13. WILDFIRE

13.1 HAZARD PROFILE

13.1.1 Hazard Description

A wildfire is any non-structural fire that occurs in the wildland (forested, semi-forested, or less developed areas), including naturally occurring fires and human-caused fires, whether accidental or intentional (prescribed burns or arson). Most wildfires in New Jersey are caused by humans (NPS 2023). Wildfires can be highly destructive and difficult to control. They result in the uncontrolled destruction of forests, brush, field crops, grasslands, real estate, and personal property. In the State of New Jersey each year, an average of 1,500 wildfires damage or destroy 7,000 acres of forests. Wildfires also threaten homeowners who live within or adjacent to forest environments (NJFFS 2023).

The height of wildfire season in New Jersey is March through May, corresponding with the driest live fuel moisture periods of the year, though wildfires can occur every month of the year. Drought, snow pack, and local weather conditions can expand the length of the fire season. Fires in the early and late fire season usually are human-caused. Lightning generally is the cause of most fires in the peak season (NJOEM 2024).

The New Jersey Forest Fire Service (NJFFS) is responsible for protecting the 3.15 million acres of wildland in the state. NJFFS has 85 full-time employees that provide services including staffing the state's 21 fire towers, which are operational during in March, April, May, October, and November. NJFFS divides the State into three divisions—north, south and central—and 29 sections of 100,000 acres with a dedicated forest fire warden in each. Figure 13-1 shows the NJFFS divisions and sections. Passaic County is located in Division A, split between Section A2 and the secondary response area.

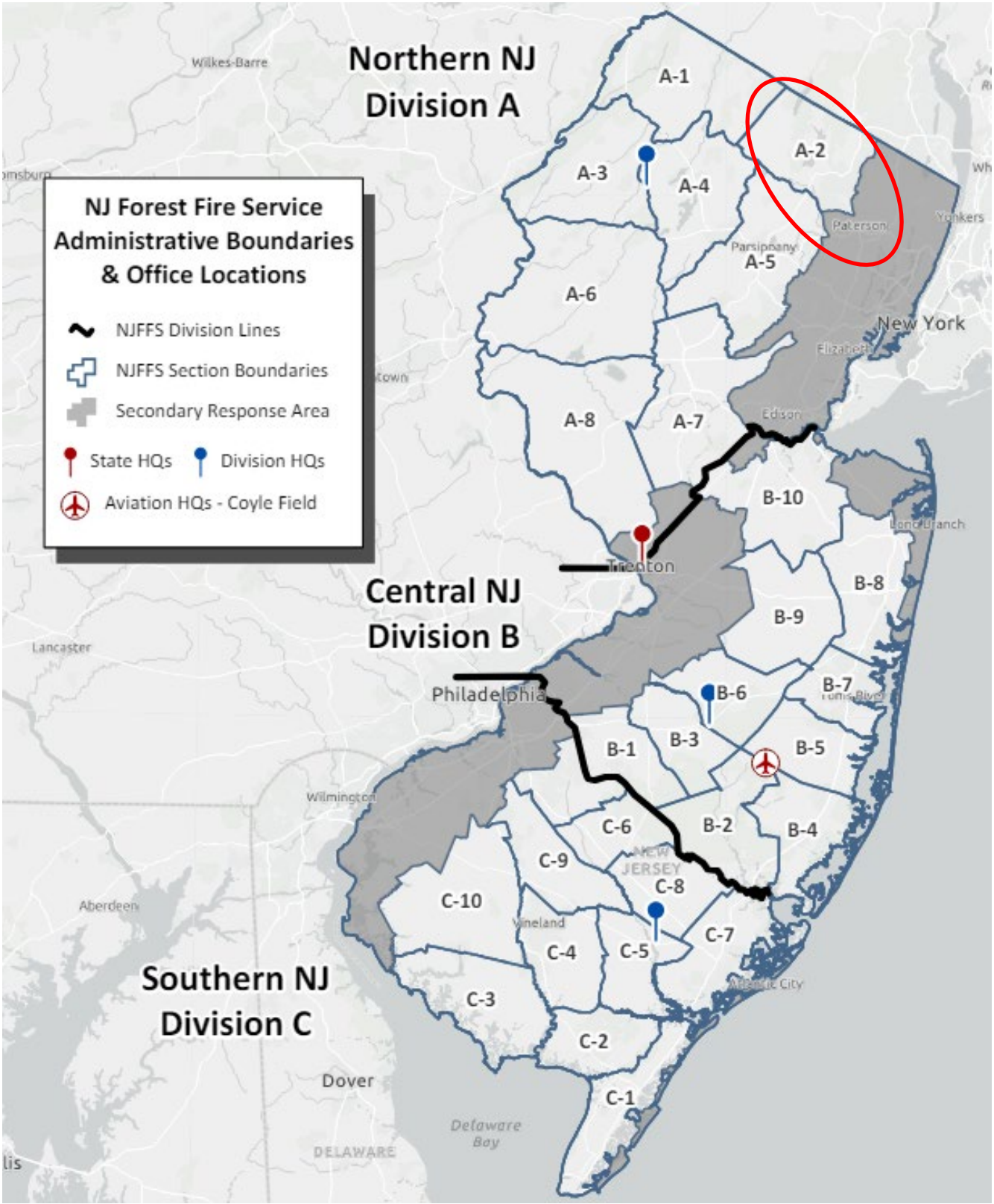
13.1.2 Location

NJFFS created the New Jersey Wildfire Risk Assessment to provide a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in New Jersey. This assessment permits an area of interest to be defined for the user; a report for the wildfire hazard potential for Passaic County was created, identifying four measures of wildfire hazard—wildfire fuel hazard, wildfire hazard potential, wildfire burn probability, and surface fuel mapping—as described in the sections below.

Wildfire Fuel Hazard Areas

NJFFS developed wildfire fuel hazard data for the entire state (NJHC 2000). Figure 13-2 shows the high, very high, and extreme fuel hazard areas in Passaic County. The majority of Passaic County exhibits low fuel hazard and low to moderate wildfire risk. However, certain areas, particularly in the northern and western parts of the county, fall within high to extreme risk area. Overall, Passaic County has 15.4 square miles, or 8.3 percent of its total jurisdictional area, classified under the wildfire risk categories of extreme, very high, or high. Table 13-1 summarizes the area within each wildfire fuel hazard area, specific to Passaic County jurisdictions.

Figure 13-1. NJFFS Administrative Boundaries



Source: NJDEP 2020
Note: Passaic County indicated by red oval.

