13. WILDFIRE

13.1 HAZARD PROFILE

13.1.1 Hazard Description

A wildfire can be defined as any non-structural fire that occurs in the wildland (NPS 2023). Three distinct types of wildfires include the following: naturally occurring wildfire, human-caused wildfire, and prescribed fire. Many of these are highly destructive and can be difficult to control. They occur in forested, semi-forested, or less developed areas. Wildfires can be caused by lightning, human carelessness, and arson. Most frequently, wildfires in the State of New Jersey are caused by humans (NPS 2023). Wildfires result in the uncontrolled destruction of forests, brush, field crops, grasslands, real estate, and personal property, and have secondary impacts on other hazards such as flooding, by removing vegetation and destroying watersheds.

Wildfires can trigger other hazard events, specifically floods and mudflows. Wildfires, particular large-scale fires, can dramatically alter the terrain and ground conditions, making land already devastated by fire susceptible to floods. Normally, vegetation absorbs rainfall, reducing runoff. However, wildfires leave the ground charred, barren, and unable to absorb water, creating conditions perfect for flash flooding and mudflows. Flood risk in these impacted areas remain significantly higher until vegetation is restored, which can take up to five years after a wildfire (FEMA 2016). For detailed information regarding flooding, see Chapter 10 (Flood).

Flooding after a wildfire can be exacerbated by debris and ash left from the fire. These materials can form mudflows. During and after a rain event, as water moves across charred and denuded ground, it can also pick up soil and sediment and carry it in a stream of floodwaters. These mudflows have the potential to cause significant damage to impacted areas. Areas directly affected by fires and those located below or downstream of burn areas are most at risk for flooding (FEMA 2016).

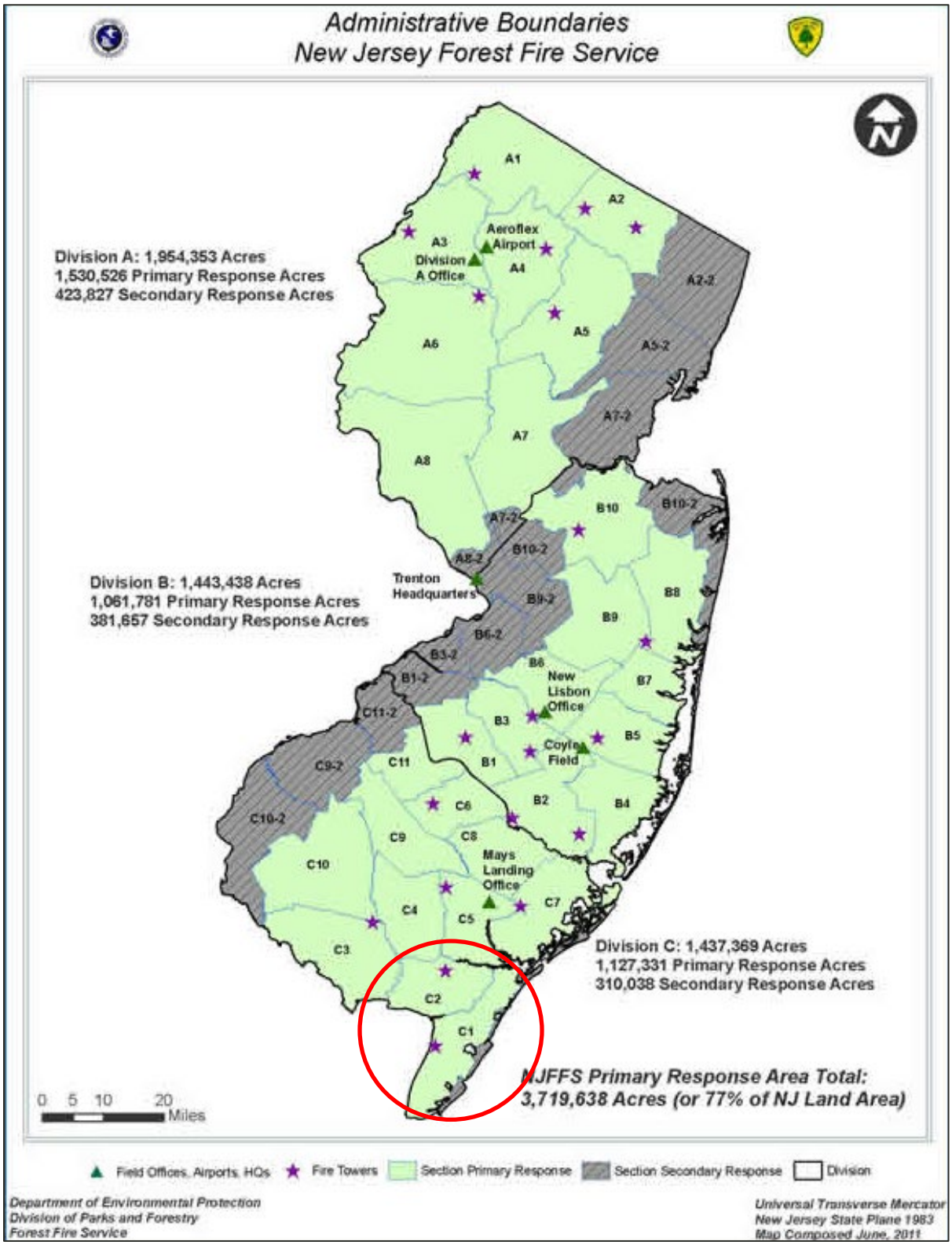
The height of wildfire season in the State of New Jersey runs March through May, corresponding with the driest live fuel moisture periods of the year (NJOEM 2024). While the spring season is historically the period in which wildfire danger is the highest, wildfires can occur every month of the year. Drought, snow pack, and local weather conditions can expand the length of the fire season. Early and late fire season usually are associated with human-caused fires. Lightning generally is the cause of most fires in the peak season (NJOEM 2024).

State Monitoring

The New Jersey Forest Fire Service (NJFFS), a division of the New Jersey Department of Environmental Protection (NJDEP), is responsible for protecting the 3.15 million acres of wildland in the State. NJFFS is under the direction of the State fire warden and is headquartered in Trenton. NJFFS has 85 full-time employees that provide an array of services including staffing the State's 21 fire towers, which are operational during the months of March, April, May, October, and November.

NJFFS divides the State into three regions (Northern, Central, Southern) each totaling about 1,250,000 acres. There are 29 sections of 125,000-acres with a dedicated forest fire warden in each; and 269 districts each consisting of 15,000-20,000 acres. In total, 29 section forest fire wardens, 269 district forest fire wardens and 2,000 trained crew members respond to fires on an as-needed basis (NJFFS 2020). Figure 13-1 illustrates the NJFFS region divisions within the State. Cape May County is located in Division C (Southern NJ).

Figure 13-1. Fire Divisions of New Jersey



Source: NJDEP 2013
Note: The red circle indicates the location of Cape May County. The County is located in Fire Division C

13.1.2 Location

In the State of New Jersey, each year, an average of 1,500 wildfires damage or destroy 7,000 acres of the State's forests. Wildfires not only damage woodlands but threaten homeowners who live within or adjacent to forest environments (NJFFS 2023). Wildfire risks varies from region to region, due to a combination of factors, including climate, poverty, education, demographics, and other causal factors (USFA 2013). In Cape May County, wildfires have the potential to occur anywhere in the County. Additionally, a portion of Cape May County is located within the New Jersey Pine Barrens. The Townships of Upper and Dennis and the Borough of Woodbine are all located in the Pine Barrens.

The Pinelands and Pine Barrens

The New Jersey Pine Barrens are characterized by low, dense forests of pine and oak, ribbons of cedar and hardwood swamps bordering drainage courses, pitch pine lowlands, and bogs and marshes combine to produce an expansive vegetative mosaic unsurpassed in the Northeast. The Pine Barrens was recognized as a nationally and internationally important ecological region when, in 1978, Congress created the Pinelands National Reserve, our country's first National Reserve and a U.S. Biosphere Reserve of the Man and the Biosphere Program. The Pinelands National Reserve encompasses approximately 1.1 million acres statewide, occupying 22 percent of New Jersey's land area and covering portions of seven counties and all or parts of 56 municipalities. It is the largest body of open space on the Mid-Atlantic seaboard between Richmond and Boston and is underlain by aquifers containing 17 trillion gallons of some of the purest water in the land. Through the creation of the Pinelands Commission, the State of New Jersey formed the necessary partnerships to preserve, protect and enhance the natural and cultural resources of the Pinelands (NPS 2018).

