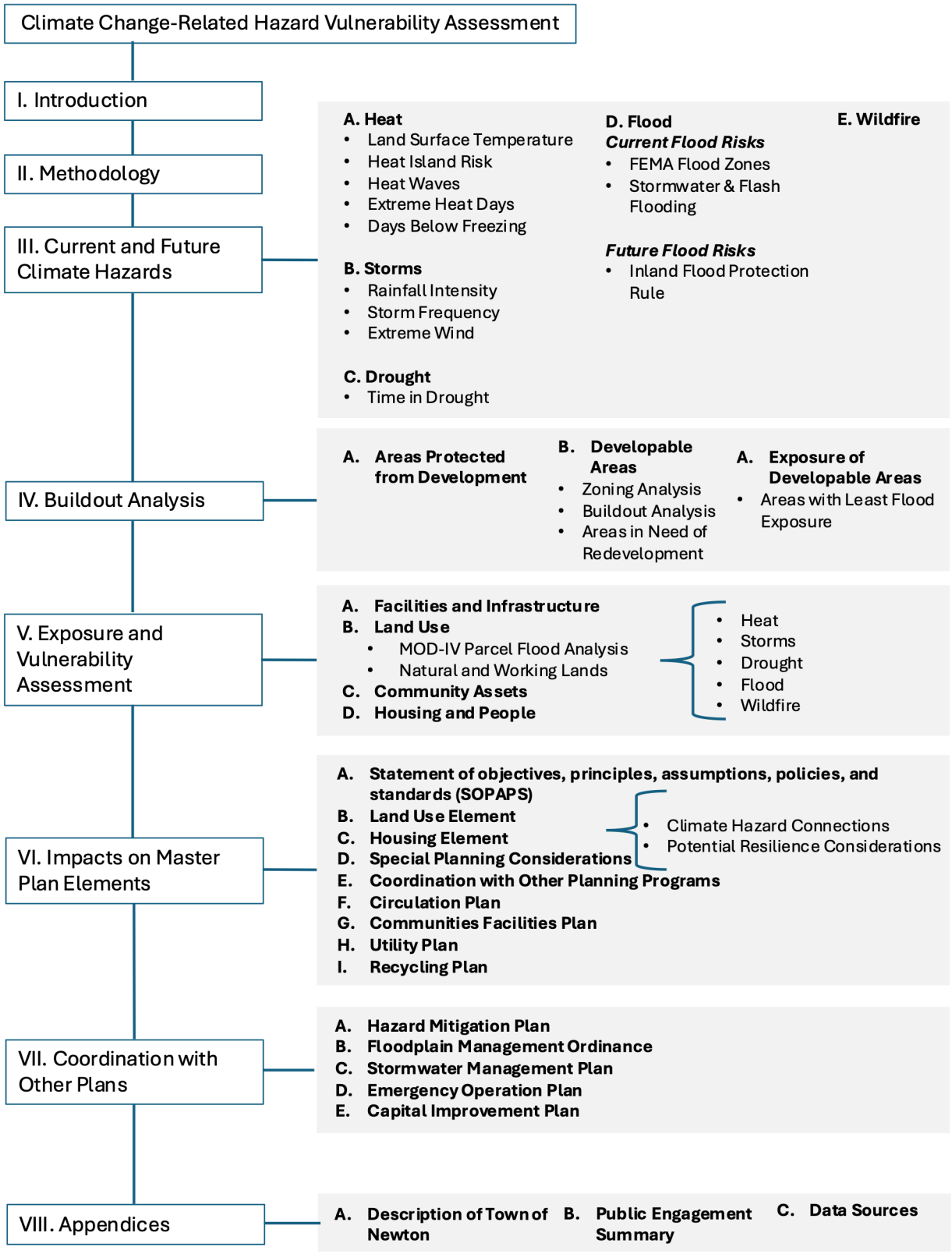
In accordance with the requirements of the MLUL, this assessment relies upon "the most recent natural hazard projections and best available science" provided by the NJDEP. This assessment was conducted in the summer and fall of 2025 and relies upon the best available data at that time. Publicly available datasets and data made available through various tools were utilized to analyze local climate change-related hazards and potential impacts to the Borough at the three planning horizons below. The hazard projections align with a moderate greenhouse gas emissions scenario representing a future with a reduction in fossil fuel use consistent with today's global policies. It should be noted that the projected changes would be slightly greater under a higher greenhouse gas emissions scenario (i.e., representing a future with continued growth of fossil fuel use).

- Present day to assess current impacts and align with the shorter-term planning needs of the 10-year Master Plan Reexamination Report (MPRR) cycle.
- Mid-century to assess future impacts and align with longer-term community planning needs and visioning.
- Late-century to assess long-term planning needs in alignment with the NJDEP Protecting Against Climate Threats (PACT) initiatives including the Inland Flood Protection Rule. This rule is detailed in Section III.D.

The results of the web-based assessment were presented to Butler municipal staff and residents to obtain feedback and confirm results. These stakeholders also provided input on hazards for which web-based data was not available, including stormwater and flash flooding. Details on public engagement are included in Appendix B.

This document is organized into eight sections, depicted in Figure II-1. Each section addresses a required component as set forth by the MLUL.

Figure II-1. Butler CCRHVA document structure



III. Current and Future Climate Hazards

The New Jersey Municipal Land Use Law (MLUL) requires a CCRHVA to include an "analysis of current and future threats to, and vulnerabilities of, the municipality associated with climate change-related natural hazards, including, but not limited to increased temperatures, drought, flooding, hurricanes, and sea-level rise." This section addresses that requirement and includes analysis of the additional hazards of extreme precipitation, wind, and wildfire.

Local stakeholders were asked via an online survey to rank their level of personal concern for the Borough from the hazards of heat, drought, flooding, extreme precipitation, wind, and wildfire. Most respondents indicated that wind was their biggest concern for the Borough, followed by drought, extreme precipitation, and flooding. Heat and wildfire were of less concern. Local stakeholders were also asked to report how frequently they are personally affected by each hazard. Respondents indicated being most frequently affected by wind in the borough, followed by heat and extreme precipitation. Less frequent impacts were reported from drought, flooding, and wildfire (see Appendix B for details).

A. Heat

Average annual temperatures in New Jersey have risen by about 4 °F since 1900. By 2100, the annual average temperature in New Jersey is projected to increase an additional 3.7–6.2 °F.[2] Increased temperatures can have adverse impacts on public health, infrastructure, and plants (see Section V). Urbanized areas are disproportionately affected by heat due to higher population density, more impervious surfaces, and fewer natural landscapes. Less than half of the local stakeholders who responded to the survey (48%) indicated being personally affected by heat in the borough "many times" or "a few times" each year (Appendix B).

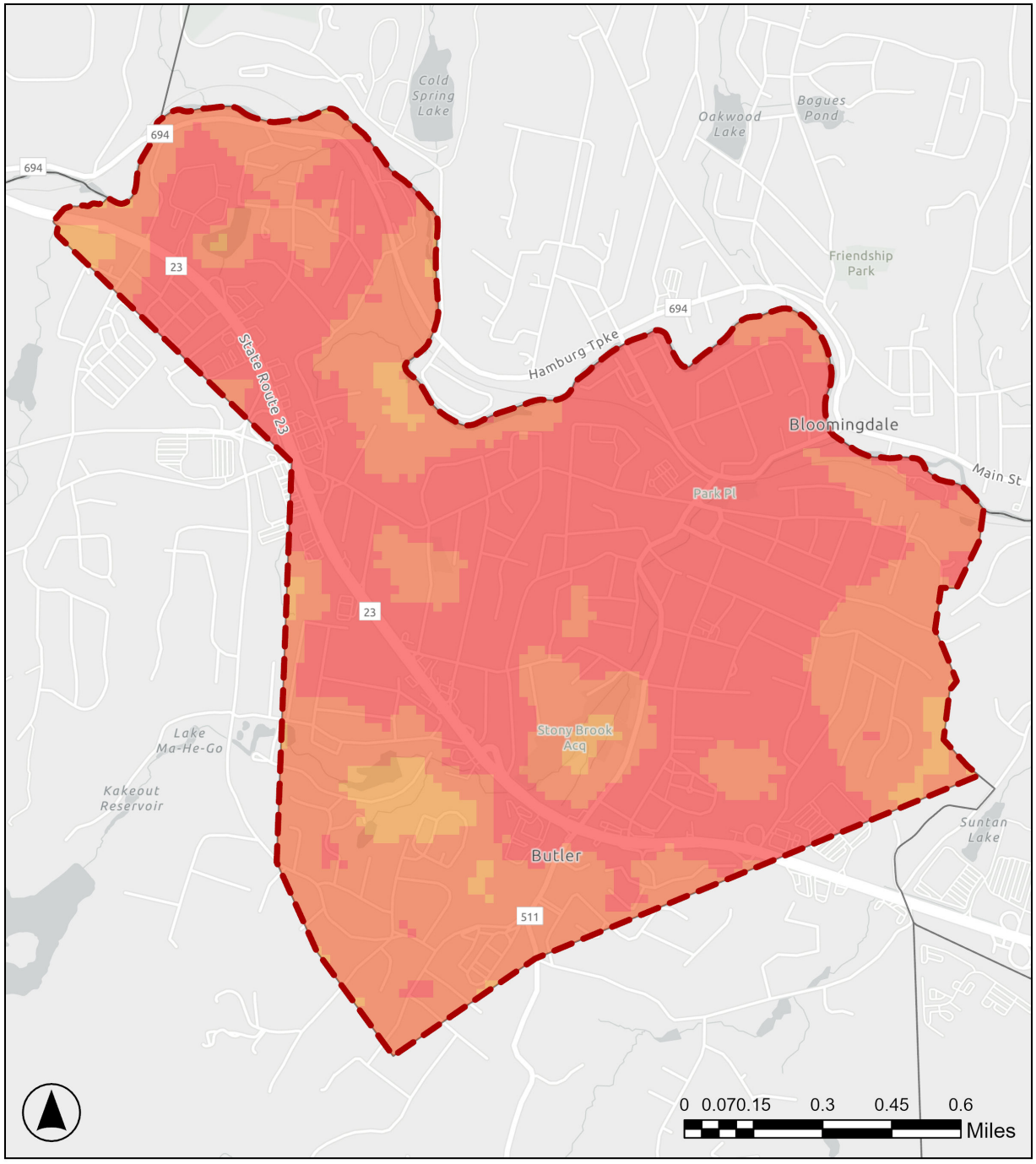
Land Surface Temperature

Map III-1 depicts the land surface temperature (temperature of the ground) in Butler in the summer of 2022. This data was collected by satellites at 100 square foot resolution. Impervious surfaces and structures, such as buildings and roads, absorb more solar radiation, increase land surface temperature, and emit more heat than natural surfaces such as trees and water.

The land surface temperature in Butler is generally high, ranging from 80 °F to over 110 °F. Most of the borough's land surface reaches temperatures between 90 °F and 110 °F due to its highly developed nature. Residential neighborhoods, along with major commercial corridors and roads located near the borough's center, experience surface temperatures exceeding 110 °F. In contrast, areas characterized by forestland, wetlands, and waterbodies are comparatively cooler, typically ranging between 80 °F and 90 °F.

[2] Davies, K., Shope, J., Broccoli, A., Gerbush, M., Kaplan, M., Robinson, D., Nikolopoulos, E., Araujo, D., Kopp, R., Herb, J. & Spector, A. 2025. State of the Climate: New Jersey 2024. Rutgers, The State University of New Jersey, New Brunswick, NJ. DOI: 10.7282/00000539.

Map III-1. Land surface temperature (°F) – Summer 2022



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Land Surface Temperature (°F)

Below 80 | 90 - 100

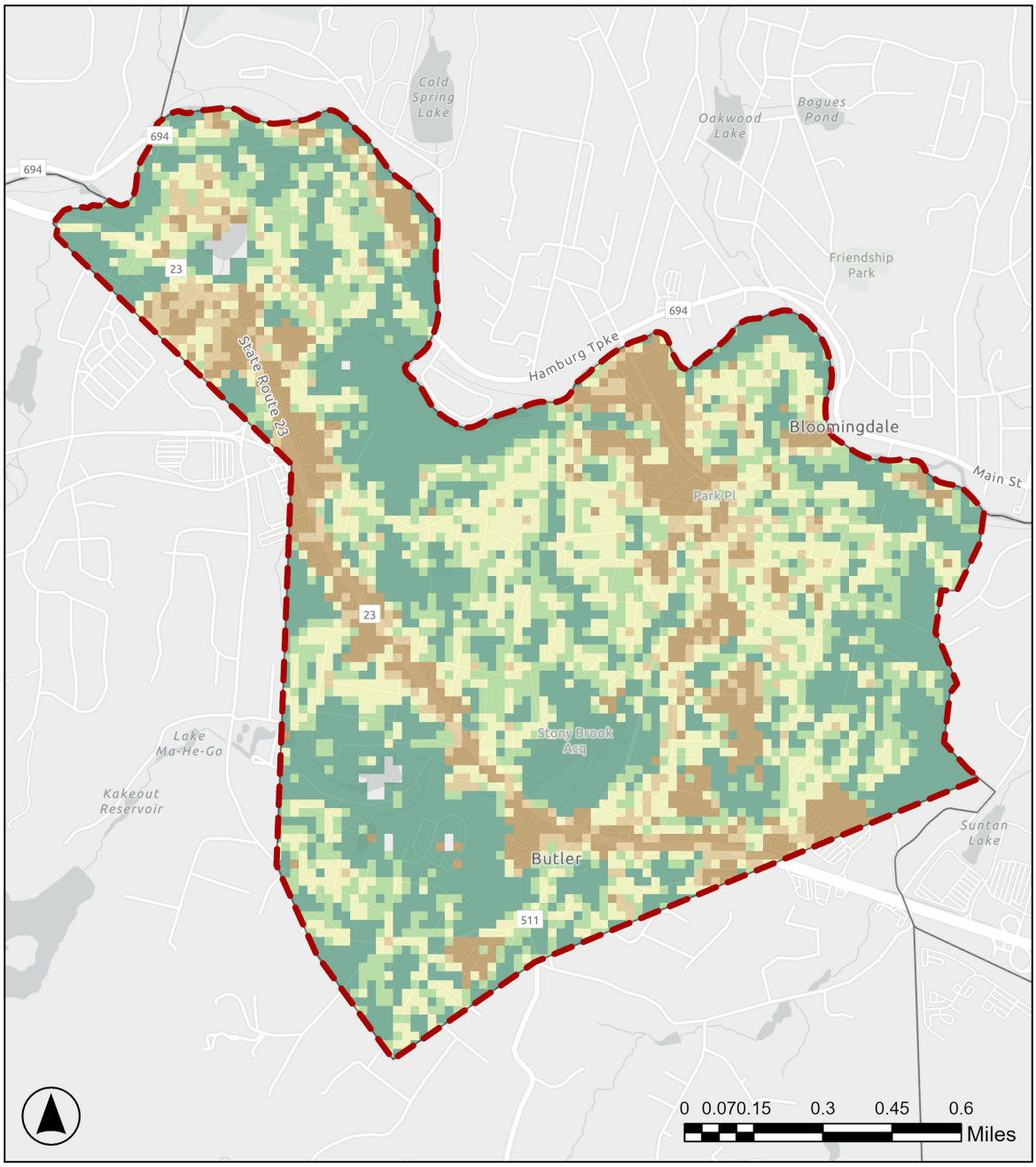
80 - 90 | 100 - 110 | Over 110

Heat Island Risk

While land surface temperature provides a granular depiction of potential heat impacts in the municipality, analysis of heat island risk offers a broader understanding of how heat can impact communities. A heat island is an area that is significantly warmer than the surrounding region. Areas with more impervious surface than tree canopy are at risk of the heat island effect. Heat islands can increase daytime temperatures, reduce nighttime cooling, and cause greater air pollution. Land use and zoning ordinances can mitigate heat island effects by setting standards for tree cover, vegetation, and impervious surface.

Map III-2 depicts the ratio between tree canopy cover and impervious surface in Butler. For each Census Block Group, the analysis provides a ratio value from negative one (100% impervious cover) to positive one (100% canopy cover). This range of potential values is split evenly into five groups in the map below, ranging from “higher canopy cover” to “higher impervious cover.” Heat island risk in Butler generally reflects its land use patterns. Residential, commercial, and industrial areas on the northwestern side of the municipality, particularly around the Main Street commercial corridor, have moderately higher ratios of impervious surface coverage, increasing the potential for heat island effects. In the rest of the borough, land use is more mixed with moderately higher tree canopy cover, reducing heat island risk. Additionally, natural areas such as forestland and waterbodies in the southern and northeastern parts of the borough help offset heat risk.

Map III-2. Heat island risk



LEGEND

Heat Island Risk Analysis

- Higher Impervious Cover
- Moderately Higher Impervious Cover
- Equivalent Canopy / Impervious Cover
- Moderately Higher Canopy Cover
- Higher Canopy Cover

(Source: New Jersey Climate Change Resource Center)

Heat Waves

A heat wave is a period of unusually hot weather. Typically, heat waves are warmer than the historical averages for the area and much warmer than the temperatures before and after the heat wave event. Heat waves have a direct impact on human health, the local environment, and the economy (see Section V). Climate change is projected to drive longer and more frequent heat waves in NJ.[3]

Table III-1 provides a measure of change in future heat wave number and duration compared to the historical period of 1981–2010 at the county level. The threshold for a heat wave in Morris County is three days with average daily temperature meeting or exceeding 78 °F. This threshold is the 95th percentile of 30 years (1981–2010) of daily average temperature during the warm season (May 1 to September 30). Average temperature is a synthesis of the daily maximum and minimum temperatures. Daily maximums emphasize the highest heat conditions a person may be exposed to, but daily minimums have been shown to be more important for heat stress and illness when elevated for an extended period.

Table III-1. Heat waves in Morris County

	Baseline 1981–2010	Moderate Emissions	
		Mid-century 2036–2065	Late-century 2070–2099
Average annual number of heat waves	1.1	3.9	5.1
Average days of heat wave duration	3.2	7.9	10.3
Maximum days of heat wave duration	7.5	16.2	20.5

(Source: New Jersey Public Health Adapt–Climate Conditions that Impact Health)

The data for Morris County indicates that the average number of heat waves annually may increase from about one per year to 4–5 throughout the century. The average length of heat waves is projected to increase from about three days to 8–10 days throughout the century. The typical maximum duration of heat waves may increase from around eight days to 16–21 days throughout the century.

Extreme Heat Days

Table III-2 provides a measure of change in future extreme heat days compared to a historical period of 1981–2010 at the municipal level. The total number of days per year with maximum temperatures above 95 °F is an indicator of how often very hot conditions occur. July is historically the hottest month in New Jersey. Higher maximum temperatures exceed thresholds of comfort, increasing the occurrence of heat-related illnesses, energy demand, and harmful impacts on plants and animals.

[3] Davies, K., Shope, J., Broccoli, A., Gerbush, M., Kaplan, M., Robinson, D., Nikolopoulos, E., Araujo, D., Kopp, R., Herb, J. & Spector, A. 2025. State of the Climate: New Jersey 2024. Rutgers, The State University of New Jersey, New Brunswick, NJ. DOI: 10.7282/00000539.

Table III-2. Extreme heat days

	Baseline 1981–2010	Moderate Emissions		
		Change from Baseline		
		2030	2060	2090
Days greater than 95 °F	0	+ 2	+ 6	+ 8
Average daily high temp. in July (°F)	80	+ 2	+ 4	+ 4

(Source: New Jersey Public Health Adapt – Climate Conditions that Impact Health)

Butler experienced an average of zero days above 95 °F annually from 1981–2010. By 2030, this may increase by two days annually and may increase by eight days by the end of the century. Butler experienced an average daily high temperature of 80 °F in July from 1981–2010. By 2030, the average daily high in July may increase by 2 °F and may increase by 4 °F by the end of the century.

Days Below Freezing

Table III-3 provides a measure of change in the future annual number of days below 32 °F compared to a historical period of 1981–2010 at the municipal level. The projected change to the median number of days is presented, which is the middle value of the range. Fewer very cold days mean fewer "code blue" situations, but potential impacts to agriculture, infrastructure, and disease vectors (e.g., mosquitoes and ticks).

Table III-3. Days below freezing

	Baseline 1981–2010	Moderate Emissions	
		Mid-century 2050–2070	Late-century 2080–2090
Median number of days below freezing	124	111	105

(Source: New Jersey Adapt Climate Snapshots – Forest Climate Risk Report)

Butler experienced a median of 124 days below 32 °F annually from 1981–2010. By the middle of the century, this may decrease to a median of 111 days below freezing each year. By the late century, the median number of days below freezing may decrease to 105 days annually.

B. Storms

Storms in New Jersey can bring heavy precipitation, flooding, and strong winds. Extreme events are those where conditions substantially exceed what is considered normal for a location. The NJCCRC's *State of the Climate: New Jersey 2024* reports that the frequency and intensity of extreme precipitation in New Jersey is expected to increase with climate change. The total annual rainfall within the state has increased by ~7% since the early 1900s, with the most intense events generating more rainfall compared to historical episodes. An increase in total annual rainfall of

about 3–13% may occur by the end of the century with moderate greenhouse gas emissions; additionally, extreme 24-hour rainfall is projected to increase about 5–15%. Heavy rainfall can cause flooding and increase the likelihood of waterborne disease outbreaks. Heavy wind associated with storms can damage structures and vegetation, including impacts to agriculture.

Wind and extreme precipitation ranked first and third, respectively, as personal stakeholder concerns, as reported in survey responses, suggesting that storm-related hazards represent key community concerns (see Appendix B).

Rainfall Intensity

More intense rainfall means more rain within a given timespan, which can overwhelm stormwater infrastructure and cause flash flooding. Table III-4 provides a measure of change in rainfall over a 24-hour period for various annual storm probabilities compared to a historical period of 1981–2010 at the municipal level.

Table III-4. Rainfall (in inches) over 24 hours by annual storm probability

	Baseline 1981–2010	Moderate Emissions	
		Mid-century 2036–2065	Late-century 2070–2099
50% chance storm	3.46	3.74	3.88
20% chance storm	4.39	4.83	4.97
10% chance storm	5.18	5.70	5.90
4% chance storm	6.34	7.04	7.35
2% chance storm	7.33	8.20	8.64
1% chance storm	8.41	9.50	10.09

(Source: New Jersey Public Health Adapt – Climate Conditions that Impact Health)

The baseline amount of rainfall in a 24-hour period in Butler ranges from 3.46 inches (50% chance storm) to 8.41 inches (1% chance storm) for the period between 1981 and 2010. Throughout the century, this may increase by approximately one-quarter of an inch (50% chance storm in the mid-century) to nearly one and a half inches (1% storm in the late-century).

Storm Frequency

More frequent rainfall means that a given storm will occur more frequently in the future than it has historically. Table III-5 provides a measure of change in the frequency of the 10% chance (10-year) and 1% chance (100-year) storms compared to a historical period of 1950–1999 at the municipal level.[4]

[4] NOAA National Weather Service. Precipitation Frequency Data Server. 2025. Atlas 14 precipitation frequency estimates.

Table III-5. Increase in probability for the 10% and 1% chance storm

	Historical 1950–1999	Moderate emissions	
		Mid-century 2020–2069	Late-century 2050–2099
10% chance storm	11.28%	16.03%	18.03%
1% chance storm	0.99%	1.97%	2.60%

Source - Northeast Regional Climate Center, unpublished data.

The frequency of extreme rainfall events in Butler is projected to increase throughout the century. The probability of the 10% chance (10-year) storm may increase to a 16.03% chance annually by the mid-century and an 18.03% chance by the late-century. The probability of the 1% chance (100-year) storm may increase to a 1.97% chance annually by the mid-century and a 2.60% chance by the late-century.

Extreme Wind

Extreme wind can be a standalone hazard but often occurs as a secondary effect of other severe weather events, such as thunderstorms, tropical cyclones, tornadoes, and hailstorms. Wind hazards in Butler were assessed using historic data on the occurrence of high wind events and tornadoes.[5,6] Since 1950, eight tornadoes ranging in magnitude from F0–F2 have been documented in Morris County, although none within Butler.[7] Wind events have been recorded on 34 days in Morris County, with zero wind events reported in Butler. However, being in proximity to the Pequannock River and small waterbodies and given heightened storm vulnerability of the state as a whole, Butler should expect potential exposure.

Wind was ranked as the number one hazard personally affecting local stakeholders. Most local stakeholders who responded to the survey (68%) indicated being personally affected by wind "many times" or "a few times" each year within the borough. Residents across the borough reported a dramatic increase in strong winds that cause extensive damage, with common impacts including downed trees, lost roof shingles, siding damage, and repeated power outages (see Appendix B).

[5] Rutgers New Jersey Agricultural Experiment Station. 2025. Tornadoes in New Jersey: 1950 to Present.
[6] NOAA National Centers for Environmental Information (NCEI). 2025. Storm Events Database.
[7] NOAA National Weather Service. 2025. The Fujita Scale.

C. Drought

The NJCCRC's *State of the Climate: New Jersey 2024* reports that New Jersey is projected to receive more of its rainfall from extreme precipitation events, with longer and drier periods between these events, resulting in more short-term drought conditions. Drought can have impacts across many sectors including public health, water supply management, agriculture, and the environment. Drought also increases the risk of wildfire (see Section III.E), especially in combination with high temperatures (Section III.A).[8]

Time in Drought

Table III-6 provides a measure of change in the percent time spent in drought conditions annually for Morris County, compared to a historical period from 1981 to 2014. Droughts occur when evapotranspiration exceeds rainfall over a period of time that is considered abnormal for the region. Severe drought is when this imbalance becomes even more extreme due to heat or long periods without rainfall. These projections were developed based on modeled changes in precipitation and temperature, and do not account for variables such as soil moisture or reservoir levels.

Table III-6. Annual* percent time in drought in Morris County[9]

	Historical 1981–2014	Moderate emissions	
		Mid-century 2041–2070	Late-century 2071–2100
Drought	16.3%	-2.0%	+1.5%
Severe Drought	0%	+2.3%	+3.7%

(Source: Forthcoming dataset by Shope, J., Nikolopoulos, E., and Araujo, D.S.D.)
**In the northern hemisphere, the hydrological "water year" is the 12-month period from October to September.*

Historically, drought conditions have affected Morris County approximately 16% of the year (approximately two months). Under the moderate emission scenarios, the annual time spent in drought is projected to initially decrease by 2.0% from historical conditions by mid-century but then increase by 1.5% over historical levels by late century. Morris County has not historically experienced severe drought conditions, but future severe droughts may occur 2.3% of the year by mid-century and 3.7% of the year by late-century.

[8] NJ Office of Emergency Management. 2024. 2024 New Jersey State Hazard Mitigation Plan.
[9] Shope, J., Nikolopoulos, E., and Araujo, D.S.D. 2025. DRAFT New Jersey Projected Future Drought Dataset Technical Documentation.

D. Flood

Flooding damages property and infrastructure, disrupts services, and impacts health. Few local stakeholders reported frequent flood impacts in the borough, with 15% of survey respondents personally affected by flooding "many times" or "a few times" each year (Appendix B). Flooding in Butler is driven by three factors:

- Fluvial flooding, or riverine flooding, when intense rain events cause rivers and streams to overtop their banks;
- Pluvial flooding, when intense rain events lead to surface water accumulation; and
- Land cover type, which influences infiltration and runoff.

While this analysis primarily assesses fluvial flooding in Butler, it is important to note that flash flooding and other pluvial flooding can be especially hazardous. Further modeling beyond the scope of this analysis is needed to assess the compound impacts.

This assessment identifies current and future flood risks in Butler. Current flood risk measures include FEMA flood zones and stormwater/flash flooding locations. Future flood risk is assessed according to the Inland Flood Protection Rule. Each of these flood measures is defined and mapped in this section.

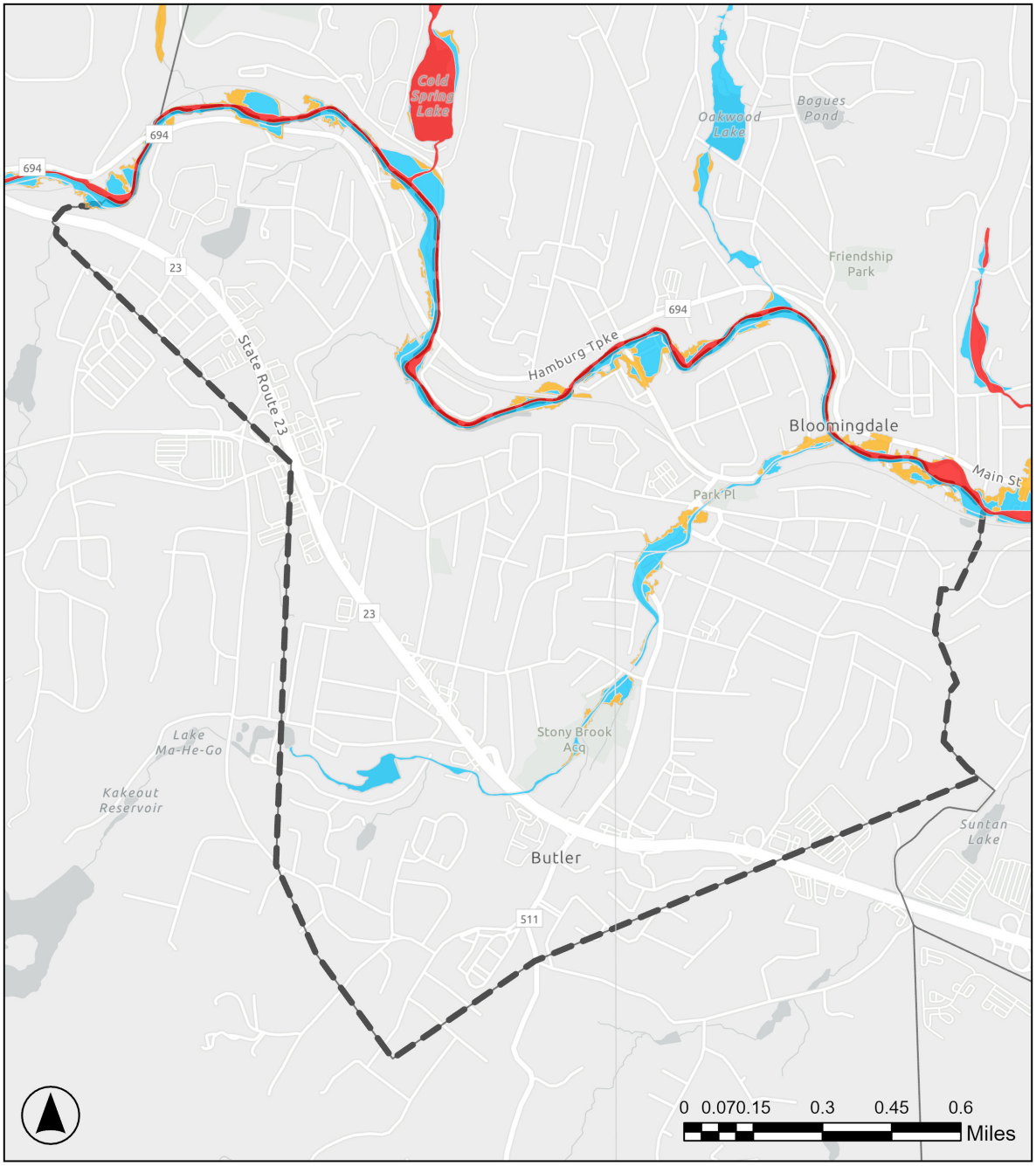
Current Flood Risks

FEMA Flood Zones

The Federal Emergency Management Agency (FEMA) models flood hazards for much of the state. The 1% annual (100-year) flood, also known as the base flood, has a 1% chance of being equaled or exceeded in any given year. The 0.2% annual (500-year) flood has a 0.2% chance of being equaled or exceeded in any given year. The regulatory floodway is a portion of the floodplain that must remain unobstructed to safely convey floodwaters and is an area where development is highly restricted.

Map III-3 depicts the FEMA flood zones in Butler. Portions of Butler fall within FEMA's 1% and 0.2% annual chance flood zones, particularly around bodies of water such as the Pequannock River and the Stone House Brook, one of its tributaries. However, most of the municipality's residential, commercial, natural, and industrial properties are designated as areas of minimal flood hazard. The northern boundary of the municipality along the Pequannock River is designated as a regulatory floodway in an area primarily characterized by wetlands.

Map III-3. FEMA flood zones



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FEMA Flood Zones

- 1 Pct Annual Chance Flood
- 0.2 Pct Annual Chance Flood
- Regulatory Floodway

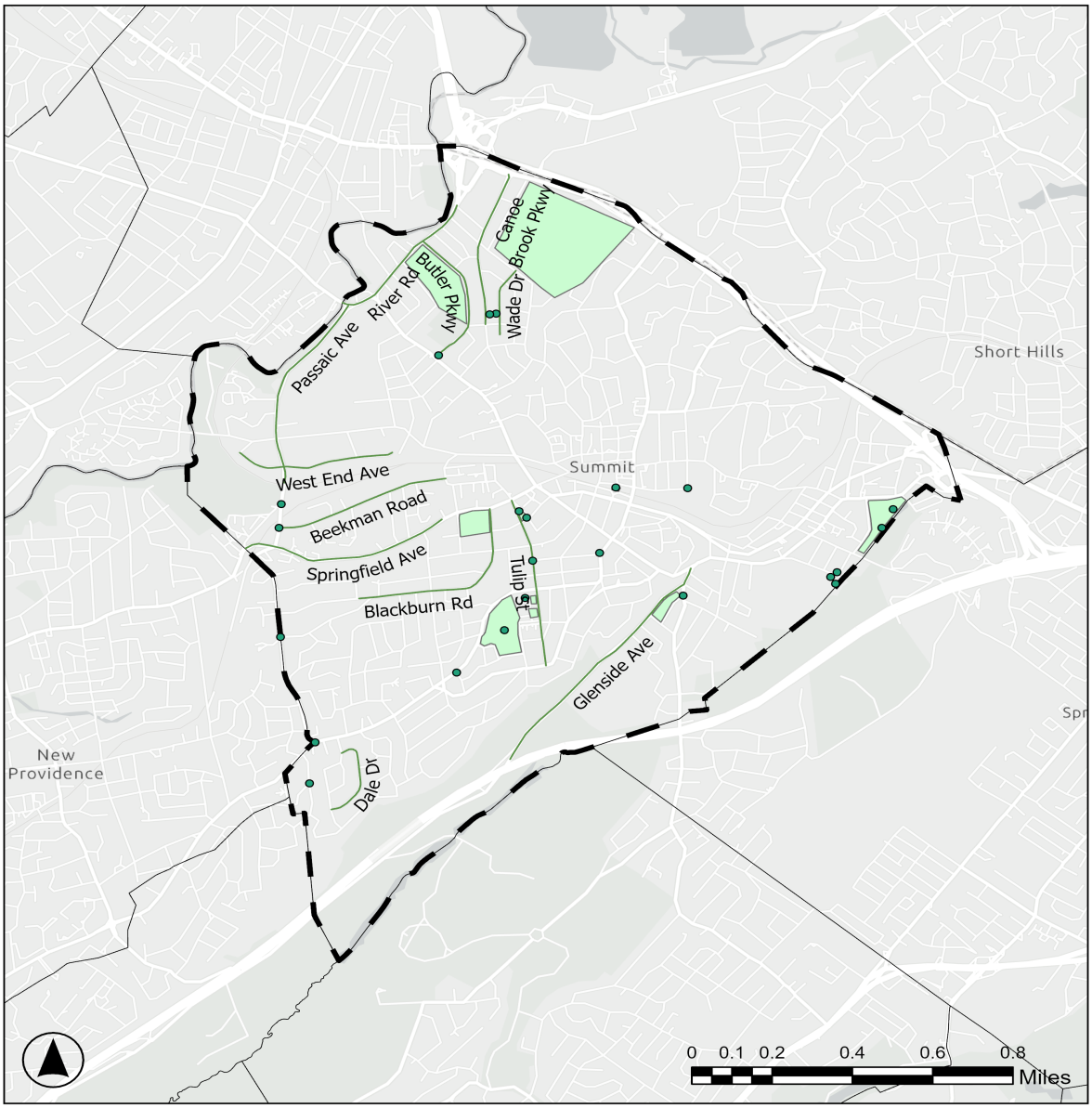
Stormwater and Flash Flooding

Flooding can occur during flash flood events when stormwater infrastructure is overwhelmed by extreme precipitation. Map III-4 depicts current observed locations of flooding during precipitation events.