Figure 13-2. Wildfire Fuel Hazard for Passaic County

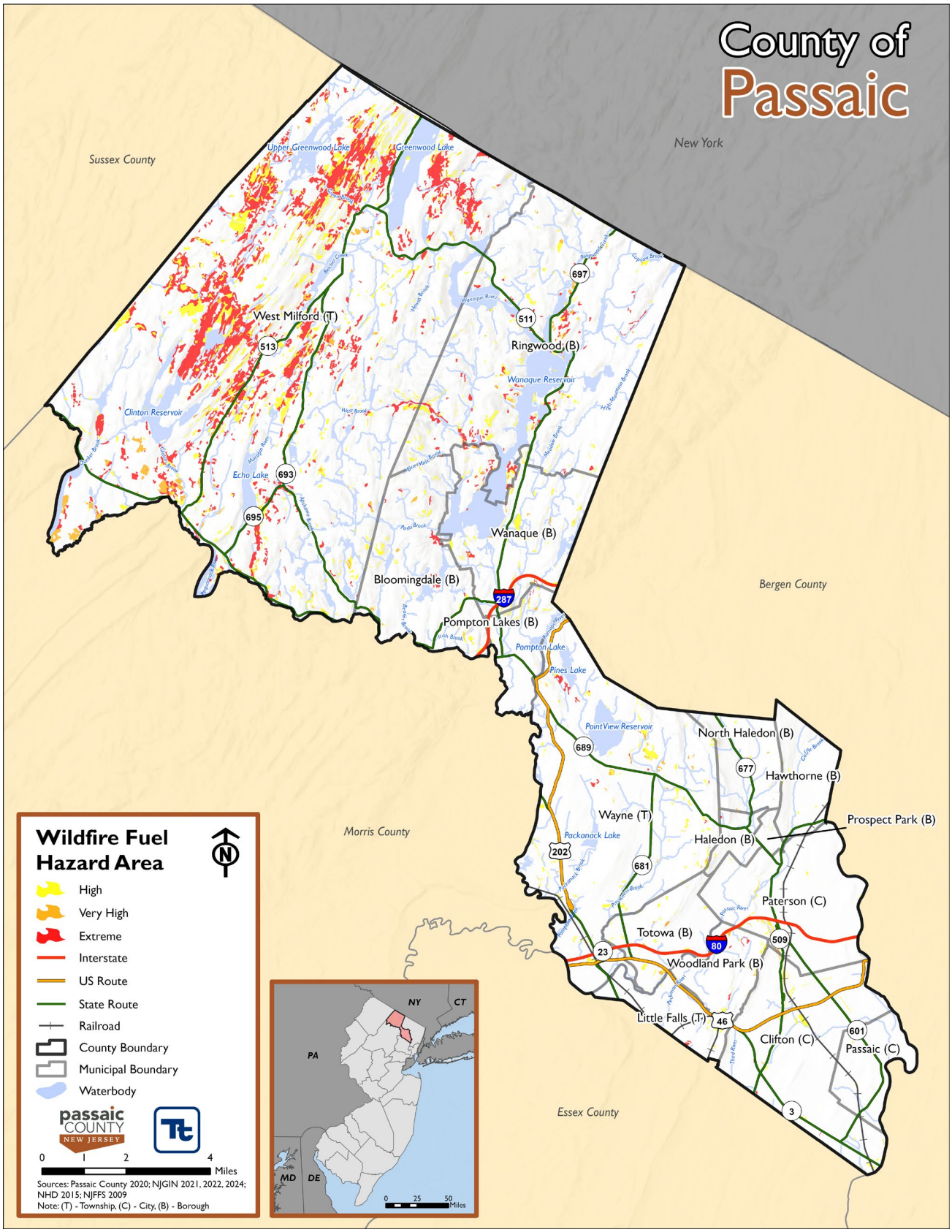


Table 13-1. Land Area In the Extreme, Very High or High Wildfire Fuel Hazard Area in Passaic County

Jurisdiction	Total Land Area (Excluding Water Bodies)(square miles)	Land Area (Excluding Water Bodies) in the Extreme, Very High, or High Wildfire Fuel Hazard Area	
		Total Area (square miles)	% of Jurisdiction Total
Bloomingdale (B)	8.8	0.3	3.0%
Clifton (C)	11.4	0.2	1.6%
Haledon (B)	1.2	<0.1	1.0%
Hawthorne (B)	3.4	<0.1	0.4%
Little Falls (Twp)	2.9	<0.1	1.4%
North Haledon (B)	3.5	<0.1	0.7%
Passaic (C)	3.2	<0.1	0.1%
Paterson (C)	8.7	0.1	1.1%
Pompton Lakes (B)	2.9	0.1	2.2%
Prospect Park (B)	0.5	<0.1	0.6%
Ringwood (B)	25.0	1.2	4.6%
Totowa (B)	4.1	0.1	2.4%
Wanaque (B)	7.9	0.4	4.7%
Wayne (Twp)	23.8	0.6	2.5%
West Milford (Twp)	75.1	12.5	16.7%
Woodland Park (B)	3.1	0.1	2.6%
Passaic County	**185.4**	**15.4**	**8.3%**