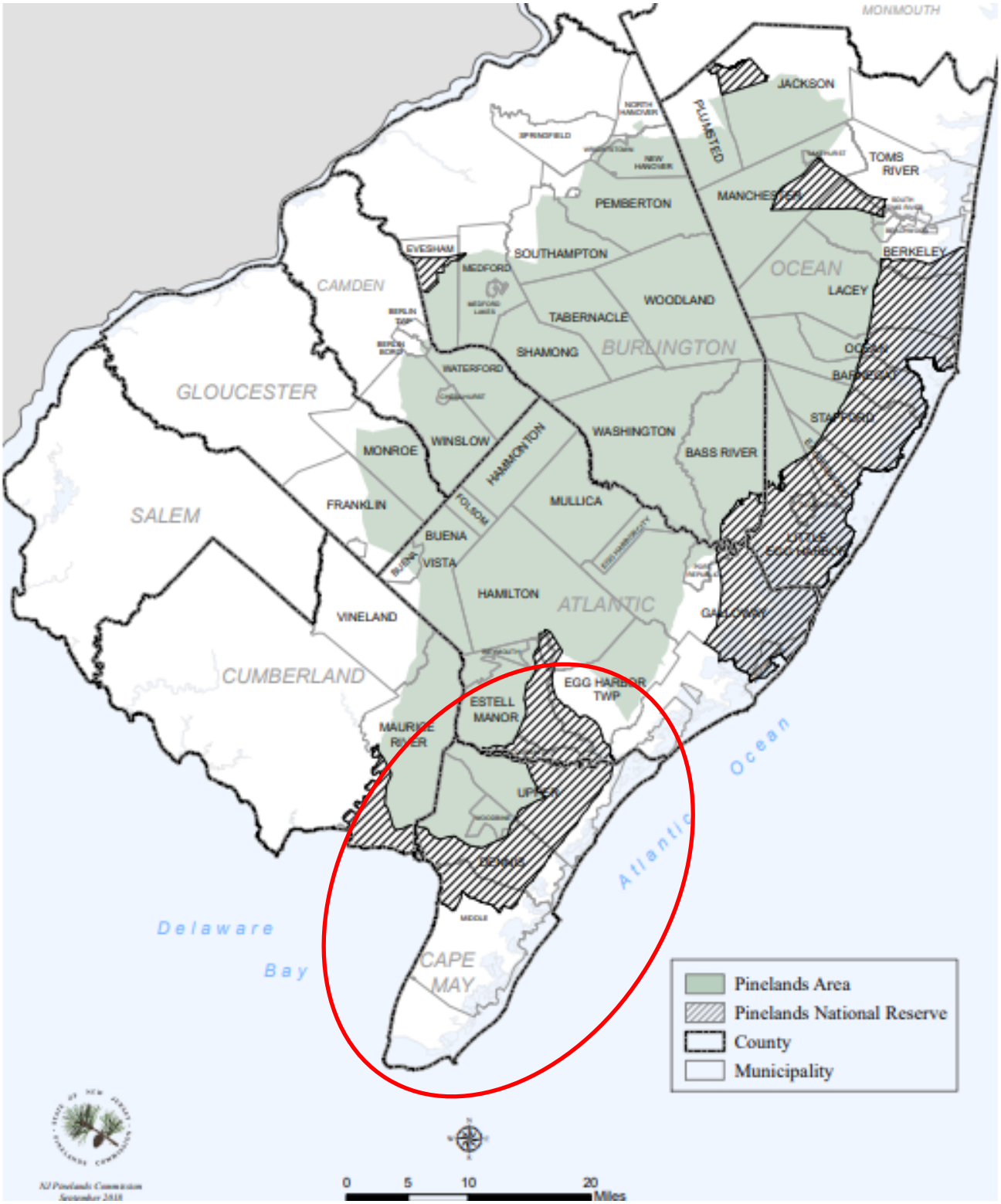
According to the New Jersey Pinelands Commission 2013 Pinelands Long-Term Economic Monitoring Program, 18.75 percent of Cape May County's municipalities (or 3 of the 16 municipalities) are located within the Pinelands Area, as shown in Figure 13-2 (NJ Pinelands Commission 2018). Approximately 5.5 percent of Cape May County's 2010 population (5,341 residents) resided in the Pinelands Area and 21.6 percent of the County's total land area (34,820 acres) were also reported as located within the Pinelands Area (NJ Pinelands Comsission 2014).

Naturally occurring wildfires burning several thousands of acres per year have been a common occurrence in the Pinelands for many hundreds of years. Development of the unique flora of the Pinelands is closely related to the occurrence of fire, with many plant species relying on fire for a part of their reproductive cycle (NJOEM 2024).

Pinelands fires tend to burn extremely hot and spread rapidly. Crown fires here are fairly common (spreading from treetop to treetop). While Pinelands fires generally do not cause casualties due to the low population residing within its limits, property loss can run in the thousands of dollars per event, not including costs associated with emergency response and firefighting. Often, State roads have closed because of smoke conditions (NJOEM 2024).

Conditions conducive to forest fires are some of the most consistent and serious impacts of drought, a hazard profiled earlier in this plan. This applies particularly to the Pine Barrens, where drying conditions favor the combustion of forest fuels. Generally, a relative humidity of less than 40 percent, winds greater than 13 miles an hour, and precipitation of less than 0.01 inches during a month are ideal conditions for forest fires in the Pine Barrens. The season of greatest fire threat runs from March through May, though extensive fires have occurred in the summer and autumn months (NJOEM 2024).

Figure 13-2. Pinelands Management and Planning Areas in Cape May County



Source: NJ Pinelands Commission 2018
Note: The red circle indicates the location of Cape May County.

Wildland-Urban Interface and Intermix

The Wildland-Urban Interface (WUI) is a zone where human development meets or intermingles with wildland vegetation. This area is particularly susceptible to wildfires due to the proximity of structures to natural fuels. There are two main types of WUI (L. Annie Hermansen-Báez n.d.):

- Interface WUI: Areas where housing is adjacent to wildland vegetation but not intermingled. Vegetation occupies less than 50% of the area.
- Intermix WUI: Areas where housing is intermingled with wildland vegetation. Vegetation occupies more than 50% of the area.

WUI helps to understand the varying degrees of wildfire risk and the necessary management strategies within the County. Figure 13-3 illustrates the WUI interface and intermix wildfire hazard areas within Cape May County, showing that many of the WUI areas are located near major roadways which are critical facilities for the communities during hazard events.

Wildfire Fuel Hazard Areas

NJFFS developed Wildfire Fuel Hazard data for the entire state based on NJDEP data (NJHC 2000). NJFFS created the New Jersey Wildfire Risk Assessment provides a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in the state of New Jersey. This assessment tool permit an area of interest to be defined for the user; a report for the wildfire hazard potential for Cape May County was created. The wildfire hazard potential (WHP) dataset represents an index that quantifies the relative potential for wildfire that may be difficult to control. Figure 13-4 displays the WHP for Cape May County, and Table 13-1 shows the number of acres impacted by each WHP category.