Stormwater points identified by stakeholders are scattered in the eastern portion of the municipality, such as Boonton Avenue and Stonybrook Pool. As per community reports, flooding is strong and causes severe impacts, including road and property damage. Some of the impacted areas include Route 23, Stony Brook Swim Club, and the intersection of Kiel Avenue and Park Place. Flooding at these locations can affect business operations, transportation capabilities, and access to community spaces.

Road sections impacted by stormwater flooding are mainly in the eastern portion of the central area of the municipality including Myrtle Avenue, Main Street, and Route 511. These segments indicate recurring or potential disruptions to local transportation networks during storm events, potentially affecting emergency access and daily mobility for residents. There are four areas identified by stakeholders that experience stormwater flooding. One of those areas is between Hillcrest Avenue and Western Avenue near Western Avenue Park, whereas the other prominent one is between Center Street and Roosevelt Avenue near Tomahawk Professional Services. These areas are likely associated with insufficient drainage infrastructure and low-gradient terrain, making them particularly vulnerable to prolonged inundation following significant precipitation events.

Map III-4. Stormwater and/or flash flooding locations



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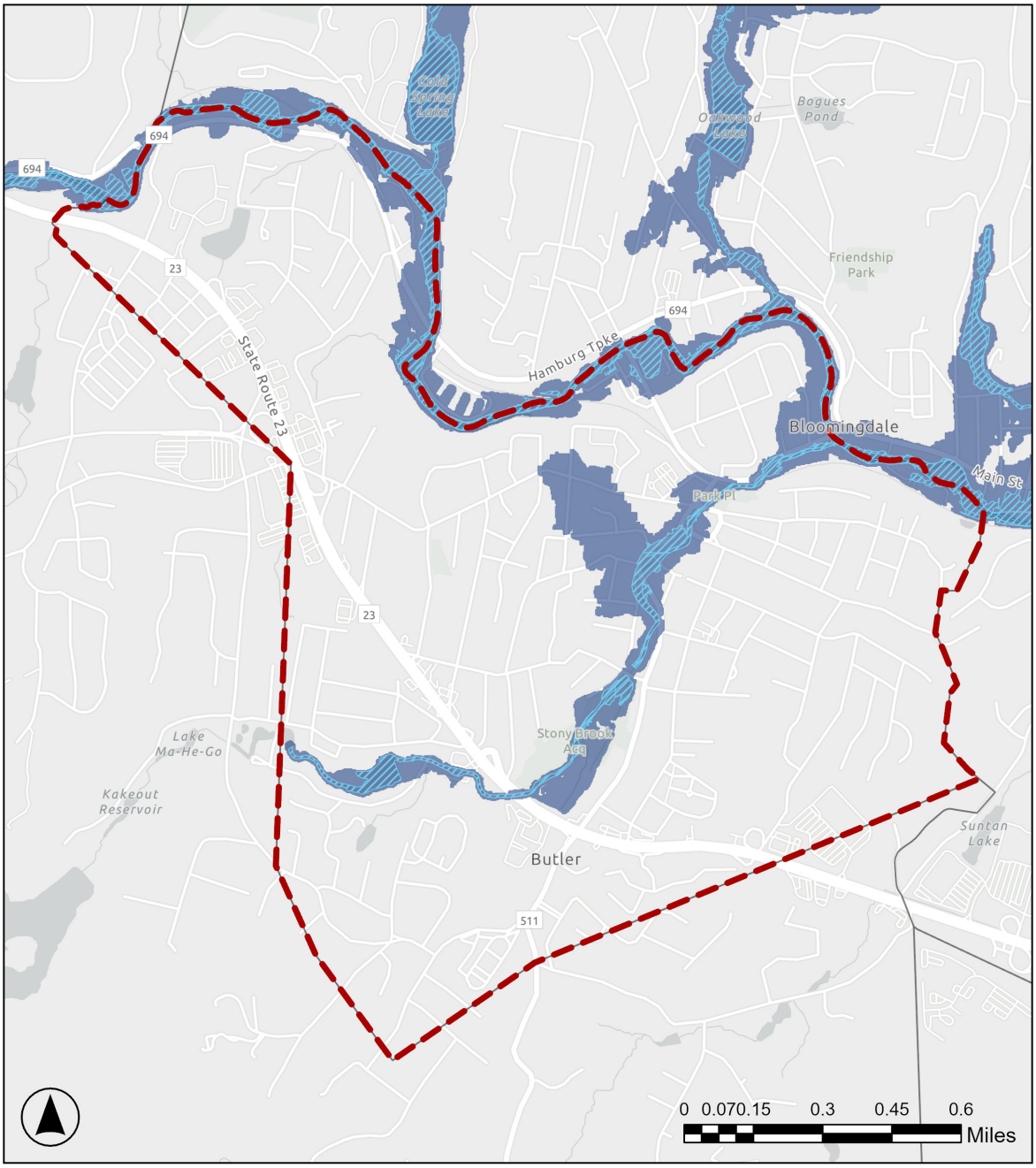
- Stormwater Points
- Road Sections Affected by Stormwater Flooding
- Areas Affected by Stormwater Flooding

Future Flood Risks

Inland Flood Protection Rule

In July 2023, the NJDEP adopted its Inland Flood Protection Rule, establishing a new Design Flood Elevation (DFE) standard for specific types of new construction and redevelopment in inland/fluvial areas. The new DFE is three feet above the elevation of the 1% Chance Annual Flood or, where NJDEP flood mapping is available, two feet above NJDEP's flood hazard area DFE if that is higher. Map III-5 depicts areas in Butler that may be subject to the Inland Flood Protection Rule by estimating the extent of an additional three feet of flooding on top of the current FEMA 1% annual chance flood zone. It should be noted that the map is for planning purposes only, and a site-specific survey is needed for flood impact analyses, permitting, or other legal or regulatory purposes. The green "low-lying" areas are below the elevation of the expanded flood surface, and therefore have the potential to flood, but are hydrologically disconnected from the rest of the flood zone. This information can support local efforts to safeguard critical facilities and community assets.

Map III-5. Areas potentially subject to the Inland Flood Protection Rule



LEGEND

FEMA 1% Annual Chance Flood Zone
Approximate extent of Inland Flood Design Elevation

(Source: New Jersey Climate Change Resource Center)

E. Wildfire

Wildfires are unplanned fires in natural areas including forests or grasslands. The NJCCRC's *State of the Climate: New Jersey 2024* reports that 798 wildfires burned 4,847 acres in New Jersey during the exceptionally dry 2024 fall season. Increasing temperatures are anticipated to cause greater evaporation and drier vegetation, exacerbating conditions contributing to wildfires. Wildfire smoke contains air pollutants that decrease air quality and pose risks to human health.

Wildfire hazards in Butler were assessed using historic wildfire data from the National Interagency Fire Center (NIFC)[10] and NOAA[11] and data on risk to potential structures from the New Jersey Wildfire Risk Assessment Portal.[12] The risk to potential structures dataset integrates modeled wildfire likelihood and intensity with generalized consequences to a structure on every pixel, allowing comparison of wildfire risk in locations with existing or future development.

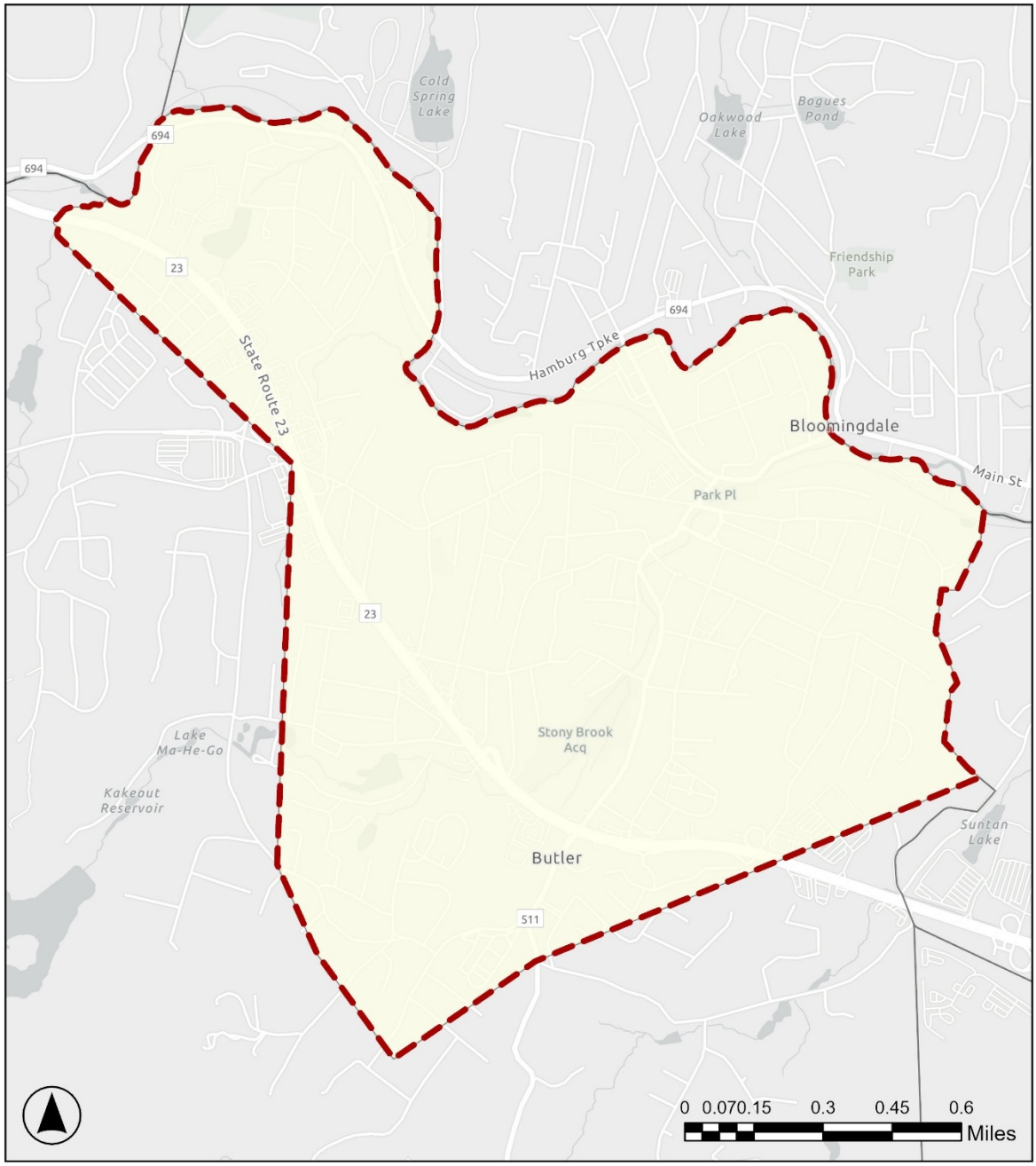
Map III-6 depicts wildfire risk to potential structures and locations of historic wildfire incidents documented by the NIFC in Butler. Wildfire does not pose a significant risk to Butler; however, surrounding municipalities within approximately 1.5–2.0 miles have moderate exposure to wildfires. All areas of Butler are classified as low risk for potential structural impacts. Although Butler itself is at relatively low risk, NOAA has documented eight wildfire events in Morris County since 1950. These wildfires have caused power outages, burned hundreds of acres, disrupted transit service, and led to facility shutdowns and road closures. Despite these impacts, only one injury has been reported, with no fatalities or significant economic losses. Local stakeholders rank wildfire as having the lowest frequency of personal impact, consistent with the historical record of wildfires in Butler (Appendix B).

[10] National Interagency Fire Center. 2025. NIFC Open Data Site.

[11] National Oceanic Atmospheric Administration. National Centers for Environmental Information, 2025

[12] NJ Forest Fire Service. 2025. New Jersey Wildfire Risk Assessment Portal.

Map III-6. Wildfire risk to potential structures



LEGEND

Wildfire Risk to Potential Structures

Low

High

(Source: NJ Wildfire Risk Explorer)

IV. Buildout Analysis

This section addresses the MLUL requirement that the CCRHVA include a "build out analysis of future residential, commercial, industrial, and other development in the municipality, and an assessment of the threats and vulnerabilities identified above related to that development." Certain areas within a municipality are not fit for development, including wetlands, waterbodies, and buffers around protected lands or species. This section identifies and analyzes the developable areas within the municipality with respect to the current zoning designations and exposure to current and future climate hazards. This analysis is a high-level planning exercise and should not be substituted for site-specific determinations of developability, which require field survey and professional engineering evaluation. This analysis differs from other applications of buildout analyses, such as those used in determining a municipality's realistic development potential to comply with affordable housing obligations.

The methodology used in this section includes the following steps:

- Identifying the developable areas within Butler by determining and removing all areas that are protected from development;
- Analyzing these areas with the current zoning districts and any areas identified by the municipality for redevelopment, then calculating the total potential development for these areas;
- Analyzing the exposure of developable areas to heat and flooding. This section details varying levels of exposure for potential lots and units, from areas that are expected to remain dry to those that may be completely inundated; and
- Finally, identifying the developable areas and potential development least exposed to flooding.

A. Areas Protected from Development

Areas protected from development were identified based on two broad categories, detailed in Table IV-1:

- Non-developable areas are already developed lands (based on land use categories), water features, or wetlands.
- Constrained areas are those with development limitations due to environmental concerns.

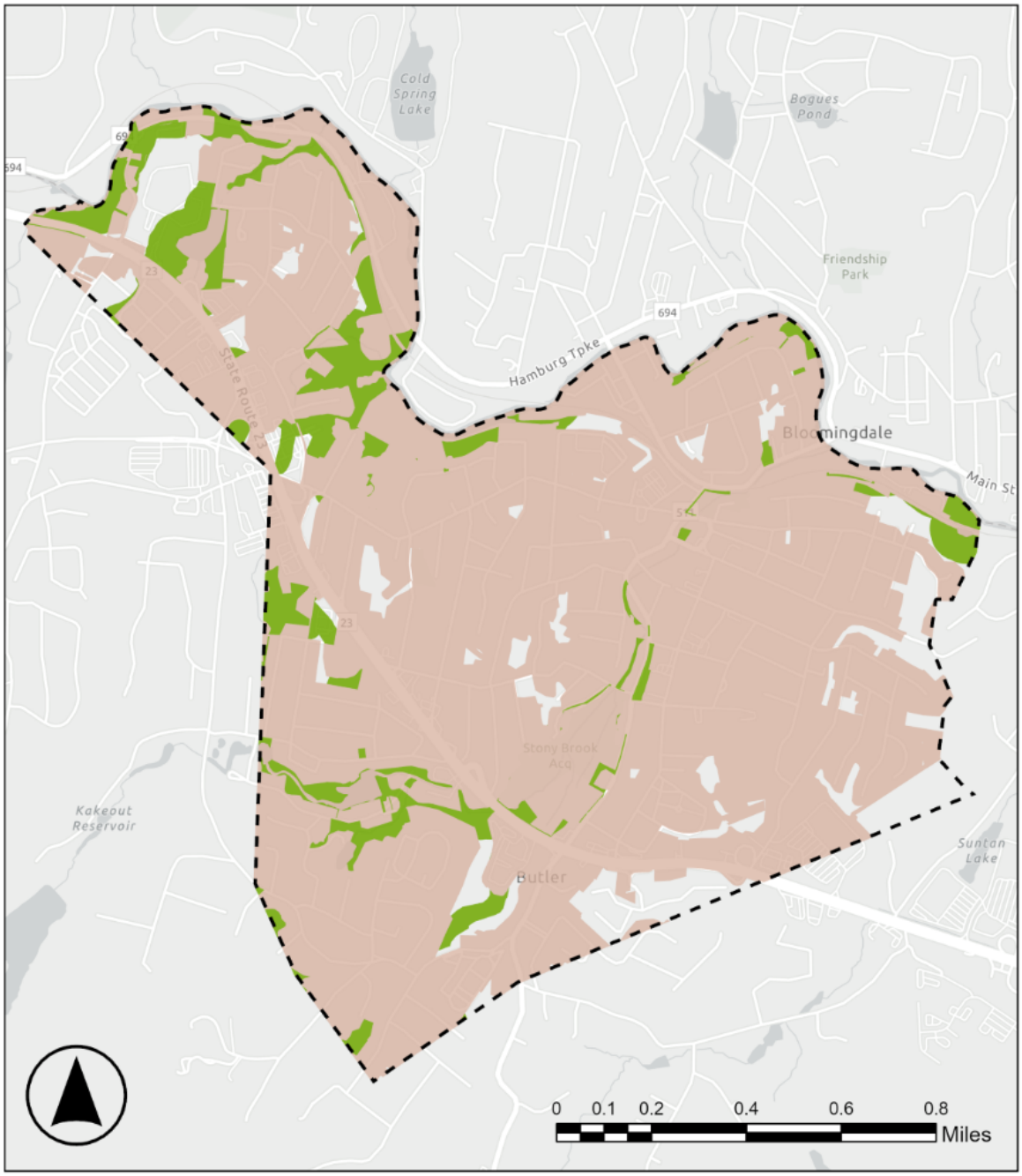
Table IV-1. Areas protected from development

Areas Protected from Development	Land Types	Datasets
Non-Developable Areas	Water, wetlands, transportation, barren land with extractive mining*, non-vacant urban land, publicly owned recreational lands, and open space/conserved land	▪ 2020 Land Use Land Cover Dataset ▪ 2023 Parcel MOD-IV Composite ▪ Protected Areas Database of the United States (PAD-US) ▪ State, Local and Nonprofit Open Space of New Jersey ▪ Preserved Farmland of New Jersey
Constrained Areas	▪ Riparian buffers for inland and coastal waters ▪ Threatened and endangered species habitat ▪ Regional Commissions, where applicable (Pinelands Management area, Highlands Preservation area, Hackensack Meadowlands District)	▪ Landscape Project v3.4 ▪ Pinelands Management Area ▪ Preservation and Planning Area ▪ Riparian Area ▪ NJSEA Preserve and Sustainable Uplands Reserve

Note: All land type categories and associated datasets identified in this table should be reviewed on a case-by-case basis to verify the nature, extent, and permanence of development restrictions.

** Barren land with extractive mining was included as a non-developable area due to the highly disruptive nature of these practices to the landscape. It is possible that future conditions after remediation of such sites may revert them to developable land and should be evaluated on a case-by-case basis.*

Map IV-1. Areas Protected from Development



Legend

- Constrained
- Not Developable

B. Developable Areas

Developable areas were broadly identified through GIS-based mapping analysis to exclude the non-developable and constrained areas. The remaining developable areas consist primarily of undeveloped lands that are not subject to regulatory or environmental development restrictions. To further refine the developable areas, Butler's zoning ordinance was analyzed.

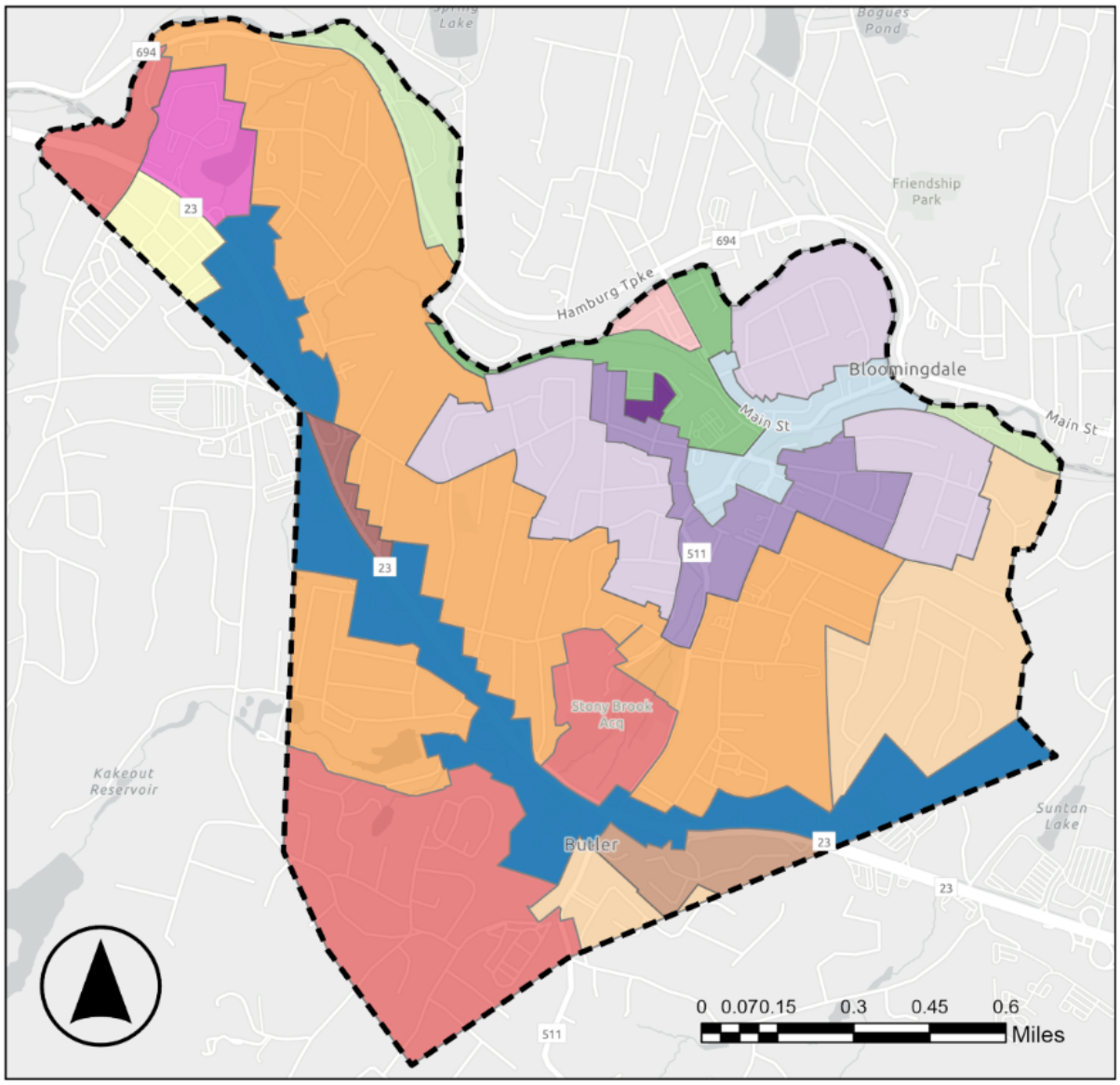
Zoning Analysis

Located in the Highlands Region of northern New Jersey, Butler is composed of a mix of residential, commercial, and light industrial land uses. Although the borough is located entirely in the Planning Area of the Highlands region, conformance with the Highlands Regional Master Plan (RMP) is not required. The Pequannock River runs across the northern border and the Stone House Brook cuts through the center of the Borough. Map IV-2 presents the zoning districts within the Borough which include: Residential (R-1 to R-8), Senior Citizen Housing (SC), Main Street Redevelopment Zone (MSR), Central Business (CBD), Highway Commercial (HC), Light Industrial (LI), Light Industrial/Central Business (LI/CBD), and Restricted Commercial (RC).

Residential development is distributed across eight district zoning classifications. The Main Street Redevelopment Zone, Central Business, and Light Industrial districts are clustered within the northeastern border of the Borough along Main Street. The Highway Commercial district divides Butler's central area and runs along Route 23.

Table IV-2 lists key developmental controls and minimum lot sizes permitted in each zoning district. The single-family residential R-3 zone, which is the most prevalent residential district, is concentrated in the central part of Butler. The residential R-6 and R-8 zones, which allow for apartment housing, are located in the northwestern part and reflect a medium-density development pattern.

Map IV-2. Zoning



Legend

Zoning Districts

- R-1 - Single Family Residential 12500 sq. ft.
- R-2 - Single Family Residential 12500 sq. ft.
- R-3 - Single Family Residential 10250 sq. ft.
- R-4 - Single Family Residential 6250 sq. ft.
- R-5 - Single/Two Family Residential 6250/9375 sq. ft.
- R-6 - Garden Apartment
- R-7 - Townhouse/Light Industrial
- R-8 - Garden Town Apartments
- SC - Senior Citizen Housing
- MSR - Main Street Redevelopment Zone
- CBD - Central Business
- HC - Highway Commercial
- LI - Light Industrial
- LI/CBD - Light Industrial/Central Business
- RC - Restricted Commercial

Table IV-2. Butler zoning ordinance

Zoning District	Permitted Uses	Minimum Lot Size
R-1 – Residential	Single-family dwellings; public purpose uses; limited recreational uses	17,250 sq ft
R-2 – Residential	Single-family dwellings; townhouses (as planned development)	12,500 sq ft
R-3 – Residential	Single-family dwellings; townhouses	10,250 sq ft
R-4 – Residential	Single-family dwellings; public uses	6,250 sq ft
R-5 – Residential	Single-family and two-family dwellings	6,250 / 9,375 sq ft
R-6 – Residential	Single-family dwellings; garden apartments / multifamily	10,250 sq ft (base)
R-7 – Residential	Single-family dwellings; townhouses	10,250 sq ft (base)
R-8 – Residential	Apartments; townhouse/apartment mix	No Minimum Listed
SC – Senior Citizen Housing	Senior citizen housing developments; associated residential amenities	80,000 sq ft
MSR – Main Street Redevelopment Zone		No Minimum Listed
CBD – Central Business	Retail, offices, restaurants, services, institutional/commercial uses	No Minimum Listed
HC – Highway Commercial	Private parks and beaches; retail, offices, restaurants, services, institutional/commercial uses	30,000 sq ft
LI – Light Industrial	Business and professional offices	60,000 sq ft

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LI/CBD – Light Industrial/Central Business	Retail, offices, restaurants, services, institutional/commercial uses	20,000 sq ft
RC – Restricted Commercial		No Minimum Listed

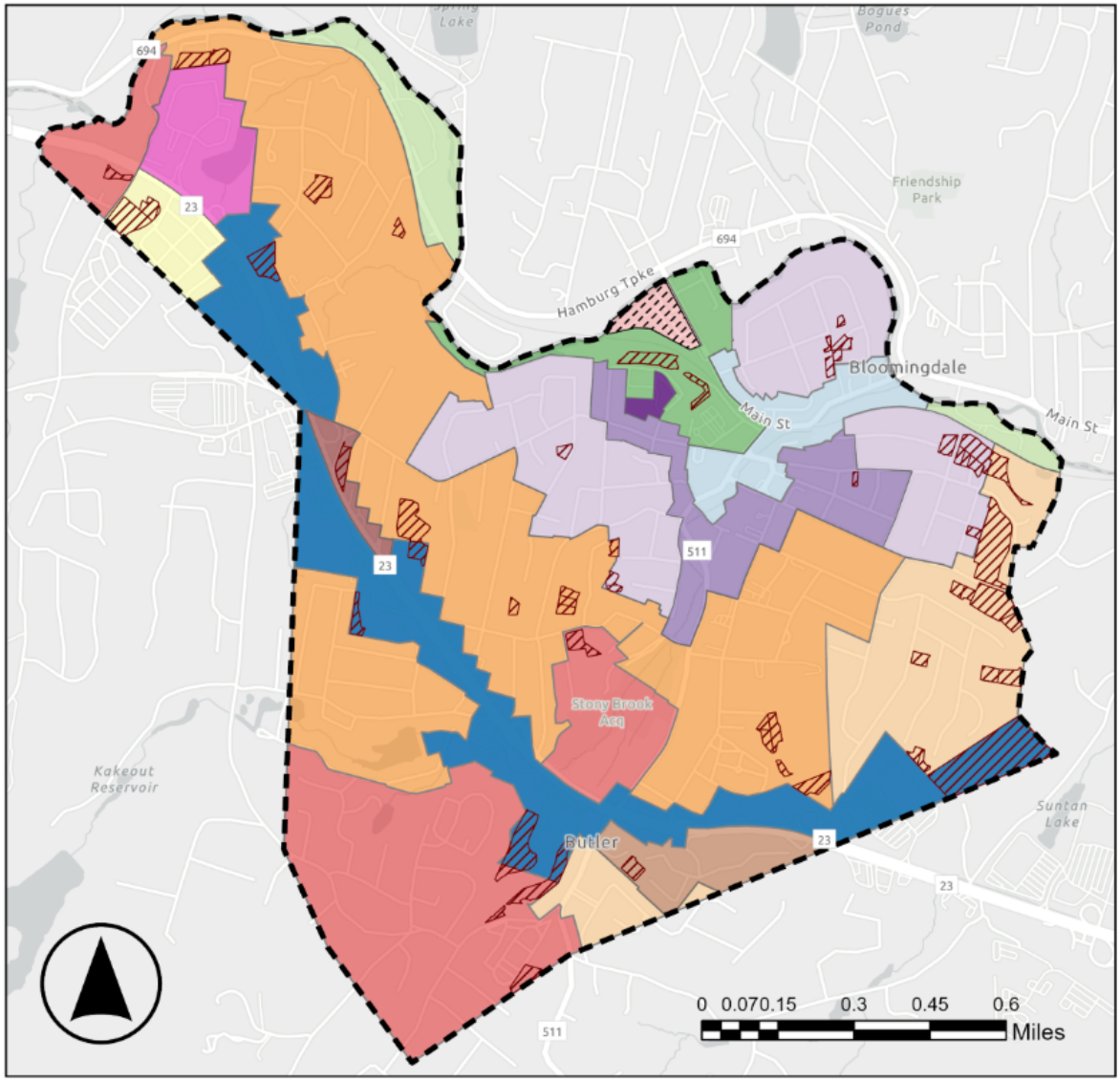
Buildout Analysis

After broadly identifying the developable areas, the GIS-based zoning analysis resolved spatial discrepancies. Large parcels spanning multiple zoning districts were split by the district to ensure compliance with its zoning regulations. Irregular parcels that did not conform to the minimum lot size requirements of the applicable zoning designation were thoroughly reviewed before removing them from the analysis. Minimum lot sizes for each zoning district were used to determine how many potential lots could be developed within Butler.

Map IV-3 illustrates the developable areas resulting from this analysis along with the zoning districts of Butler. The areas vary in shape and size and are not individual tax parcels. Along with developable areas, the area in need of redevelopment identified by Butler is also shown on this map which has the zoning designation of Main Street Redevelopment Zone.

Table IV-3 shows the total available areas for development along with their development potential, calculated by applying an 80% gross-to-net conversion factor to account for roads, stormwater infrastructure, and utility easements. After calculating the net area, the minimum lot size requirement was used to determine the number of potential lots. As the permitted use within the R-1 to R-4 residential zones in Butler is single-family housing, the number of lots is equivalent to the number of potential units for development. A total of 66 developable areas are identified across all zoning districts. Of these, 51 areas are located within the seven residential zoning districts, with a potential for 126 lots. The highway commercial zoning district contains 12 developable areas with a potential for 43 new lots. Assuming all developable areas are available to be developed to their full potential, the total buildout for Butler across the residential, commercial, business, and light industrial districts is estimated at 174 potential lots.