Source: NJGIN 2024; NJFFS 2009

Wildfire Hazard Potential

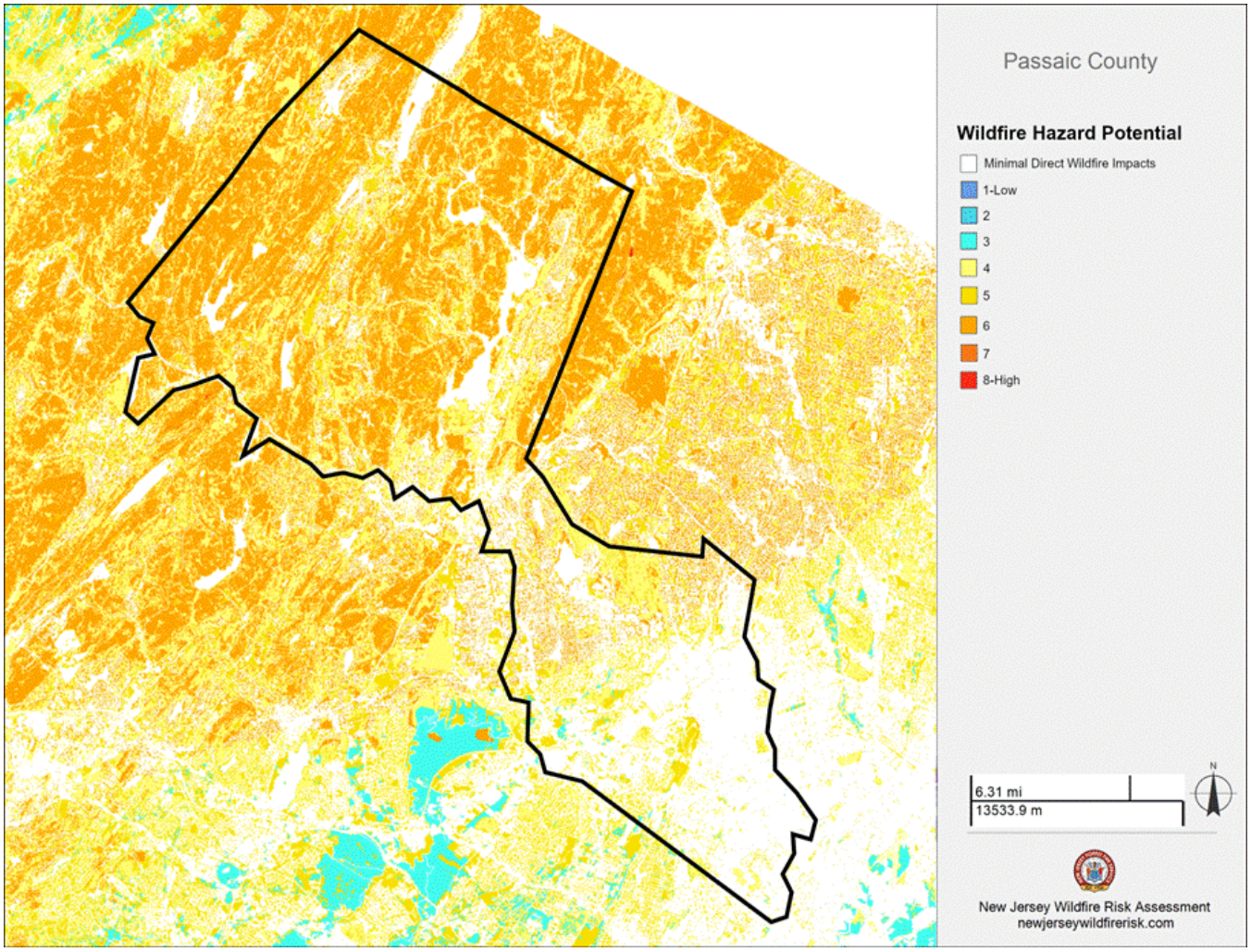
The wildfire hazard potential (WHP) dataset represents an index that quantifies the relative potential for wildfire that may be difficult to control. Figure 13-3 displays the WHP for Passaic County, and Table 13-2 shows the number of acres impacted by each WHP category.

Burn Probability

Burn probability is the annual probability of wildfire burning in a specific location. At the community level, burn probability is averaged where housing units occur. Burn probability is based on fire behavior modeling across thousands of simulations of possible fire seasons. In each simulation, factors contributing to the probability of a fire occurring, including weather, topography, and ignitions are varied based on patterns derived from observations in recent decades (New Jersey Forest Fire Service 2024).

Burn probability is not predictive of any currently forecasted weather or fire danger conditions. Rather, it is a probability that any specific location may experience wildfire in any given year. It does not indicate anything about the intensity of fire if it occurs (New Jersey Forest Fire Service 2024). Table 13-3 displays Passaic County's Burn Probability; also refer to Figure 13-4.

Figure 13-3. Wildfire Hazard Potential for Passaic County



Source: New Jersey Forest Fire Service 2024

Table 13-2. Wildfire Hazard Potential in Passaic County

	Wildfire Hazard Potential Category	Acres	Percent
	Minimal Direct Wildfire Impacts	43,779	34.4 %
	1-Low	0	0.0 %
	2	0	0.0 %
	3	273	0.2 %
	4	31,683	24.9 %
	5	9,245	7.3 %
	6	42,049	33.1 %
	7	134	0.1 %
	8-High	5	0.0 %
	Total	127,168	100.0 %

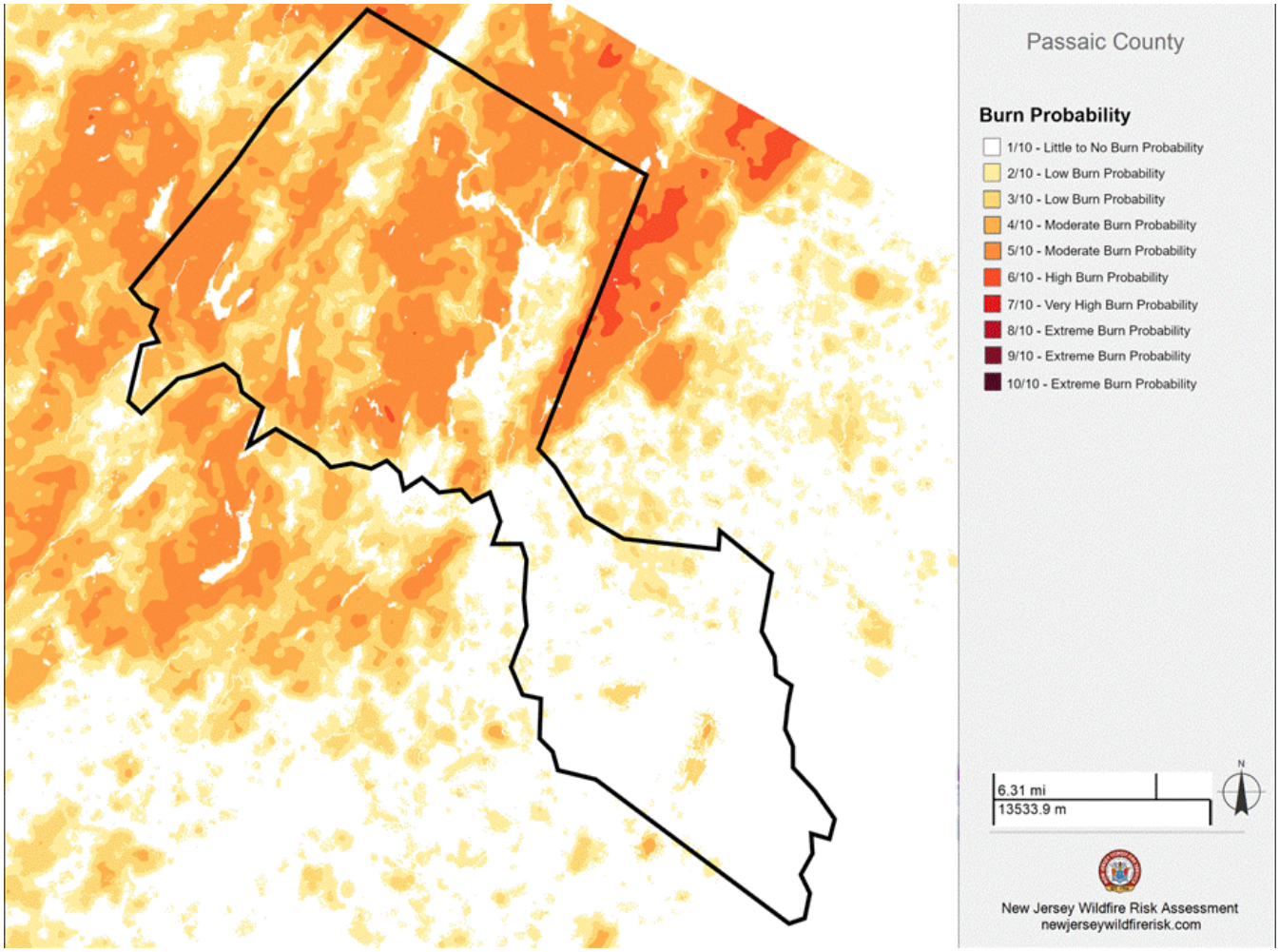
Source: New Jersey Forest Fire Service 2024