Table 13-1. Wildfire Hazard Potential in Cape May County

	Wildfire Hazard Potential Category	Acres	Percent
	Minimal Direct Wildfire Impacts	55,673	30.4 %
	1-Low	0	0.0 %
	2	30	0.0 %
	3	7,523	4.1 %
	4	16,392	9.0 %
	5	29,164	15.9 %
	6	52,515	28.7 %
	7	16,025	8.8 %
	8-High	5,720	3.1 %
	Total	**183,042**	**100.0 %**

Source: New Jersey Forest Fire Service 2024

Figure 13-3. Wildland-Urban Interface and Intermix Wildfire Hazard Area

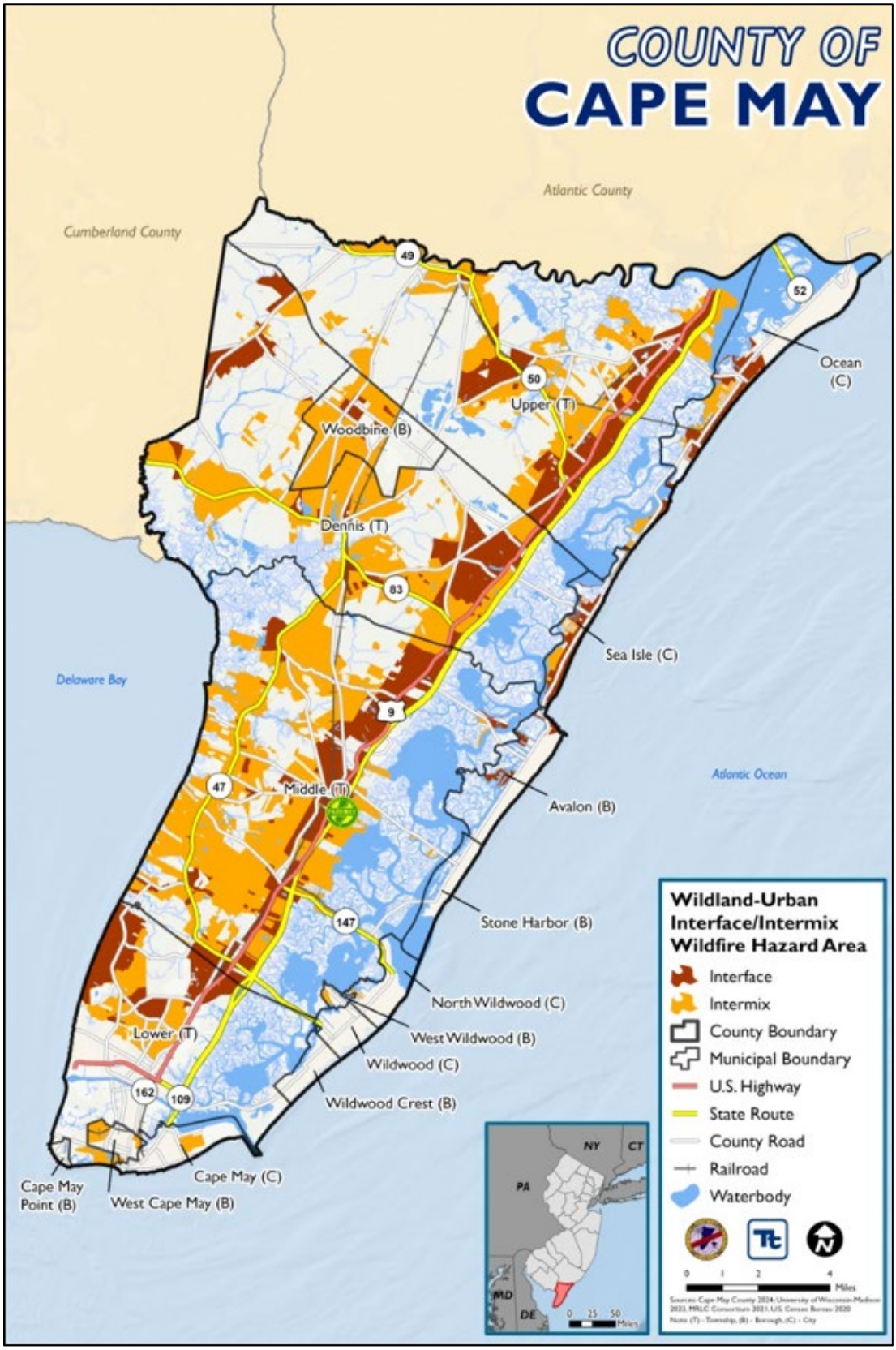
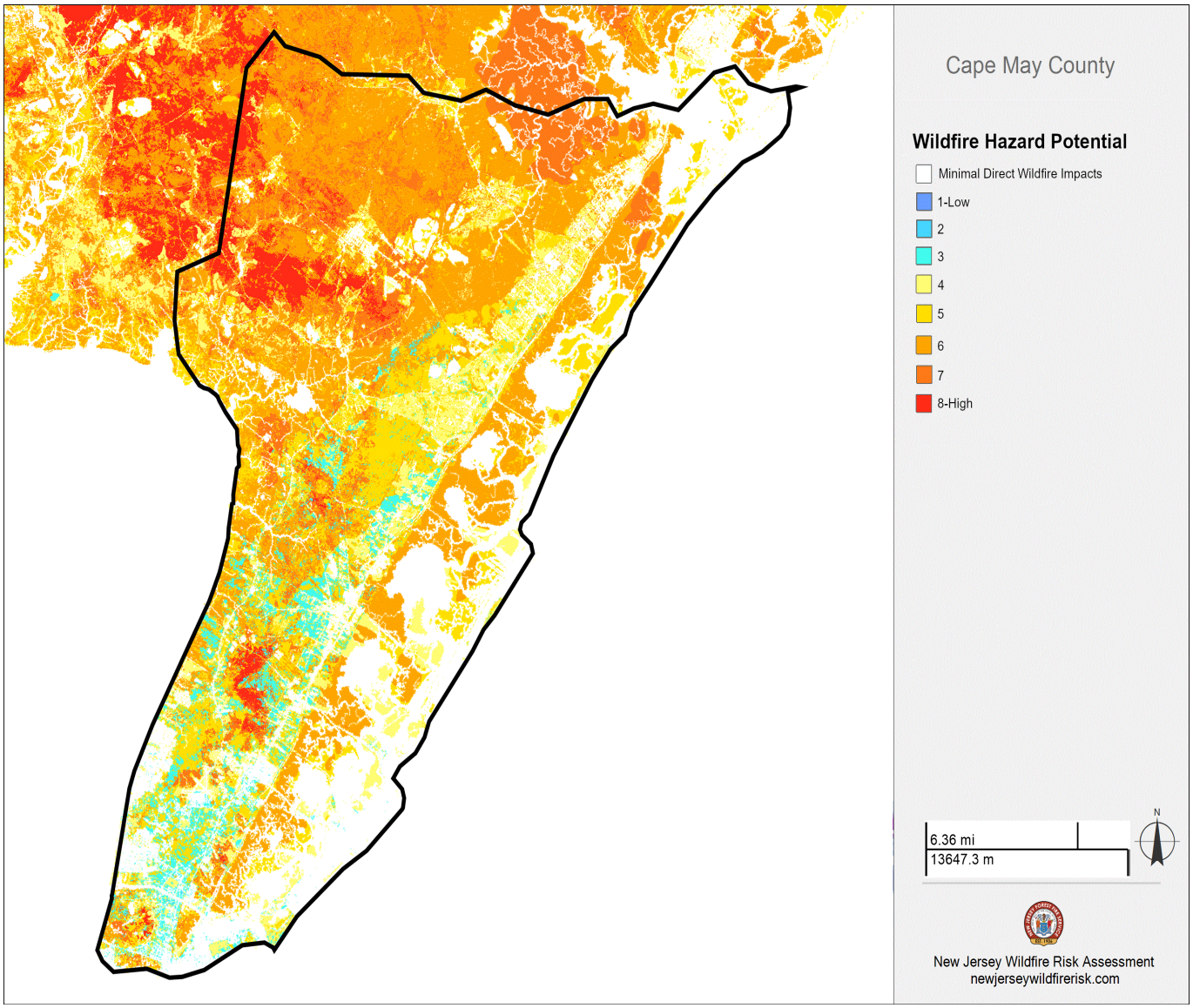


Figure 13-4. Wildfire Hazard Potential in Cape May County



Source: New Jersey Forest Fire Service 2024

Burn Probability

Burn probability is the annual probability of wildfire burning in a specific location. At the community level, burn probability or wildfire likelihood 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).