Map IV-3. Developable areas and zoning districts in Butler



Legend

Developable Areas

- Developable Areas
- Areas in Need of Redevelopment

Zoning Districts

- R-1 - Single Family Residential 12500 sq. ft.
- R-2 - Single Family Residential 12500 sq. ft.
- R-3 - Single Family Residential 10250 sq. ft.
- R-4 - Single Family Residential 6250 sq. ft.
- R-5 - Single/Two Family Residential 6250/9375 sq. ft.
- R-6 - Garden Apartment
- R-7 - Townhouse/Light Industrial
- R-8 - Garden Town Apartments
- SC - Senior Citizen Housing
- MSR - Main Street Redevelopment Zone
- CBD - Central Business
- HC - Highway Commercial
- LI - Light Industrial
- LI/CBD - Light Industrial/Central Business
- RC - Restricted Commercial

Table IV-3. Developable areas and development potential

Zoning District	Number of Developable Areas	Gross Developable Area (Sq. Ft.)	Net Developable Area (Sq. Ft.)	Minimum Lot Size (Sq. Ft.)	Potential Number of Lots
Highway Commercial	12	1,604,453	1,283,562	30,000	43
Light Industrial/Central Business	2	101,996	81,597	20,000	4
R-1 - Residential	5	193,660	154,928	17,250	9
R-2 - Residential	11	558,812	447,049	12,500	36
R-3 - Residential	16	452,159	361,727	10,250	35
R-4 - Residential	15	251,061	200,849	6,250	32
R-5 - Residential	1	7,357	5,885	6,250	1
R-6 - Residential	2	134,213	107,370	10,250	10
R-7 - Residential	1	32,416	25,933	10,250	3
Restricted Commercial	1	42,990	34,392	30,000	1
Total	**66**	**3,379,115**	**2,703,292**		**174**

Areas in Need of Redevelopment

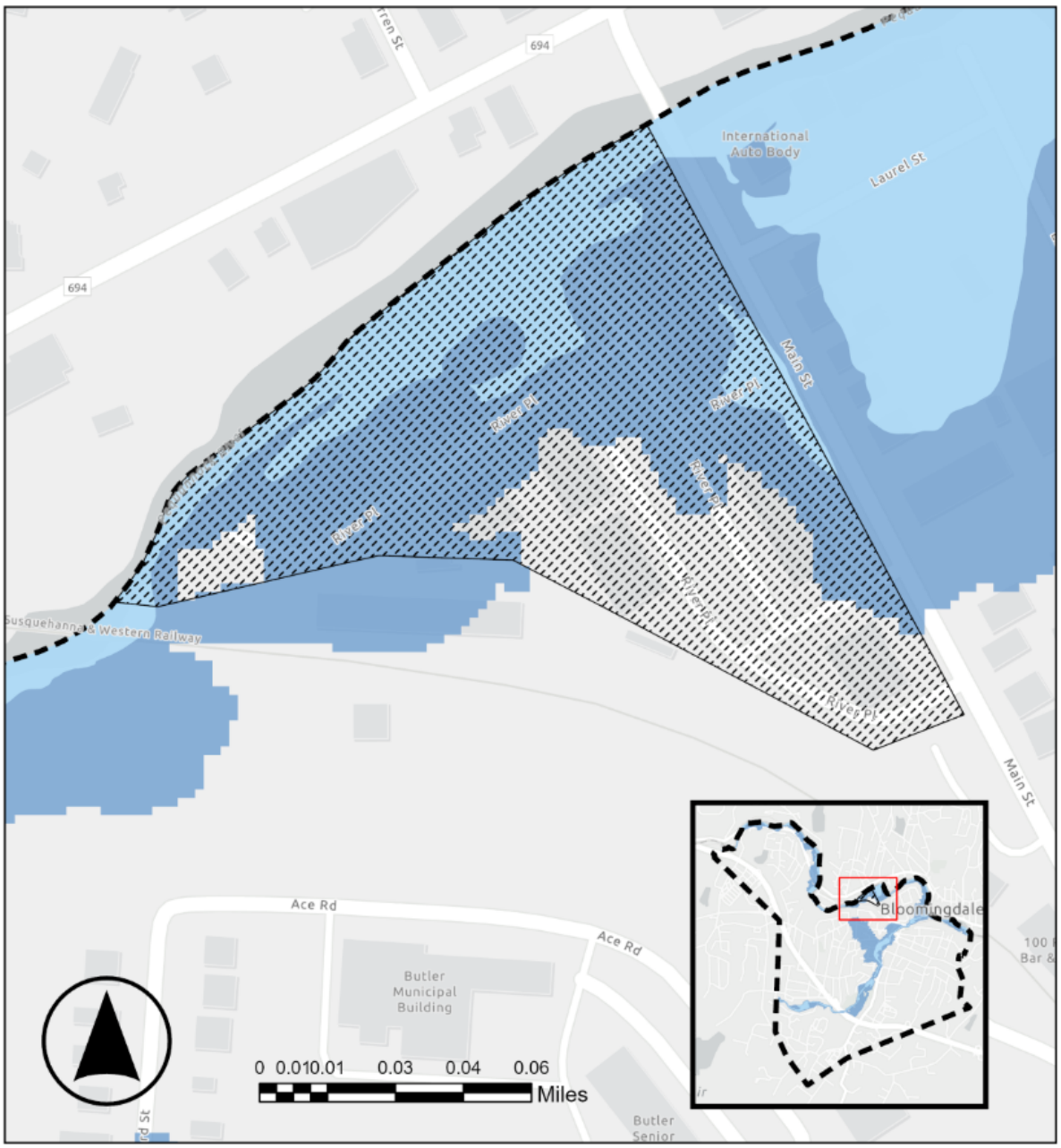
New Jersey's Local Redevelopment and Housing Law (LRHL) authorizes municipalities to designate underutilized or substandard properties as areas in need of redevelopment and to transform them into healthier, more vibrant, or economically productive spaces. The redevelopment process has its own regulatory requirements and approvals under the LRHL, and hence the development potential for these areas is not included within this buildout analysis.

Map IV-4 shows the flood exposure of the redevelopment area, labeled as “Redev Area.” Flood exposure is categorized as follows:

- Not inundated: 0% of the area is exposed to flooding
- Limited inundation: 1% to 50% of the area is exposed to flooding
- Considerable inundation: 51% to 99% of the area is exposed to flooding
- Completely inundated: 100% of the area exposed to flooding

Due to its proximity to the Pequannock River, the redevelopment area shows a risk of limited flood exposure under the FEMA 1% annual chance flood scenario and the approximate extent of the NJDEP Inland Flood Protection Rule (1% chance plus 3 feet). The purpose of this analysis is to highlight flooding challenges and support informed redevelopment decisions.

Map IV-4. Areas in need of redevelopment within FEMA flood scenarios



Legend

Flood Scenario

- 1pct Annual Chance Flood
- Approx. extent of the Inland Flood Protection Rule

Areas in Need of Redevelopment

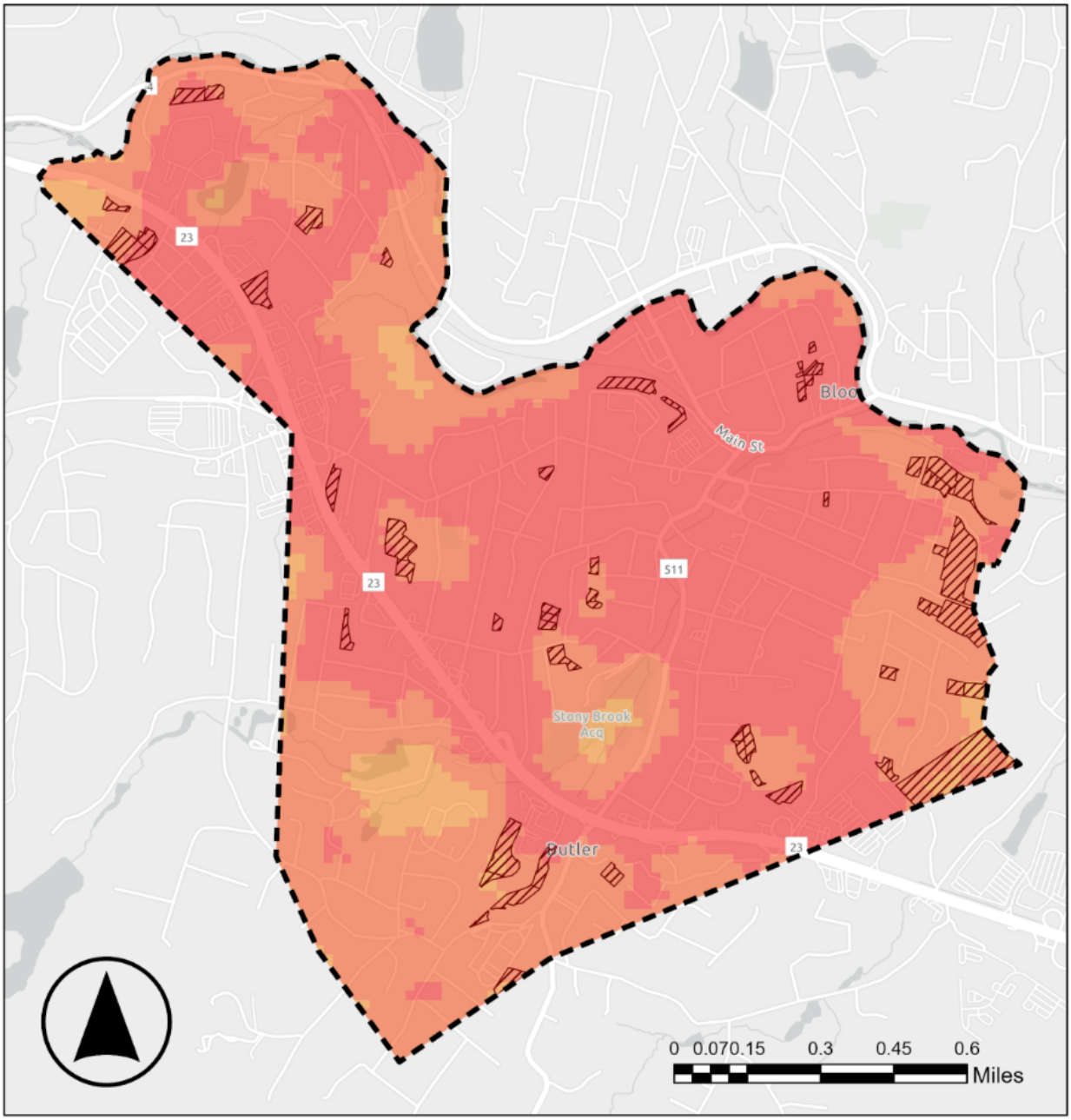
- Redev Area

C. Exposure of Developable Areas

Identifying the climate hazard exposure of developable areas is the critical component of this build-out analysis to support decisions about where future development may face significant risk. This exposure analysis identifies how heat and flooding are projected to impact the development potential identified in Table IV-3.

Map IV-5 shows the developable areas with respect to land surface temperature. As detailed in Section III.A, temperature projections indicate that Butler may experience increasing heat throughout the century. Since impervious cover, including buildings and streets, traps more heat, Butler shows a pattern of higher temperatures in residential, commercial, and industrial zoning districts. Developable areas are scattered over these zones and may require consideration of heat mitigation strategies for new development. Because green spaces help moderate surface and air temperatures through shading and evapotranspiration, opportunities to reduce impervious coverage and to incorporate additional trees, green roofs, permeable paving, and landscaped buffers within these developable areas should be explored. Such measures would not only help offset projected temperature increases but could also improve stormwater management, reduce building energy demand, and enhance quality of life for residents in surrounding neighborhoods.

Map IV-5. Developable areas and land surface temperature



Legend

Developable Areas

Developable Areas

Land Surface Temperature

- Below 80
- 80 - 90
- 90 - 100
- 100 - 110
- Over 110

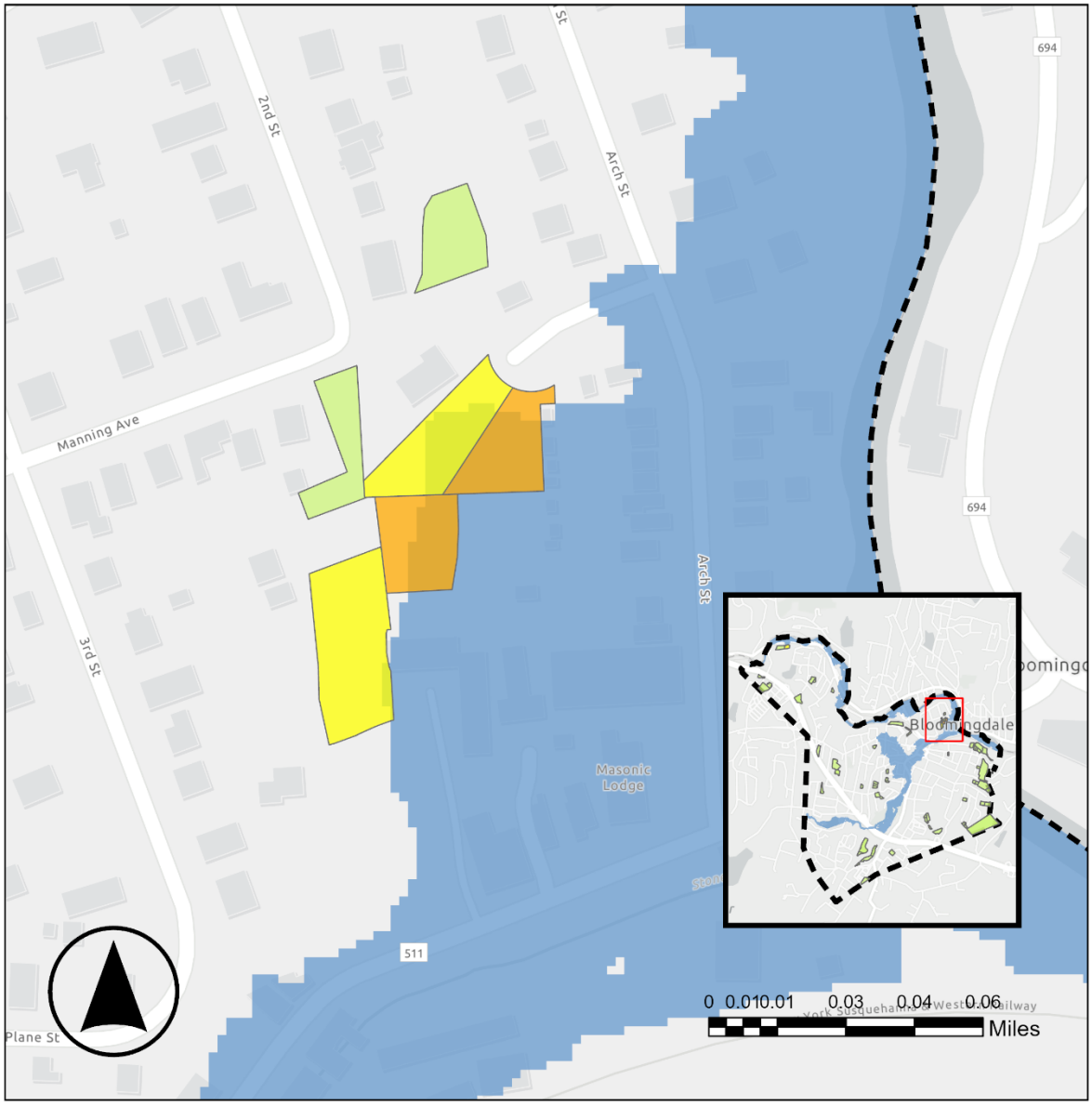
Maps IV-6 and IV-7 depict the flood exposure of developable areas within the approximate extent of the NJDEP Inland Flood Protection Rule. Within the Inland Flood Protection Rule (1% chance plus 3 feet), the majority of developable areas with development potential are not exposed to flooding. Two developable areas show considerable flood exposure and three areas show limited flood exposure along the Pequannock River. No developable areas are exposed to flooding within the FEMA 1% annual chance flood zone.

Table IV-4 shows the areas impacted by the Inland Flood Protection Rule flood measures based on zoning designation. The number of potential lots exposed is calculated using the 80% gross-to-net conversion factor and minimum lot sizes. Within the Inland Flood Protection Rule scenario, 64 of 66 developable areas remain either not exposed to flood risk or experience limited flood exposure. Two developable areas are exposed to considerable flood risk, while no areas are exposed to complete flood risk.

Table IV-4. Developable areas with development potential exposed within approx. extent of the Inland Flood Protection Rule

Zone ID	Total No. of Developable Areas	Not Inundated (0%)				Limited Inundation (1–50%)				Considerable Inundation (51–99%)			
		No. of Developable Areas	Gross Area (Sq Ft)	Net Area (Sq Ft)	Units/Lots	No. of Developable Areas	Gross Area (Sq Ft)	Net Area (Sq Ft)	Units/Lots	No. of Developable Areas	Gross Area (Sq Ft)	Net Area (Sq Ft)	Units/Lots
Highway Commercial	12	12	1,604,453	1,283,562	43	-	-	-	-	-	-	-	-
Light Industrial/Central Business	2	2	101,996	81,597	4	-	-	-	-	-	-	-	-
R-1 - Residential	5	5	193,660	154,928	9	-	-	-	-	-	-	-	-
R-2 - Residential	11	11	558,812	447,049	36	-	-	-	-	-	-	-	-
R-3 - Residential	16	15	423,398	338,718	33	1	28,761	23,008	2	-	-	-	-
R-4 - Residential	15	11	203,574	162,859	26	2	28,624	22,899	4	2	18,863	15,091	2
R-5 - Residential	1	1	7,357	5,885	1	-	-	-	-	-		-	-
R-6 - Residential	2	2	134,213	107,370	10	-	-	-	-	-		-	-
R-7 - Residential	1	1	32,416	25,933	3	-	-	-	-	-	-		-
Restricted Commercial	1	1	42,990	34,392	1	-	-	-	-	-	-		-
Total	**66**	**61**	**3,302,867**	**2,642,294**	**166**	**3**	**57,384**	**45,908**	**6**	**2**	**18,863**	**15,091**	**2**

Map IV-6. Levels of flood exposure for developable areas with development potential within approx. extent of the Inland Flood Protection Rule



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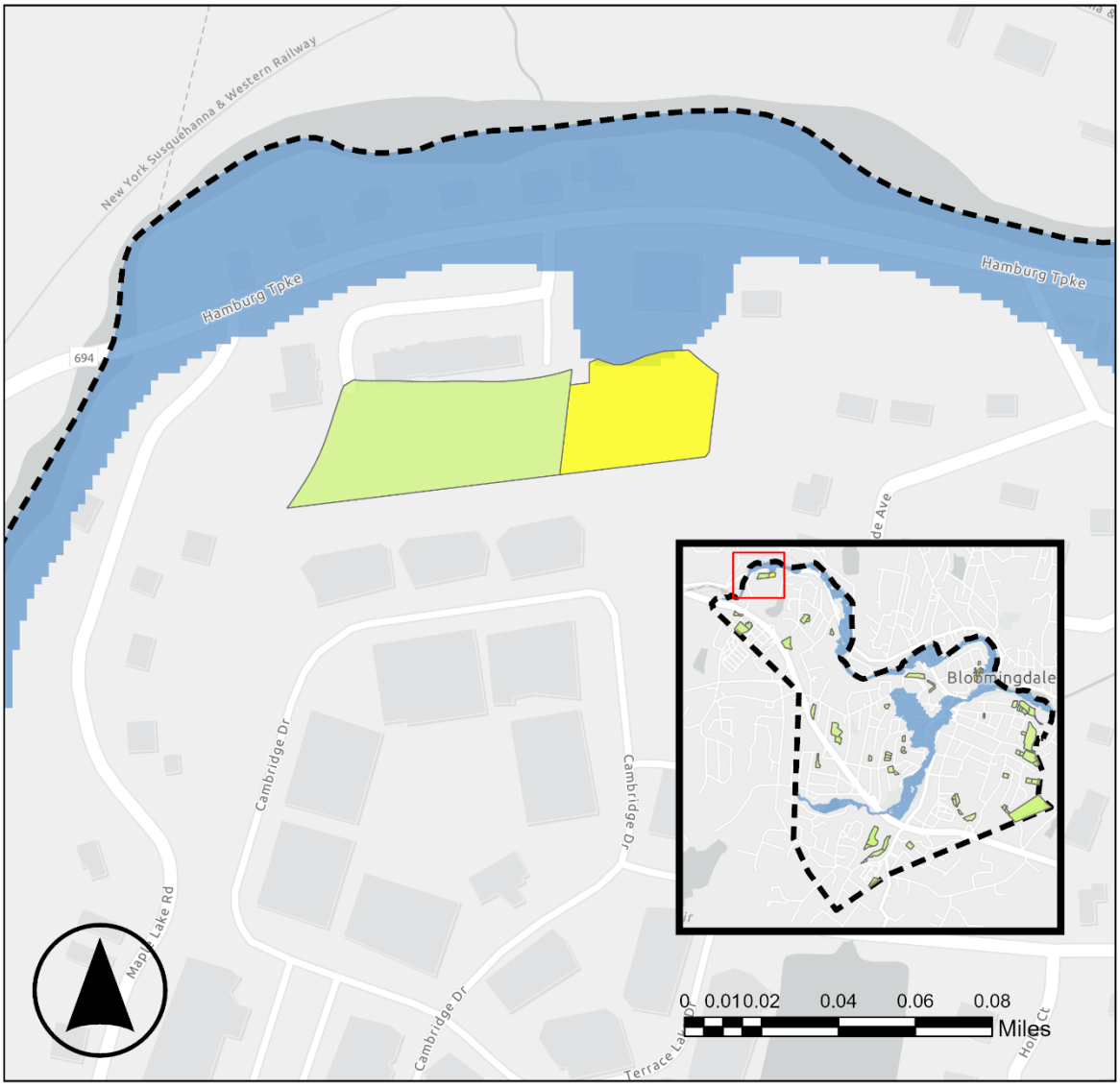
Flood Scenario

- Approx. extent of the Inland Flood Protection Rule

Developable Areas - Approx. extent of the Inland Flood Protection Rule

- Not Inundated
- Limited Inundation
- Considerable Inundation
- Completely Inundated

Map IV-7. Levels of flood exposure for developable areas with development potential within approx. extent of the Inland Flood Protection Rule



Legend

Flood Scenario

- Approx. extent of the Inland Flood Protection Rule

Developable Areas - Approx. extent of the Inland Flood Protection Rule

- Not Inundated
- Limited Inundation
- Considerable Inundation
- Completely Inundated

Areas with Least Flood Exposure

None of the developable areas and their associated potential lots are exposed to flood risk under the FEMA 1% annual chance flood scenario, presenting the most favorable conditions. The areas with the greatest potential for development are within the Highway Commercial and Residential R-2 to R-4 districts. Under the FEMA 1% annual chance flood scenario, all 174 units/lots are developable with no risk of flooding. Within the approximate extent of the Inland Flood Protection Rule, two areas are at considerable flood risk, and three areas are exposed to limited flood risk. This represents only a minor reduction from the FEMA 1% annual chance flood scenario. Under this scenario, 61 areas and 166 units/lots are developable with no flood risk.

The buildout analysis presented in this section establishes a planning-level baseline for understanding future development potential within Butler and its relationship to the climate-related hazards of heat and flooding. The analysis may help inform the evaluation of potential strategies, such as exploring rezoning opportunities in areas with lower flood exposure for mixed-use or identifying underutilized developed areas for redevelopment. Opportunities for risk-informed density transfer, the reallocation of development potential from areas of higher flood risk to areas of comparatively lower flood risk, may also be worth exploring as part of a broader resilience strategy. Additionally, proactive land-use policies, investment in watershed resilience infrastructure, heat adaptation resilience planning, and zoning approaches that balance development opportunities with long-term flood risk management could be considered as Butler looks toward its future growth.

V. Exposure and Vulnerability Assessment

New Jersey's MLUL requires a CCRHVA to identify "critical facilities, utilities, roadways, and other infrastructure that is necessary for evacuation purposes and for sustaining quality of life during a natural disaster, to be maintained at all times in an operational state." This section addresses and significantly expands upon that requirement, analyzing the climate hazard exposures of additional community facilities, assets, and population groups of importance to local planning. Where applicable, for consistency with Hazard Mitigation Planning, this section is categorized to facilitate alignment with FEMA Community Lifelines.

A. Facilities and Infrastructure

This subsection addresses the MLUL's requirement for a CCRHVA to identify "critical facilities, utilities, roadways, and other infrastructure that is necessary for evacuation purposes and for sustaining quality of life during a natural disaster." It includes analysis of the following:

- Critical facilities are essential to maintain quality of life. These include facilities related to education (e.g., schools and childcare centers), safety and security (e.g., law enforcement, fire stations, and emergency operation centers), and health and medical care (e.g., hospitals, dialysis centers, VA medical facilities, and nursing homes). Commercial facilities that provide the community with essential shopping and services are included in Section V.C, Community Assets.

- Infrastructure and utilities necessary to maintain services. These include facilities related to transportation and evacuation routes (e.g., roads, public transit, aircraft landing facilities, ferry terminals, gas stations, EV charging stations, and rail lines), energy (e.g., power plants), and water systems (e.g., wastewater treatment plants).

- Hazardous facilities and known contaminated sites from which climate hazards may cause releases of hazardous materials.

These facilities, sites, and assets fall within the following FEMA Community Lifelines: Safety and Security; Health and Medical; Food, Water, Shelter; Transportation; Energy; Communications; Water Systems; Hazardous Materials. Climate risks to facilities and infrastructure are related to the asset's exposure to hazards and its ability to operate during or despite climate-related weather events. Risks also depend upon the ability of responders to provide services to the community from the asset and the ability of residents to access the services they provide.

Heat

As detailed in Section III.A, temperature projections indicate that Butler may experience increasing heat throughout the century. Increasing temperatures have a variety of impacts on facilities and infrastructure. While heat will not necessarily impact critical facilities themselves, increasing temperatures will require a greater health and medical services response. This may include

planning for increased mobilization to and from health facilities and cooling centers. As per the Morris County data, there is one cooling center in Butler, situated at 10 High Street.[13] Additionally, schools have experienced operational challenges related to extreme heat. Older facilities often are not equipped with central air conditioners and may not be safe during extreme heat events.

Extreme heat also acts as a stressor on New Jersey's energy systems due to increased demand for electricity for cooling and heating.[14] Heat can impact energy infrastructure, increasing the likelihood of mechanical issues or service disruptions. Currently, there are two energy plants in Butler: one on Ace Road, and the other near the intersection of the New York, Susquehanna and Western Railway and Stone House Brook[15]

Communications infrastructure is critical to the daily functions of municipalities and is especially vital to emergency response and management. Communication infrastructure can be physical or cyber and is vital to the functionality of other infrastructure systems like utilities and transportation. Extreme heat can be a threat to telecommunications that are already high heat generators with temperature thresholds that may not be designed to endure extreme heat. Intense heat waves can cause overheating of machinery, increase fire risks, and lead to malfunctions in cooling systems. Failure or degradation of equipment catalyzes a slowdown of services across all other facilities and infrastructure. Currently, there are four Land Mobile Private Transmission Towers, which are located at 26 Lincoln Road, 12 Belleview Avenue, 52 Morse Avenue, and 10 High Street, whereas the only Antenna Structure Registration is located at 1 Ace Road.

Hazardous materials are also of concern during extreme heat events since nearly all chemicals are affected by heat. Extreme temperatures can impact the storage and transport of hazardous materials, especially if they are volatile.[16] Butler has several large industrial sites, all along the river towards the northern area of the borough, and 11 Known Contaminated Sites, out of which four are within the approximate extent of the Inland Flood Protection Rule (Map V-2).

Heat also impacts transportation. High temperatures can warp materials and reduce the reliability of air, land, and maritime systems. This impacts how goods and people move across all travel modes, including roads, railways, public transit, active transportation, water transport, and aviation infrastructure. More specifically, extreme heat could accelerate the degradation of roads, lead to power system failures due to overheating, and increase public safety risks for pedestrians and transit riders in areas with limited shade or tree canopy.

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[13]Morris County, NJ – Office of Emergency Management, "Cooling Centers" page. https://www.morriscountynj.gov/Departments/Office-of-Emergency-Management/Cooling-Centers

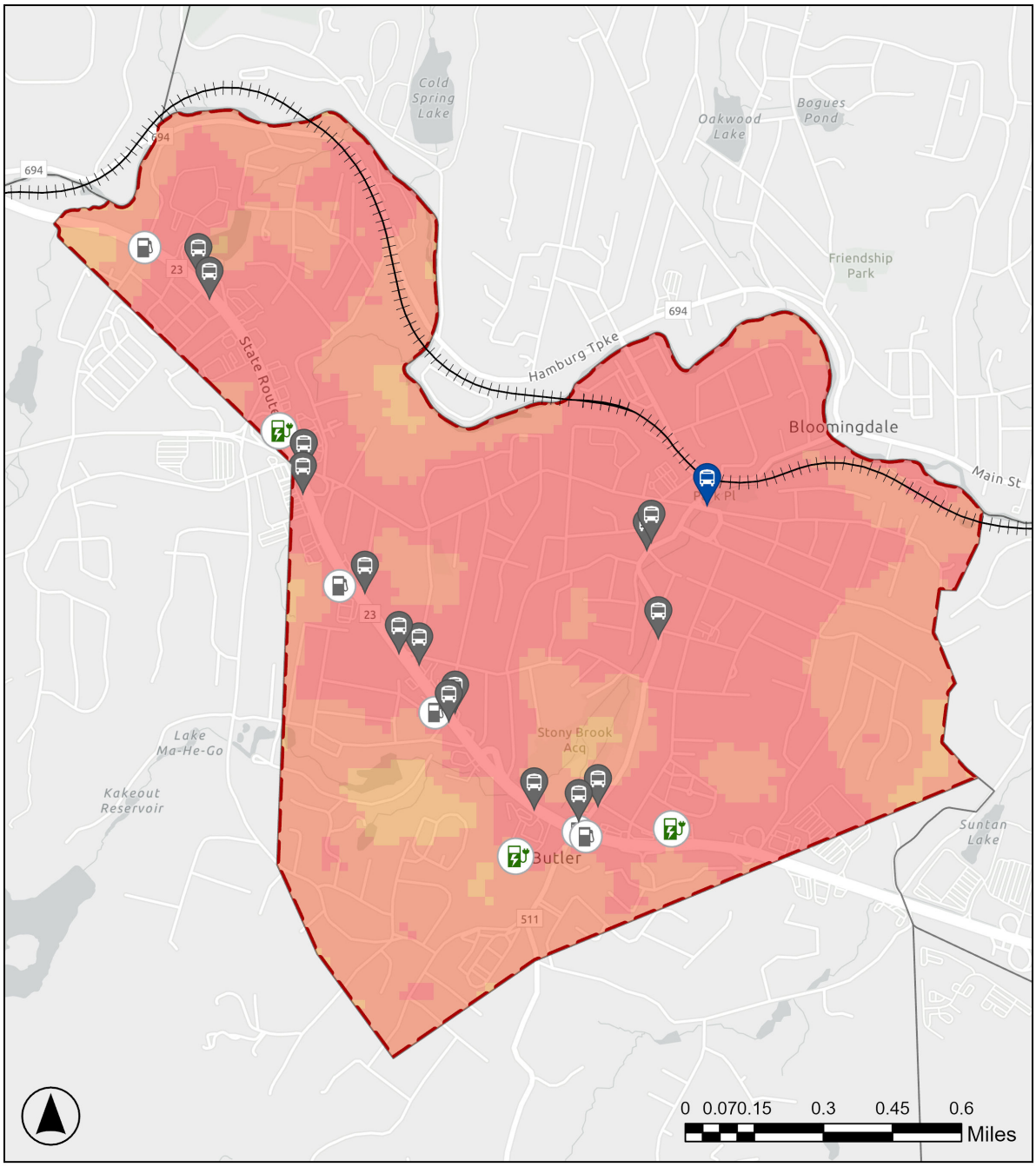
[14] Filión, N.A., Knutsen, M., and Phillips, S. New Jersey Department of Environmental Protection. 2025. New Jersey Extreme Heat Resilience Action Plan. https://dep.nj.gov/wp-content/uploads/climatechange/extreme_heat_rap_071924-screen-version.pdf.

[15] NJHazAdapt. https://njhazadapt.rutgers.edu/explorer/

[16] New Jersey Office of Emergency Management. 2024. State of New Jersey All-Hazards Mitigation Plan.

Map V-1 depicts transportation assets in Butler that may be impacted by increasing temperatures. Butler's key transportation infrastructure is in areas of relatively high land surface temperatures, ranging from 90 to over 110 °F. All of the municipality's NJ Transit bus stops are located along State Route 23 and Boonton Ave, with the exception of one bus stop on High Street off Boonton Ave and near Stone House Brook. This is the only bus stop with shelter in the municipality. Butler currently has four electric vehicle charging stations around Route 23, where land surface temperatures can exceed 110 °F. Additionally, the Susquehanna & Western Railway crossing from east through west in the north part of the borough also experiences temperatures from 90 to over 110 °F. Future temperature increases have the potential to impact bus, freight rail, road, and electric vehicle infrastructure, potentially causing delays in travel and the transport of goods and materials.

Map V-1. Land surface temperature and transportation infrastructure



LEGEND

Transportation Infrastructure

Bus Stops

- No Shelters
- With Shelters

- Gas Service Stations
- EV Charging Stations
- North American Rail Network Lines

Land Surface Temperature (°F)

- Below 80
- 80 - 90
- 90 - 100
- 100 - 110
- Over 110

Storms

As detailed in Section III.B, the frequency and intensity of extreme precipitation events are anticipated to increase throughout the century. Extreme precipitation and wind affect the built environment across all sectors. Extreme precipitation directly impacts stormwater management and water quality when overloaded water and sewage systems flood, with untreated water posing public health risks.

For transportation, extreme precipitation events have been linked with increased risk of traffic accidents, road inaccessibility and/or closures, inability to use active transportation modes (e.g., biking and walking), pavement buckling, and material erosion on the base of bridges in water due to faster stream flow. Major bridges in Butler include the Route 23 Bridge and the bridge at the intersection of Hamburg Turnpike and Main Street. Additionally, increased frequency of extreme precipitation leads to faster rates of degradation of utilities, can disrupt maintenance of energy and transportation infrastructure and can disrupt construction or maintenance (see the discussion of relevant infrastructure in the section on heat above).

Historically, high winds in New Jersey have caused fatalities and damage to residential, commercial, and industrial buildings as well as power, communication, transportation, water, and other lifeline systems. Extreme winds can cause structural damage to facilities, including the breakage or collapse of compromised components such as building materials like roofs, signage, or windows and outdoor components like fencing or cooling systems. Facilities and infrastructure are also vulnerable to indirect hazards such as falling trees and downed power lines.

Transportation, utilities, and communication infrastructure are also vulnerable, as high winds can lead to disruptions in public transit service, create hazardous conditions for road users, interrupt emergency communications, and catalyze water and power outages. Roadways, railways, and bridges can be shut down due to structural compromise or blockage from trees and/or debris. Extreme winds can also contribute to the spread of wildfires and contaminant dispersal.

Drought

As detailed in Section III.C, Butler's time in drought each year is anticipated to increase throughout the century. Facilities and infrastructure that depend on water are those most affected by drought. For example, energy production may be affected due to the need for cooling water in the two power plants in Butler.[17] Drinking water and water treatment may also be impacted.

During drought, water use patterns may shift to higher rates of groundwater pumping potentially impacting water quantity. Increased groundwater pumping during droughts may also increase the risk of land subsidence, particularly in fine-grained soils which can damage infrastructure such as sidewalks, roads, and rail lines.

[17] NJHazAdapt. https://njhazadapt.rutgers.edu/explorer/

The Kakeout Reservoir in Kinnelon Borough is Butler's potable water source. The borough's Water Utility supplies water to approximately 8,000 people in Butler and additionally supplies the High Crest Lake section of West Milford and the Borough of Kinnelon. Water from the reservoir, which has a capacity of approximately 950 million gallons, undergoes conventional treatment at the water plant which provides approximately one million gallons per day of treated water to its customers, and can supply as high as two million gallons per day during the summer months. Butler's wastewater is treated at the Two Bridge Sewerage Authority Plant in Lincoln Park, NJ.