Table 13-3. Passaic County Burn Probability

	Burn Probability Category	Acres	Percent
	1/10 - Little to No Burn Probability	50,083	39.4 %
	2/10 - Low Burn Probability	11,900	9.4 %
	3/10 - Low Burn Probability	14,433	11.3 %
	4/10 - Moderate Burn Probability	26,077	20.5 %
	5/10 - Moderate Burn Probability	24,376	19.2 %
	6/10 - High Burn Probability	299	0.2 %
	7/10 - Very High Burn Probability	0	0.0 %
	8/10 - Extreme Burn Probability	0	0.0 %
	9/10 - Extreme Burn Probability	0	0.0 %
	10/10 - Extreme Burn Probability	0	0.0 %
	Total	**127,168**	**100.0 %**

Source: New Jersey Forest Fire Service 2024

Figure 13-4. Passaic County Burn Probability

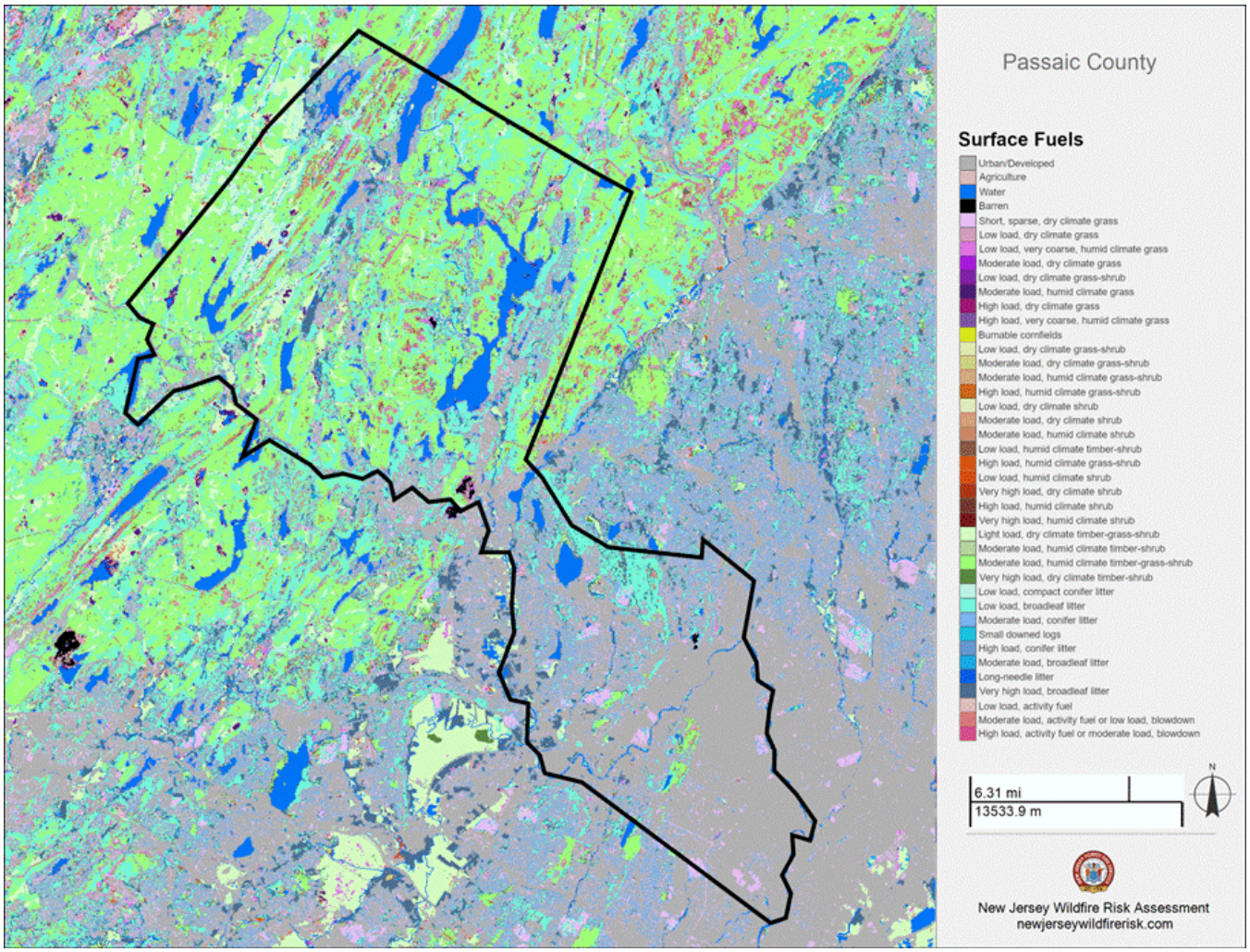


Source: New Jersey Forest Fire Service 2024

Surface Fuel Mapping

Surface fuels are defined by fire behavior fuel models, which are used to compute surface fire behavior characteristics, including rate of spread, flame length, fire line intensity, and other metrics. Surface fuels are generally defined as those that are within 6 feet of the ground. They are categorized as grass, grass/shrub, shrub, timber/understory, timber litter and slash. Figure 13-5 and Table 13-4 present the surface fuel mapping for Passaic County (New Jersey Forest Fire Service 2024).