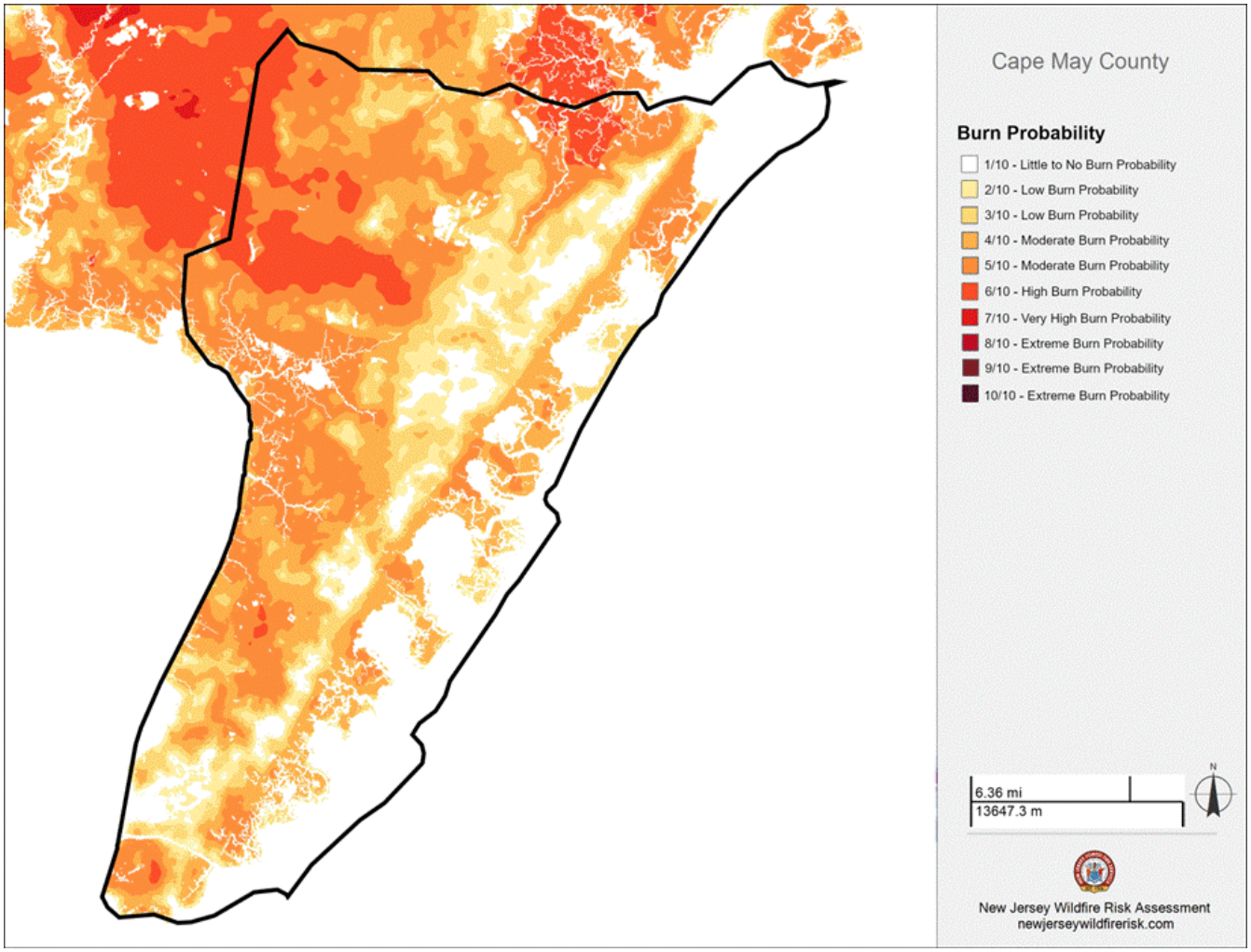
Burn Probability is not predictive and does not reflect any currently forecasted weather or fire danger conditions. Burn Probability is simply a probability that any specific location may experience wildfire in any given year. It does not say anything about the intensity of fire if it occurs (New Jersey Forest Fire Service 2024). Table 13-2 displays Cape May County's Burn Probability; also refer to Figure 13-5.

Table 13-2. Cape May County Burn Probability

	Burn Probability Category	Acres	Percent
	1/10 - Little to No Burn Probability	55,463	30.3 %
	2/10 - Low Burn Probability	15,412	8.4 %
	3/10 - Low Burn Probability	21,248	11.6 %
	4/10 - Moderate Burn Probability	36,383	19.9 %
	5/10 - Moderate Burn Probability	43,391	23.7 %
	6/10 - High Burn Probability	11,145	6.1 %
	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	**183,042**	**100.0 %**

Source: New Jersey Forest Fire Service 2024

Figure 13-5. Cape May County Burn Probability



Source: New Jersey Forest Fire Service 2024

13.1.3 Extent

The extent (i.e., magnitude or severity) of wildfires depends on climate factors, such as dryness or presence of drought, and human activity. The NJFFS uses two indices to monitor the dryness of forest fuels and the possibility of fire ignitions becoming wildfires:

- The National Fire Danger Rating Systems Buildup Index reflects the combined cumulative effects of daily drying and precipitation fuels with a 10-day time lag constant. It is a rating of the total amount of fuel available for combustion (National Wildfire Coordinating Group 2023).
- The Keetch-Byram Drought Index determines forest fire potential 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). It is expressed in hundredths of an inch of soil moisture depletion (NOAA NIDIS 2023).

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

In addition to the two indices, the NJFFS uses the National Fire Danger Rating System (NFDRS) to provide a measure of 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 help the public understand fire potential. The NJFFS slightly adapted the color system for their purposes. The NFDRS, with the NFFS color scheme, is shown in Table 13-3.

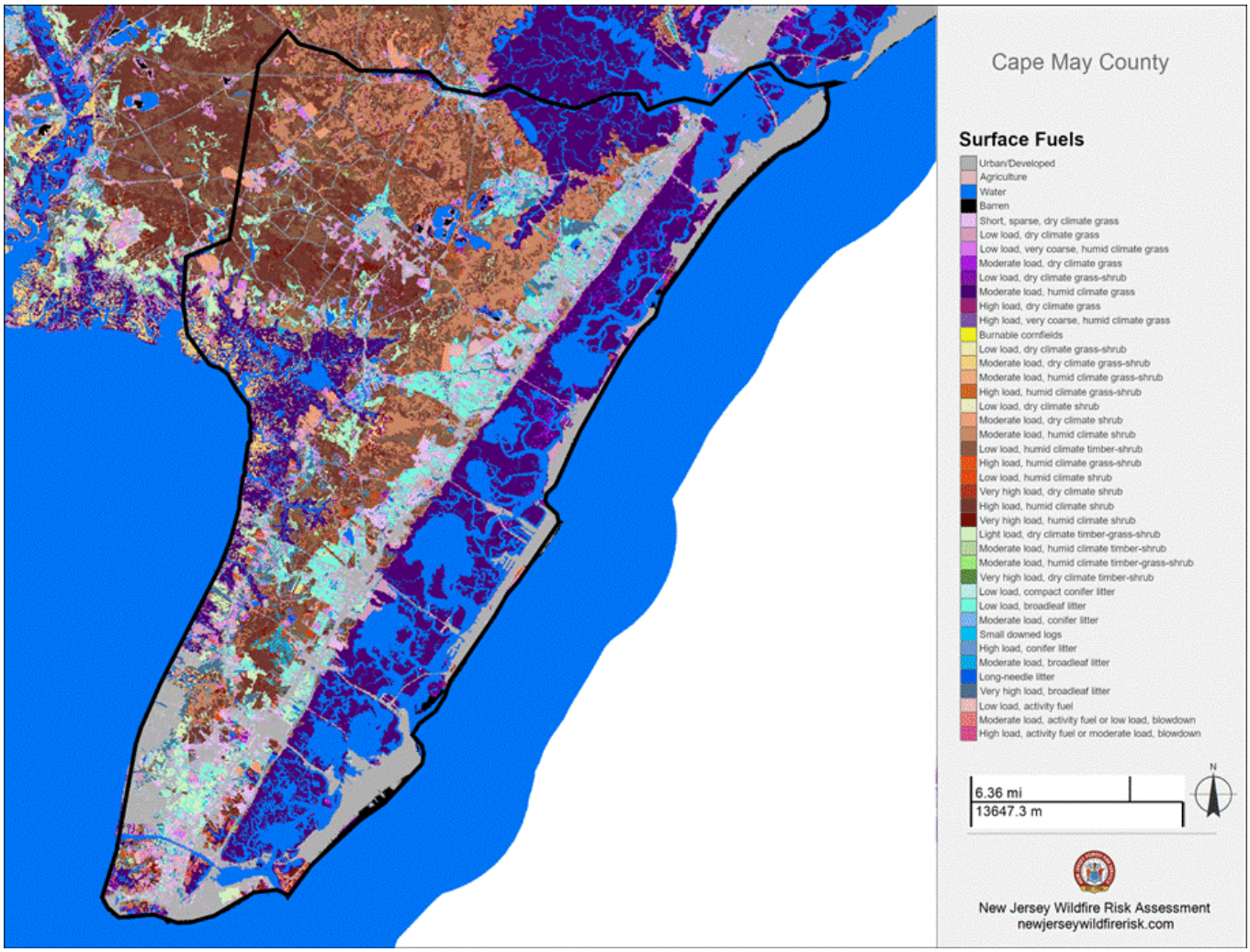
Table 13-3. Fire Danger Rating and Color Code

Fire Danger Rating and Color Code	Description
Low (L) (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 (M) (Blue)	Fires can start from most accidental causes, but except for 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 (H) (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 (VH) (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 burn into heavier fuels.
Extreme (E) (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 (trunks, branches, and treetops) 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.