Flood

Transportation infrastructure is particularly vulnerable to flooding when roads and railways become impassable, disrupting daily life, emergency and healthcare services, and the food supply chain. Flooded energy and communications infrastructure can impact emergency response coordination and hinder oil, gas, and electricity production. For hazardous sites, flooding can mobilize pollutants and lead to acute and chronic health effects. Potential public health impacts from mobilized pollutants include respiratory illnesses from mold exposure and infectious disease spread from microorganism contamination of clean water. The pollution impacts of flooding can continue after flood waters recede. Finally, flooding impacts in water systems can include damaged wells, contaminated aquifers and wells, and backed-up sewage systems that can overflow and discharge sewage into communities and water sources.

Map V-2 depicts potential flood exposure of Butler's facilities and infrastructure including critical facilities, government facilities, transportation infrastructure, hazardous sites, and industrial parcels. The map highlights the assets located within the FEMA 1% annual chance flood zone and the approximate extent of the Inland Flood Protection Rule. The analysis of hazardous sites included facilities present within the municipality regulated by any of the following programs:

- Toxic Catastrophe Prevention Act (TCPA)
- Discharge Prevention Containment and Countermeasure (DPCC)
- Known Contaminated Sites
- Community Right to Know
- Solid and Hazardous Waste Facilities
- Combined Sewer Overflow
- Scrap Metal Facilities

A majority of Butler's essential services are situated outside of the FEMA flood zone; however, vulnerable transit infrastructure and industrial sites are present in the eastern and southern corridors. Table V-1 summarizes the number of each type of facility and infrastructure exposed at each flood measure. Butler has 16 public transit stations, out of which the bus stops along

Boonton Avenue at Belleview Avenue and High Street are located within the FEMA 1% annual chance flood zone. The transit stop of Boonton Avenue Station at Hasbrouck Avenue is vulnerable under the approximate extent of the Inland Flood Protection Rule. The New York, Susquehanna and Western Railway (NYS&W) is also within the flood zone in the north of Butler which might disrupt regional freight services.

Among Butler's facilities providing safety and security, only the Butler Police Department on High Street is within the approximate extent of the Inland Flood Protection Rule. Other exposed facilities include one of the borough's public works garages on Belleview Avenue which is within the approximate extent of the Inland Flood Protection Rule.

Four of the 11 Known Contaminated Sites are located within the approximate extent of the Inland Flood Protection Rule – the Mullin Glass Company Inc., Jordan Transportation Company, River Place, and the Vibration Mountings & Controls Inc. As quantified in Table V-2, the exposure of the industrial parcels under both FEMA 1% annual chance flood zone and the approximate extent of the Inland Flood Protection Rule represents a total of 29 acres at risk spread between 11 facilities with a net equalized value of over $17 million.

To identify commercial facilities that provide essential shopping and services, Homeland Infrastructure Foundation-Level Data (HIFLD)[18] and USDA SNAP Retailers[19] datasets were reviewed. Although these facilities were not mapped for this analysis because their locations frequently change, they include: five banks, four of which are located along Route 23, in the southern portion of the borough; six grocery stores; and two pharmacies, Wayne Pharmacy, located at 1481 State Route 23, Suite 3, and CVS, located at the intersection of Kinnelon Road and Decker Road, along Route 23. These commercial facilities are important for post-storm continuity of services and are typically analyzed in the Hazard Mitigation Plan (HMP). See Section VII for discussion of the Morris County HMP and Butler's Municipal Annex. From a land use perspective, Butler may consider overall impacts on commercial zoning, which is detailed in Section V.C.

[18] US Department of Homeland Security. 2025. Homeland Infrastructure Foundation-Level Data. https://www.dhs.gov/gmo/hifld

[19] USDA. 2026. Snap Retailer Location data. https://arcg.is/vPyHL2

Map V-2. Facilities and infrastructure within FEMA flood zones

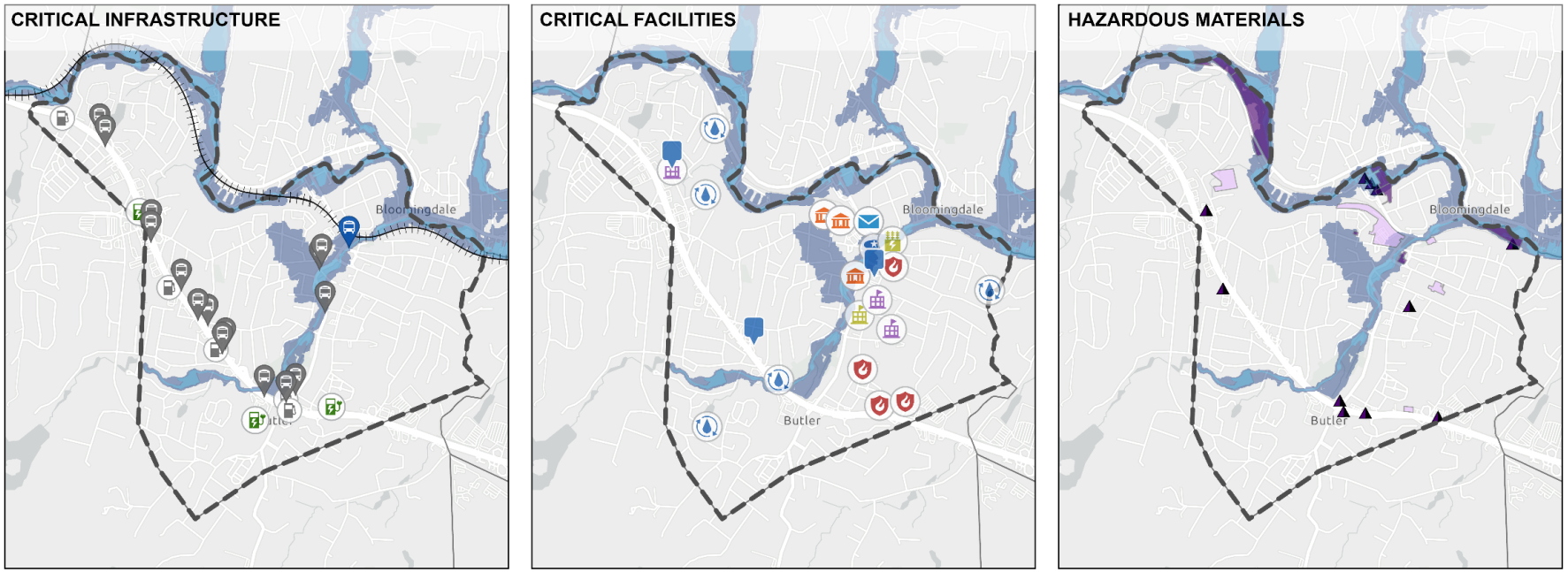


Table V-1 Flood exposure of facilities and infrastructure

	Total #	# Exposed in...	
		FEMA 1% Annual Chance Flood	Approximate extent of Inland Flood Protection Rule
Government Facilities			
Municipal facilities	4	0	1
Post offices	1	0	0
Safety and Security			
Child care centers	3	0	0
Fire stations	4	0	0
Local law enforcement	1	0	1
Public schools	3	0	0
Private schools	1	0	0
Electric Substation	1	0	0
Water and sewer infrastructure	5	0	0
Transportation			
Public transit stations	16	2	3
Gas stations (NJEMS)	5	0	0
EV charging stations	4	0	0
Hazardous Sites			
Known Contaminated Sites	11	0	4

**Although public schools are included in this section as critical facilities, school property parcels (Public School Property-15A and Other School Property-15B) are analyzed with the other public property classes in Section V.C.*

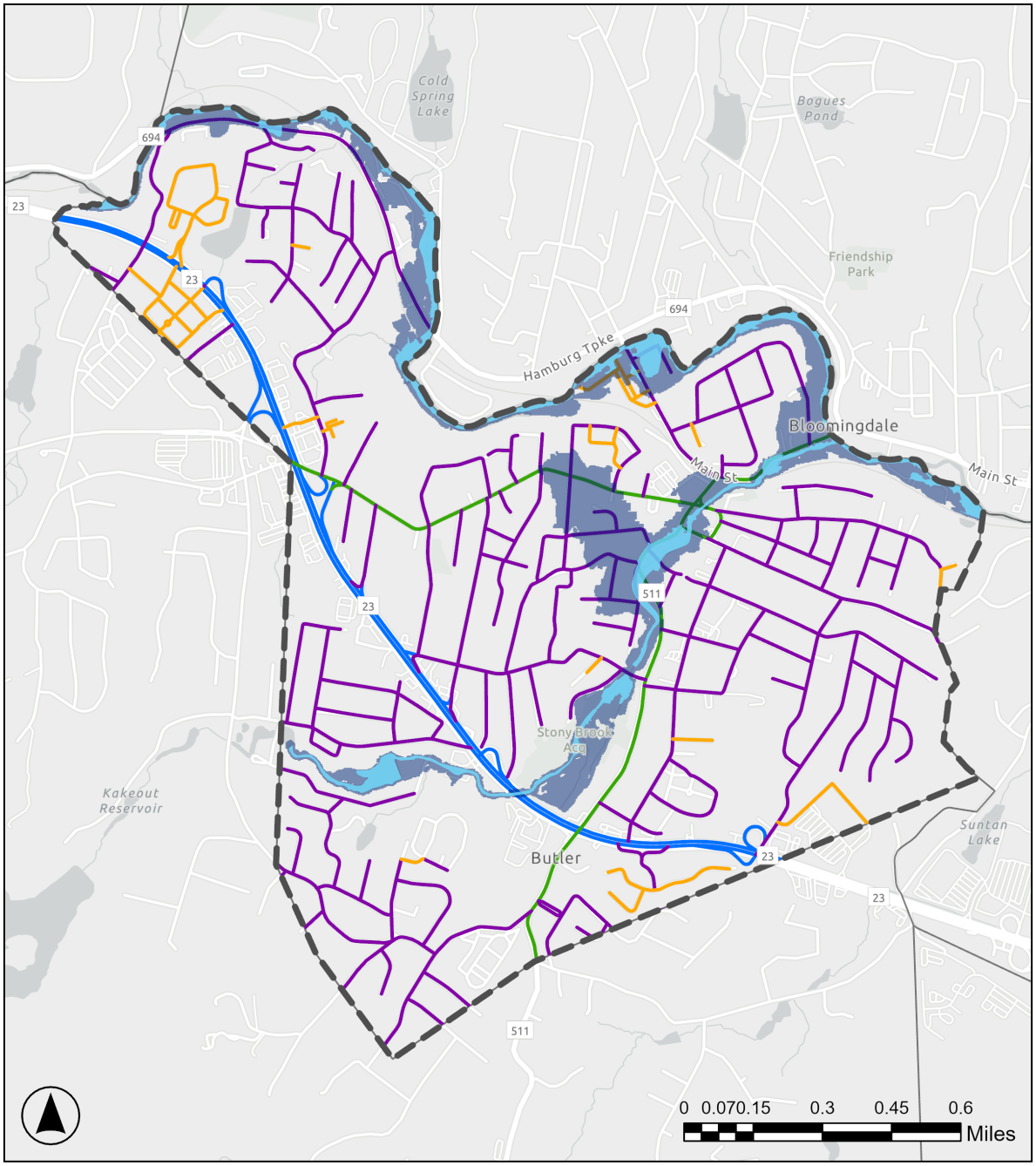
Table V-2. Flood exposure of industrial parcels

		Number / land area exposed in...					
		FEMA 1% Annual Chance Flood			FEMA 1% Annual Chance Flood + 3 feet		
MOD IV Property Class	Total # parcels	# Parcels	Acres	Net Equalized Value ($)	# Parcels	Acres	Net Equalized Value ($)
Industrial (4B)	16	2	0.9	1,423,964	11	29	17,349,800

* Net equalized value is the sum of land and improvement value, adjusted to reflect market value.

In addition to direct flood risk to facilities and infrastructure, it is important to understand potential impacts to access due to flood exposure of surrounding roads and/or evacuation routes. Roadway jurisdictions are shown on Map V-3. The map distinguishes roads by color depending on jurisdiction of the road including Highway Authority, State, County, Municipal, Private, or other entities. This information can support planning of flood adaptation strategies for roadways by understanding which entity is responsible for road maintenance, improvement, funding, and regulation.

Map V-3. Roadway jurisdictions



LEGEND

Road Jurisdiction

- Highway Authority
- State
- County
- Municipal
- Private
- Other

- FEMA 1% Annual Chance Flood Zone
- Approximate extent of Inland Flood Protection Rule

Wildfire

While wildfire does not appear to pose a significant hazard to Butler's facilities and/or infrastructure, there have been eight documented wildfire events in Morris County since 1950 (see Section III.E). Wildfires can cause significant disruption to transportation, communications, utilities, and hazardous sites. Wildfires can reach temperatures of 2,200 °F in extreme conditions,[20] which can melt nearby building materials and infrastructure assets without direct flame contact. Fires can directly damage or structurally compromise power lines, telecommunications towers, water distribution systems, roads, bridges, and other transportation infrastructure through melting, warping, collapse, or the deformation of critical components of these systems. Direct fire impact on hazardous sites can release toxins into the air, water, and soil and can alter both hazardous substances and processing facilities. Wildfires can also overwhelm fire departments and other emergency services.

B. Land Use

MOD-IV Parcel Flood Analysis

The Parcels and MOD-IV Composite of New Jersey dataset provides basic information regarding property location, class, and tax value for each tax parcel in New Jersey.[21] This dataset was intersected with flood data to calculate the percentage of each parcel exposed under various flood scenarios. For the purposes of this assessment, a parcel is considered exposed if at least 50% of the land area is inundated or within the FEMA flood zone. Structures are likely to be impacted on most parcels at this threshold, although exceptions may include large parcels with limited development. Municipal equalized valuation ratios, from the New Jersey Division of Taxation's New Jersey 2023 Table of Equalized Valuations,[22] were applied to reflect assessment values that were closer to true market value. This information is useful when considering costs to repair, rebuild, or relocate after flood losses.

This assessment analyzed flood exposure for each property class within the FEMA 1% annual chance flood zone and the approximate extent of the Inland Flood Protection Rule. The results are included in each relevant subsection: Industrial property is included in Section V.A – Facilities and Infrastructure; Farm property is included in Section V.B – Natural and Working Lands; Commercial, schools, and other public property is included in Section V.C – Community Assets; Residential and apartments property is included in Section V.D – Housing and People.

As an overview, this section includes an analysis of all parcels in Butler within the FEMA 1% annual chance flood zone, detailed in Table V-3 and depicted in Map V-4. Only 11 of Butler's 2,176 residential parcels are located within the FEMA 1% annual chance flood zone, totaling two acres and a net equalized value of over $4.9 million at risk. More industrial and commercial parcels are within the FEMA 1% annual chance flood zone, with two of 16 industrial parcels and 14 of 155

[20] US Geological Survey. 2024. How Hot Are Wildfires?
[21] NJ Office of GIS. 2025. Parcel and MOD-IV Composite of New Jersey.
[22] https://www.nj.gov/treasury/taxation/pdf/lptval/2023/allcounties.pdf

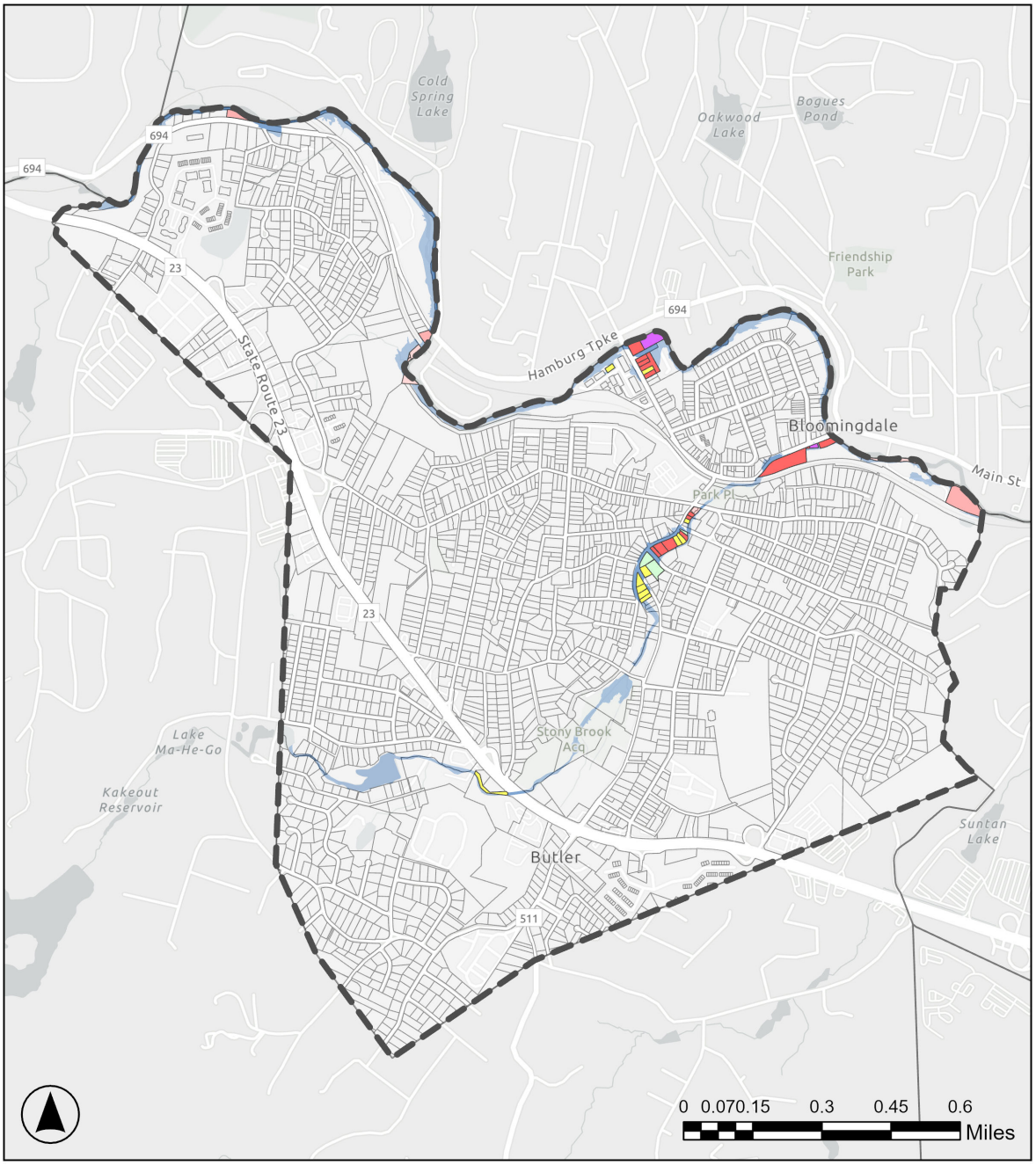
commercial parcels at risk with a net equalized value of $1.4 million and $6.7 million at risk respectively. Three school and public property parcels and three vacant land parcels are within the flood zone adding approximately $1.2 million and $0.13 million respectively to the borough's total value at risk.

Table V-3. Property parcels within FEMA 1% annual chance flood zone

		Number / land area exposed in...		
		FEMA 1% Annual Chance Flood		
MOD IV Property Class	Total # parcels	# Parcels	Acres	Net Equalized Value ($)
Residential (2)	2,176	11	2	4,938,012
Apartments (4C)	14	0	0	0
Commercial (4A)	155	14	5	6,737,072
Industrial (4B)	16	2	1	1,423,964
Farm (3A and 3B)	1	0	0	NA
Schools and other Public Property (15A through 15F)	83	3	1	1,157,757
Vacant Land (1)	51	3	3	131,628
Unclassified Land	52	7	1	NA
Total	**2,548**	**40**	**13**	**14,388,433**

**Does not include transportation parcels (5A and 5B).*

Map V-4. Property parcels within FEMA 1% annual chance flood zone



LEGEND

- FEMA 1% Annual Chance Flood Zone

Parcels Inundated at 50% or More - FEMA 1% Chance Annual Flood

- Residential
- Apartments
- Commercial
- Industrial
- Farm
- Schools and Other Public Property
- Railroad Property
- Vacant
- No Value
- Uninundated Parcels

Natural and Working Lands

Natural and working lands include wetlands, forests, agricultural land, and other open/green space. These lands benefit communities in many ways. They are especially important for addressing climate change for their capacity to absorb carbon from the atmosphere and mitigate the impacts of increasing temperatures. Butler Borough is characterized by a mix of residential development and natural landscapes. Natural lands include deciduous and mixed forests (approximately 183 acres combined), wooded wetlands (approximately 26 acres), and surface water resources such as streams, canals, and lakes (approximately 21 acres). Protecting and restoring natural areas to reduce climate impacts was the top-ranked land use strategy among the local stakeholder survey respondents, reflecting strong community support for nature-based approaches to hazard mitigation (see Appendix B).

Heat

As detailed in Section III.A, temperature projections indicate that Butler may experience increasing heat throughout the century. Warmer temperatures may extend the length of the growing season and the types of crops that are viable in New Jersey. However, warmer winter temperatures can disrupt chilling time necessary for many perennial crops and allow more insects to overwinter, increasing growing season pest pressure. Extreme heat can damage crops before harvest or lead to early season development that can be damaged by later frosts. Warmer temperatures may also exacerbate drought conditions that can limit groundwater irrigation and stress rain-fed crops. In wetlands, extreme heat can disrupt ecosystems by contributing to habitat loss, changes in wildlife diversity and behavior, and degrading soil and water quality. In forests and green spaces, high temperatures can degrade soil health, increase the frequency and duration of wildfires, and accelerate the life cycles of insect pests, allowing them to mature and spread more rapidly.[23] When combined with extreme precipitation, heat can also increase the temperature of runoff entering waterways resulting in water quality issues.

Storms

The increasing frequency of extreme precipitation events (see Section III.B) may impact natural and working lands across urban and rural areas, contributing to heightened risks from pests, diseases, invasive species, and storm-related damage.[24] Heavy precipitation and associated runoff increase the rate of streambank erosion and destabilization, which may damage surrounding areas and impact water quality.[25] As the Stone House Brook canal passes through the borough and the Pequannock River runs along its boundaries, the land around these waterbodies is at risk of inundation in case of flooding, especially the Stony Brook Acquisition.

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[23] New Jersey Office of Emergency Management. 2024. State of New Jersey All-Hazards Mitigation Plan. https://njsp.njoag.gov/njoem/programs/hazard-mitigation/hazard-mitigation-grant-program/hazard-mitigation-plans/2024-mitigation-plan/.

[24] NJ Climate Change Alliance. 2022. Forest Resource Considerations for A New Jersey Natural and Working Lands Strategy.

[25] New Jersey Department of Environmental Protection. 2025. New Jersey Scientific Report on Climate Change. (Eds. B. Wiley, K. Raper, J. Bonventre, R. Hill, L.A. Lester, N.A. Procopio). Trenton, NJ. 275 pp.

Extreme precipitation can also negatively impact agriculture, including planting delays, root disease, and limited access to pastures for livestock.[26] Increased soil erosion and agricultural runoff may result in increased manure, fertilizer, and pesticides entering local waterways and contaminating surface and groundwater.[27]

High winds in New Jersey have historically caused significant agricultural losses and economic setbacks due to the impact of projectile debris (e.g., hail), damaging crops and killing livestock.[28] In forested areas and open spaces, extreme winds can cause tree failure, such as breakage or uprooting. This damage makes trees more susceptible to disease or pests, weakening overall forest health and making canopies less resistant to additional threats like wildfires.

Flood

Natural and working lands help absorb excess rainwater and buffer storm surge, thereby reducing flooding in surrounding areas. However, flooding can also damage vegetation, negatively affecting ecosystem health and the agricultural industry.

In watersheds, flooding can increase sedimentation and bank erosion, introducing hazardous materials into nearby waterbodies and creating conditions favorable to waterborne pollution that may affect local water supplies. In addition to these human health and water quality concerns, flooding threatens ecosystems. Flooding can contribute to the inundation of forests and vegetated lands, damaging vegetation and flora, and negatively affecting forest health and the agricultural industry.

Map V-5 depicts natural and working lands in Butler within the FEMA 1% annual chance flood zone and the approximate extent of the Inland Flood Protection Rule. There is only one farm (3B) parcel in Butler, which is not within the flood zone. Most of the flood exposure of natural and working lands consists of wetlands and forest along the northern and eastern boundary of Butler, primarily following the Pequannock River corridor. Recreational and forested lands along Stone House Brook, a perennial stream, are within the approximate extent of the Inland Flood Protection Rule. Butler does not have much agricultural area, and very little of it is subject to potential flooding, along Stone House Brook waterway.

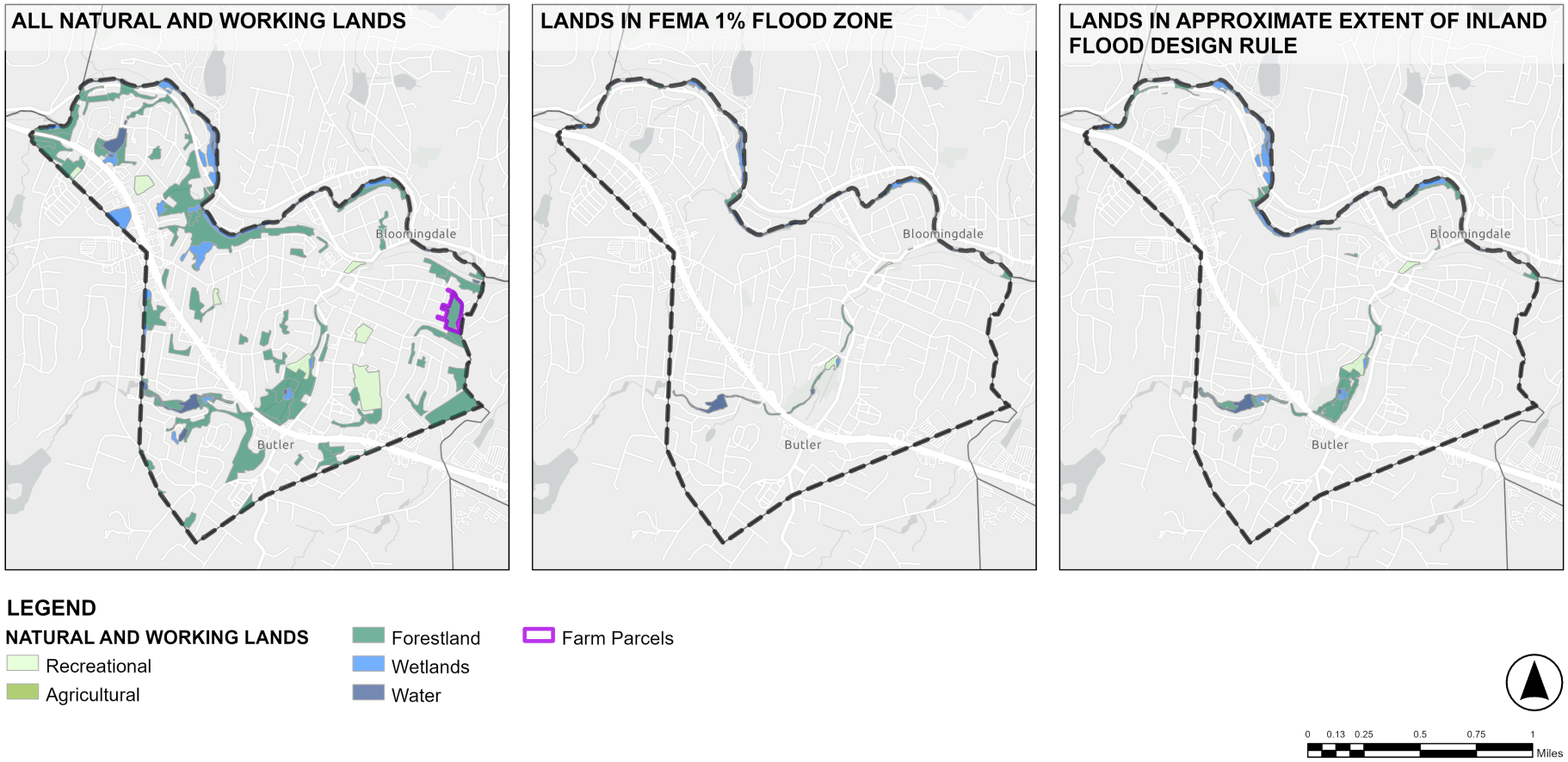
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[26] Hristov, A. N., Degaetano, A. T., Rotz, C. A., et al. 2018. Climate change effects on livestock in the Northeast US and strategies for adaptation. *Climatic Change*, 146, 33-45.

[27] U.S. Global Change Research Program. 2016. The impacts of climate change on human health in the United States: A scientific assessment. Pages 1–312 in A. Crimmins, J. Balbus, J. L. Gamble, C. B. Beard, J. E. Bell, D. Dodgen, R. J. Eisen, N. Fann, M. D. Hawkins, S. C. Herring, L. Jantarasami, D. M. Mills, S. Saha, M. C. Sarofim, J. Trtanj, and L. Ziska, editors. U.S. Global Change Research Program, Washington, DC.

[28] New Jersey Office of Emergency Management. 2024. State of New Jersey All-Hazards Mitigation Plan. https://njsp.njoag.gov/njoem/programs/hazard-mitigation/hazard-mitigation-grant-program/hazard-mitigation-plans/2024-mitigation-plan/

Map V-5. Flood exposure of natural and working lands



Drought

As detailed in Section III.C, Butler's time in drought each year is anticipated to increase throughout the century. Droughts can affect wetlands, forests, agriculture, and other open/green space. Wetlands may become drier during prolonged droughts, potentially decreasing fisheries production and the quality of tourism and recreation opportunities (see Section V.C for details on recreation and tourism in Butler). Potential impacts of wetland loss in Butler are discussed in the next section.

Agricultural drought occurs when there is not enough water available for a particular crop to grow at a particular time due to soil moisture deficiencies and lack of groundwater and precipitation. Agricultural drought may result in a reduction in crop yields, economic loss, livestock stress, an increased demand for irrigation, and soil degradation. Morris County is having its 31st driest year-to-date in 132 years of records (January–April 2026), while April itself was its 42nd driest April on record (1.12 inches below normal). No heat or air quality warnings were in effect as of early June 2026.[29]

Drought may also compound risks from other climate hazards. Additionally, drought in combination with high temperatures can increase the risk of wildfires in natural and working lands, due to an increase in evaporation, dry soil conditions, and large-scale loss of trees and vegetation.

Wildfire

Butler has a low wildfire risk compared to the moderate exposure of neighboring municipalities; however, the county has recorded eight wildfire events since 1950 (see Section III.E). Statewide, wildfires account for the damage or destruction of about 7,000 acres of forests each year, releasing pollutants such as carbon monoxide, volatile organic compounds, carbon dioxide, hydrocarbons, nitrogen oxides, and fine particulate matter. Wildfires destroy vegetation, threaten biodiversity, and damage habitat for threatened and endangered species. Conversely, many plant species have adapted to fire, and some are dependent on it for reproduction. In addition to the hazard of direct contact with fire, wildfires can cause prolonged secondary hazards to the lands they impact, including the weakening of soils, stripping of vegetation to absorb runoff, and the baking of soils with high clay content, creating impervious conditions that can increase the chance of flooding.

[29] National Integrated Drought Information System. (2026). *Drought conditions for Morris County, New Jersey*. Drought.gov. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. Retrieved July 14, 2026, from https://www.drought.gov/states/new-jersey/county/morris

C. Community Assets

There are other assets in a community that may not be "critical" as defined by a CCRHVA. Assets with local value may be places that:

- Represent community identity;
- Are important to quality of life;
- Provide essential shopping and services (e.g., grocery and convenience stores, pharmacies, medical offices, etc.);
- Have significance for cultural reasons; and/or
- Provide community recreation.

This analysis examined the exposure of these community assets using publicly available data on the locations of libraries, art venues, entertainment and sporting venues, public access points to tidal waterways, and historic properties. Additional community assets identified by Butler municipal staff and residents included Park at Western & Kiel Ave, Butler Forest Reserve / Preserve, Kinnelon High School, and Butler Library, among others. Many of these assets fall within the FEMA Community Lifelines of Food, Hydration, Shelter.

Local planning can benefit from understanding impacts to these assets that shape everyday life in the community. Climate hazards may pose immediate and/or direct risks based on the exposure of the asset itself, as well as indirect and/or long-term risks associated with potential loss of the value provided to the community. Community assets in Butler were identified through publicly available datasets and input from municipal staff, residents, and other local stakeholders. Public datasets included locations of: (a) libraries, (b) art venues, (c) entertainment and sporting venues, and (d) historic properties. Community assets identified by local stakeholders were categorized as follows (see Appendix B for a list of each place identified):

- **Civic & Community** - Organizations focused on community needs such as social connections and advocacy, including senior centers, youth centers, etc.
- **Businesses** - Shops, restaurants, and other commercial entities providing community services.
- **Cultural** - Museums, galleries, theaters, etc.
- **Recreation** - Playgrounds, parks, trails, ball fields, etc.
- **Religious** - Churches, temples, and other spiritual centers.

Although essential commercial services (e.g., groceries, banks, hardware stores, etc.) may also be considered community assets, these facilities are included in Section V.A because of their importance to recovery after natural disasters. In this section, overall exposure analysis of commercial property parcels is included to support consideration of risks to commercially zoned areas.