Figure 13-5. Surface Fuels in Passaic County



Source: New Jersey Forest Fire Service 2024

Table 13-4. Surface Fuels in Passaic County

Surface Fuel Model	Description	Acres	Percent
NB1	Urban/Developed	35,847	28.2 %
NB3	Agriculture	16	0.0 %
NB8	Water	7,842	6.2 %
NB9	Barren	147	0.1 %
GR1	Short, sparse, dry climate grass	3,801	3.0 %
GR2	Low load, dry climate grass	677	0.5 %
GR3	Low load, very coarse, humid climate grass	1,655	1.3 %
GR4	Moderate load, dry climate grass	14	0.0 %
GR5	Low load, dry climate grass-shrub	0	0.0 %
GR6	Moderate load, humid climate grass	498	0.4 %
GR7	High load, dry climate grass	0	0.0 %
GR8	High load, very coarse, humid climate grass	0	0.0 %
AG9	Burnable cornfields	0	0.0 %
GS1	Low load, dry climate grass-shrub	482	0.4 %
GS2	Moderate load, dry climate grass-shrub	157	0.1 %
GS3	Moderate load, humid climate grass-shrub	0	0.0 %
GS4	High load, humid climate grass-shrub	0	0.0 %
SH1	Low load, dry climate shrub	0	0.0 %
SH2	Moderate load, dry climate shrub	75	0.1 %
SH3	Moderate load, humid climate shrub	3,034	2.4 %
SH4	Low load, humid climate timber-shrub	865	0.7 %
SH5	High load, humid climate grass-shrub	0	0.0 %
SH6	Low load, humid climate shrub	276	0.2 %
SH7	Very high load, dry climate shrub	0	0.0 %
SH8	High load, humid climate shrub	0	0.0 %
SH9	Very high load, humid climate shrub	0	0.0 %
TU1	Light load, dry climate timber-grass-shrub	5,197	4.1 %
TU2	Moderate load, humid climate timber-shrub	239	0.2 %
TU3	Moderate load, humid climate timber-grass-shrub	27,897	21.9 %
TU5	Very high load, dry climate timber-shrub	119	0.1 %
TL1	Low load, compact conifer litter	3,465	2.7 %
TL2	Low load, broadleaf litter	21,874	17.2 %
TL3	Moderate load, conifer litter	6,881	5.4 %
TL4	Small downed logs	0	0.0 %
TL5	High load, conifer litter	82	0.1 %
TL6	Moderate load, broadleaf litter	1,366	1.1 %
TL8	Long-needle litter	235	0.2 %
TL9	Very high load, broadleaf litter	4,429	3.5 %
SB1	Low load, activity fuel	0	0.0 %
SB2	Moderate load, activity fuel or low load, blowdown	0	0.0 %
SB3	High load, activity fuel or moderate load, blowdown	0	0.0 %
		Total	**127,170**	**100.0 %**

Source: New Jersey Forest Fire Service 2024

13.1.3 Extent

The extent (that is, magnitude or severity) of wildfires depends on the weather (dryness/drought) and human activity. To determine the potential for wildfires, the NJFFS uses two indices to measure and monitor the dryness of forest fuels and the possibility of fire ignitions becoming wildfires:

- The National Fire Danger Rating System's (NFDRS) **Buildup Index** measures the combined cumulative effects on fuels of daily drying and precipitation, with a 10-day time lag constant. It is a rating of the total amount of fuel available for combustion (NOAA 2020).
- The **Keetch-Byram Drought Index** (KBDI) is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8 inches) and is expressed in hundredths of an inch of soil moisture depletion (NPS 2023).

Both indices are used for fire preparedness planning, which includes the campfire and burning restrictions, fire patrol assignments, staffing of fire lookout towers, and readiness status for observation and firefighting aircraft (NJDEP 2023).

The NJFFS also uses the NFDRS to measure relative seriousness of burning conditions and threat of fire in the state (Western Fire Chiefs Association 2023). It allows the NJFFS to estimate the daily fire danger for a given area. The NFDRS uses a five-color coded system to report fire potential to the public (USFS n.d.). The NJFFS adapted the color system for New Jersey, as shown in Table 13-5.

Table 13-5 Fire Danger Rating and Color Code

Fire Danger Rating and Color Code	Description
Low (Green)	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (Blue)	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (Yellow)	All fine dead fuels ignite readily, and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (Orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they bum into heavier fuels.
Extreme (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

13.1.4 Previous Occurrences

FEMA Major Disaster and Emergency Declarations

Passaic County has not been included in any major disaster (DR) or emergency (EM) declarations for wildfire-related events (FEMA 2023).

USDA Declarations

The U.S. Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans from the U.S. Department of Agriculture (USDA) to producers suffering losses in those counties and in contiguous counties. Between 2019 and 2023, Passaic County was not included in any USDA wildfire-related agricultural disaster declarations (USDA 2024).

Previous Events

Between August 2019 and November 2024, Passaic County was affected by one wildfire and one occurrence of smoke from fires originating in Canada (NJDEP 2024). The fire in the County occurred in early November 2024, during the 2025 Plan Update process; several wildfires ignited in northern New Jersey due to exceptionally dry conditions. The Jennings Creek Wildfire burned approximately 5,000 acres in the border area between New Jersey and New York and posed substantial challenges to firefighting efforts due to high wind gusts and low humidity (IQAir 2024).Table 13-6 summarizes these events. For events prior to 2019, refer to the 2020 Passaic County HMP.

Table 13-6. Wildfire Events in Passaic County (2019 to 2024)

Event Date	Event Type	FEMA Declaration Number	Passaic County Included in Declaration?	Location Impacted	Description
June 1 to August 21, 2023	Wildfire	N/A	N/A	County-wide	Smoke from fires in Nova Scotia, Canada, produced unsafe air conditions in the Northeast. NJDEP recorded 23 ozone and fine particulate exceedance days between June 1 and August 21 due to the Nova Scotian wildfires.
November 11 to 22, 2024	Wildfire	N/A	N/A	Northern Passaic County	A wildfire ignited near Cannonball Road and Pompton Lake during an exceptionally dry period. The event, called the Jennings Creek wildfire, affected more than 5,000 acres in Passaic County and Orange County, New Jersey. The hilly and steep terrain of Passaic County contributed to the rapid spread, exacerbated by strong winds.