Source: NJFFS 2023

Surface fuels are defined by fire behavior fuel models. A fuel model contains the parameters required by the surface fire spread model to compute surface fire behavior characteristics, including rate of spread, flame length, fire line intensity, and other fire behavior metrics. As the name might suggest, surface fuels account only for surface fire potential and surface fuels are generally defined to be less than six feet in height off the ground. Surface fuels typically are categorized into one of six primary fuel types based on the primary carrier of the surface fire: 1) Grass, 2) Grass/Shrub, 3) Shrub, 4) Timber/Understory, 5) Timber Litter and 6) Slash. These surface fuel models provide the input parameters needed to compute surface fire behavior. Figure 13-6 and Table 13-4 visualize the surface fuel in Cape May County (New Jersey Forest Fire Service 2024).

Figure 13-6. Surface Fuels in Cape May County



Source: New Jersey Forest Fire Service 2024

Table 13-4. Surface Fuels in Cape May County

Surface Fuel Model	Description	Acres	Percent	Surface Fuel Model	Description	Acres	Percent
NB1	Urban/Developed	23,765	13.0 %	SH5	High load, humid climate grass-shrub	0	0.0 %
NB3	Agriculture	1,080	0.6 %	SH6	Low load, humid climate shrub	2,354	1.3 %
NB8	Water	29,491	16.1 %	SH7	Very high load, dry climate shrub	0	0.0 %
NB9	Barren	1,426	0.8 %	SH8	High load, humid climate shrub	19,894	10.9 %
GR1	Short, sparse, dry climate grass	5,453	3.0 %	SH9	Very high load, humid climate shrub	2,124	1.2 %
GR2	Low load, dry climate grass	3,868	2.1 %	TU1	Light load, dry climate timber-grass-shrub	4,988	2.7 %
GR3	Low load, very coarse, humid climate grass	2,941	1.6 %	TU2	Moderate load, humid climate timber-shrub	104	0.1 %
GR4	Moderate load, dry climate grass	987	0.5 %	TU3	Moderate load, humid climate timber-grass-shrub	296	0.2 %
GR5	Low load, dry climate grass-shrub	1,355	0.7 %	TU5	Very high load, dry climate timber-shrub	16	0.0 %
GR6	Moderate load, humid climate grass	31,864	17.4 %	TL1	Low load, compact conifer litter	0	0.0 %
GR7	High load, dry climate grass	0	0.0 %	TL2	Low load, broadleaf litter	7,236	4.0 %
GR8	High load, very coarse, humid climate grass	0	0.0 %	TL3	Moderate load, conifer litter	3,664	2.0 %
AG9	Burnable cornfields	0	0.0 %	TL4	Small downed logs	0	0.0 %
GS1	Low load, dry climate grass-shrub	1,275	0.7 %	TL5	High load, conifer litter	295	0.2 %
GS2	Moderate load, dry climate grass-shrub	2,784	1.5 %	TL6	Moderate load, broadleaf litter	2,495	1.4 %
GS3	Moderate load, humid climate grass-shrub	123	0.1 %	TL8	Long-needle litter	441	0.2 %
GS4	High load, humid climate grass-shrub	0	0.0 %	TL9	Very high load, broadleaf litter	3,358	1.8 %
SH1	Low load, dry climate shrub	0	0.0 %	SB1	Low load, activity fuel	0	0.0 %
SH2	Moderate load, dry climate shrub	991	0.5 %	SB2	Moderate load, activity fuel or low load, blowdown	0	0.0 %
SH3	Moderate load, humid climate shrub	15,248	8.3 %	SB3	High load, activity fuel or moderate load, blowdown	0	0.0 %
SH4	Low load, humid climate timber-shrub	13,124	7.2 %				
						Total	**183,040** **100.0 %**

Source: New Jersey Forest Fire Service 2024

13.1.4 Previous Occurrences

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2025, Cape May County was not included in any major disaster (DR) or emergency (EM) declarations for wildfire-related events (FEMA 2025).

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in contiguous counties. Between August 2019 and March 2025, Cape May County was not included in any USDA wildfire-related agricultural disaster declarations (USDA 2024).

Previous Events

The NJFFS keeps records of wildfires and prescribed burns in the State of New Jersey, as shown in Table 13-5. In Cape May County, between 2018 and 2023, there have been a total of 205 fires with a total acres burned of 85.75. During the same timeframe, there have been 219 prescribed burns with 1,870 acres of land treated. For events prior to 2019, refer to the 2019 Cape May County HMP.

Table 13-5. Wildfires and Prescribed Burns in Cape May County 2018-2023

	Wildfires		Prescribed Burns	
Year	Number of Fires	Acres Burned	Number of Treatments	Acres Treated
2018	31	15.5	47	251
2019	38	10.5	41	106
2020	31	15.25	37	246
2021	34	9.5	38	394
2022	38	22	40	298
2023	33	13	16	575
Total	**205**	**85.75**	**219**	**1,870**

Source: New Jersey Forest Fire Service 2024

13.1.5 Probability of Future 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 13-6. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. In Chapter 20, the identified hazards of concern for Cape May County were ranked. Based on historical records and input from the Planning Partnership, the probability of occurrence for wildfire in the County is considered "*occasional*".

Table 13-6. Probability of Future Wildfire Events in Cape May County

Hazard Type	Number of Occurrences Between 2018 and 2023	Percent Chance of Occurring in Any Given Year
Wildfire	205	100%

Sources: New Jersey Forest Fire Service 2024

Climate Change Projections

A gradual change in temperatures will alter the growing environment of many tree species throughout the United States and New Jersey, reducing the growth of some trees and increasing the growth of others. Tree growth and regeneration may be affected more by extreme weather events and climatic conditions than by gradual changes in temperature or precipitation. Warmer temperatures may lead to longer dry seasons and multi-year droughts, creating triggers for wildfires, insects, and invasive species. An increase in invasive species, such as the emerald ash borer, can lead to the destruction and death of ash 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 while wildfires can burn during a given year (US EPA 2022).

Climate change may also increase the frequency of lightning strikes. 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). 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).

According to the temperature projections for Southern New Jersey, including Cape May County, this area can expect warmer and drier conditions which may increase the frequency and intensity of wildfires. Higher temperatures are expected to increase the amount of moisture that evaporates from land and water. These changes have the potential to lead to more frequent and severe droughts, which, in turn, increases the likelihood of wildfires (US EPA 2022).

13.1.6 Cascading Impacts on Other Hazards

Following wildfires, cascading hazards such as debris flow, landslides, and flooding may occur due to loss of stabilizing vegetation, resulting in potentially catastrophic sequences. When wildfire hits in drought-stricken areas, watersheds and reservoirs can be further impacted by ash and debris flows, water treatment facilities may shut down with damage or loss of power, crops can be destroyed, and smoke can affect animal and human health (NIDIS 2023).

Flooding after a wildfire is often more severe, as debris and ash left from the fire can form mudflows. During and after a rain event, as water moves across charred and denuded ground, it can also pick up soil and sediment and carry it in a stream of floodwaters. These mudflows have the potential to cause significant damage to impacted areas. Areas directly affected by fires and those located below or downstream of burn areas are most at risk for flooding (FEMA 2020). For detailed information regarding flooding, see Chapter 10 (Flood).

As previously mentioned, intense wildfire events that destroy existing ecosystems can result in 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).

13.2 VULNERABILITY AND IMPACT ASSESSMENT

The 2023 Wildland-Urban Interface/Intermix obtained through the SILVIS Laboratory, Department of Forest Ecology and Management, University of Wisconsin – Madison, was referenced to delineate wildfire hazard areas. The University of Wisconsin – Madison wildland fire hazard areas are based on the 2020 Census and 2021 National Land Cover Dataset and the Protected Areas Database. For this risk assessment, the high-, medium-, and low-density interface areas were combined and used as the "Interface" hazard area, and the high-, medium-, and low-density intermix areas were combined and used as the "Intermix" hazard areas.