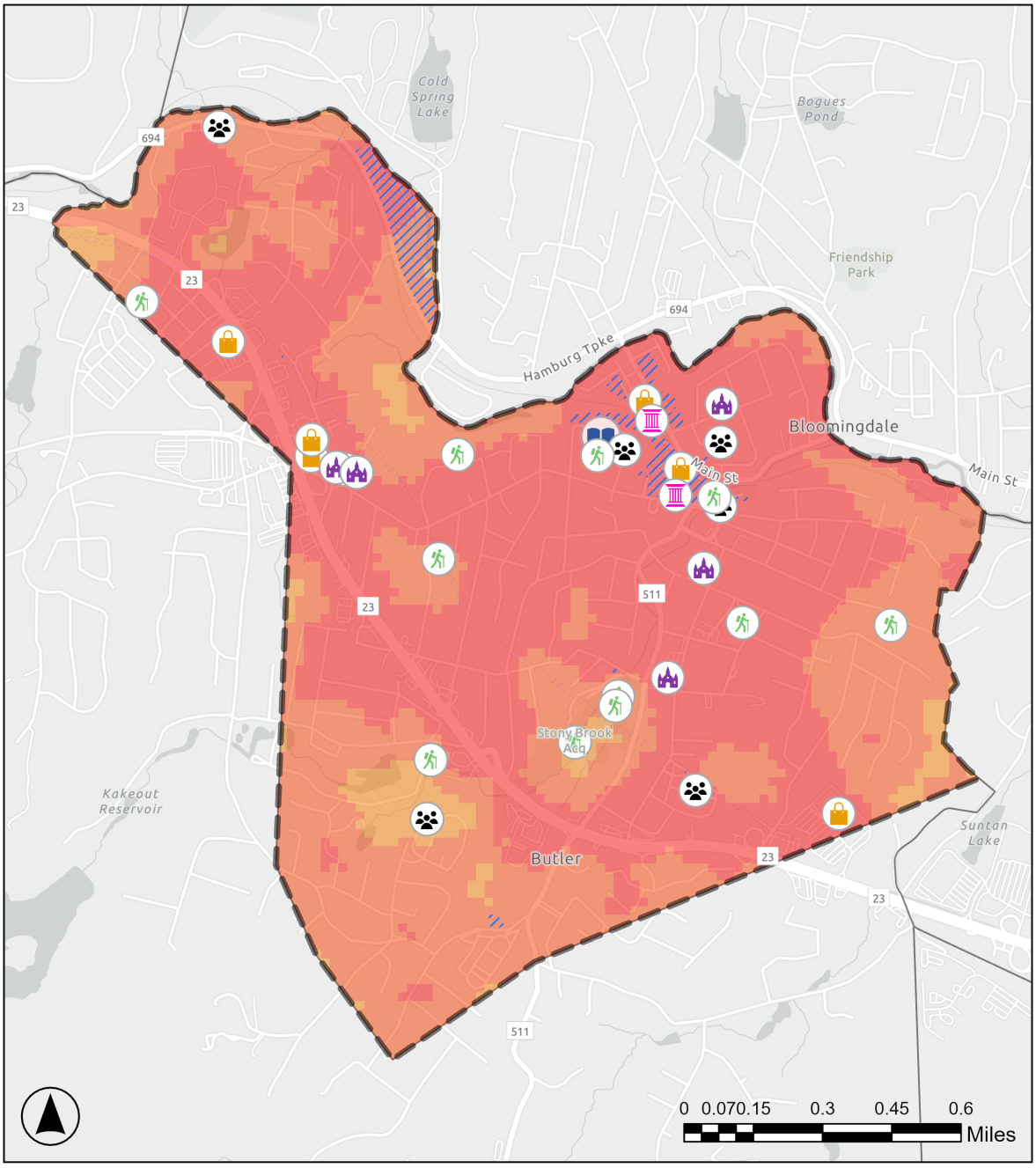
Heat

As detailed in Section III.A, temperature projections indicate that Butler may experience increasing heat throughout the century. Increasing temperatures can limit a community's ability to access and use various indoor and outdoor community assets, thus impacting social well-being and public health. On the other hand, places of gathering such as parks, libraries, and community centers can provide heat relief. Parks and green spaces can provide heat relief, but these outdoor assets can become unsafe without available shaded areas, trees, and water. Indoor facilities with air conditioning such as libraries, local shops, community centers, and event venues can also serve as cooling spaces. Yet, these locations risk facing increased demand that can exceed their capacity. Ensuring such facilities are properly equipped, accessible, and resilient to extreme temperatures is essential for protecting public health and maintaining social and community well-being.[30]

Map V-6 shows that a significant portion of Butler, particularly the central and northern areas, experiences land surface temperatures over 110 °F. The community assets located within this high-heat zone include Butler's library and several historic properties. These facilities may face increased operational strain and weatherization needs given the important role they play in the community.

[30] Filión, N.A., Knutsen, M., and Phillips, S. New Jersey Department of Environmental Protection. 2025. New Jersey Extreme Heat Resilience Action Plan. https://dep.nj.gov/wp-content/uploads/climatechange/extreme_heat_rap_071924-screen-version.pdf.

Map V-6. Land surface temperature and community assets



LEGEND

Community Assets

- Libraries
- Historic Properties
- Business
- Cultural
- Recreation
- Civic & Community
- Religious

Land Surface Temperature (°F)

- Below 80
- 80 - 90
- 90 - 100
- 100 - 110
- Over 110

Storms

As detailed in Section III.B, the frequency and intensity of extreme precipitation events are anticipated to increase throughout the century. Extreme precipitation impacts community assets and economic well-being and can limit access to outdoor recreation when parks and other outdoor spaces flood and the impacts can last for extended periods. Additionally, extreme precipitation can drive biodiversity loss, impacting recreational fishing and hunting.[31] Currently, fishing and hunting are allowed under several conditions under New Jersey law[32] but most of the nearby fishing and hunting recreation spots are found outside of Butler's municipal boundaries.

Drought

As detailed in Section III.C, Butler's time in drought each year is anticipated to increase throughout the century. Community assets can have varying water supply demands, which can place stress on water infrastructure, the local economy, quality of life, and natural resources during droughts. Water-based recreational activities (e.g., boating, kayaking, water skiing, fishing, etc.) often depend on specific water levels. These activities can be restricted when water levels drop, negatively impacting local tourism and quality of life.[33]

Agricultural droughts hinder the irrigation of farms both in a rural and urban context, limiting the availability of fresh produce for farmers' markets. Reduced water supply has also been linked with lower water quality, impacting recreation, water-based jobs, and drinking water. Drought watches may trigger mandatory water conservation measures including restrictions on landscaping, gardening, outdoor recreation, and household water use. Spray parks and other water-based recreational amenities may face temporary closures to conserve water.[34]

Flood

Flooding poses both immediate and long-term risks to community assets. For inland residents, the predominant concern was resource availability, especially for those without access to a vehicle. Residents with limited mobility cannot easily access grocery stores, public transit, community or social services, or personal support networks. Superstorm Sandy also caused widespread gasoline shortages, further challenging access to community assets.

Map V-7 depicts potential flood exposure of community assets in Butler within the FEMA 1% annual chance flood zone and the approximate extent of the Inland Flood Protection Rule. Table V-4 summarizes the number of each type of community asset exposed at each flood measure. Butler's library is not exposed in either the FEMA 1% annual chance flood or the approximate extent of the Inland Flood Protection Rule.

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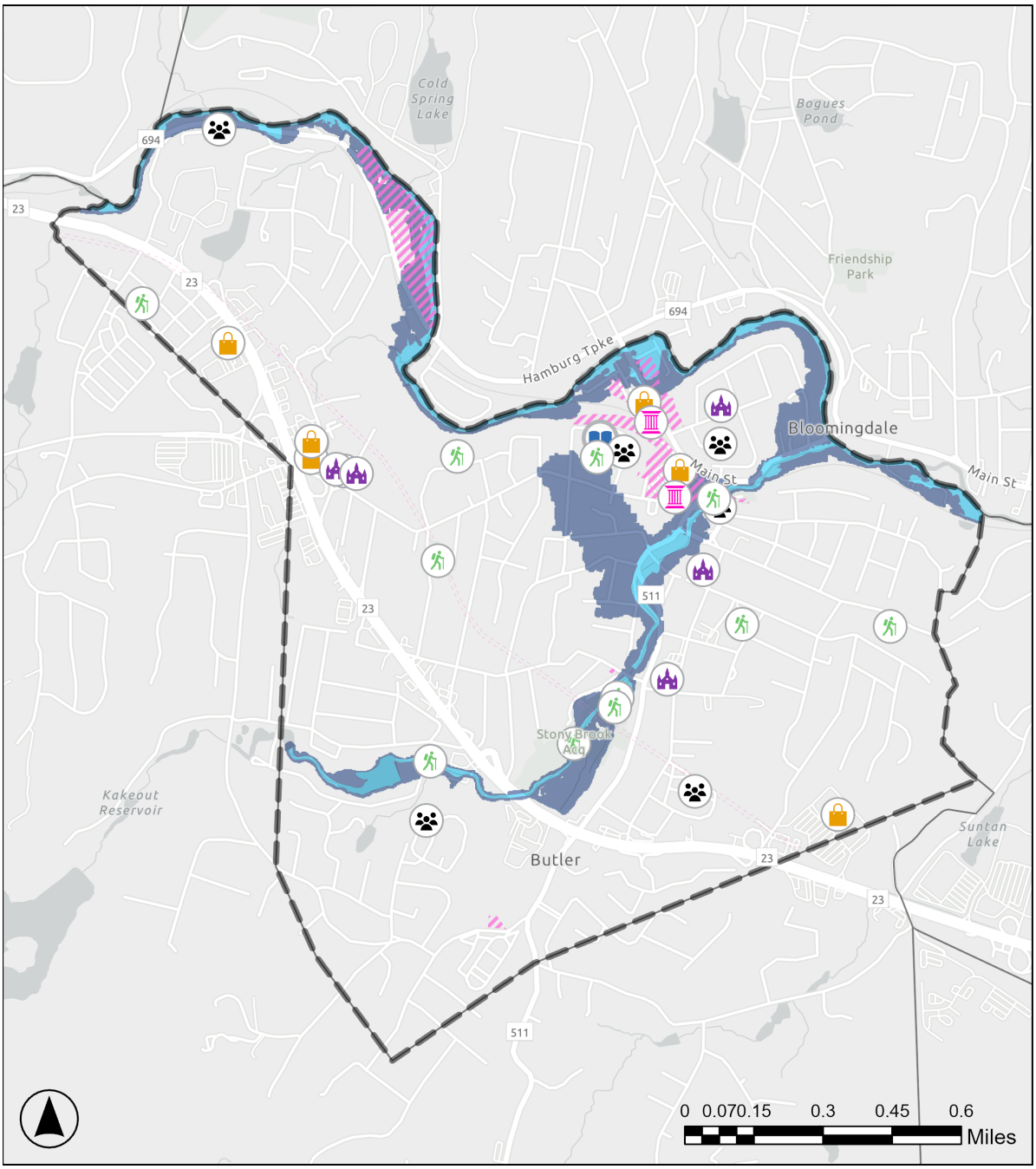
[31] NJDEP. 2023. Outside, Together! A statewide comprehensive outdoor recreation plan for New Jersey.
[32] Borough of Butler. (n.d.). Fishing License Rules. https://www.butlerborough.com/cn/webpage.cfm?TPID=3583
[33] NOAA. 2025. National Integrated Drought Information System. By Sector: Recreation & Tourism.
[34] State of NJ. 2024. 2024 New Jersey Water Supply Plan.

Table V-4. Flood exposure of community assets

	Total #	# Exposed in...	
		FEMA 1% Annual Chance Flood	FEMA 1% Annual Chance Flood + 3 feet
Libraries	1	0	0
Shelter	6	1	1
Business*	7	0	0
Civic & Community*	7	0	1
Cultural*	2	0	1
Religious*	5	0	0
Recreation*	11	3	5

**Community assets identified by stakeholders*

Map V-7. Community assets within FEMA flood zones



LEGEND

Community Assets

- Historic Properties
- Libraries

Identified by stakeholders

- Business
- Civic & Community
- Cultural
- Religious
- Recreation

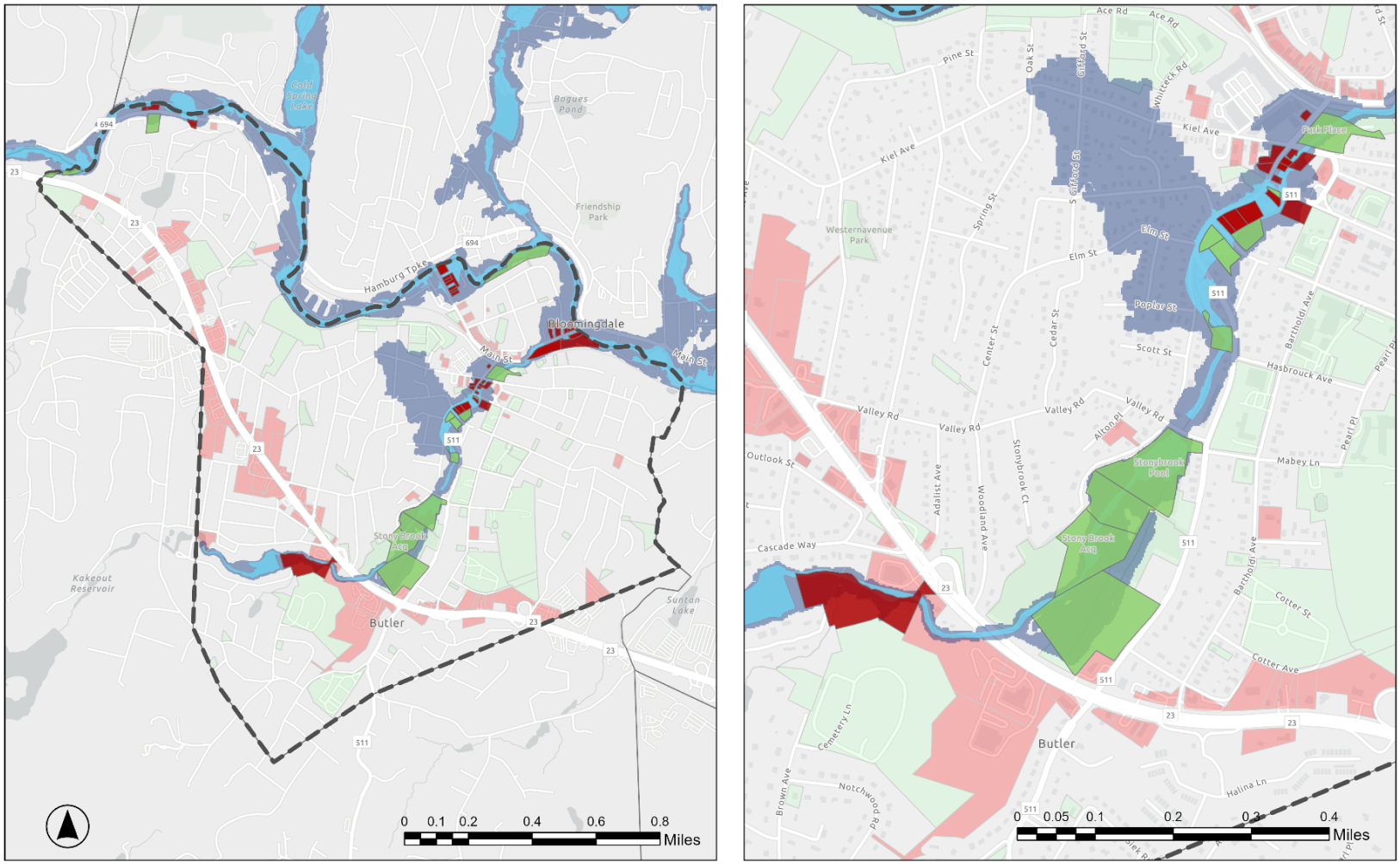
Flood Scenarios

- FEMA 1% Annual Chance
- Approximate extent of Inland Flood Protection Rule

Map V-8 depicts the community asset parcels exposed by each flood measure for the following property classes: Commercial, Schools, Public Properties, Church and Charitable, and Other Exempt Properties. Table V-5 provides details on the number of parcels, land area, and value of property exposed.

Flood exposure of community asset parcels is concentrated along Butler's local waterways. Commercial properties are the most exposed land use, with 14 parcels spread across five acres within the FEMA 1% annual chance flood zone with a net equalized value of $6.7 million. Within the approximate extent of the Inland Flood Protection Rule, exposed commercial parcels increase to 35 with a net equalized value of $15.2 million.

Map V-8. Community asset parcels within FEMA flood zones



LEGEND

Commercial, Public property, Schools and other public property Parcels in Butler
- Commercial
- Schools and Other Public Property

Parcels Inundated 50% or more FEMA 1% Annual Probability Flood Zone
- Commercial
- Schools and Other Public Property

Parcels Inundated 50% or more Approximate extent of Inland Flood Design Rule
- Commercial
- Schools and Other Public Property

Flood Scenarios
- FEMA 1% Annual Chance Flood Zone
- Approximate extent of Inland Flood Design Rule

Table V-5. Flood exposure of community asset parcels within FEMA flood zones

		# Exposed in...					
		FEMA 1% Annual Chance Flood			FEMA 1% Annual Chance Flood + 3 feet		
MOD IV Property Class	Total # parcels	# Parcels	Acres	Net Equalized Value ($)	# Parcels	Acres	Net Equalized Value ($)
Commercial	155	14	5	6,737,072	35	16	15,293,600
Schools	6	0	0	0	0	0	0
Public Properties	40	3	0.9	1,157,757	10	15	6,080,800
Church and Charitable	9	0	0	0	0	0	0
Other Exempt	27	0	0	0	3	13	1,067,800
Total	**237**	**17**	**6**	**7,894,829**	**48**	**44**	**22,442,200**

Wildfire

Although Butler itself is at relatively low risk for wildfires, NOAA has documented eight wildfire events in Morris County since 1950 (see Section III.E). Community assets most at risk during wildfires are those located within the Wildland Urban Interface where the built environment intermingles with undeveloped land, such as forests and grasslands.[35] Wildfire can disrupt the food supply chain due to impacts on roads used to transport agricultural products.[36] Wildfires can also severely impact local air quality, making it undesirable to visit parks and other community assets even after a wildfire has been extinguished.[37] This can particularly affect individuals with respiratory conditions (see Section VD).

D. Housing and People

Climate hazards can exacerbate existing housing issues such as escalating housing costs, displacement of lower-income people, and aging infrastructure. Although everyone who lives in

[35] U.S. Fire Administration. 2022. What is the WUI?

[36] New Jersey Office of Emergency Management. 2024. State of New Jersey All-Hazards Mitigation Plan. https://njsp.njoag.gov/njoem/programs/hazard-mitigation/hazard-mitigation-grant-program/hazard-mitigation-plans/2024-mitigation-plan/

[37] Mattson, A. 2025. As wildfires increase, NJ considers public-health impact. *NJ Spotlight News*.

New Jersey is vulnerable to climate change, some population groups are more vulnerable than others. Assessing the disproportionate impacts faced by these populations is necessary to assess the impacts of climate change on the community as a whole. Table V-6 provides data on Butler's vulnerable population groups.[38]

Table V-6. Overburdened populations in Butler

	Population	Percent of Total Population
Low-income*	1,258	15.46
No health insurance	213	2.62
Aged 65 and older	1,304	16.03
Aged 17 and younger	1,476	18.15
Disabled	826	10.16
Minority	2,702	33.22
American Indian or Alaska Native	0	0
Asian	286	3.5
Black or African American	157	1.93
Native Hawaiian or Pacific Islander	0	0
Some other race	44	0.5
Two or more races	187	2.3
Hispanic	2,034	25
Living in group quarters	37	0.45
	Household Estimate	Household Percent
Limited English proficiency households	158	1.9
No vehicle households	196	2.4
Mobile home housing units	0	0
Multi-unit housing units	1,136	13.97

**Below twice the poverty threshold as determined by the US Census Bureau.*

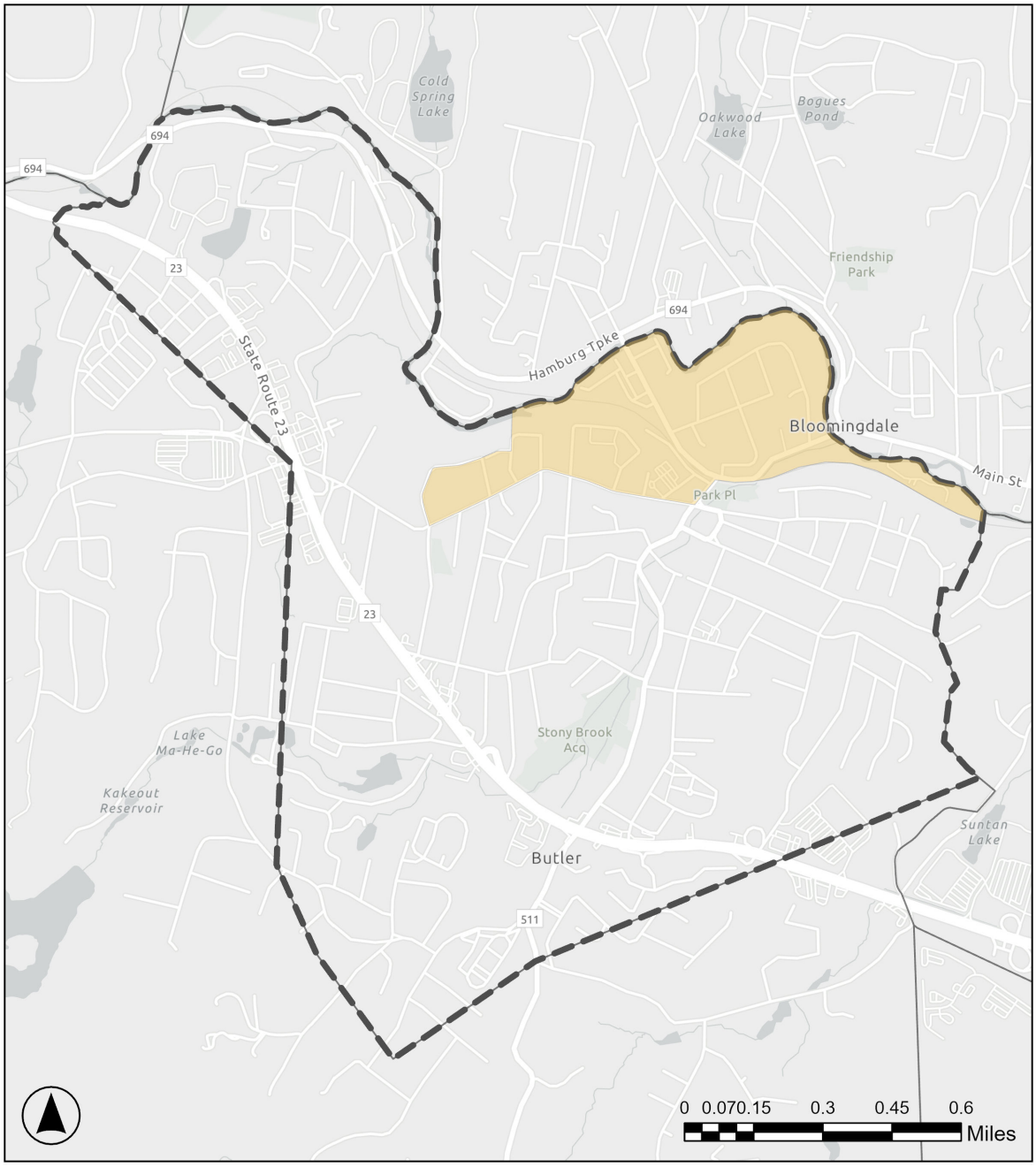
[38] U.S. Census Bureau. 2022. American Community Survey Five Year Estimates.

Additionally, the New Jersey Environmental Justice Law (N.J. Stat. Ann. 13:1D-157) defines Overburdened Communities (OBC) as census block groups with:

- At least 35 percent low-income households (at or below twice the poverty threshold as determined by the United States Census Bureau); or
- At least 40 percent of the residents identify as minority or as members of a State recognized tribal community; or
- At least 40 percent of the households have limited English proficiency (without an adult that speaks English "very well" according to the United States Census Bureau).

The OBC designation facilitates mapping of these vulnerable populations within each municipality statewide. As depicted on Map V-9, one of Butler's census block groups located in the northern area of the municipality is classified as an OBC due to the percentage of low-income and minority households.

Map V-9. Overburdened communities



LEGEND

Overburdened Communities under the New Jersey Environmental Justice Law

Low Income and Minority

Heat

As detailed in Section III.A, temperature projections indicate that Butler may experience increasing heat throughout the century. Hot days, in combination with poor housing conditions and lack of climate control, can have significant impacts on health. Lack of air conditioning, crowded living, and inadequate access to alternative shelters during heat waves can cause heightened anxiety, disrupt sleep patterns, and stress cardiovascular systems.[39] Housing with insufficient building insulation located in areas of high surface temperature or potential heat islands may expose residents to temperatures that can exceed outside temperatures. In New Jersey, heat-related hospital admissions during the warm season (May to September) increased approximately 156% between 2004 and 2013.[40] Children, elderly people, and those with pre-existing conditions are especially at risk. In Butler, 34% of the population is either 65 or older (16%) or 17 or younger (18%).

The combination of high heat with high humidity increases risk to outdoor occupational groups for heat-related illnesses like heat stroke.[41] Occupational groups that are particularly vulnerable because of the amount of time spent outside include workers in construction, agriculture, forestry, and natural resource management. Construction accounts for the majority of Butler residents employed in Natural Resources, Construction, and Maintenance Occupations, with 178 of 244 workers (73%) employed in the construction sector.[42] High temperatures also increase the concentration of ground-level ozone in the air. This is particularly harmful for individuals with chronic respiratory conditions.[43]

To better understand potential heat stress challenges to vulnerable residents, Map V-10 depicts housing parcels relative to land surface temperature in summer 2022. Most of Butler's housing is located in higher-temperature areas, partly because impervious surfaces (i.e., buildings, roofs, sidewalks, parking lots, streets, etc.) trap heat. The eastern and southern residential zones can experience land surface temperatures between 100 and 110 °F. Map V-11 depicts heat island risk relative to census block groups designated as OBCs. Butler's OBC census block group may be at risk of heat island effect due to moderately higher impervious surface than tree canopy.

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[39] Filión, N.A., Knutsen, M., and Phillips, S. New Jersey Department of Environmental Protection. 2025. New Jersey Extreme Heat Resilience Action Plan. https://dep.nj.gov/wp-content/uploads/climatechange/extreme_heat_rap_071924-screen-version.pdf.

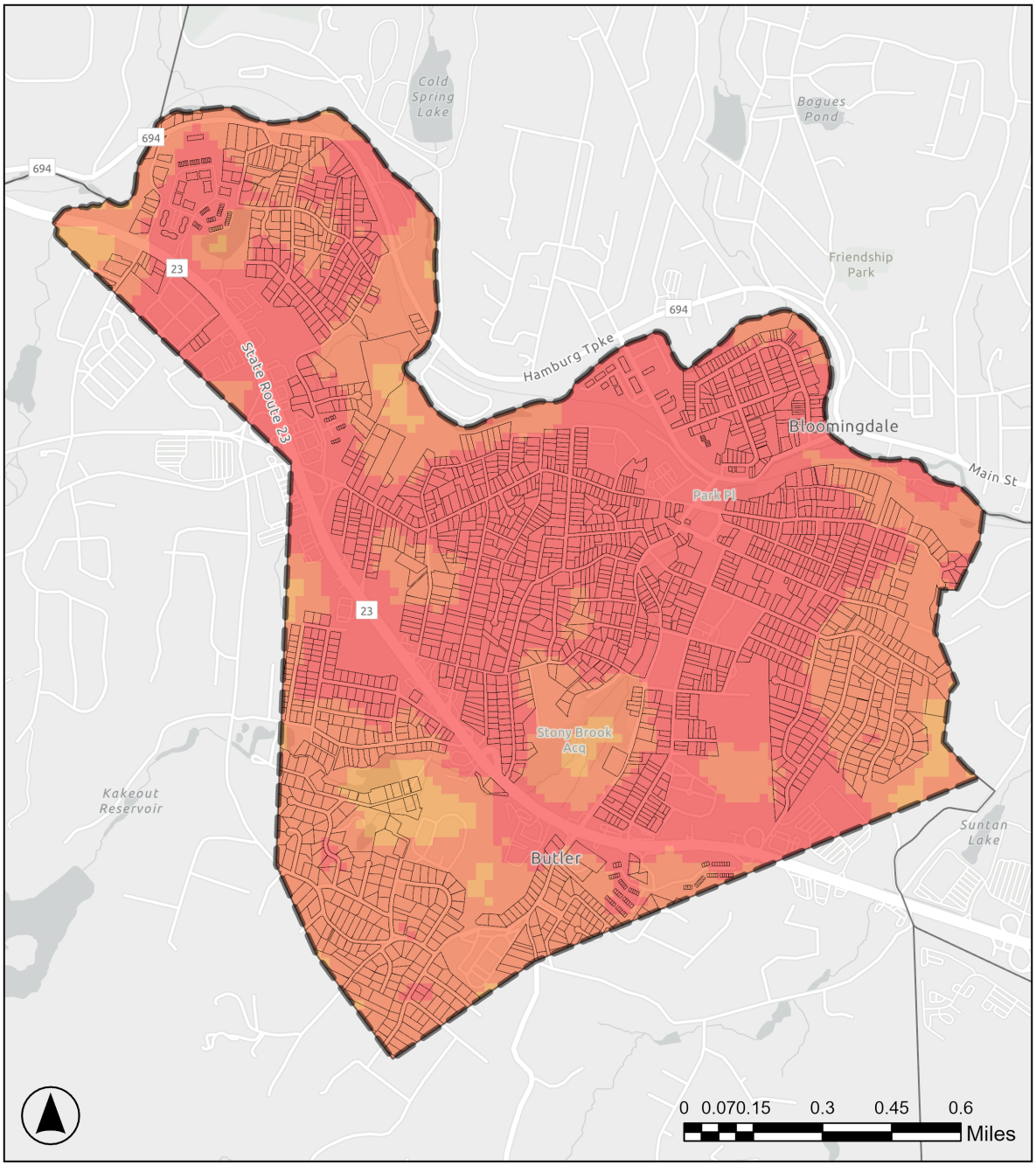
[40] Moran, D., J. Whytlaw, J. Herb, M. Kaplan, J. Madrigano, and P. Kinney. 2017. New Jersey Climate and Health Profile Report. New Jersey Climate Adaptation Alliance. New Brunswick, NJ: Rutgers University. National Crop Frequency data 2008-2025. USDA, National Agricultural Statistics Service. https://www.nass.usda.gov/Research_and_Science/Cropland/Release/index.php

[41] NJDEP. 2022. Climate Change Impacts on Human Health & Communities: Addendum to the 2020 New Jersey Scientific Report on Climate Change. Version 1.0. (Eds. J.A. Bonventre, L.A. Lester). Trenton, NJ. 54 pp.

[42] U.S. Census Bureau. (2024). Selected characteristics of the civilian employed population (Table S2405), 2020–2024 American Community Survey 5-year estimates: Butler borough, Morris County, New Jersey. https://data.census.gov/table/ACSST5Y2024.S2405?q=acs&g=060XX00US3402709040&y=2024

[43] Centers for Disease Control and Prevention. 2022. Heat and chronic conditions.

Map V-10. Land surface temperature and housing



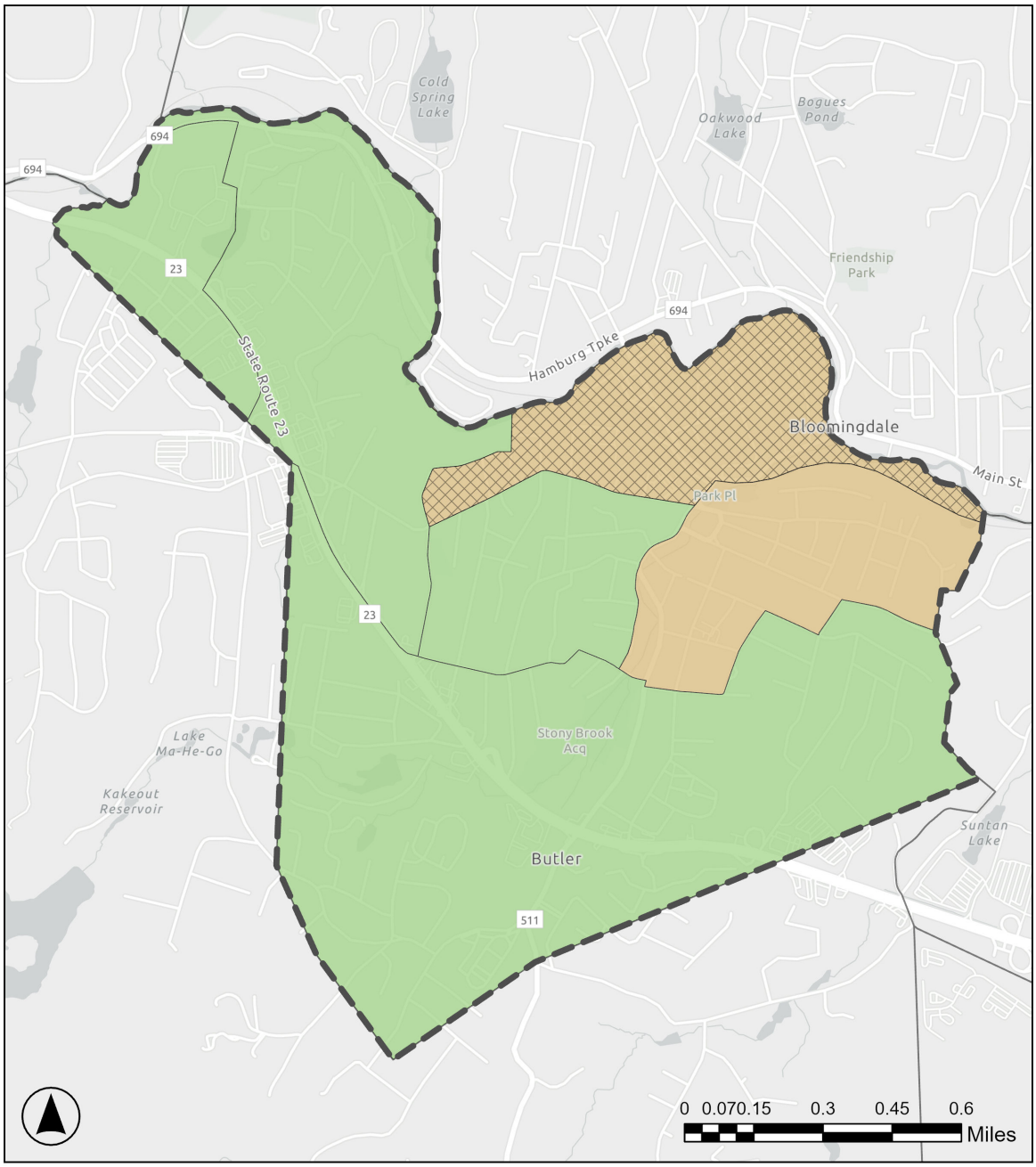
LEGEND

Residential and Apartments

Land Surface Temperature (°F)

- Below 80
- 80 - 90
- 90 - 100
- 100 - 110
- Over 110

Map V-11. Heat island risk to Overburdened Communities



LEGEND

Ratio Between Canopy Cover and Impervious Surfaces

- Higher Canopy Cover
- Moderately higher Canopy Cover
- Equivalent Canopy/Impervious Cover
- Moderately Higher Impervious Cover
- Higher Impervious Cover

Overburdened Communities under the New Jersey Environmental Justice Law

Storms

As detailed in Section III.B, the frequency and intensity of extreme events are anticipated to increase throughout the century. The public health impacts of storms are well documented in New Jersey. For example, extreme rainfall during the warm season has been connected to increases in hospitalizations for gastrointestinal illness.[44] In the aftermath of Superstorm Sandy, adults exposed to mold in their homes were more likely to be diagnosed with asthma and more likely to report mental health distress. Children living in homes that experienced even minor damage were at higher risk for psychological and emotional issues.[45] According to data from the US Census Bureau, approximately 2.6% of Butler's population does not have health insurance and may be at particular risk of health impacts.