Source: NJDEP 2024

Table 13-7 summarizes NJFFS records of wildfires and prescribed burns in Passaic County between 2018 and 2023. In that time, the County experienced 139 fires with a total area burned of 1,159 acres. During the same timeframe, there were 60 prescribed burns covering 819 acres.

Table 13-7. Wildfires and Prescribed Burns in Passaic County 2018-2023

Year	Wildfires		Prescribed Burns	
	Number of Fires	Acres Burned	Number of Treatments	Acres Treated
2018	8	8	2	129
2019	7	2	1	78
2020	12	27	11	40
2021	21	7	18	131
2022	60	28	14	60
2023	31	1,087	14	381
Total	139	1,159	60	819

Source: New Jersey Forest Fire Service 2024
Note: 2024 data was not available at the time of this update, so it was not reflected in the table.

13.1.5 Probability of Future Occurrences

Probability Based on Previous Occurrences

Information on previous wildfire occurrences in the County was used to calculate the probability of future occurrence of such events, as summarized in Table 13-8. Based on historical records and input from the Steering Committee, the probability of occurrence for wildfire in the County is considered “Frequent.”

Table 13-8. Probability of Future Wildfire Events in Passaic County

Hazard Type	Number of Occurrences Between 2018 and 2023	Percent Chance of Occurring in Any Given Year
Wildfire	139	100%

Source: NOAA-NCEI
Note: Due to limitations in data, not all wildfire events occurring between 1954 and 1996 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is calculated using the number of occurrences between 1996 and 2023. This table includes events that occurred within Passaic County, so it does not include the air quality impacts from the Canadian wildfires in 2023.

Effect of Climate Change on Future Probability

Wildfire incidents are predicted to increase throughout the United States due to climate change, causing at least a doubling of areas burned within the next century (US EPA 2022). Potential climate change impacts on wildfire risk include the following:

- Higher temperatures are expected to increase the amount of moisture that evaporates from land and water. This can to lead to more frequent and severe droughts, which, in turn, increases the likelihood of wildfires (US EPA 2022).
- A gradual change in temperatures will alter the growing environment of many tree species in New Jersey, reducing the growth of some trees and increasing the growth of others.
- Warmer temperatures may lead to longer dry seasons and multi-year droughts, creating triggers for insects and invasive species. An increase in invasive species, such as the emerald ash borer, can lead to the destruction and death of trees, adding more fuel for fires.

- Increased temperature and change in precipitation will also affect fuel moisture during wildfire season and the length of time during which wildfires can burn during a given year (US EPA 2022).
- A warmer atmosphere holds more moisture, which is one of the key items for triggering a lightning strike. If the frequency of lightning strikes increases, the potential for wildfires from these strikes also increases (National Geographic 2014).

Based on current projections, Passaic County can expect warmer and drier conditions which may increase the frequency and intensity of wildfires.

13.1.6 Cascading Impacts on Other Hazards

Wildfires, particularly large-scale fires, can dramatically alter the terrain and ground conditions, making land already devastated by fire susceptible to floods. Wildfires increase the risk of flooding and mudflow in impacted areas. Normally, vegetation absorbs rainfall, reducing runoff. However, wildfires leave the ground charred, barren, and unable to absorb water, creating conditions ideal for flash flooding and mudflows. Flood risk in these impacted areas remains significantly higher until vegetation is restored, which can take up to five years after a wildfire (FEMA 2021).

13.2 VULNERABILITY AND IMPACT ASSESSMENT

A spatial analysis was conducted using NJFFS wildfire fuel hazard data. The hazard area for the analysis was the combination of high, very high, and extreme, wildfire fuel hazard areas. NJFFS GIS data were overlaid on mapping of updated assets (population, building stock, critical facilities, and new development). Assets with their centroid in the hazard area were totaled to estimate the numbers and values at risk.

13.2.1 Life, Health, and Safety

Overall Population

Wildfires have the potential to impact human health and life as follows:

- First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke.
- Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.
- Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar, water vapor, and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides), and toxics (formaldehyde, benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency (or temperature) of combustion, and the weather.

Table 13-9 summarizes the estimated population exposed to the wildfire hazard by municipality. Based on the analysis, 261 residents, or 0.1 percent of the County's population, live in the extreme, high, and very high wildfire fuel hazard areas. The Township of West Milford has the greatest number of individuals located in these hazard areas (107 persons).

Table 13-9. Population in Wildfire Fuel Hazard Areas

Jurisdiction	Total Population	Population Living in the Wildfire Fuel Hazard Area (High, Very High, Extreme)	
		Number of Persons	% of Jurisdiction Total
Bloomingdale (B)	7,726	0	0.0%
Clifton (C)	89,451	9	<0.1%
Haledon (B)	8,945	5	0.1%
Hawthorne (B)	19,456	0	0.0%
Little Falls (Twp)	14,229	0	0.0%
North Haledon (B)	8,801	13	0.1%
Passaic (C)	70,048	14	<0.1%
Paterson (C)	157,864	0	0.0%
Pompton Lakes (B)	11,052	0	0.0%
Prospect Park (B)	6,299	0	0.0%
Ringwood (B)	11,692	61	0.5%
Totowa (B)	10,975	13	0.1%
Wanaque (B)	11,217	16	0.1%
Wayne (Twp)	54,143	23	<0.1%
West Milford (Twp)	24,797	107	0.4%
Woodland Park (B)	13,291	0	0.0%
Passaic County	519,986	261	0.1%

Source: US Census Bureau 2022; NJOIT 2024; NJFFS 2023; Microsoft 2019

Socially Vulnerable Population

Table 13-10 presents the estimated socially vulnerable populations located within the wildfire fuel hazard area. There are 44 persons over the age of 65 years, 11 persons under the age of 5 years, 5 non-English speakers, 19 persons with a disability, and 8 persons living in poverty located in the hazard area.

Economically disadvantaged populations may be more vulnerable because they lack the financial resources needed to evacuate. The population over age 65 is more vulnerable because they are more likely to need medical attention that may not be available due to isolation during a wildfire event, and they may have more difficulty evacuating. Smoke and air pollution from wildfires can be a severe health hazard for medically sensitive populations, including children, the elderly, and those with respiratory and cardiovascular diseases.