Asset data (population, building stock, critical facilities) were used to support an evaluation of assets exposed and potential impacts and losses associated with this hazard. To determine what assets are exposed to wildfire, available and appropriate GIS data were overlaid with the hazard area; Assets with their centroid located in the hazard area were totaled to estimate the totals and values exposed to a wildfire event.

13.2.1 Life, Health, and Safety

Overall Population

Wildfires have the potential to impact human health and life of residents and responders, structures, infrastructure, and natural resources. The most vulnerable populations include emergency responders and those within a short distance of the interface between the built environment and the wildland environment. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke.

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. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.

Table 13-7 summarizes the number of people located in the WUI interface and intermix hazard areas. There is a total of 40,755 people in Cape May County that is in the WUI interface hazard area. The Township of Middle has the highest population of 11,201 peoples located in the WUI interface hazard area. There is a total of 16,677 people in Cape May County that is in the WUI intermix hazard area. The Township of Middle has the highest population of 7,901 peoples located in the WUI intermix hazard area.

Table 13-7. Population located in the Wildland-Urban Interface and Intermix Hazard Areas

Jurisdiction	Total Population (U.S. Census Bureau 2020 Decennial)	Population in the Wildland-Urban Interface Hazard Area		Population in the Wildland-Urban Intermix Hazard Area	
		Number of Persons	% of Jurisdiction Total	Number of Persons	% of Jurisdiction Total
Avalon (B)	1,243	240	19.3%	0	0.0%
Cape May (C)	2,768	0	0.0%	42	1.5%
Cape May Point (B)	305	0	0.0%	0	0.0%
Dennis (T)	6,285	2,938	46.7%	2,432	38.7%

Jurisdiction	Total Population (U.S. Census Bureau 2020 Decennial)	Population in the Wildland-Urban Interface Hazard Area		Population in the Wildland-Urban Intermix Hazard Area	
		Number of Persons	% of Jurisdiction Total	Number of Persons	% of Jurisdiction Total
Lower (T)	22,057	10,846	49.2%	1,618	7.3%
Middle (T)	20,380	11,201	55.0%	7,901	38.8%
North Wildwood (C)	3,621	0	0.0%	31	0.9%
Ocean (C)	11,229	3,946	35.1%	155	1.4%
Sea Isle (C)	2,104	1,958	93.1%	98	4.7%
Stone Harbor (B)	796	0	0.0%	0	0.0%
Upper (T)	12,539	8,533	68.1%	3,337	26.6%
West Cape May (B)	1,010	0	0.0%	55	5.4%
West Wildwood (B)	540	0	0.0%	30	5.6%
Wildwood (C)	5,157	0	0.0%	0	0.0%
Wildwood Crest (B)	3,101	0	0.0%	0	0.0%
Woodbine (B)	2,128	1,093	51.4%	978	46.0%
Cape May County	**95,263**	**40,755**	**42.8%**	**16,677**	**17.5%**

Source: U.S. Census Bureau 2020; University of Wisconsin-Madison 2023, MRLC Consortium 2021
Note: (B) Borough; (C) City; (T) Township

Socially Vulnerable Population

The homeless, elderly, children, and low-income individuals are particularly vulnerable to wildfire hazards. The elderly are at increased risk of injuries and fatalities due to limited mobility, chronic health conditions, and difficulty evacuating quickly. This vulnerability is exacerbated by factors such as reduced physical capability and reliance on medical equipment. Children are also at heightened risk due to their dependence on adults for evacuation and protection, as well as their susceptibility to smoke inhalation. Low-income individuals frequently lack access to reliable transportation, safe housing, and resources for emergency preparedness, increasing their exposure to wildfire dangers. The homeless population faces significant risks due to prolonged exposure to the elements, limited access to safe shelters, and challenges in obtaining necessary resources to remain safe during wildfire events.

Table 13-8 and Table 13-9 illustrate the number of vulnerable persons located in the WUI interface and intermix hazard areas. There is a total of 10,744 persons over the age of 65, 1,935 persons under the age of 5, 523 non-English speaking persons, 5,681 persons with disability, and 3,295 persons in poverty located within the WUI interface hazard area of the County. There is a total of 3,970 persons over the age of 65, 900 persons under the age of 5, 288 non-English speaking persons, 2,361 persons with disability, and 1,370 persons in poverty located within the WUI intermix hazard area of the County.

Table 13-8. Estimated Number of Vulnerable Persons Located in the Wildland-Urban Interface Hazard Area

Jurisdiction	Persons Over 65	Percent of Total	Persons Under 5	Percent of Total	Non-English Speaking Persons	Percent of Total	Persons with a Disability	Percent of Total	Persons in Poverty	Percent of Total
Avalon (B)	148	19.4%	4	19.0%	0	0.0%	31	19.4%	13	18.3%
Cape May (C)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Cape May Point (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Dennis (T)	610	46.7%	225	46.6%	16	46.3%	278	46.6%	151	46.5%
Lower (T)	2,713	49.2%	546	49.1%	107	49.0%	1,786	49.2%	1,164	49.1%
Middle (T)	2,656	55.0%	525	54.9%	273	55.0%	1,632	54.9%	979	54.9%
North Wildwood (C)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ocean (C)	1,342	35.1%	72	35.0%	14	34.1%	519	35.1%	401	35.1%
Sea Isle (C)	956	93.0%	5	83.3%	12	92.6%	244	92.8%	105	92.9%
Stone Harbor (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Upper (T)	2,065	68.0%	482	68.0%	44	67.9%	800	68.0%	150	67.9%
West Cape May (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
West Wildwood (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wildwood (C)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wildwood Crest (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Woodbine (B)	254	51.3%	76	51.0%	57	50.7%	391	51.3%	332	51.4%
Cape May County	**10,744**	**40.5%**	**1,935**	**47.0%**	**523**	**37.1%**	**5,681**	**40.4%**	**3,295**	**39.0%**

Source: U.S. Census Bureau, American Community Survey 2018-2022; University of Wisconsin-Madison 2023, MRLC Consortium 2021, U.S. Census Bureau 2020
Note: (B) Borough; (C) City; (T) Township

Table 13-9. Estimated Number of Vulnerable Persons Located in the Wildland-Urban Intermix Hazard Area

Jurisdiction	Persons Over 65	Percent of Total	Persons Under 5	Percent of Total	Non-English Speaking Persons	Percent of Total	Persons with a Disability	Percent of Total	Persons in Poverty	Percent of Total
Avalon (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.00%
Cape May (C)	11	1.4%	2	1.4%	0	0.0%	2	1.2%	2	1.4%
Cape May Point (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Dennis (T)	505	38.7%	186	38.5%	13	37.6%	230	38.6%	125	38.5%
Lower (T)	404	7.3%	81	7.3%	15	6.9%	266	7.3%	173	7.3%
Middle (T)	1,873	38.8%	370	38.7%	192	38.6%	1,151	38.7%	691	38.8%
North Wildwood (C)	14	0.8%	0	0.0%	0	0.0%	6	0.9%	2	0.7%
Ocean (C)	52	1.4%	2	1.0%	0	0.0%	20	1.4%	15	1.3%
Sea Isle (C)	47	4.6%	0	0.0%	0	0.0%	12	4.6%	5	4.4%
Stone Harbor (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Upper (T)	807	26.6%	188	26.5%	17	26.2%	313	26.6%	58	26.2%
West Cape May (B)	20	5.4%	2	4.8%	0	0.0%	6	4.8%	1	3.7%
West Wildwood (B)	10	5.6%	1	2.9%	0	0.0%	5	4.7%	1	5.6%
Wildwood (C)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wildwood Crest (B)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Woodbine (B)	227	45.9%	68	45.6%	51	45.4%	350	45.9%	297	46.0%
Cape May County	**3,970**	**15.0%**	**900**	**21.9%**	**288**	**20.4%**	**2,361**	**16.8%**	**1,370**	**16.2%**

Source: U.S. Census Bureau, American Community Survey 2018-2022; University of Wisconsin-Madison 2023, MRLC Consortium 2021, U.S. Census Bureau 2020
Note: (B) Borough; (C) City; (T) Township

13.2.2 General Building Stock

Buildings located within the NJFFS identified extreme, very high, or high fuel hazard areas are exposed and considered 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 located in the defined hazard area by municipality. Approximately 32.1-percent ($76,224,864,511) of the County's building replacement cost value is located in the extreme, very high, and high wildfire fuel risk hazard area. The Township of Lower has the greatest number of buildings located in the wildfire hazard area (12,053 structures – 47.5-percent of its total).