Tropical storms and hurricanes damage residential buildings, including impacts from tree debris and the loosening of windows or roof shingles. Mobile homes are especially susceptible to damage or loss. Financially burdened households are also at particular risk as their response to extreme weather is constrained by limited resources. These constraints may prevent evacuation, the purchase of backup energy systems, or access to emergency services. Review of summary data on the National Flood Insurance Program in Butler indicates that there are six Repetitive Loss properties with a total of 15 claims paid on these structures since 1978.[46]

Power outages during winter months pose additional risks to vulnerable populations, including the elderly and medically frail, who are more susceptible to cold exposure in homes and facilities without heat. In New Jersey, where approximately 15.8% of homes rely on electricity for heating, the loss of power can have serious health implications. Beyond residential settings, individuals in medical facilities may face life-threatening situations if critical equipment fails due to storm-induced outages. Vulnerable populations, like the elderly, especially in coastal communities, are considered the most vulnerable due to the direct exposure to high-impact storms, limited adaptive capacity, and need for additional time or assistance during evacuations.[47]

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[44] Gleason, J. & Fagliano, J. 2017. Effect of drinking water source on associations between gastrointestinal illness and heavy rainfall in New Jersey. https://doi.org/10.1371/journal.pone.0173794

[45] Abramson, D., Alst, D., Merdjanoff, A., Piltch-Loeb, R., Beedasy, J., Findley, P., Peek, L., Mordy, M., Moroso, S., Ocasio, K., Park, Y.S, Sury, J., Tobin, J. 2015. Sandy Child and Family Health Study PERSON Report. https://www.researchgate.net/publication/280925388_Sandy_Child_and_Family_Health_Study_PERSON_Report

[46] Federal Emergency Management Agency. 2026. Open FEMA Dataset: NFIP Multiple Loss Properties - v1. https://www.fema.gov/openfema-data-page/nfip-multiple-loss-properties-v1

[47] New Jersey Office of Emergency Management. 2024. State of New Jersey All-Hazards Mitigation Plan. https://njsp.njoag.gov/njoem/programs/hazard-mitigation/hazard-mitigation-grant-program/hazard-mitigation-plans/2024-mitigation-plan/

Drought

Butler's time in drought each year is anticipated to increase throughout the century (see Section III.C). Drought can exacerbate climate-related effects on social systems. While the built environment, including housing, is not directly damaged by drought, a home's dependence on the public water supply can influence its livability during drought periods.[48]

During periods of heightened demand on public water systems, increasing operational costs may be passed down to the consumer. Increasing water supply rates may restrict water access for financially constrained households. In rural communities, the stresses of droughts are felt more acutely due to the reliance on private wells, their susceptibility to drying up, and the costly nature of maintaining them. Limitations to financial and technical resources further exacerbate a community's vulnerability to drought-related hazards.[49]

[48] New Jersey Department of Environmental Protection. 2025. New Jersey Scientific Report on Climate Change. (Eds. B. Wiley, K. Raper, J. Bonventre, R. Hill, L.A. Lester, N.A. Procopio). Trenton, NJ. 275 pp.
[49] Interagency Council on Climate Resilience. 2025. New Jersey Statewide Flood Resilience Initiatives.

Flood

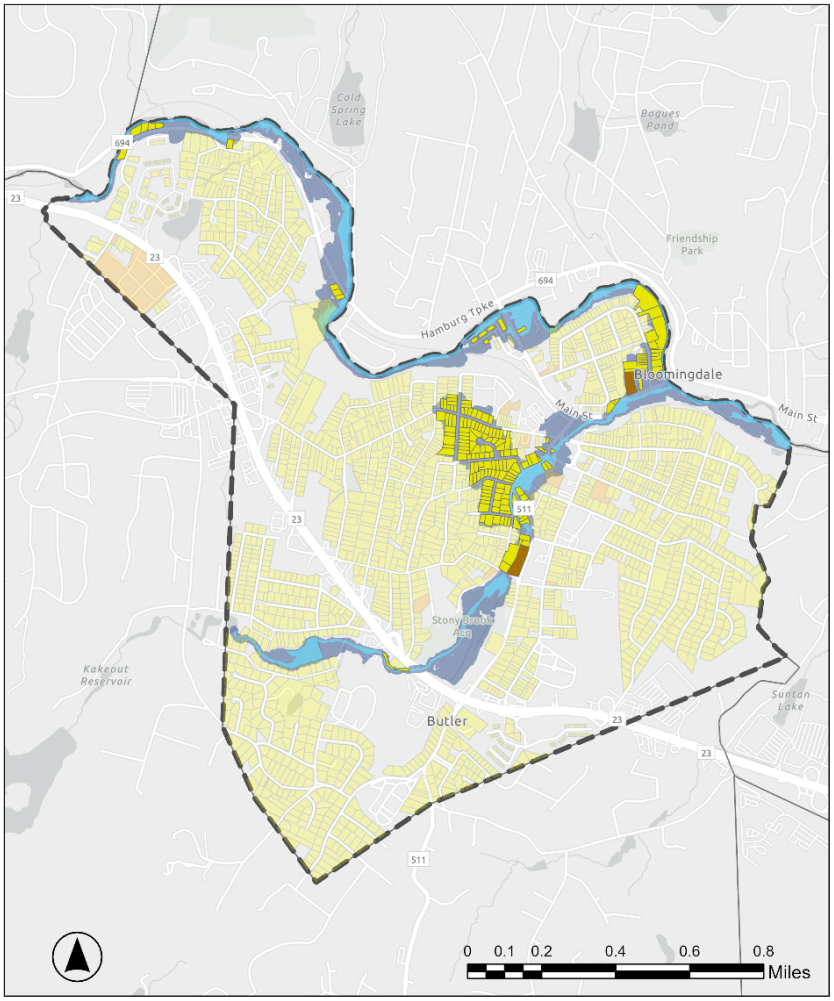
Flooding impacts vulnerable populations by exacerbating existing underlying inequities. In addition to impacts to property, flooding causes physical and mental health impacts. The most direct health impact from flooding is drowning and trauma. Other health impacts from flooding can be the result of increased risk of exposure to contaminants such as bacteria, mold, parasites and chemical pollutants that can cause gastrointestinal, respiratory and other conditions. Costly repairs and displacement resulting from flood damages can create financial burdens that disproportionately impact low- to moderate-income families.[50]

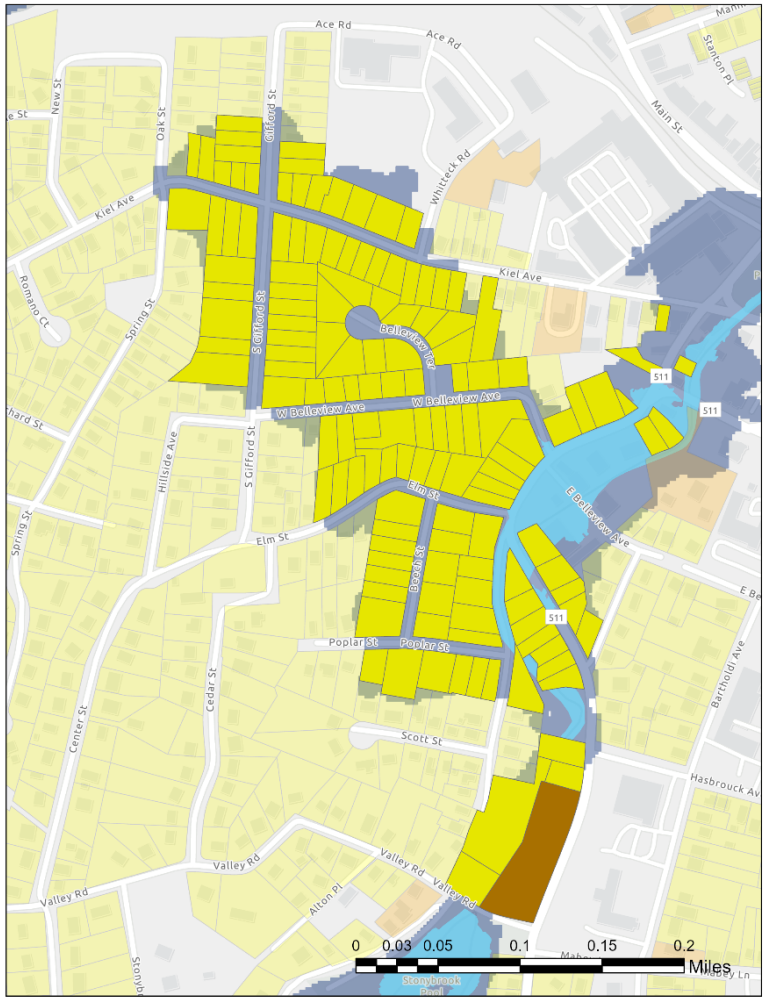
Map V-12 depicts the potential flood exposure of housing parcels in Butler within the FEMA 1% annual chance flood zone and the approximate extent of the Inland Flood Protection Rule. Table V-7 provides details on the number of residential parcels, land area, and value of property exposed.

A small fraction of Butler's 2,189 residential and apartment parcels are within the FEMA 1% annual chance flood zone. These 11 parcels total two acres with a net equalized value of approximately $4.9 million. Future flood risk exposes a greater proportion of housing parcels, with 182 parcels within the FEMA 1% annual chance flood zone plus three feet. The economic impact increases significantly to $74.8 million under this scenario. As illustrated by Map V-12, most of the impacted residential properties are concentrated in the central part of the borough west of Boonton Avenue. Residential parcels on the northern edge of the borough along the Pequannock River are also exposed.

[50] Interagency Council on Climate Resilience. 2025. New Jersey Statewide Flood Resilience Initiatives.

Map V-12. Housing parcels within FEMA Flood Zones





LEGEND

Parcels Inundated 50% or more FEMA 1% Annual Probability Flood Zone
- Residential
- Apartments

Parcels Inundated 50% or more Approximate extent of Inland Flood Design Rule
- Residential
- Apartments

Residential Parcels
- Residential
- Apartments

Flood Scenarios
- FEMA 1% Annual Chance Flood Zone
- Approximate extent of Inland Flood Design Rule

Table V-7. Flood exposure of housing parcels within FEMA Flood Zones

		Number / land area exposed in...					
		FEMA 1% Annual Chance Flood			Approximate extent of Inland Flood Protection Rule		
MOD IV Property Class	Total # parcels	# Parcels	Acres	Net Equalized Value ($)	# Parcels	Acres	Net Equalized Value ($)
Residential (2)	2,176	11	2	4,938,012	179	41	68,775,400
Apartment (4C)	14	0	0	0	3	2	6,017,900
Total	**2,190**	**11**	**2**	**4,938,012**	**182**	**43**	**74,793,300**

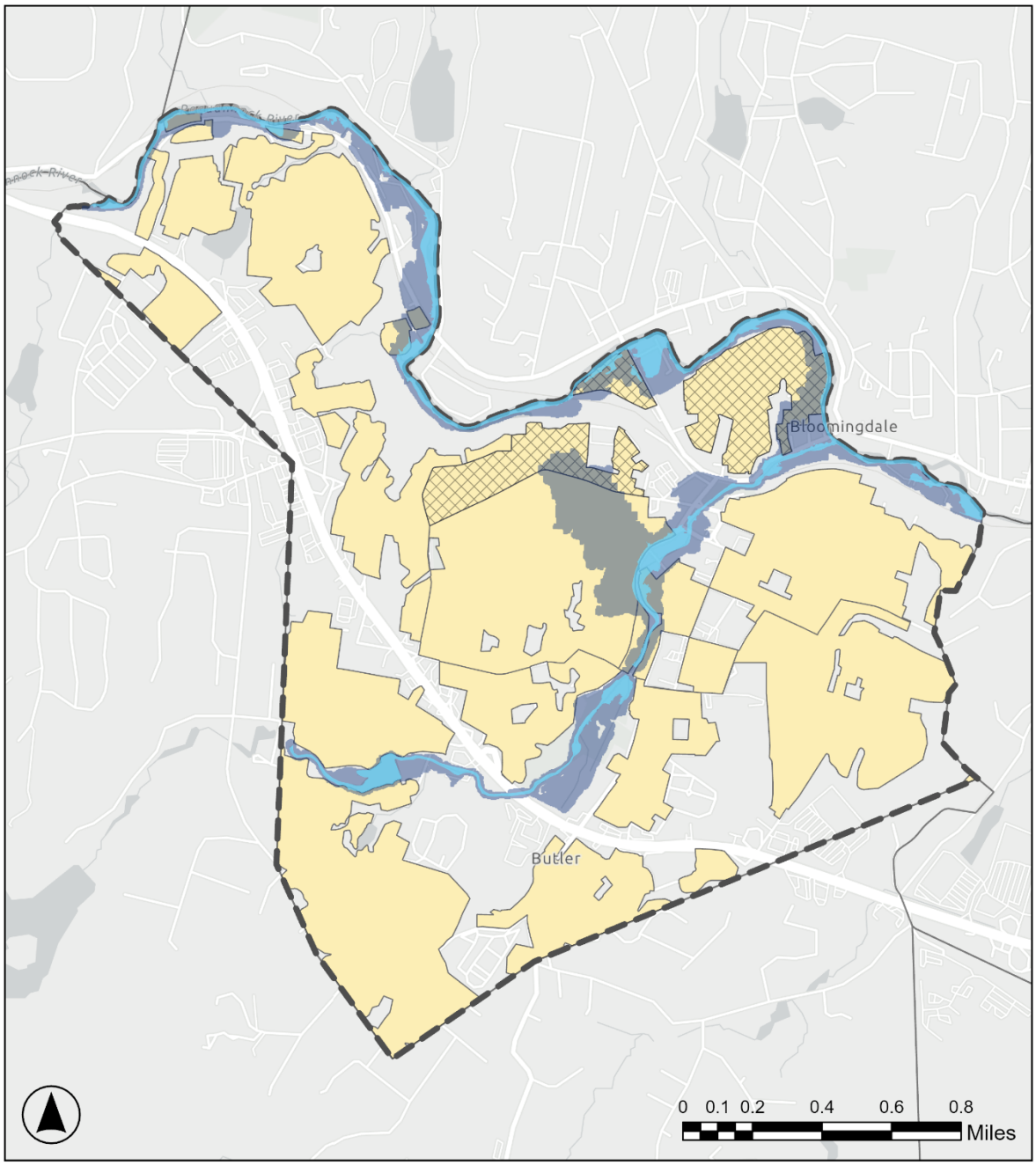
Map V-13 depicts potential flood exposure of OBCs in Butler. Table V-8 summarizes the number of people exposed within Butler's OBC census block for each flood measure. Within the OBC census block, an estimated 11 low-income residents are within the FEMA 1% annual chance flood zone and an estimated 119 residents are within the approximate extent of the Inland Flood Protection Rule. A small portion of Butler's limited English proficiency population also resides within these flood risk areas.

Table V-8. Flood exposure of Overburdened Communities

	Total # in OBC census blocks	Estimated number of people exposed in...	
		FEMA 1% Annual Chance Flood	FEMA 1% Annual Chance Flood + 3 feet
Low-income*	597	11	119
Minority	430	8	86
Limited English proficiency households	100	2	20

**At or below twice the poverty threshold as determined by the United States Census Bureau.*

Map V-13. Overburdened Communities within FEMA flood zones



LEGEND

Flood Scenarios

- FEMA 1% Annual Chance Flood Zone
- Approximate extent of Inland Flood Design Rule
- Overburdened Communities Residential LULC
- Census BG Data by Residential Land Use

Wildfire

Wildfire does not pose a significant risk to Butler (see Section III.E). Housing most at risk during wildfires is that located in areas where the built environment mixes with natural land. Wildfires can cause shifts in the housing market as fires destroy homes and displace residents. Municipalities may struggle to bounce back and provide sufficient housing stock after wildfires, causing a plateau or declining population in communities with large or recurring events.[51]

[51] New Jersey Office of Emergency Management. 2024. State of New Jersey All-Hazards Mitigation Plan. https://njsp.njoag.gov/njoem/programs/hazard-mitigation/hazard-mitigation-grant-program/hazard-mitigation-plans/2024-mitigation-plan/

VI. Impacts on Master Plan Elements

The New Jersey MLUL requires a CCRHVA to analyze "the potential impact of natural hazards on relevant components and elements of the master plan." Butler's master plan was completed in 2004 and the most recent reexamination in 2024. It includes the following plan elements:

Mandatory Elements

- Statement of objectives, principles, assumptions, policies, and standards
- Land Use
- Housing Element Fair Share Plan

Optional Elements

- Special Planning Considerations
- Coordination with Other Planning Programs
- Circulation Plan
- Community Facilities
- Utility Plan
- Recycling Plan

These elements were reviewed and analyzed to identify connections with the current and future climate hazards and exposures identified in this CCRHVA. For each element, this section includes a summary of relevant findings and potential considerations for Butler to improve resilience to climate-related hazards.

A. Statement of objectives, principles, assumptions, policies, and standards (SOPAPS)

The MLUL requires a municipal master plan to include a "statement of objectives, principles, assumptions, policies and standards" to guide the physical, economic, and social development of the municipality. Butler's 2004 Master Plan lists 11 objectives to guide long-term development and land use goals. Specifically, three (3) objectives relate directly to climate change. They are: (1) Objective #5: To minimize the environmental impact resulting from future development pressure, particularly in areas of steep slopes, freshwater wetlands and flood hazard areas; (2) Objective #7: To provide adequate municipal open space for a variety of active and passive recreational uses; and (3) Objective #11: To promote the conservation of energy and the recycling of recyclable materials.

Climate Hazard Connections

Butler's SOPAPS has limited references to climate hazards. Sections III and V call attention to issues of flooding, increased rainwater, and heat that can be further incorporated into Butler's SOPAPS. As shown in Maps III-3 and III-5, there are parcels along the Borough's riverwalk that are prone to flooding.

Objective #5 highlights the need to "(e)stablish appropriate regulations which discourage unnecessary development within flood hazard areas and in the vicinity of freshwater wetlands." However, in order to adequately address flood risk found in Butler, the municipality will need to further develop this objective, acknowledging that the flood hazard footprint is evolving under climate change.

Objective #7 relates to open space, which directly relates to the borough's resilience to extreme heat. Maps V-1 and V-6 demonstrate land surface temperature throughout the borough. Objective #7 provides more specific recommendations on how to enhance open space, and thus, Objective #7 seems to be the objective in the master plan that ties most directly to the CCRHVA and its findings. Objective #11 refers to recycling and energy conservation, which is primarily tied to sustainability and climate mitigation but can provide some benefits for climate resilience. For example, buildings that incorporate energy efficient design have demonstrated improved thermal comfort and reduced overheating.

It is worth noting, however, that the 2024 Reexamination §IV.3 identifies preparation of this CCRHVA as a recommended specific change, framing it as a regulatory prerequisite to future land use action.

Potential Resilience Considerations

- Adopt, as part of the next Master Plan update or amendment, a Borough-specific objective stating that the Borough's physical, economic, and social development is to be planned in recognition of changing climate conditions over the planning horizons specified in CCRHVA Section II, and that the hazard findings of CCRHVA Section III and exposure findings of CCRHVA Section V are to be treated as the operative baseline for planning decisions

- Revise the Borough-specific objective concerning flood hazard areas and freshwater wetlands to reference not only currently mapped FEMA 1% annual chance flood zones but also the approximate extent of the Inland Flood Protection Rule analyzed throughout CCRHVA Section V.

- Adopt an explicit policy statement, as required by N.J.S.A. 40:55D-28 as amended February 4, 2021, on the consistency, coordination, and integration of the CCRHVA with existing and proposed natural hazard mitigation, floodplain management, stormwater management, and emergency operations plans.

B. Land Use Element

The MLUL requires a municipal master plan to include a land use element. Butler's existing Land Use Element is primarily an assessment of existing physical conditions and zoning conditions. The land use element provides a general description of the land use in the borough and insight into general development patterns. The element also includes environmental constraints maps in its appendix that include flood hazard areas. Overall, the element acknowledges limits on growth within the borough given the borough's goal to preserve its open space and due to the existing infrastructure.

The 2015 reexamination report ends with eight (8) plan recommendations concerning land use. Those most related to climate change hazards are the following:

- To ensure that redevelopment respects the borough's environmental features and complements the surrounding area
- Steeply sloped areas, wetlands, floodplains and stream buffers should be preserved to the greatest extent possible
- To implement municipal actions that comply with NJDEP's reduction of flood risk through Low Impact Development – Best Management Practices

Notably, as mentioned above, the 2024 reexamination report recommends that Butler create a CCRHVA. This update also has a subsection about new NJDEP regulations related to stormwater.

Climate Hazard Connections

One area of alignment is between the 2004 Borough-specific objective discouraging "unnecessary development within flood hazard areas and in the vicinity of freshwater wetlands," and CCRHVA Section III.D and Section V findings on flood exposure.

The Land Use Element currently makes very few references to climate hazards. The 2024 Reexamination §IV.2.D recommendation to "update the Borough's maps indicating the locations of environmentally sensitive features and floodplains" is consistent with the CCRHVA but does not capture the full scope of what CCRHVA Sections III and V make possible: heat exposure mapping, drought projections, current and future flood scenarios at parcel resolution, and overburdened communities exposure. The identification of residential, commercial and industrial flood hazard areas in the land use element does not match the flood footprint in the CCRHVA (approximate extent of the Inland Flood Protection Rule).

Several connections can be made between Butler's land use element and Sections III and V findings on heat exposure. The land use element designates the highest-intensity commercial and industrial uses along Route 23, which is identified as one of the highest-heat areas in Sections III and V. Additionally, two census block groups in the northeastern corner are classified as having

moderately high impervious cover, with one of those being designated an OBC. This aligns with the pattern of development and land use within those census blocks as Butler's Main Street functions as a commercial and industrial corridor.

Map V-4 demonstrates the various land uses in the borough and highlights parcels at risk of flooding. Most of the impacted residential properties are concentrated in the central part of the borough west of Boonton Avenue; properties on the northern municipal boundary along the Pequannock River are also vulnerable. The land use element can incorporate these findings and identify flood resilience strategies.

Potential Resilience Considerations

- Adjust Lot Coverage and Building Standards to reduce ground temperatures and address heat risk.
- Allow for more multi-family use permissions, preserving more open space and reducing additional impervious surface coverage.
- In the next land use plan element update, integrate CCRHVA Section V parcel-level flood exposure data (Tables V-2, V-3, V-8) as a constraint layer on the land use plan and accompanying zoning analysis.
- Identify the eleven known contaminated sites catalogued in CCRHVA Section V.A, specifically the four sites within the approximate extent of the Inland Flood Protection Rule, as a Special Planning Consideration within the Land Use Element, with attention to mobilization-of-contaminants risk under future flood scenarios.
- In the recommended map update of environmentally sensitive features and floodplains (2024 Reexamination §IV.2.D), incorporate at minimum: the FEMA 1% annual chance flood zone, the approximate extent of the Inland Flood Protection Rule, the land surface temperature classifications from CCRHVA Map V-1 and Map V-10, the Overburdened Community census block boundaries from CCRHVA Map V-11, and the locations of known contaminated and toxic release inventory sites from CCRHVA Section V.A.
- For the HC Highway Commercial Corridor Zone, incorporate heat mitigation provisions into the design standards.
- For residential land use categories — particularly those in the eastern and southern residential zones identified by CCRHVA Section V.D as experiencing land surface temperatures between 100 and 110 °F, and the northeastern census block groups identified by Section V.D as having moderately high impervious cover and including one Overburdened Community — incorporate heat mitigation provisions at the development standards level.

- Recognize that the land use element's assumptions about supportable density depend on water and energy systems that the CCRHVA documents are under increasing stress.

- For the light industrial land use categories and the rail-river corridor at Riverdale, incorporate flood-resilience design and siting standards informed by CCRHVA Table V-2.

C. Housing Element

The Municipal Land Use Law requires all New Jersey municipalities to have a housing element as part of their master plan; the housing element is also known as a housing element fair share plan (HEFSP). Climate hazards are interrelated with housing affordability, indoor environmental quality, residential stability, and neighborhood assets. Lack of safe, affordable housing can pressure low-income residents to live in areas with environmental concerns. Houses can face structural damage due to flooding or wildfires. Overall, Butler's HEFSP addresses housing concerns, focusing on compliance with the borough's affordable housing unit requirements, but the element lacks a discussion on the borough's climate hazard concerns.

Climate Hazard Connections

There is no specific mention of climate change or climate hazards in Butler's housing element. Some of the housing element's spatial aspects intersect with CCRHVA findings, such as the placement of affordable housing units outside of flood exposure areas. Another point of consistency is the element's recognition of senior housing as a distinct land use category, which aligns with CCRHVA Section V.D's emphasis on vulnerable populations during heat events and power outages.

However, the rehabilitation programs and development mentioned in the element do not prioritize CCRHVA findings related to heat exposure, flooding, or equity considerations. The element could address gaps by making connections between housing and climate hazards using the analysis found in Sections III and V, for example, utilizing NJ's Inland Design Flood Elevation in assessments of whether or not housing would be suitable for the location based on future flood risks (see Maps V-4 and V-12). Additionally, when constructing new housing, it could consider the inclusion of open space to help reduce surface temperatures, particularly in high-heat areas (see Map V-10).

Potential Resilience Considerations

- Consider establishing density bonuses that allow more dwelling units in exchange for meeting borough objectives for affordable housing or sustainable design.

- Adopt heat-resistant design standards for residential dwellings.

- In the next housing plan update, incorporate housing parcel flood exposure data (Table V-7) as a potential constraint.

- Inventory Butler's affordable housing stock by parcel exposure to FEMA 1% annual chance

flood and approximate extent of the Inland Flood Protection Rule, by land surface temperature classification per CCRHVA Map V-10, and by Overburdened Community census block per CCRHVA Map V-11.

- Revise the rehabilitation program to incorporate prioritization criteria that are informed by the hazard and exposure analysis included in the CCRHVA. Rehabilitation funded under the program should include, where appropriate, flood-resilience or heat-resilience upgrades alongside the substandard-condition repairs.

- Treat parcels within the approximate extent of the Inland Flood Protection Rule as presumptively unsuitable for new inclusionary or affordable construction absent specific mitigation, and treat the OBC census blocks identified in CCRHVA Section V.D as eligible for prioritized investment in heat-resilience infrastructure.

- Incorporate equity findings of CCRHVA Table V-8, Overburdened Community census blocks exposed to the approximate extent of the Inland Flood Protection Rule, and commit the housing plan's rehabilitation, inclusionary, and senior housing components to address those exposures specifically.

- For Butler senior citizen housing, incorporate a requirement that emergency backup power, cooling refuge capacity, and resident heat-event response procedures be documented and maintained.

D. Special Planning Considerations

Butler's Special Planning Considerations element supplements the borough's land use element and is composed of five sub-elements, or specific areas/programs within the borough. The three most directly CCRHVA-related are a study to revitalize the Route 23 highway corridor area, plans to renew planning for central business district revitalization, and coordination of stormwater regulations across the borough.

Climate Hazard Connections

Overall, in this element, there is little mention of climate change. However, the stormwater regulations section of the element includes a discussion of the NJDEP stormwater regulations, as of 2004. The NJDEP stormwater regulations required Butler to: (1) create additional stormwater management strategies, (2) increase buffering along stream corridors, and (3) create maintenance plans for all stormwater structures in the borough. As stormwater flooding is an acknowledged hazard in the CCRHVA, this sub-element is positioned as a planning instrument addressing the hazard. It does not, however, project stormwater management capacity against the future precipitation intensity projected in Sections III.B and V.A.

Maps V-1, V-2 and Table V-1 show that the Route 23 corridor and the Central Business District (CBD) are both subject to extreme heat and flooding exposure. The Route 23 corridor includes most of the bus stops, charging stations and commercial frontage in Butler, and the CBD includes all of

the emergency shelters, library and several historic properties. This finding is a possible connection that can be incorporated into the special planning considerations element.

Potential Resilience Considerations

- Create an overlay zone adjacent to stream corridors and flood hazard areas, to ensure additional buffering and stormwater management protection measures are in place for those parcels.
- Extend the 2004 Route 23 Highway Commercial Study Area design standards to include heat-mitigation design provisions for the HC Highway Commercial Corridor Zone, aligned with CCRHVA Map V-1.
- For the North Main Street Redevelopment Area, incorporate flood-resilience requirements informed by CCRHVA Tables V-5, V-6 and the finding that community asset parcels are flood-exposed along Butler's local waterways.
- For Central Business District revitalization, incorporate heat-mitigation design provisions consistent with CCRHVA Section V.C's finding that emergency shelters, the library, and historic properties in the central high-heat zone face increased operational strain and weatherization needs.
- Update the Storm Water Regulations sub-element to incorporate Inland Flood Protection Rule, requiring stormwater analysis based on both current and future rainfall.

E. Coordination with Other Planning Programs

The Borough of Butler created a “Coordination with other Planning Programs” master plan element. The intent of this element was for Butler to work collaboratively with other regional planning efforts, specifically outlining planning and development consistencies with adjacent municipalities, Morris County, the State Development and Redevelopment plan, and the Highlands designation. One of the intents of the element is to address coordination, consistency, and integration questions that arise when Butler's hazards do not respect municipal boundaries. Butler’s 2024 master plan reexamination includes a statement on state policy changes and acknowledges that the state Municipal Land Use Law (MLUL) now requires that land use elements include a CCRHVA.

Climate Hazard Connections

This element connects to climate hazards in several ways. The goals related to coordinating with other planning programs revolve around developing with environmental preservation in mind and include a focus on clustered development to ensure more open space is available and is preserved. A specific key alignment is that the Pequannock River boundary with Bloomingdale is presented as a shared hazard vulnerable to flooding. Another is that the Highlands framework

governs regional water supply and therefore connects directly to CCRHVA drought findings. Also, this is the location in the master plan to note alignments between the County HMP regarding identification of climate-related hazards.

However, this element does not outline any inter-municipal coordination effort with adjoining communities specifically on climate resilience or shared-hazard response, for example, related to shared flooding hazards, drought, wind or wildfire risks.

Potential Resilience Considerations

- Ensure that County and Municipal environmental guidance documents are consistent with one another, such as the county master plan and open space plan.
- Initiate inter-municipal coordination with Bloomingdale specifically on Pequannock River flood exposure, building on the 2013 Riverwalk Feasibility Study referenced in the 2015 Reexamination.
- Document that a benefit of Butler's potential conformance with the Highlands Council as a Planning Area is its function as a climate-resilience instrument, aligned with CCRHVA Sections III.C and V findings on drought and water-supply-dependent infrastructure.
- In the next reexamination or update, include the MLUL-required specific policy statement on the consistency, coordination, and integration of the CCRHVA with the County Hazard Mitigation Plan, the Borough's Floodplain Management Plan, the Stormwater Management Plan, and the Emergency Operations Plan.
- In the COP element's discussion of adjoining municipalities, reference for each adjoining community whether its own planning record contains a CCRHVA, whether its hazard profile under climate change overlaps with Butler's, and whether shared hazard infrastructure creates coordination obligations that the current COP element does not address.

F. Circulation Plan

The Borough of Butler's circulation element addresses the coordination of automobile circulation within the borough. The element designates roads as: County Arterial, Primary Borough Roads, Secondary Borough Roads and Local Roads. The element then provides brief recommendations aimed at alleviating traffic congestion, improving traffic safety and improving pedestrian circulation. Key aspects related to climate hazards are the mention of improved stormwater drainage and storm resiliency in the element, limited discussion of public transportation, and the introduction of electric vehicle (EV) infrastructure as a concern (2024 Reexamination).

Climate Hazard Connections

While the connection between climate hazards and the circulation element is generally limited, the element's recommendation to improve six streets for improved stormwater drainage aligns with CCRHVA Section III.B's anticipation of increased extreme precipitation.

Several connections can be made between the circulation element and the CCRHVA including heat, storm, and flooding-related impacts to transportation and pedestrian infrastructure. For example, Map V-1 assesses land surface temperatures alongside bus stops and EV charging locations. In many cases, bus stops are located in areas with a high surface temperature. Future temperature increases can accelerate road degradation and increase public safety risks for pedestrians and transit riders in areas with limited shade. Regarding flooding, Map V-2 and Table V-1 identify several bus stops within the FEMA 1% annual chance flood zone, and the Boonton Avenue Station at Hasbrouck Avenue within the approximate extent of the Inland Flood Protection Rule. Finally, Section III.B and Section V.A document that extreme precipitation events and extreme wind events are linked with increased risk of traffic accidents, road closures, road blockage, pavement buckling, and material erosion, which is not addressed within the circulation element. These vulnerabilities identified in the CCRHVA can be incorporated into the circulation element and its planning recommendations.

Potential Resilience Considerations

- Coordinate with transit agencies to determine feasibility of implementing heat-mitigating shelters at all bus stops along Route 23 and Boonton Avenue.
- Through urban heat island mitigation ordinances and green building codes, promote the usage of cool pavements to lower land surface temperatures.
- Update the Circulation Plan Element's functional classification analysis to incorporate CCRHVA Section V.A hazard exposures by asset type and location.
- In EV charging infrastructure planning, consider exposure to extreme heat when evaluating locations for charging infrastructure.
- Coordinate with Morris County for Boonton Avenue on flood-resilience treatment of the corridor.
- Pursue tree canopy and shade infrastructure investment along the pedestrian circulation routes identified, prioritizing routes connecting residential neighborhoods to schools, parks, and central borough community assets in areas exposed to over 110 °F land surface temperatures (Map V-6).

G. Community Facilities Plan

Butler's community facilities element catalogues all public and semi-public spaces within the borough, dividing these facilities into Public Owned Facilities, Board of Education Facilities and Semi-Public Space. Key aspects related to climate change include the addressing of utility operations within community facilities, water and sewer infrastructure, and its open space analysis. The element emphasizes the need for new recreation facilities, outlining planning for a recreation facility.