Table 13-10. Estimated Number of Vulnerable Persons Located in the Wildfire Fuel Hazard area

Jurisdiction	Vulnerable Persons Living in the Wildfire Fuel Hazard Area (High, Very High, and Extreme)									
	Persons Over 65	% of Total	Persons Under 5	% of Total	Non-English Speaking Persons	% of Total	Persons with a Disability	% of Total	Persons in Poverty	% of Total
Bloomingdale (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Clifton (C)	1	<0.1%	0	0.0%	1	<0.1%	1	<0.1%	0	0.0%
Haledon (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Hawthorne (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Little Falls (Twp)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
North Haledon (B)	3	0.1%	0	0.0%	0	0.0%	1	0.1%	0	0.0%
Passaic (C)	1	<0.1%	1	<0.1%	3	<0.1%	1	<0.1%	3	<0.1%
Paterson (C)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Pompton Lakes (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Prospect Park (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ringwood (B)	10	0.5%	2	0.4%	0	0.0%	4	0.4%	1	0.4%
Totowa (B)	2	0.1%	0	0.0%	0	0.0%	1	0.1%	0	0.0%
Wanaque (B)	3	0.1%	0	0.0%	0	0.0%	2	0.1%	1	0.1%
Wayne (Twp)	4	<0.1%	1	<0.1%	0	0.0%	1	<0.1%	0	0.0%
West Milford (Twp)	20	0.4%	7	0.4%	1	0.4%	8	0.4%	3	0.4%
Woodland Park (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Passaic County	44	0.1%	11	<0.1%	5	<0.1%	19	<0.1%	8	<0.1%

Source: US Census 2020; NJOIT 2024; Microsoft 2019; NJFFS 2009.

13.2.2 General Building Stock

Buildings in the extreme, very high, or high fuel hazard areas are vulnerable to the wildfire hazard. Buildings constructed of wood or vinyl siding are generally more likely to be impacted by the fire hazard than buildings constructed of brick or concrete. Table 13-11 summarizes the estimated building stock inventory in the defined hazard area by municipality. Approximately 0.3 percent ($265,254,645) of the County's building replacement cost value is located in the wildfire fuel hazard area. The Township of West Milford has the greatest number of buildings in the hazard area (50 structures, 0.5 percent of its total). The Township of Wayne has the highest replacement cost value with an estimate of $130 million, or 0.8 percent of the jurisdictional total.

Table 13-11. Structures Located in the Extreme, Very High, or High Wildfire Fuel Hazard Area

	Jurisdiction Total Buildings		Number of Buildings		Replacement Cost Value (RCV)	
Jurisdiction	Number of Buildings	Replacement Cost Value (RCV)	Count	% of Jurisdiction Total	Value	% of Jurisdiction Total
Bloomingdale (B)	2,406	$1,358,262,927	1	<0.1%	$5,410,510	0.4%
Clifton (C)	20,935	$15,833,226,790	3	<0.1%	$7,499,980	<0.1%
Haledon (B)	1,898	$1,277,354,659	1	0.1%	$267,414	<0.1%
Hawthorne (B)	6,079	$3,946,342,797	0	0.0%	$0	0.0%
Little Falls (Twp)	2,915	$3,414,669,325	3	0.1%	$21,728,104	0.6%
North Haledon (B)	2,952	$2,161,286,853	4	0.1%	$4,834,653	0.2%
Passaic (C)	5,784	$11,383,166,371	1	<0.1%	$632,823	<0.1%
Paterson (C)	16,686	$18,630,913,440	2	<0.1%	$5,021,323	<0.1%
Pompton Lakes (B)	3,271	$1,954,260,257	1	<0.1%	$249,537	<0.1%
Prospect Park (B)	1,016	$492,237,246	0	0.0%	$0	0.0%
Ringwood (B)	4,369	$2,697,179,876	29	0.7%	$24,383,166	0.9%
Totowa (B)	3,765	$5,499,989,017	6	0.2%	$3,450,684	0.1%
Wanaque (B)	3,183	$2,352,891,840	7	0.2%	$28,027,056	1.2%
Wayne (Twp)	15,577	$15,872,014,112	17	0.1%	$130,312,576	0.8%
West Milford (Twp)	9,452	$5,622,763,478	50	0.5%	$32,221,224	0.6%
Woodland Park (B)	2,965	$3,101,377,870	1	<0.1%	$1,215,593	<0.1%
Passaic County	103,253	$95,597,936,857	126	0.1%	$265,254,645	0.3%

Source: NJOIT 2024; Microsoft 2019; RS Means 2024; NJFFS 2009

Table 13-12 lists buildings in the fuel hazard area by occupancy class. Passaic County has 126 buildings at risk: 78 residential, 37 commercial, and 11 government, religious, agricultural, or educational. The Township of West Milford has the highest number of residential buildings in this hazard area (35).

Table 13-12. Buildings in the Wildfire Fuel Hazard Area, by Occupancy Class

Jurisdiction	Buildings in the Wildfire Fuel Hazard Area (High, Very High, and Extreme)			
	Residential	Commercial	Industrial	Other[a]
Bloomingdale (B)	0	0	0	1
Clifton (C)	2	1	0	0
Haledon (B)	1	0	0	0
Hawthorne (B)	0	0	0	0
Little Falls (Twp)	0	2	0	1
North Haledon (B)	4	0	0	0
Passaic (C)	1	0	0	0
Paterson (C)	0	2	0	0
Pompton Lakes (B)	0	1	0	0
Prospect Park (B)	0	0	0	0
Ringwood (B)	21	8	0	0
Totowa (B)	4	2	0	0
Wanaque (B)	4	3	0	0
Wayne (Twp)	6	10	0	1
West Milford (Twp)	35	7	0	8
Woodland Park (B)	0	1	0	0
Passaic County (Total)	78	37	0	11

Source: Microsoft 2019; NJFFS 2009; NJOIT 2024

a. Other = Government, Religion, Agricultural, and Education

13.2.3 Community Lifelines and Other Critical Facilities

Wildfires can impact water supplies throughout the County due to residual pollutants like char or debris landing in water resources, which can clog wastewater pipes and culverts. If a wildfire reaches critical facilities, it can complicate response and recovery efforts. For example, hazardous materials and fuel storage could rupture due to excessive heat, acting as fuel for the fire and causing rapid spreading. Communication facilities could become inoperable, exacerbating communication difficulties, and compromised fire stations would make fire suppression and support services more challenging.

Wildfires may also affect transportation routes, blocking residents and commuters from traveling in the County during a wildfire event because of debris polluting the air, making it difficult to drive, or flames being too close to roadways. Roads and bridges in fire-risk areas are crucial as they provide access to large areas and isolated neighborhoods. Fires can create conditions that block access, isolating residents and emergency service providers.