Buildings located in the Wildland-Urban Interface (WUI) and Intermix areas are particularly vulnerable to wildfires due to several factors. These structures are often close to natural vegetation, which can serve as fuel for fires. The primary risks include (FEMA: Geospatial Resource Center 2022):

- **Embers**: Small, burning pieces of material that can be carried by the wind and ignite buildings by landing on combustible surfaces like roofs or entering through vents.
- **Direct Flame Contact**: Flames from nearby vegetation or other burning structures can directly ignite buildings.
- **Radiant Heat**: Intense heat from nearby fires can cause buildings to ignite without direct flame contact, especially if they are close to other burning structures or vegetation.

To mitigate these risks, it's crucial to create defensible space around buildings, use fire-resistant building materials, and maintain vegetation to reduce fuel loads.

Table 13-10 and Table 13-11 illustrates the number of buildings in the WUI interface and intermix hazard areas. There are a total of 49,292 buildings with a replacement cost value of over $76 billion located in the WUI interface hazard area of the County. The Township of Lower has the largest number of buildings located within the WUI interface (12,053). Sea Isle City has the highest replacement cost value for buildings located in the WUI interface (approximately $22 billion).

There are a total of 19,496 buildings with a replacement cost value of over $21 billion located in the WUI intermix hazard area of the County. The Township of Middle has the largest number of buildings located within the WUI intermix (8,793) and the highest replacement cost value of buildings located in the WUI intermix (approximately $7 billion).

Table 13-12 and Table 13-13 illustrate the number of buildings located in the WUI interface and intermix hazard areas by general occupancy class. There are a total of 39,816 residential buildings, 8,803 commercial buildings, 8 industrial buildings, and 665 government, religion, agriculture, and education buildings located within the WUI interface hazard area. The Township of Lower has the highest number of residential (9,194) and commercial (2,726) buildings located in the WUI interface hazard area. The Township of Middle has the highest number of industrial (6) and government, religion, agricultural, and education (216) buildings located within the WUI interface hazard area.

There are a total of 12,960 residential buildings, 5,734 commercial buildings, 2 industrial buildings, and 799 government, religion, agriculture, and education buildings located within the WUI intermix hazard area. The Township of Middle has the highest number of residential (5,697), commercial (2,733), and government, religion, agriculture, and education (363) buildings located in the WUI intermix hazard area. Both Ocean City and the Township of Upper have one industrial building located within the WUI intermix hazard area.

Table 13-10. Buildings in the WUI Interface Hazard Area

Jurisdiction	Jurisdiction Total Buildings		Buildings in the Wildland-Urban Interface Hazard Area			
			Number of Buildings		Replacement Cost Value	
	Count	Replacement Cost Value	Count	% of Jurisdiction Total	Value	% of Jurisdiction Total
Avalon (B)	6,696	$25,723,512,232	1,213	18.1%	$5,956,660,259	23.2%
Cape May (C)	4,650	$16,203,622,284	0	0.0%	$0	0.0%
Cape May Point (B)	850	$1,686,539,666	0	0.0%	$0	0.0%
Dennis (T)	8,700	$8,299,131,210	3,666	42.1%	$3,426,210,595	41.3%
Lower (T)	25,387	$22,775,836,898	12,053	47.5%	$8,777,144,160	38.5%
Middle (T)	20,691	$27,392,475,766	10,331	49.9%	$14,463,996,024	52.8%
North Wildwood (C)	5,843	$11,753,681,214	0	0.0%	$0	0.0%
Ocean (C)	19,235	$44,649,077,467	6,799	35.3%	$10,277,155,518	23.0%
Sea Isle (C)	7,416	$23,896,778,328	6,901	93.1%	$22,218,922,913	93.0%
Stone Harbor (B)	4,202	$8,177,015,155	0	0.0%	$0	0.0%
Upper (T)	10,936	$14,864,714,357	7,297	66.7%	$10,049,009,002	67.6%
West Cape May (B)	1,760	$2,893,441,733	0	0.0%	$0	0.0%
West Wildwood (B)	920	$1,064,788,340	0	0.0%	$0	0.0%
Wildwood (C)	4,460	$12,875,631,194	0	0.0%	$0	0.0%
Wildwood Crest (B)	6,159	$11,797,908,652	0	0.0%	$0	0.0%
Woodbine (B)	2,107	$3,249,453,892	1,032	49.0%	$1,055,766,040	32.5%
Cape May County	**130,012**	**$237,303,608,388**	**49,292**	**37.9%**	**$76,224,864,511**	**32.1%**

Source: Cape May County 2024; RS Means 2024; University of Wisconsin-Madison 2023, MRLC Consortium 2021, U.S. Census Bureau 2020
Note: (B) Borough; (C) City; (T) Township

Table 13-11. Buildings in the WUI Intermix Hazard Area

Jurisdiction	Jurisdiction Total Buildings		Buildings in the Wildland-Urban Interface Hazard Area			
			Number of Buildings		Replacement Cost Value	
	Count	Replacement Cost Value	Count	% of Jurisdiction Total	Value	% of Jurisdiction Total
Avalon (B)	6,696	$25,723,512,232	0	0.0%	$0	0.0%
Cape May (C)	4,650	$16,203,622,284	72	1.5%	$337,616,802	2.1%
Cape May Point (B)	850	$1,686,539,666	0	0.0%	$0	0.0%
Dennis (T)	8,700	$8,299,131,210	3,826	44.0%	$4,048,837,503	48.8%
Lower (T)	25,387	$22,775,836,898	2,122	8.4%	$1,624,354,513	7.1%
Middle (T)	20,691	$27,392,475,766	8,793	42.5%	$7,909,453,791	28.9%
North Wildwood (C)	5,843	$11,753,681,214	56	1.0%	$66,539,272	0.6%
Ocean (C)	19,235	$44,649,077,467	267	1.4%	$474,036,270	1.1%
Sea Isle (C)	7,416	$23,896,778,328	336	4.5%	$1,270,007,178	5.3%
Stone Harbor (B)	4,202	$8,177,015,155	0	0.0%	$0	0.0%
Upper (T)	10,936	$14,864,714,357	2,979	27.2%	$4,171,146,368	28.1%
West Cape May (B)	1,760	$2,893,441,733	115	6.5%	$334,811,938	11.6%
West Wildwood (B)	920	$1,064,788,340	45	4.9%	$141,438,016	13.3%
Wildwood (C)	4,460	$12,875,631,194	0	0.0%	$0	0.0%
Wildwood Crest (B)	6,159	$11,797,908,652	0	0.0%	$0	0.0%
Woodbine (B)	2,107	$3,249,453,892	884	42.0%	$659,258,635	20.3%
Cape May County	**130,012**	**$237,303,608,388**	**19,495**	**15.0%**	**$21,037,500,286**	**8.9%**

Source: Cape May County 2024; RS Means 2024; University of Wisconsin-Madison 2023, MRLC Consortium 2021, U.S. Census Bureau 2020
Note: (B) Borough; (C) City; (T) Township

Table 13-12. Buildings in the WUI Interface Hazard Area by General Occupancy Class

Jurisdiction	Buildings in the Wildland-Urban Interface Hazard Area by General Occupancy Class			
	Residential	Commercial	Industrial	Other
Avalon (B)	1,127	83	0	3
Cape May (C)	0	0	0	0
Cape May Point (B)	0	0	0	0
Dennis (T)	2,707	867	0	92
Lower (T)	9,194	2,726	0	133
Middle (T)	8,076	2,033	6	216
North Wildwood (C)	0	0	0	0
Ocean (C)	6,264	522	0	13
Sea Isle (C)	6,193	691	0	17
Stone Harbor (B)	0	0	0	0
Upper (T)	5,411	1,768	0	118
West Cape May (B)	0	0	0	0
West Wildwood (B)	0	0	0	0
Wildwood (C)	0	0	0	0
Wildwood Crest (B)	0	0	0	0
Woodbine (B)	844	113	2	73
Cape May County	**39,816**	**8,803**	**8**	**665**