Climate Hazard Connections

While the element does not specifically reference climate issues, its asset inventory is consistent with the CCRHVA Section V exposure maps that show community assets and facilities locations in proximity to the FEMA flood zone. Table V-1 shows schools, law enforcement and fire stations located within the FEMA flood zones, and Maps V-6 and V-7 show emergency shelters' proximity to the floodplain and location in high-heat zones. The community facilities element can incorporate the CCRHVA flood exposure and heat exposure analysis for community assets. This can include flood exposure for critical facilities such as the Butler Police Department building on High Street, which is within the approximate extent of the Inland Flood Protection Rule. Emergency response continuity from a flood-exposed police facility is an operational planning concern.

Regarding open space, the acknowledgement of Butler's open space deficit in the community facilities element is connected to the climate-refuge aspects of open space including heat relief, but these functions and resilience strategies related to increased open space are not addressed.

Potential Resilience Considerations

- Conduct facility-by-facility climate exposure assessment for the Borough's public and semi-public facility inventory, working from CCRHVA Section V.A and Section V.C.
- Reframe the element's open space deficit analysis to incorporate the heat-refuge function CCRHVA Section V.C identifies for parks, libraries, and community centers.
- In coordination with Butler Electric Company, incorporate CCRHVA findings for substation exposure to climate hazards.
- Evaluate weatherization-and-cooling capacity of community facilities and incorporate into community facilities element.

H. Utility Plan

The Borough of Butler's utility plan element is short and limited. It explains that while the borough plans to continue maintenance of the borough's water supply and sewage disposal systems, the borough has no plans for utility expansion.

Climate Hazard Connections

There are no mentions of climate hazards in the brief language of the element. The CCRHVA contains utility-relevant findings regarding the climate hazards exposure of water and sewage infrastructure. The 2024 reexamination does reference the state's energy master plan but does not include any plans to align with its goals of clean renewable energy and investment in climate resilient electric grid infrastructure.

Potential Resilience Considerations

- Incorporate CCRHVA utility-relevant findings regarding the climate hazards exposure of water and sewage infrastructure
- Develop a water supply resilience assessment informed by CCRHVA Section III.C drought projections and Section V.D water-access findings for financially constrained households.

I. Recycling Plan

This element outlines compliance with the state recycling laws and also outlines the various recycling programs, ordinances, and goals for the borough. There are currently no aspects related to climate hazards.

Climate Hazard Connections

While there is no connection between Butler's recycling element and the climate hazard findings of the CCRHVA, there are some indirect connections that exist that could be expanded. For example, the recycling collection system operates over climate-exposed roadways that the CCRHVA projects will be subject to increased extreme precipitation, extreme heat, and wind events, which could disrupt collection operations. Further, opportunities exist for the element to connect climate hazards with increased needs for storm debris management and climate-informed management of contaminated commercial and industrial materials handling.

Potential Resilience Considerations

- Add to the recycling plan element a provision addressing storm debris management during and after extreme wind and extreme precipitation events anticipated to increase per CCRHVA Section III.B.
- Add to the recycling plan element a service-continuity provision recognizing that curbside collection operates over the roadway network CCRHVA Section V.A identifies as climate-exposed.
- Frame the Recycling Plan element's climate connection explicitly in the next master plan update, e.g., materials recovery reduces demand for virgin materials and associated energy and emissions, etc.

VII. Coordination with Other Plans

The New Jersey MLUL requires a CCRHVA to include a "policy statement on the consistency, coordination, and integration of the climate change-related hazard vulnerability assessment with any existing or proposed natural hazard mitigation plan, floodplain management plan, comprehensive emergency management plan, emergency response plan, post-disaster recovery plan, or capital improvement plan." This section addresses and expands upon that requirement by analyzing how the hazard exposures identified in Sections III, IV, and V may impact Butler's following plans:

- Morris County Hazard Mitigation Plan (including municipal annex)
- Flood Damage Prevention Code
- Stormwater Management Plan
- Emergency Response Plan
- Capital Improvement Plan

These plans were reviewed and analyzed to identify connections with the current and future climate hazards and exposures identified in this CCRHVA. For each plan, this section includes a summary of relevant findings and potential considerations for Butler to improve resilience to climate-related hazards.

A. 2025 Morris County Hazard Mitigation Plan (HMP) and Borough of Butler Municipal Annex

Every county in New Jersey has a Hazard Mitigation Plan (HMP), which identifies and ranks the potential hazards and vulnerabilities that face the county and outlines goals and mitigation actions. Additionally, HMPs are required in order for counties to qualify for disaster mitigation funding from FEMA. The Morris County HMP is a 2025 update built around five planning goals carried forward unchanged from the 2020 update. The objective of the Morris County HMP that is most relevant to climate change-related hazards is Goal 1: Reduce the impacts of hazards on people, property, the environment and the economy.

The local hazard mitigation annexes contained within the county HMP provide more detail regarding municipality-specific hazard analysis for the jurisdictions within each county. The Butler jurisdictional annex includes an identification and ranking of hazards and risks, and six mitigation actions to achieve a more resilient community. There is no ranking for "climate change" itself — rather, climate change is handled within each hazard profile as a future-conditions subsection. The annex lists six mitigation actions, and three of the six are directly tied to flooding: Action 1 (Home

Elevation/Acquisition for repetitive-loss properties), Action 2 (DPW flood protection — the DPW is in the 1% floodplain), and Action 6 (Update the Flood Damage Prevention Ordinance, which the annex states has not been updated since 1988).

Climate Hazard Connections

Both the HMP and the CCRHVA place flood at the center of Butler's risk profile. The HMP annex, consistent with the CCRHVA analysis, ranks flood High in Table 9, dedicates three of six mitigation actions to flood, and identifies one critical facility (the DPW) as exposed in both the 1% and 0.2% events (Annex Table 8). The HMP and CCRHVA agree that flood threatens critical facilities, although the CCRHVA's catalog of vulnerable properties is more comprehensive because it uses the approximate extent of the Inland Flood Protection Rule. Also, the HMP's repetitive loss focus aligns with the CCRHVA's overburdened-community flood exposure data, both pointing to the fact that targeted, equity-aware acquisition/elevation has measurable beneficiaries. Also, the HMP does not separate flash/stormwater flooding from riverine flooding or connect its flood ranking to Butler's stormwater infrastructure capacity; the CCRHVA gives explicit numerical reasons that this connection should be drawn.

A primary area of misalignment is that climate-change projections rely on statewide or county-scale narratives in the HMP, but they are at the Butler municipal scale in the CCRHVA. This results in a different planning baseline that is not aligned with the updated projections now available in the CCRHVA. This mismatch will, in turn, have direct implications for how existing regulatory tools are evaluated and their adequacy under climate-change projected conditions.

Another area of disagreement is that while the HMP's hazardous-substances climate-change subsection states that there are no impacts from climate change-related to hazardous substance incidents, CCRHVA Section V.A flood findings contradict this, identifying four contaminated sites and 11 industrial parcels within the approximate extent of the Inland Flood Protection Rule. Climate-driven flooding mobilizes stationary contaminants; the HMP's framing of hazardous substances as climate-neutral is not consistent with the CCRHVA evidence.

Regarding heat, extreme heat is ranked as a Moderate hazard in the HMP, but the CCRHVA's heat findings are extensive. The Butler annex contains no mitigation action addressing heat. CCRHVA Maps V-10 and V-11 document that Butler's eastern and southern residential zones experience land surface temperatures between 100 and 110 °F in summer, and that one of Butler's census block groups classified as an Overburdened Community has elevated heat-island risk.

Generally, Overburdened Communities (OBC) framing is absent from the HMP. Using a "vulnerable populations" framing (children, elderly, low-income, persons with disabilities; Base Plan §2.3.1), the HMP does not identify specific geographies, while the CCRHVA's OBC analysis finds one of Butler's census block groups in the northeast qualifying as an OBC (CCRHVA Section V.D and CCRHVA Table V-6).

Finally, the HMP Butler annex's six mitigation actions do not include any action targeting natural-lands exposure to climate-related hazards, or any actions to mitigate wildfire or drought.

Potential Resilience Considerations

- Formally adopt the CCRHVA and re-baseline Butler's per-hazard Climate Change subsections (or annex equivalent) on Butler-specific CCRHVA Tables III-1, III-2, III-4, III-5, and III-6 projections.
- Add a new Butler mitigation action for hazardous substance flood mobilization.
- Add a Butler mitigation action for heat — at minimum a cooling-center and heat-island plan focused on the eastern/southern residential zones and the OBC census block group with elevated impervious cover and heat-island risk.
- In the next HMP update, separate stormwater/flash flooding from riverine flooding in Butler's annex hazard analysis, tie it explicitly to CCRHVA Table III-4 rainfall intensity projections, and extend the analysis to include the natural and working lands findings in CCRHVA Section V.B.
- Add Overburdened Community analysis to the Butler annex's vulnerability assessment, using CCRHVA Table V-6 and Table V-8 data, and require future Butler mitigation actions to identify any OBC-targeting benefit.
- Update Annex Action 1 (Home Elevation/Acquisition) to specifically prioritize the residential and apartment parcels within the FEMA 1% annual chance flood zone and the approximate extent of the Inland Flood Protection Rule identified in CCRHVA Table V-7.

B. Butler Flood Damage Prevention Code

The borough does not have a specific floodplain ordinance nor a floodplain management plan. However, the borough addresses floodplain and the associated issues of flooding in Butler Code Chapter 124, Flood Damage Prevention (adopted 2025, replacing 1988 ordinance). The Flood Damage Prevention Code (FDPC) describes how the borough handles approvals for new development and existing construction within the floodplain. Its content is relevant to climate-related hazards because it maps a flood hazard area, establishes a design elevation standard to which new construction or substantially improved buildings must be elevated, and sets activity restrictions in flood-prone areas.

Climate Hazard Connections

Butler’s FDPC is directly tied to climate hazards, as flooding is a direct climate hazard. Maps III-3 and III-5 identify and assess the FEMA flood areas within the borough, and the geography of the floodplain described in the Butler FDPC matches generally well with CCRHVA maps of the flood hazard in Butler.

One strong connection is that by prohibiting development in riparian zones without an NJDEP permit, the FDPC provides a regulatory mechanism that protects the natural-lands exposure shown in the CCRHVA. Another specific area of alignment is that hazardous substance storage in flood hazard areas is recognized as a concern and regulated in the FDPC. It prohibits the

placement or storage of containers holding hazardous substances in a flood hazard area unless state provisions are met. This supports the CCRHVA's finding that contaminated sites and industrial parcels are within the approximate extent of the Inland Flood Protection Rule and are at risk (CCRHVA Table V-2). However, the hazardous-substance prohibition addresses new placement and storage, but does not address legacy facilities, while the CCRHVA documents flooding exposure on contaminated and industrial facilities that is not addressed by the FDPC.

The most important misalignment is that the +1 ft general freeboard standard in the FDPC is below the CCRHVA's standard of the Inland Flood Protection Rule. CCRHVA Tables V-1, V-3, V-5, V-6, V-8, and V-9 all consistently report exposure in this scenario as the policy-relevant future condition that should be applied to development with a 50–75-year design life. The flooding ordinance contains no future-conditions or climate-projection standard, while the CCRHVA Tables III-1 through III-6 provide Butler-specific projections for rainfall intensity and storm frequency.

The CCRHVA Section III.D finds that Butler flooding is driven in part by "stormwater infrastructure overwhelmed by extreme precipitation," but the FDPC does not address stormwater management capacity.

Finally, the ordinance contains no reference to overburdened communities, while the CCRHVA Section V.D documents OBC flood exposure.

Potential Resilience Considerations

- Adopt a +3 ft freeboard standard for general development in delineated watercourse flood hazard areas, mirroring the NJDEP Inland Flood Protection Rule's scope and aligning the regulatory baseline with the CCRHVA's exposure analysis.
- Add a future-conditions reference standard to §124-12, allowing the Floodplain Administrator to apply the higher of (a) the LDFE as currently defined or (b) an elevation derived from CCRHVA Table III-4 late-century projections where the applicant proposes a development with a design life of 50 years or greater.
- Amend §124-61 to require flood preparedness and source-control plans for existing facilities holding hazardous substances within the approximate extent of the Inland Flood Protection Rule, with an implementation schedule.
- Add an Overburdened Community variance criterion to §124-45 and a notice-and-engagement requirement to §124-29 for development applications in or affecting the OBC census block group identified in CCRHVA Section V.D Map V-9.
- Codify the §124-11 mapping basis hierarchy with a periodic review requirement, requiring the Floodplain Administrator to review the Best Available Flood Hazard Data Area at least every five years, on a schedule coordinated with the HMP annex update cycle and the CCRHVA update cycle.

C. Stormwater Management Plan/Ordinance

The Borough has both a stormwater management plan (SWMP) and a stormwater management ordinance, which was approved by Morris County. The 2007 SWMP fulfills Butler's obligations under state stormwater rules, and it established the standards to be applied to major developments through the Stormwater Control Ordinance. The plan locates and highlights local waterway health, flooding, geology, and watersheds, followed by detailed stormwater design recommendations. The SWMP goals most related to climate-related hazards are those related to reducing flood damage, minimizing stormwater runoff, and maintaining groundwater recharge. The 2-, 10-, and 100-year storm definitions are not internally specified in the plan — they are imported from N.J.A.C. 7:8 Subchapter 5, which references the historical rainfall record then in use.

Climate Hazard Connections

The SWMP's regulatory geography and the CCRHVA's exposure geography agree. This includes the SWMP's 300-foot Category One buffer along the Pequannock River matching precisely the same geography that CCRHVA Section V.B identifies as the principal location of flood-exposed wetland and forest in Butler. The two documents also agree on nonstructural approaches to stormwater management.

The SWMP connects directly and is consistent with the CCRHVA's projected increases in drought time because it requires major developments to maintain groundwater recharge to preserve base-flow capacity. The SWMP also identifies that the high temperature of runoff entering waterways can impair water quality, consistent with the CCRHVA's framing of this problem that climate change will intensify.

The primary gap in connecting to climate hazards is that the SWMP uses a historical basis for its design storm baselines, while the CCRHVA's projections are forward-looking. This could result in the SWMP's compliance alternatives being inadequate to manage stormwater under climate change-informed projections.

Finally, the SWMP does not contain enhanced-review procedures for development affecting OBCs and does not include OBC geography as a stormwater design criterion.

Potential Resilience Considerations

- Update the SWMP's stormwater quantity standards to require a future-conditions analysis using CCRHVA Table III-4 late-century projections as the design basis for major development with a design life of 50 years or greater, in addition to the existing historical-baseline standards.
- Add a "Future Conditions and Climate Hazards" subsection to the SWMP Background section, summarizing the Butler-specific CCRHVA Section III findings most relevant to stormwater management.

- Adopt an overlay designation for major development applications within or upstream of the Overburdened Community census block group identified in the CCRHVA, with enhanced TSS-removal, nutrient-control, and runoff-rate requirements within the overlay.
- Replace the SWMP's build-out analysis (currently inherited from the 2004 Master Plan) with the build-out analysis from the CCRHVA Section IV when finalized.
- Add explicit heat-island co-benefit criteria to the SWMP's Nonstructural Stormwater Management Strategies section.
- Update the SWMP to reference and align with CCRHVA findings, and also the post-2007 New Jersey statutory and regulatory developments that have superseded or supplemented its 2006/2007 framework.

D. Emergency Response and Operations Plan

Butler's 2025 Emergency Response Plan (ERP) is a short operational document that outlines how local emergency services should handle certain emergency incidents. The ERP is a public-facing summary of coordinated response by Police, Fire, EMS, and the Tri-Boro First Aid Squad. This analysis also includes the Butler responses to the Rutgers EOP questionnaire, completed in 2025.

The content most relevant to climate-related hazards is the framework for Preparedness, Response, Recovery, and Mitigation with stated goals to: "Reduce adverse effects on people, property, and the environment" and to "Ensure equitable delivery of emergency services to all populations." While it does not specifically include climate change-related hazards in its functional annex, it incorporates hazard rankings from the Morris County HMP and also recognizes hurricanes, tornadoes, earthquakes, and wildfires as natural disaster incidents.

Climate Hazard Connections

The ERP Annexes H (Evacuation) and R (Shelter Reception and Care) establish a framework for sheltering Butler residents displaced by flood, storms, or other hazards. However, the plans do not identify the emergency shelter that the CCRHVA Section V.C shows as flood-exposed, or what backup capacity exists if the exposed shelter is unavailable during a flood event. Likewise, contingency planning for a flood-exposed police station is not addressed in the Continuity of Operations procedures.

Although the ERP and EOP do not explicitly mention heat hazards, the public-health coordination structure outlined could be applied to the projected medical demands associated with increasing temperatures, as emphasized in CCRHVA Section V.A. However, it is worth noting that a heat wave reaching the projected late-century maximum duration (20.5 days per CCRHVA Table III-1) or a coincident severe-weather event could affect multiple municipalities served by the same regional health department, creating a resource-scarcity constraint at the regional level that no individual municipality controls.

A notable misalignment is that “flood” is ranked as a Low Risk in the EOP, contradicting both the HMP and the CCRHVA. The EOP's hazard-ranking statement is either inaccurate, or it reflects a different analytical judgment. Further, there is no functional and hazard annex dedicated to flood, though one is strongly supported by Butler’s CCRHVA-documented exposure to climate change-related flooding hazards and by flood being ranked High in the HMP. The public ERP §IV (Natural Disasters) enumerates Hurricanes, Tornadoes, Earthquakes, and Wildfires — and does not list flood.

Likewise, there is no heat-dedicated annex despite CCRHVA Section V.A and V.D heat findings. The CCRHVA Section V.A heat narrative places heat-driven medical demand at the center of facility-and-infrastructure exposure. The cooling-center activation, mobile cooling, and heat-driven medical mobilization would presumably operate through Annex G (EMS), Annex M (Public Health), and Annex R (Shelter), but a dedicated heat protocol would ensure an operational structure that could handle the increased severity and duration of heat waves projected through the end of the century.

Finally, the EOP and the ERP both mention differential vulnerability and are consistent with the CCRHVA's OBC framing. However, the EOP states a general equity objective but does not reference the specific census block group in the northeast of Butler identified in CCRHVA Section V.D Map V-9 as an Overburdened Community that is exposed under the Inland Flood Protection Rule. Operationally, this means alert and warning (Annex A), evacuation (Annex H), shelter reception (Annex R), and social services (Annex S) procedures do not have OBC-specific geographic targeting.

Potential Resilience Considerations

- Add a dedicated Flood Annex to the ERP to consolidate flood-specific procedures into a single operational instrument.
- Add a dedicated Extreme Heat Annex to the ERP, addressing cooling-center activation, mobile cooling, vulnerable-population outreach, and heat-driven medical mobilization.
- Revise the public-facing ERP to include flood as a Natural Disaster type in §IV.A, structurally parallel to the existing Hurricanes, Tornadoes, Earthquakes, and Wildfires entries.
- Incorporate the CCRHVA Section V.D Overburdened Community geography into Annex A (Alert/Warning/Communications), Annex H (Evacuation), Annex R (Shelter Reception and Care), and Annex S (Social Services) procedures.
- Update Annex J (HazMat) to specifically address flood-mobilization of contaminants from the four sites identified in CCRHVA Section V.A.

- Verify the operational status of the one emergency shelter exposed in both the FEMA 1% annual chance flood zone and the approximate extent of the Inland Flood Protection Rule (CCRHVA Table V-4), and either (a) relocate the shelter designation to an unexposed facility, (b) implement flood-proofing sufficient to maintain operability through a major flood event, or (c) document the operational protocol for activating backup shelter capacity if the exposed shelter is unavailable.

E. Capital Improvement Plan

The capital budget and capital improvement plan (CIP) is a planning document that outlines new funding for the Police and Fire departments and various infrastructure and utility upgrades and maintenance over the period 2025–2027. It covers 15 projects intended as responsive to community needs and has no narrative rationale and no climate or hazard framing.

Climate Hazard Connections

The capital improvement plan makes no direct mention of any climate-related hazard, but much of the investment included in the CIP is directly relevant to CCRHVA findings and potentially addresses climate-driven needs. The water utility investment, the largest single capital project, is responsive to CCRHVA projections and findings on drought that emphasize increased water demand and stress on water-supply infrastructure. It is not, however, described in the CIP in terms of its connection to climate-related hazards.

Road improvements are directionally aligned with CCRHVA Section V.A transit/transportation findings, but it is unclear whether the investments are allocated to addressing specific flood-related exposures. CCRHVA Section V.A identifies that two of Butler's 16 public transit stations are within the FEMA 1% annual chance flood zone and three are within the approximate extent of the Inland Flood Protection Rule, and that the New York, Susquehanna and Western Railway corridor in the north of Butler is flood exposed.

In addition to the listed projects, there are a number of gaps that could be addressed to align investments more closely with climate-related hazards facing Butler:

- No project line is specifically designated for stormwater capacity, flood mitigation, or floodplain infrastructure.
- No project line is specifically designated for cooling centers, heat-island mitigation, or extreme-heat preparedness, despite the CCRHVA's documentation of Butler's projected increase from 0 to +8 days above 95 °F by 2090, and specific areas designated with elevated heat-island risk.
- No project line is specifically designated for OBC infrastructure investment to address flood exposure.

- The CIP contains no public infrastructure investment that would reduce contaminant-mobilization risk at the four sites identified within the CCRHVA as within the FEMA 1% + 3 ft flood zone.

- Another gap is that the Recreation Improvements line is undersized relative to natural-infrastructure opportunities for flood-buffering and heat-mitigation benefits.

Potential Resilience Considerations

- Add a climate-resilience rationale field to each project line in the CIP narrative. A rationale field at the project level (a single sentence per project, no separate document required) would align the investment with grant applications that increasingly require climate-resilience rationale.

- Add a programmed project line for stormwater capacity upgrades and flood mitigation infrastructure in the next CIP cycle, as informed by CCRHVA findings and projections.

- Add a programmed project line for cooling-center infrastructure and heat-island mitigation, informed by CCRHVA Section III.A. Capital investments could include: backup power and air conditioning capacity at one or more designated cooling centers; urban tree canopy investment in the eastern/southern residential zones and the OBC census block group; permeable pavement and bioswale investment with stormwater co-benefits.

- Designate a programmed project line for OBC infrastructure investment, making the equity dimension visible in the budgeting process.

- For building and road improvements, specify in each project's CIP description whether and how much is allocated to flood exposure and to evacuation. An allocation note converts a non-specific line into one aligned with climate-related hazards.

- Add a project line for public-infrastructure investment supporting flood-mobilization-of-contaminants risk reduction at the four exposed sites identified in CCRHVA Section V.A. The investments could include: upstream stormwater controls limiting runoff loading at these sites; downstream water-quality monitoring infrastructure; access easements for emergency containment; bioswales or constructed wetlands as natural-infrastructure filtration.

- Reframe the Recreation Improvements line as a "Recreation and Natural Infrastructure" line, with scope expansion to include the Pequannock River and Stone House Brook corridors as flood-buffering and heat-mitigating natural infrastructure per CCRHVA Section V.B.

VIII. Appendices

Appendix A: Description of Borough of Butler

The Borough of Butler (henceforth, "Butler") is located in Morris County, New Jersey. It is nestled between the Morris County municipalities of Kinnelon to the west, Pequannock to the south, and Riverdale to the east, with Passaic County municipalities of Bloomingdale and West Milford bordering it to the north. The borough spans 2.089 square miles and is almost entirely developed with most of its land use devoted to residential single-family detached structures. Butler also has two centralized commercial districts along State Route 23 and Main Street. Approximately 2.53% of its land is covered by water.[52] Major bodies of water include the Pequannock River along the northern boundary, Terrace Lake, and Stone House Brook, which branches throughout the center of the borough and connects to the Pequannock River. Map A-1 depicts Butler's location.

[52] DMA 2000 Hazard Mitigation Plan Update – Morris County, New Jersey (July 2020).

Map A-1. Borough of Butler



LEGEND

NJ

Butler Borough

Municipal Boundaries

Originally known as West Bloomingdale, Butler was incorporated as a borough by the New Jersey Legislature on March 13, 1901. Like many municipalities of its era, Butler transitioned from a primarily farming community to an industrial hub. Its abundant water resources, particularly the Pequannock River, attracted manufacturers in the late 1800s. Notable companies such as the Pequannock Valley Paper Company and the Newbrough Hard Rubber Company played a major role in the borough's economic growth. In 1881, the community was renamed Butler in honor of Richard Butler, owner of the Hard Rubber Company. The arrival of the New Jersey Midland Railroad in 1871 further spurred development, making Butler a key transportation and manufacturing center. Over time, the borough evolved from an industrial base to a suburban community, characterized largely by single-family homes. Since 1958, vacant land availability has sharply declined, and by 2020, approximately 99% of the borough was built out, reflecting its full transition to a residential suburb. Butler also retains cultural ties to its industrial past through historic sites and local organizations, including Tri-Boro community groups that foster regional identity.

Demographics

According to the 2023 American Community Survey,[53] Butler's residential population is 8,072. The population density is approximately 3,965 people per square mile. Table A-1 includes detailed demographic information for Butler.

Table A-1. Demographic data for Butler Borough, Morris County, New Jersey

	NJ	County	Borough
Total Population	9,267,014	510,375	8,072
Population Density	1,260 people/sq mile	1,107 people/sq mile	3,965 people/sq mile
Population change (2020 to 2023)	+381,596	+17,660	+403
Median age	40.1	42.7	40.9
Population below 18	2,031,322	106,161	1,398
Population above 65	1,599,816	90,759	1,219
Median Household Income	$101,050	$134,929	$110,375
Persons in poverty	889,287	25,600	755

[53] U.S. Census Bureau. 2023. American Community Survey Five Year Estimates. Via https://datausa.io/profile/geo/butler-nj

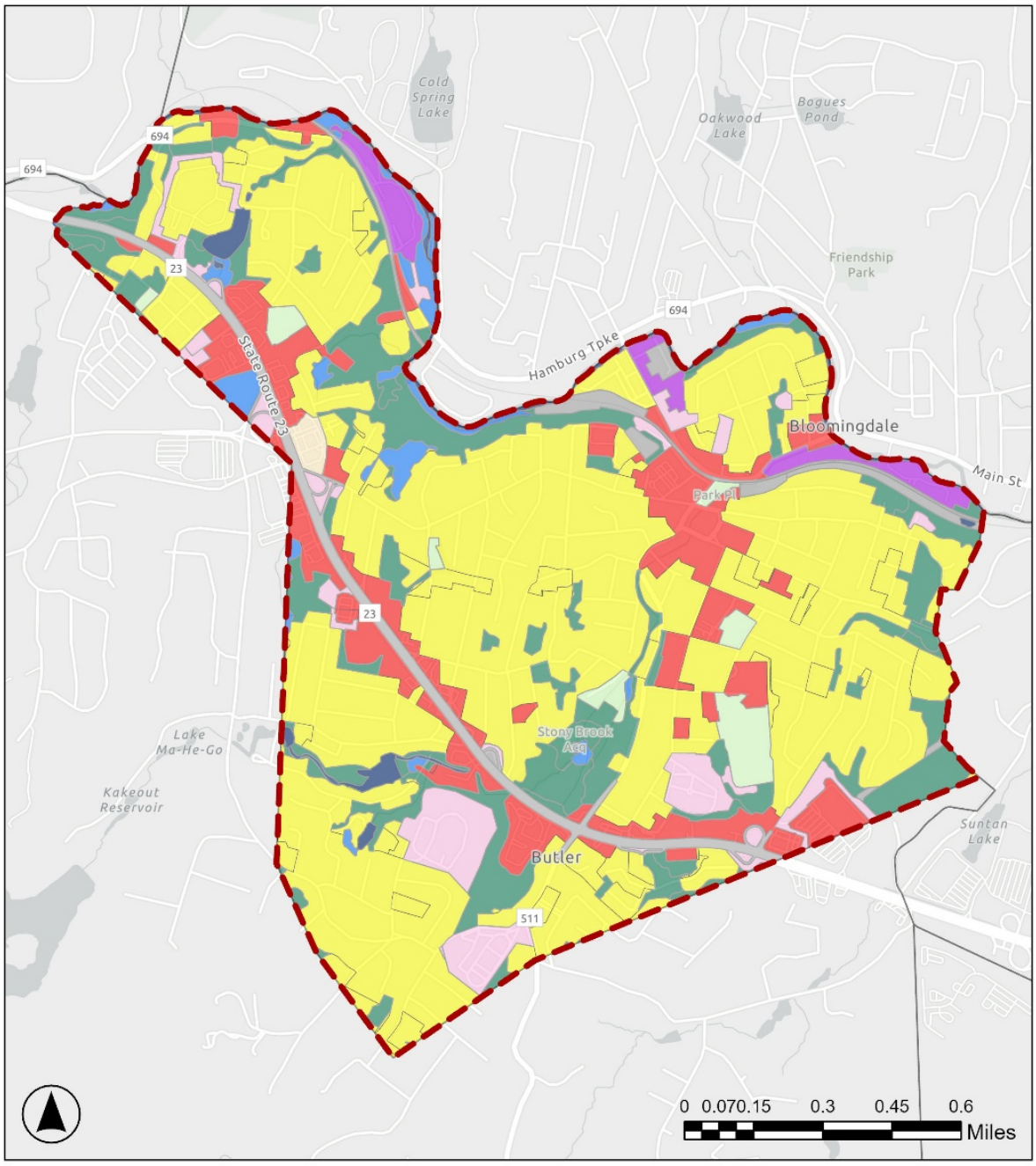
Land Uses

Butler is a suburban borough and one of the smallest among Morris County's 39 municipalities. More than half of its land area is dedicated to residential use, which is dispersed throughout the borough. Commercial and business uses are also prevalent, particularly along New Jersey State Route 23 and Main Street — two distinct commercial districts. Main Street has a historic character, featuring older businesses, some industrial uses, and retail shops with residential units above the first floor. In contrast, Route 23 is dominated by drive-by, chain-style retail establishments.[54] Other significant land uses include roads and rail. State Route 23 serves as Butler's main artery, traversing the borough from north to south and extending from Port Jervis, New York, to Verona in Essex County, New Jersey. Interstate 287 and County Route 511 also intersect or lie nearby, providing regional connectivity. While Butler currently lacks passenger rail stations, the New York, Susquehanna & Western Railway freight line passes through the borough.[55] NJ Transit bus service is the primary form of public transit in the borough with a direct route to the Port Authority Bus Terminal in New York City. Map A-2 depicts Butler's land use-land cover. Table A-2 and Map A-3 detail property parcels and classes.

[54] Borough of Butler Master Plan (August 2004).

[55] Borough of Butler, New Jersey. (2015). Master Plan Reexamination.

Map A-2. Land Use-Land Cover (2020)



LEGEND

Land Use Land Cover 2020

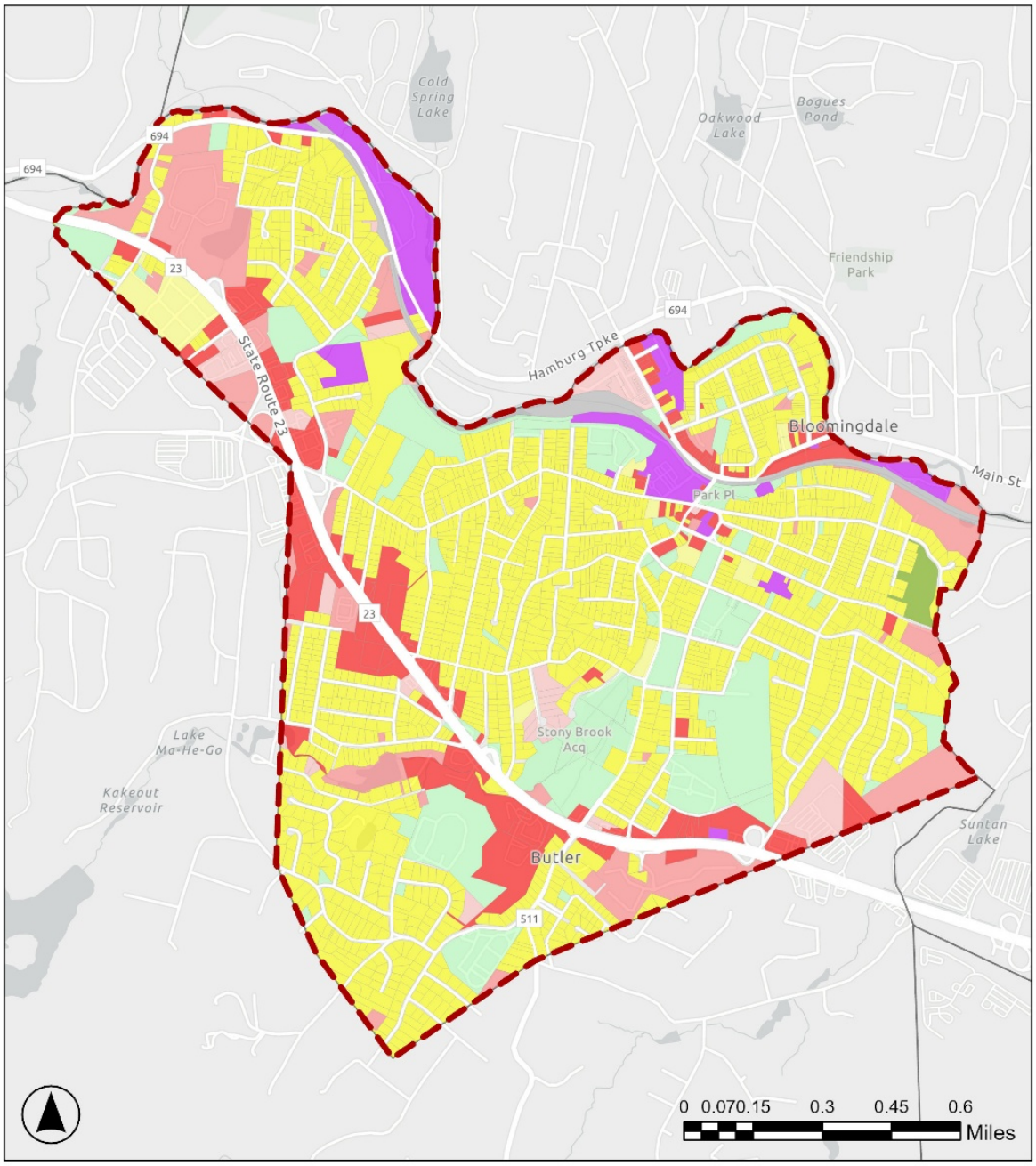
- Residential
- Commercial
- Industrail and Commercial
- Industrial
- Mixed or Other Urban
- Transportation, Communication and Utilities
- Recreational
- Agricultural
- Forestland
- Water
- Wetlands
- Barren Lands

Table A-2. Butler parcels by property class

Property Class	Number of Parcels	Area in acres
Residential (2)	2,176	606
Apartments (4C)	14	22
Commercial (4A)	155	112
Industrial (4B)	16	47
Education (15A and 15B)	6	34
Public Property (15C)	40	50
Church and Charitable (15D)	9	12
Cemeteries (15E)	5	40
Farmlands (3A and 3B)	1	6
Transportation (5A and 5B)	5	20
Other Exempt (15F)	23	32
Vacant Land (1)	51	113
Unclassified Land	52	39
Total	**2,553**	**1,134**

(Source: Parcels and MOD-IV Composite of NJ)

Map A-3. Borough of Butler parcels and property classes



LEGEND

Parcels by Property Class

- Residential
- Apartments
- Commercial
- Industrial
- Farm
- Schools and Other Public Property
- Railroad Property
- Vacant
- No Value

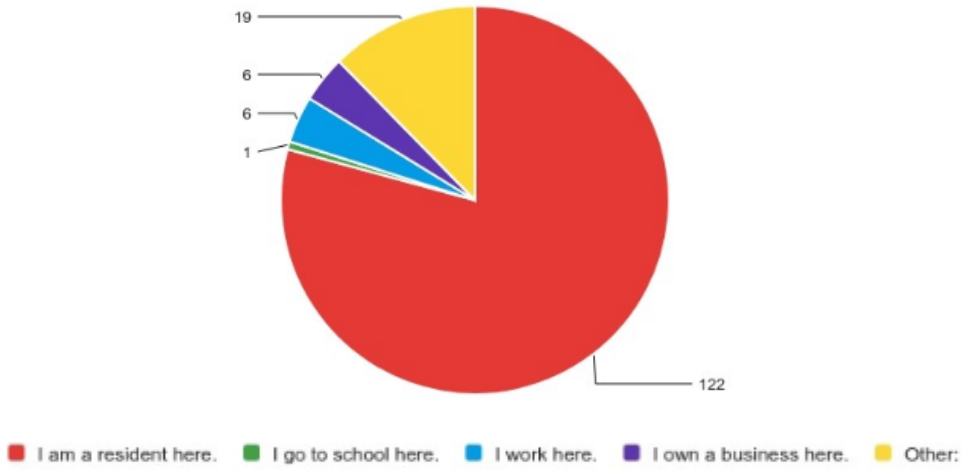
(Source: Parcels and MOD IV Composite of NJ)

Appendix B: Public Engagement Summary

The borough advertised the CCRHVA public engagement opportunities through its municipal website and email starting on March 17, 2026. The in-person meeting was held on April 16, 2026, at borough hall. The meeting included a brief presentation by Rutgers to explain the overall CCRHVA project (process, goals, etc.) and an overview of hazard assessment findings, followed by participants visiting "stations" with large, printed maps to share locations and experiences with flooding, community assets, other climate hazards (heat, wind, drought, wildfire), and any other questions or concerns. The online survey was designed to replicate the opportunities for input provided at the in-person meeting. To this end, respondents were asked to mark digital maps and provide details about the locations of climate hazards and community assets. The survey was open for five weeks from March 17 to April 25, 2026, and had 141 responses. Input from the in-person meeting and the survey was used to refine the hazard analyses and maps in Sections III and V.