Table 13-13 summarizes the number of community lifelines in the Passaic County wildfire fuel hazard area. Overall, Passaic County has 21 facilities in wildfire fuel hazard areas, representing 1.6 percent of the County's total facilities. Several jurisdictions have no critical facilities in these hazard areas. The Town of West Milford has the highest number of facilities in hazard areas, totaling 11, which is 9.6 percent of the jurisdiction's facilities.

Table 13-13. Number of Facilities in the Wildfire Fuel Hazard Area

Jurisdiction	Number of Facilities in the Wildfire Fuel Hazard Area, by Lifeline Category									Total Facilities in Hazard Area	
	Communications	Energy	Food, Hydration, Shelter	Hazardous Materials	Health & Medical	Safety & Security	Transportation	Water Systems	Other Critical Facilities	Count	% of Jurisdiction Total
Bloomingdale (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Clifton (C)	0	0	0	0	0	0	0	0	0	0	0.0%
Haledon (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Hawthorne (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Little Falls (T)	0	0	0	0	0	0	0	0	0	0	0.0%
North Haledon (B)	0	0	0	0	0	0	1	0	0	1	3.2%
Passaic (C)	0	0	0	0	0	0	0	0	0	0	0.0%
Paterson (C)	0	0	0	0	0	0	0	0	0	0	0.0%
Pompton Lakes (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Prospect Park (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Ringwood (B)	0	0	0	0	0	0	0	1	0	1	1.6%
Totowa (B)	0	0	0	1	1	0	0	0	0	2	2.7%
Wanaque (B)	0	0	0	0	0	0	0	2	0	2	4.0%
Wayne (T)	0	0	0	0	0	1	2	0	0	3	1.8%
West Milford (T)	0	0	0	0	0	0	3	6	2	11	9.6%
Woodland Park (B)	0	0	0	0	0	0	0	1	0	1	2.3%
Passaic County (Total)	0	0	0	1	1	1	6	10	2	21	1.6%

Source: Passaic County HMP 2020; Passaic County 2024; NJGIN 2017, 2021, 2022; HIFLD 2017, 2018, 2022, 2023; Passaic County Department of Planning & Economic Development 2024; NJFFS 2009

13.2.4 Economy

Wildfire events can have major economic impacts on a community from the initial loss of structures and the subsequent loss of revenue from destroyed businesses. These events may cost thousands of taxpayer dollars to suppress and control and may involve hundreds of operating hours on fire apparatus and thousands of volunteer hours from the volunteer firefighters. There are also many direct and indirect costs to local businesses that excuse volunteers from working to fight these fires.

13.2.5 Natural, Historic and Cultural Resources

Natural

Wildfires are naturally occurring events in the ecosystem cycle, but intense wildfires can burn and kill plant and animal life. Intense fire can also heat narrow and shallow waterways, resulting in damage to aquatic systems. Post-fire runoff polluted with debris and contaminants can be harmful to terrestrial ecosystems and aquatic life (USGS 2023). Intense wildfire events that destroy existing ecosystems can cause an increase in invasive species that may be able to move into an area with a lack of natural competitors (U.S. Department of the Interior 2012).

Historic

Wildfires pose a significant threat to historic resources, with the potential to cause extensive damage or even complete destruction. The impact on historic infrastructure from wildfires is largely dependent on the construction materials used. Many historic structures are constructed from wood, a highly flammable material. Furthermore, these structures were often built before the implementation of strict building codes and before there was a comprehensive understanding of wildfire risks.

Cultural

Wildfires are a major threat to cultural resources, with the potential to cause extensive damage, and in some cases, complete destruction. The potential impacts on cultural resources from wildfire depend heavily on the materials used to construct the facility in which cultural resources are located. In many instances, historic structures house cultural resources and artifacts; many historic structures are made of wood, which is a highly flammable material. Outdoor events are likely to be postponed or cancelled as the result of wildfire conditions, as smoke conditions can have harmful impacts to the human body.

13.3 FUTURE CHANGES THAT MAY AFFECT RISK

13.3.1 Potential or Planned Development

Areas targeted for future growth and development have been identified across the County. Any changes in development can impact the County's risk to the wildfire hazard. Fire suppression capabilities are high at the State and local levels. However, new development and changes in population with a mix of additional structures, ornamental vegetation, and wildland fuels will require continued assessment of the hazard and mitigation risk.

The County should integrate comprehensive wildfire management strategies into existing building codes. These strategies should aim to protect structures from residual impacts such as heat, debris, and char. Given that

residential developments are generally more vulnerable to wildfire damage compared to less susceptible structures like warehouses, commercial buildings, and industrial facilities, it is crucial to prioritize these areas. Additionally, all new developments should be designed with accessible transit routes to facilitate efficient evacuation during wildfire events.

13.3.2 Projected Changes in Population

Changes in population density can significantly impact the number of persons exposed to the wildfire hazard. The New Jersey Department of Labor and Workforce Development produced population projections by County for 2029 and 2034. According to these projections, Passaic County is projected to have an increase in population in the upcoming years. These projections include a population of 536,100 by 2029 and 542,500 by 2034 (State of New Jersey 2017).

13.3.3 Climate Change

Average temperatures are anticipated to increase in New Jersey, therefore, suitability of habitats for specific types of trees potentially changes, altering the fire regime and resulting in more frequent fire events and changes in intensity. Prolonged and more frequent heat waves and droughts have the potential to increase the likelihood of a wildfire igniting. The increased potential combined with stronger winds may make it harder to contain fires and thus increase the County's vulnerability to this hazard.

Climate change will likely alter the atmospheric patterns that affect fire weather. Changes in fire patterns will, in turn, impact carbon cycling, forest structure, and species composition. Climate change associated with warmer temperatures, changes in rainfall, and increased periods of drought may create an atmospheric and fuel environment that is more conductive to large, severe fires (United Nations 2021). Understanding the interactions of climate, fire, and vegetation is essential for addressing issues associated with climate change that include the following (USFS 2011):

- Effects on regional circulation and other atmospheric patterns that affect fire weather
- Effects of changing fire regimes on the carbon cycle, forest structure, and species composition, and
- Complications from land use change, invasive species and an increasing zone of interface between wildland and urban areas.

Changes in climate patterns may impact the distribution and perseverance of insect outbreaks that create dead trees (increase fuel). When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain and are more likely to expand into residential neighborhoods.