Source: Cape May County 2024; University of Wisconsin-Madison 2023, MRLC Consortium 2021, U.S. Census Bureau 2020
Note: (B) Borough; (C) City; (T) Township
Other = Government, Religion, Agricultural, and Education

Table 13-13. Buildings in the WUI Intermix Hazard Area by General Occupancy Class

Jurisdiction	Buildings in the Wildland-Urban Intermix Hazard Area by General Occupancy Class			
	Residential	Commercial	Industrial	Other
Avalon (B)	0	0	0	0
Cape May (C)	62	8	0	2
Cape May Point (B)	0	0	0	0
Dennis (T)	2,241	1,358	0	227
Lower (T)	1,372	697	0	53
Middle (T)	5,697	2,733	0	363
North Wildwood (C)	40	16	0	0
Ocean (C)	247	10	1	9
Sea Isle (C)	310	23	0	3
Stone Harbor (B)	0	0	0	0
Upper (T)	2,116	810	1	52
West Cape May (B)	76	15	0	24
West Wildwood (B)	44	0	0	1
Wildwood (C)	0	0	0	0
Wildwood Crest (B)	0	0	0	0
Woodbine (B)	755	64	0	65
Cape May County	**12,960**	**5,734**	**2**	**799**

Source: Cape May County 2024; University of Wisconsin-Madison 2023, MRLC Consortium 2021, U.S. Census Bureau 2020
Note: (B) Borough; (C) City; (T) Township
Other = Government, Religion, Agricultural, and Education

13.2.3 Community Lifelines and Other Critical Facilities

Wildfires can have an impact on the water supplies throughout the County because of residual pollutants landing in water resources which can clog wastewater pipes, culverts, etc. Wildfires may also impact transportation routes, blocking residents and commuters from getting in and out of the County during a wildfire event because of char and debris polluting the air making it difficult to drive, or the flames having close proximity to the roadways making the route an unsafe passageway. In general, roads and bridges surrounding the areas of fire risk are important because they provide ingress and egress to large areas and, in some cases, to isolated neighborhoods. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers.

Table 13-14 and Table 13-15 provide information on the distribution of various community lifelines within the wildfire interface and intermix hazard areas. Overall, Cape May County has 194 facilities located in the wildfire interface hazard area, representing 25 percent of the County's total facilities; in the wildfire intermix hazard area, there are 94 facilities (12.1 percent). Refer to Chapter 3 (County Profile) for more information about the critical facilities and lifelines in Cape May County.

Table 13-14. Number of Facilities in the Wildfire Interface Hazard Area, by Lifeline Category

Jurisdiction	Number of Facilities in the Wildfire Interface 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 Total
Avalon (B)	1	0	0	0	0	0	0	1	2	4	12.5%
Cape May (C)	0	0	0	0	0	0	0	0	0	0	0.0%
Cape May Point (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Dennis (T)	3	0	0	0	0	5	0	12	3	23	39.7%
Lower (T)	0	0	0	1	1	1	0	15	5	23	18.9%
Middle (T)	10	0	1	3	16	13	0	8	13	64	41.6%
North Wildwood (C)	0	0	0	0	0	0	0	0	0	0	0.0%
Ocean (C)	0	0	0	0	0	2	1	5	6	14	18.2%
Sea Isle (C)	0	0	0	1	2	4	1	9	5	22	75.9%
Stone Harbor (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Upper (T)	4	2	2	1	5	8	2	3	8	35	48.6%
West Cape May (B)	0	0	0	0	0	0	0	0	0	0	0.0%
West Wildwood (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Wildwood (C)	0	0	0	0	0	0	0	0	0	0	0.0%
Wildwood Crest (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Woodbine (B)	0	0	0	0	1	3	0	0	5	9	32.1%
Cape May County	**18**	**2**	**3**	**6**	**25**	**36**	**4**	**53**	**47**	**194**	**25.0%**

Source: Cape May County 2022,2024; HIFLD 2024; USACE 2024; University of Wisconsin-Madison 2023, MRLC Consortium 2021, U.S. Census Bureau 2020
Note: (B) Borough; (C) City; (T) Township

Table 13-15. Number of Facilities in the Wildfire Intermix Hazard Area, by Lifeline Category

Jurisdiction	Number of Facilities in the Wildfire Intermix 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 Total
Avalon (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Cape May (C)	0	0	0	0	0	0	0	0	1	1	2.4%
Cape May Point (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Dennis (T)	4	0	0	0	3	5	0	6	2	20	34.5%
Lower (T)	0	0	0	0	1	1	0	5	4	11	9.0%
Middle (T)	5	0	0	3	0	6	2	12	4	32	20.8%
North Wildwood (C)	0	0	0	0	0	0	0	0	0	0	0.0%
Ocean (C)	0	0	0	0	0	0	0	4	0	4	5.2%
Sea Isle (C)	0	0	0	0	0	0	0	2	1	3	10.3%
Stone Harbor (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Upper (T)	4	0	0	0	1	1	4	0	3	13	18.1%
West Cape May (B)	0	0	0	0	0	0	0	0	0	0	0.0%
West Wildwood (B)	0	0	0	0	0	1	0	1	0	2	20.0%
Wildwood (C)	0	0	0	0	0	0	0	0	0	0	0.0%
Wildwood Crest (B)	0	0	0	0	0	0	0	0	0	0	0.0%
Woodbine (B)	0	0	0	0	1	1	0	4	2	8	28.6%
Cape May County	**13**	**0**	**0**	**3**	**6**	**15**	**6**	**34**	**17**	**94**	**12.1%**

Source: Cape May County 2022,2024; HIFLD 2024; USACE 2024; University of Wisconsin-Madison 2023, MRLC Consortium 2021, U.S. Census Bureau 2020
Note: (B) Borough; (C) City; (T) Township

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 business. 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 man 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.

Due to a lack of data regarding past structural and economic losses specific to Cape May County or its municipalities, it is not possible to estimate future losses due to wildfire events currently.

13.2.5 Natural, Historic and Cultural Resources

Natural

While wildfire is a necessary part of ecosystem health in Cape May County, intense wildfire that burns too hot can result in severe damage to the environment, including burning and killing of plant and animal life. Intense fire can also heat narrow and shallow waterways, resulting in damage to aquatic systems.

According to the USGS, post-fire runoff polluted with debris and contaminates can be extremely harmful to terrestrial ecosystems and aquatic life (USGS 2023). Studies show that urban fires in particular are more harmful to the environment compared to forest fires (Harvard University 2022). The age and density of infrastructure within Cape May County can exacerbate consequences of fires on the environment because of the increased amount of chemicals and contaminates that would be released from burning infrastructure. These chemicals, such as iron lead, and zinc, may leach into the stormwater, contaminate nearby streams, and impair aquatic life.

Intense wildfire events that destroy existing ecosystems can result in 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 are a major threat to historic resources, with the potential to cause extensive damage, and in some cases, complete destruction. The potential impacts on historic resources, particularly infrastructure, from wildfire depend heavily on the materials used for construction. Many historic structures are made of wood, which is a highly flammable material.

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

Understanding future changes that affect vulnerability can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The following sections examine potential conditions that may affect hazard vulnerability.

13.3.1 Potential or Planned Development

Any changes in development can impact the County's risk to the wildfire hazard of concern. Fire suppression capabilities are high at the state and local levels, but new development with a mix of additional structures, ornamental vegetation, and wildland fuels will require continued assessment of the hazard and mitigation risk. The County should implement wildfire management strategies in existing building code to protect structures against the residual impacts from wildfire such as heat, debris, and char. Furthermore, development should be built with access to transit routes that will enable easier evacuation during a wildfire event.

13.3.2 Projected Changes in Population

Any changes in the density of population can impact the number of persons exposed 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.

13.3.3 Climate Change

According to the USDA Forest Service, 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 climate/fire/vegetation interactions is essential for addressing issues associated with climate change that include (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 WUI.

As discussed earlier, average temperatures are anticipated to increase in New Jersey, therefore, the 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 wildfire. The increased potential combined with stronger winds may make it harder to contain fires and thus increase the County's vulnerability to this hazard.

13.3.4 Other Identified Conditions

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).

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.