Q1 – How would you describe your relation to Butler Borough? Select all that apply. - Selected Choice

141 Responses



Q1_5 Other: - Text

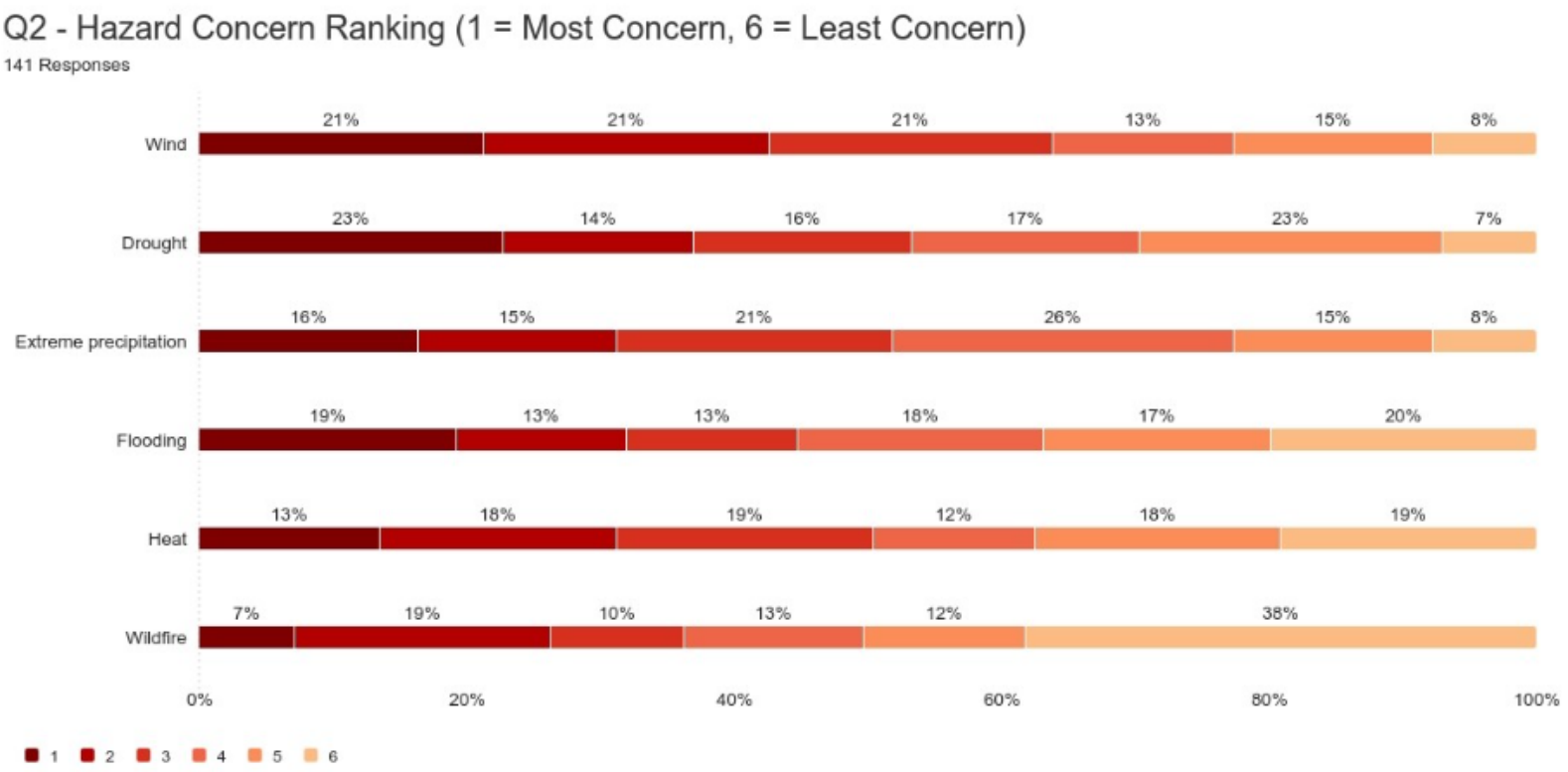
Other: - Text
Kids went to high school here
Student in BHS
We share a school district
Live in Kinnelon. Butler Electric is my Electric Co.
We use their water services in Riverdale
Live in Kinnelon, neighboring town
I went to high school here and now I live in the next town
I live in Kinnelon
My children go to school here.
Kinnelon
My kids attend school here
Nextdoor Borough
Live nearby
Live in Kinnelon but Butler Electric supplies our electricity
Neighboring town

Q2 - Rank each hazard according to your level of personal concern for Butler Borough, with 1 being the most concern and 6 being the least concern.

Note: Lower average rank indicates greater level of personal concern.

Rank	Hazard	Average Rank
1	Wind	3.03
2	Drought	3.24
3	Extreme Precipitation	3.31
4	Flooding	3.61
5	Heat	3.62
6	Wildfire	4.19

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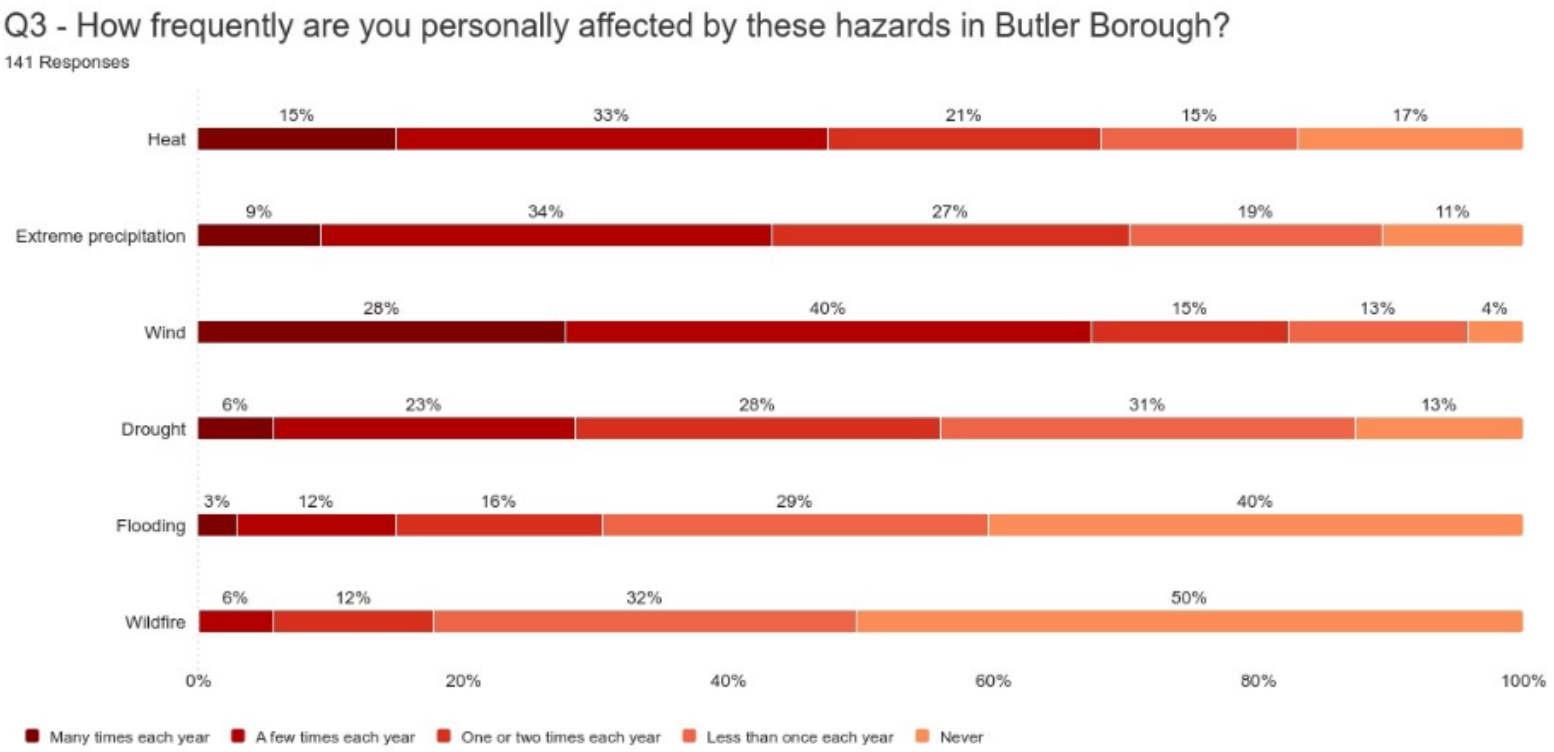

Q2 - Hazard Concern Ranking (1 = Most Concern, 6 = Least Concern)
141 Responses
Wind
21%
21%
21%
13%
15%
8%
Drought
23%
14%
16%
17%
23%
7%
Extreme precipitation
16%
15%
21%
26%
15%
8%
Flooding
19%
13%
13%
18%
17%
20%
Heat
13%
18%
19%
12%
18%
19%
Wildfire
7%
19%
10%
13%
12%
38%
0%
20%
40%
60%
80%
100%
1
2
3
4
5
6

Q3 – How frequently are you personally affected by these hazards in Butler Borough?

Note: Higher average indicates more frequently impacted. (Scale: Many times each year=5, A few times each year=4, 1 or 2 times each year=3, Less than once each year=2, Never=1).

Rank	Hazard	Average
1	Wind	3.73
2	Heat	3.13
3	Extreme precipitation	3.12
4	Drought	2.77
5	Flooding	2.08
6	Wildfire	1.73

Continued on next page


Q3 - How frequently are you personally affected by these hazards in Butler Borough?
141 Responses
Heat
15%
33%
21%
15%
17%
Extreme precipitation
9%
34%
27%
19%
11%
Wind
28%
40%
15%
13%
4%
Drought
6%
23%
28%
31%
13%
Flooding
3%
12%
16%
29%
40%
Wildfire
6%
12%
32%
50%
0%
20%
40%
60%
80%
100%
Many times each year
A few times each year
One or two times each year
Less than once each year
Never

Q4 - Please share details below about up to three important places in Butler Borough. The CCRHVA will recommend ways to protect the places most important to the community.

(Examples include recreational facilities, entertainment venues, museums, shops, places of worship, etc. We have already identified government facilities like schools and fire stations, so there is no need to share those.)

Please include:

- Place name
- Address or description of location
- Why it's important

Note: Responses to Q4 were categorized and added to the community assets maps in Section V.C.

Doyle's Pour House
Basketball Court
Butler Park
Stonybrook
Main Street Businesses / Stores
Stonybrook Woods
St. Anthony's Church / St. Anthony of Padua Church
Park on Main Street / Downtown Park
Wawa
Stony Brook Park
Stony Brook Town Pool / Swim Club / Pool
Meadtown Shopping Center
Places of Worship (general)
Butler Museum
Old Butler Rubber Plant / Rubber Mill / Factory Buildings

Continued on next page

Butler Library / Public Library
Gas Stations / Rt 23 Gas Station Corridor
Community Pool
Home Depot
Lowe's
Walmart
Police Building / Police Station
School Track
Butler Forest Reserve / Preserve
Playground near Library
Tri-Boro Ambulance / First Aid Squad
Borough Clerk / Borough Hall / Municipal Building / Town Hall
Stonybrook Trail
CityMD
Post Office
Butler Electric Supply Yard / Substation
Church of the Nazarene
Woods between Belleview & Carey Ave
QuickChek
Cemeteries / Manning St Cemetery
Stone House Brook
Fire Station
DPW Garage
Saint Anthony's School
SoulJourney Store
Butler Schools
CVS Pharmacy
Historic Police Building
Butler Methodist Church

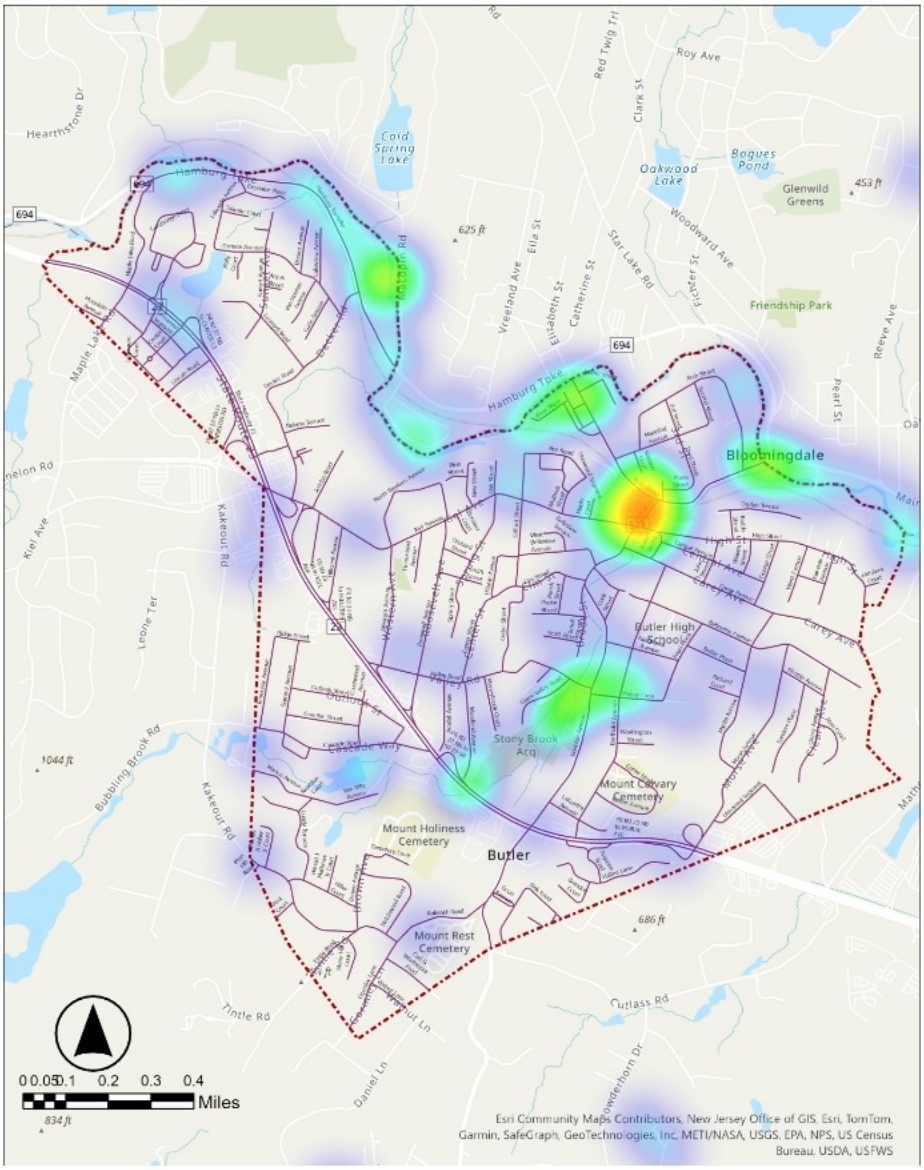
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Carey Avenue
Butler Knights of Columbus
Butler School Sports Field
Church of the Nazarene Pantry
Smith Field
Kinnelon High School
Park at Western & Kiel Ave

Q5 - Click on the map below to add locations where you have observed flooding in Butler Town.

Note: The heat map colors represent the concentration of points added to the map in a location with highest concentration=yellow/red, medium-high=green, medium-low=light blue, lowest=purple.

Q5 - Heat Map



LEGEND
Concentration of flooding locations

Low----------Medium----------High

Q6 - Please share details about each location you added to the map, including:

- **Names of flooded roads, intersections, and/or neighborhoods,**
- **How often it floods**
- **Causes of flooding (high tide, rain, storm surge)**
- **Damage or effects**

Note: Responses to Q6 were used to refine the flood map(s) in Section III. Stormwater flooding locations were added to Map III-4.

Q7-Q10 - If you have experienced any of the climate hazards below [heat, wind, drought, wildfire] in Butler Town, please share details about the event(s) including:

- **Approximate location, if applicable**
- **Year (and month/season, if known) of event(s)**
- **Observed impacts**

Heat
Throughout the summer. Not enough tree covered areas
There have been a few summers where the heat index remained the same for an entire summer with approximately 2 rainstorms throughout the entire season. It was hard to keep up with landscaping, flowers, grass and shrubs as the heat was drying up all the foliage. I had to be mindful not to use too much water, as the wells were extremely low and causing our running water to weaken.
Excessive heat causes power outages and noise pollution and heat from central air conditioning units
Some very hot days in July/august
Extreme heat…within last 10 yrs.
Last 5 years have been crazy hot
June, July, August—all Platanus die-hard—hard to be outside- causes sinus issues

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No where
Heat waves more often
Rare
Excessive heat for several days each summer. Moved to Butler in 2022.
Butler Borough (residential areas and parks), Summers 2022–2024. Repeated heat waves with high humidity created unsafe outdoor conditions, especially for vulnerable populations. Impacts included increased reliance on air conditioning, higher utility costs, disruption to daily routines, and limited outdoor activity.
Increase length and intensity of heat over the last several years.
Summer months
Summer
Summers recently have had 100+ days
none
I experience extreme heat, coupled with high humidity every summer. From about early July through late August
JCPL main electric supply line in Kinnelon
Summer (July) excessive high temperatures Elderly people succumbing to the heat need medical attention.
it got hot in the summer (July 2025)
summer
Housing is old…when it gets really hot, the air conditioning can't keep up and could affect power grids because they are running on high all day to maintain a decent temperature inside.
Summer months
Summertime. 1 or 2 weeks. Maybe a power outage. Brief
June-July 2025
We've had very hot summers.
Every summer we get a few heat waves causing drought conditions and impacting water use.
Heat waves have caused transformer failure, resulting in power outage during heat waves. I believe this has happened 1-2 times in our 3 summers living here so far. Butler Electric is very responsive and resolves within a few hours.
Occurs every year during the summer but other than alerts to stay indoors on some days, nothing bad happens.

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It has been hot, but it is the summer, unless the power failed, I was okay.
The house gets hot in the summer.
Working outside experiencing heat. Effect on Lawn and plants.
With elevated temperature and water restrictions, the flower garden withers away along with the lawns.
Summers can get very hot here and in combination with the humidity, can be dangerous to segments of the population. (Elderly, sick, etc.)

Wind
High wind is frequent
Trees fell near our home- 10/25
Many trees are older and are at risk of breaking damage to homes and cars.
Trees across roads and take down of power lines...all different places
Fallen trees
Kinnelon's tall oaks, and the mountainous terrain tends to produce whipping winds, especially after heavy rainstorms or ice storms. I've seen many trees fall onto residences and roads. Very scary to drive through during extreme weather.
Trees falling at 155 Kiel Avenue Crushed my neighbor's car. Crushed my shrubbery. Those trees were completely removed.
Wind damages roofing
Strong winds during storms throughout the year
The wind is getting stronger.... within the last 20 yrs.
The last few years we have noticed a dramatic increase in the amount of wind we receive
All year round, severe with storms in Butler Heights. Beyond the bed with windows shake the trees, etc.
No location
Super storm Sandy but also winds seem to be increasing each year
Wind comes up westwards into higher elevations.
Multiple high wind events. Trees and many branches down. Downed utility wires.
Butler Borough (throughout town) has experienced multiple events, including severe storms in 2020–2024 (including remnants of hurricanes/tropical storms). Strong wind gusts caused downed trees and power lines, property damage, and power outages lasting hours to multiple days. Road closures and safety hazards were common during these events.

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Increase in high wind events over the last several years.
3/16-3/17/26
Any time
Late fall has had high days
Adalist Ave. 2024 We have lost several large trees during high wind events
occasional
I live at the top of the hill, so that might make a difference. dangerous winds in hurricane season as well as some early spring winds.
Van Houten Ave - large pine tree downed - couple of years ago
Winter
Trees or their branches have fell in my yard and other places as well
All year, randomly
Minor. Mostly a wooded and hilled area. Tree damage
April 7, 2026
Wind damage of items and structures in my back yard on 3rd st. Has happened fall and spring for the past few years.
Wind damage and hurricanes over the past 15 years
More frequent high winds cause fallen tree branches and damaged fences, roofs, etc.
There is frequently extreme wind (possibly because we live in "Butler Heights") that makes me anxious about the potential for downed trees. I don't believe our area has directly been affected by wind-related power failures in the last 3 years. Separately, there have been several instances (only one that I'm aware of while we lived here in the past 3 years, but we are aware this has occurred previously) in which high winds related to compounding conditions (possibly lower reservoir levels, I can't recall) led to a boil water notice due to higher turbidity (I think, need to confirm) in the reservoir.
A few times a year - high winds cause trees to fall in random places around town. Had one in the backyard on Maple Lake Road during the last windstorm in March.
My house
It’s windy a lot recently
Only during bad storms or actual hurricanes was it dangerous
Tree branches falling and damaging the shed. Terrace Ave.
A few times a year the wind blows so hard that I think it will damage my home. I wish I could measure how hard it blows from Kinnelon (downhill) into Butler.

Continued on next page

High winds have taken down trees and caused damage to property/houses. Powerlines come down leaving people without power. No dates come to mind, but it happens at least yearly.
Center Street. Summer storms with strong wind brings don trees

Drought
Some homes still have well water that is suspectable. The reservoirs are chronically low.
Lower water levels in Pequannock Dried grass and timber in wooded areas that would lead to fire hazard. Behind Arch Street residences
A few summers where water was running very slowly due to no precipitation occurred for months. Landscaping was ruined and hard to keep up with water.
Seasonal drought depends on year
Usually, one a year for a short period of time at the end of summer
Had a bad drought of 2x in the last 40 yrs.
Due to the high heat and lower rain fall I know the reservoirs are extremely low.
During spring and summer seasons depending on the climate for that year and weather - it has t been a major concern but does happen
Charlotteburg Reservoir, Newfoundland
2025 Summer drought with reservoir much lower than usual
Dried lawns and rivers which.
Rare
Water conservation
Butler Borough (general area), Summer–Fall 2022. Extended periods of low rainfall led to dry conditions, stressed vegetation, and increased need for lawn watering restrictions. Residents observed browning lawns, reduced water levels, and concerns about water conservation.
Ongoing drought in New Jersey
We were sent an email to conserve water and not water our lawn summer 2025
Summer
Over last 15+ we have suffered drought warnings and actual droughts in the summer
every summer we have an extended drought, as well as some minor droughts throughout the rest of the year
Only when there is a water shortage & use is restric

Continued on next page

Summer 2024. Summer 2025 water usage precautions
Some summers I remember being told not to water the grass
Summer and into the fall months
Summer and winter. If rainfall or snow. Hit hard last year.
2025
Last summer into fall there were water restrictions.
1 year of drought
General droughts in New Jersey not specific to Butler
In fall 2024 New Jersey experienced prolonged drought resulting in a drought warning. Like the rest of the state, we were guided to avoid unnecessary uses of water outdoors. I also began reducing the frequency of flushing the toilet and took other steps to conserve water. While this did not happen, I was concerned about the potential for water quality or water supply challenges given that we are a relatively small water system.
Been a long time since we've experienced a severe drought. Have had water usage advisories but nothing drastic.
Butler Boro Reservoirs
Water restrictions are applied when needed
Water restrictions.
Water restrictions
There have been water restrictions during low/no rainfall.

Wildfire
Surrounding area
Nearby fires have occurred, and I'm fearful it will spread.
Wooded areas like behind Arch Street homes is vulnerable
Brush fire related to sparks from the JCP&L power line.
I've experienced 2 summers where we could smell the fires from West Milford and other locations.
Smell from West Milford
No wildfires in Butler, but many in west Milford and surrounding areas affect the air quality in Butler.

Continued on next page

Threaten by wildfires within the last 20 yrs.
We have had numerous fires that have come to close for comfort to the Tri County area.
None yet in town. Look for heavily wooded areas
The last two years…smoke coming from West Milford fires
Fires in the West Milford area cause smoke and red skies, 2024, I think.
We have suffered from the smoke of nearby wildfires
Smoke from more forested West Milford nearby.
Knauss wildfire was visible from home. Air pollution from that and other fires, including wildfires in Canada.
Butler Borough / surrounding wooded areas in Morris/Passaic County, occasional events in recent years (2022–2024). While not widespread locally, nearby brush fires and wildfire smoke impacted air quality. Dry conditions increased concern about fire risk in wooded and residential interface areas.
Near butler in Kinnelon summer 25
Summer
The last few years have had threats of wildfire and actual wildfire in the surrounding town, West Milford.
none that I have experienced
Summer (July, August) 2024 ,2025. Increased risk of brush fires
There have been wildfires in very nearby towns like West Milford, so it needs to be addressed before it's too late
Nearby in West Milford
Several wildfires last year. From surrounding state park reserves. 3. Increase. Could smell and see smoke. Roads are blocked. Certain properties needed to evacuate
2024 2025
The fires in surrounding areas caused /very poor air quality in Butler
No, but we've smelled smoke and been concerned about others' fires.
As far as I'm aware, wildfire has not directly occurred within the town boundaries, but in 2024 during the extended drought, there were several wildfires in nearby towns like Oakland and West Milford that caused poor air quality throughout our area.
Occurred up the highway in West Milford. 2025 I believe. Could travel down the highway to our area.
Luckily, have not seen one in person

Continued on next page

Not in butler but are quality from wildfires in other locations, like Canada.
The air quality due to neighboring fires
I have never seen a wildfire in this area but know that New Jersey had some recently.

Q11 - Below are examples of strategies related to land use and zoning that can help reduce the impacts of climate hazards. Rank their importance for your municipality, with 1 being most important and 5 being least important.

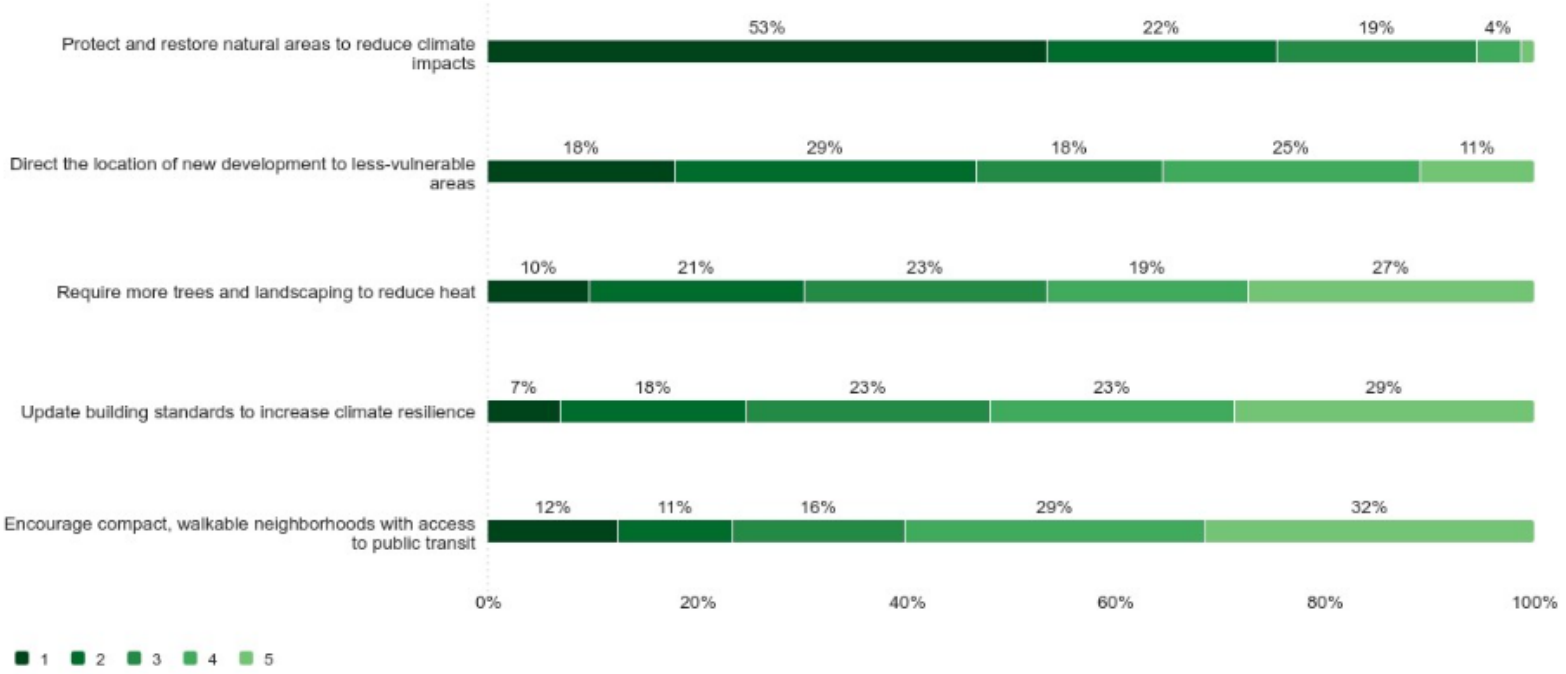
Note: Lower average rank = higher priority.

Rank	Strategy	Average Rank
1	Protect and restore natural areas to reduce climate impacts	1.78
2	Direct the location of new development to less-vulnerable areas	2.82
3	Require more trees and landscaping to reduce heat	3.34
4	Update building standards to increase climate resilience	3.49
5	Encourage compact, walkable neighborhoods with access to public transit	3.56

Continued on next page

Q11. Strategies Ranking (1 = Most Important, 5 = Least Important)

73 Responses



Appendix C: Data Sources

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Section III Detailed Data Sources

Tables

Table III-1. Heat waves = https://njhealthadapt.rutgers.edu/, Public Health Report, Table 1

Table III-2. Extreme heat days - https://njhealthadapt.rutgers.edu/, Public Health Report, Table 2

Table III-3. Days below freezing - https://njhealthadapt.rutgers.edu/, Forest Climate Risk Report

Table III-4. Rainfall (in inches) over 24-hours by annual storm probability - https://njhealthadapt.rutgers.edu/, Public Health Report, Table 3

Table III-5. Increase in annual probability for the 10% and 1% chance storm - Northeast Regional Climate Center, unpublished data

Table III-6. Annual percent time in drought - Shope, J., Nikolopoulos, E., and Araujo, D.S.D. 2025. DRAFT New Jersey Projected Future Drought Dataset Technical Documentation, unpublished data

Maps

Map III-1. Land surface temperature – Summer 2022 – https://rutgers.maps.arcgis.com/apps/mapviewer/index.html?webmap=4d8f6d249e394357827fecd5312fc861

Map III-2. Heat island risk - https://rutgers.maps.arcgis.com/apps/mapviewer/index.html?webmap=9f8adca918b0467bbcf74f5c06918e22

Map III-3. FEMA flood zones - https://rutgers.maps.arcgis.com/apps/mapviewer/index.html?webmap=cba402bdd0334334b6c2f2568d7e5443

Map III-5. Areas potentially subject to the Inland Flood Protection Rule – https://services1.arcgis.com/ze0XBzU1FXj94DJq/arcgis/rest/services/NJ_FEMA_FP3_4_9_2024/FeatureServer

Map III-6. Wildfire risk to potential structures and select historic wildfires - NJ Wildfire Risk Explorer and Wildland Fire Incident Locations | National Interagency Fire Center