

# 4.3.10 Wildfire

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the wildfire hazard in Essex County.

## **2020 HMP Update Changes**

- > Previous occurrences were updated with events that occurred between 2014 and 2019.
- The vulnerability assessment was conducted using updated population, building and critical facility/lifeline spatial data to determine exposure to the wildfire hazard.

## 4.3.10.1 Profile

## Hazard Description

A wildland fire can be defined as any non-structural fire that occurs in the wildland. Three distinct types of wildland fires have been defined and include: 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. Wildland fires can be caused by lightning, human carelessness, and arson. Most frequently, wildland fires in the State of New Jersey are caused by humans. 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 increase the probability of other natural disasters, 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. Lands impacted by wildfire increase the risk of flooding and mudflow in those areas impacted by wildfire. Normally, vegetation absorbs rainfall, reducing runoff. However, wildfires leave the ground charred, barren, and unable to absorb water; thus, 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 2013).

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 2013). For detailed information regarding flooding, see Section 4.3.6 (Flood).

The height of wildland fire season in New Jersey is typically in spring (March through May) and culminates in early May, corresponding with the driest live fuel moisture periods of the year. Although the spring months are the most severe, the summer and fall months may also experience extensive fires in the state. While the spring season is historically the period in which wildfire danger is the highest, wildland fires can occur every month of the year. Drought, snow pack, and local weather conditions can expand the length of the fire season. The early and late shoulders of the fire season usually are associated with human-caused fires. Lightning generally is the cause of most fires in the peak season.

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. From January 1, 2018, to August 12, 2018, there were 552 wildfires in New Jersey that burned over 1,300 acres. In contrast, during this same period in 2017, the State experienced 588 fires, which burned





over 5,024 acres (New Jersey Forest Fire Service [NJFFS] 2018). Details regarding the number of fires in Essex County were not included in these overall statistics.

## Location

According to the U.S. Fire Administration (USFA), the fire problem in the U.S. varies from region to region. This often is a result of climate, poverty, education, demographics, and other causal factors (USFA, 2012). Wildfires occur in virtually all of the U.S. The western portion of the U.S. is subject to more frequent wildfires, due to their more arid climate and prevalent conifer and brush fuel types. Wildfires have proven to be the most destructive in California but have become an increasingly frequent and damaging phenomenon nationwide (FEMA, 1997). States with a large amount of wooded, brush, and grassy areas, such as California, Colorado, New Mexico, Montana, Kansas, Mississippi, Louisiana, Georgia, Florida, North and South Carolina, Tennessee, Massachusetts, and the national forests of the western U.S. are at highest risk for wildfires (University of Florida, 1998). In Essex County, wildfires have the potential to occur anywhere in the County.

NJFFS, a division of the New Jersey Department of Environmental Protection (NJDEP), is responsible for protecting the 3.25 million acres of wildland in the State. NJFFS is under the direction of the State firewarden 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 29 125,000 acres sections 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 2013). Figure 4.3.10-1 illustrates the NJFFS region divisions within the State. Essex County is located in Division A (Northern NJ).





## Figure 4.3.10-1. Fire Divisions of New Jersey



Source: NJDEP 2013

Note: The red circle indicates the location of Essex County. The County is located in Fire Division A.





## Wildfire Fuel Hazard Areas

NJFFS developed Wildfire Fuel Hazard data for the entire state based on NJDEP data. For details on the information was developed, refer to: <u>https://www.state.nj.us/dep/gis/njfh.html</u>. Generally, wildfires in Essex County are more likely to occur in the western and southern portions of the County, as compared to the more urban communities (Essex County HMP 2007). Table 4.3.10-1 indicates the amount of land in each of the wildfire fuel hazard ranking zones for Essex County. Table 4.3.10-2 explains the approximate area in the NJFFS risk areas in the County.

## Table 4.3.10-1. Area in the Wildfire Fuel Hazard Ranking Zones in Essex County

Hazard Area	Area (Square Miles)
Extreme	0.3
Very High	0.1
High	1.6
Moderate	9.7
Low	29.0

Source: NJFFS 2013

### Table 4.3.10-2. Approximate Area in Wildfire Fuel Hazard Ranking Zones in Essex County

		NJ Forest Service Risk Areas (square miles)				
		% in Low to			% in High to	
NG	Total Area	Low to	Moderate	High to	Extreme	
Municipality	(Square Miles)	Moderate	Hazard Area	Extreme	Hazard Area	
Township of Belleville	3.4	0.52	15.6%	0.02	0.5%	
Township of Bloomfield	5.4	1.02	19.0%	0.02	0.4%	
Borough of Caldwell	1.2	0.18	15.1%	0.00	0.0%	
Township of Cedar Grove	4.4	1.49	34.3%	0.09	2.0%	
City of East Orange	3.9	0.28	7.3%	0.00	0.1%	
Borough of Essex Fells	1.4	0.75	53.2%	0.03	2.1%	
Township of Fairfield	10.3	4.99	48.2%	0.31	3.0%	
Borough of Glen Ridge	1.3	0.13	9.9%	0.00	0.0%	
Township of Irvington	2.9	0.18	6.1%	0.00	0.2%	
Township of Livingston	14.1	5.62	39.8%	0.24	1.7%	
Township of Maplewood	3.9	1.08	28.0%	0.04	1.0%	
Township of Millburn	9.9	4.26	43.1%	0.16	1.6%	
Township of Montclair	6.2	1.13	18.2%	0.03	0.5%	
City of Newark	26.2	4.96	18.9%	0.69	2.6%	
Borough of North Caldwell	3.1	1.16	37.6%	0.04	1.2%	
Township of Nutley	3.4	0.32	9.3%	0.02	0.5%	
City of Orange Township	2.2	0.27	12.4%	0.00	0.0%	
Borough of Roseland	3.7	1.64	44.5%	0.11	3.0%	
Township of South Orange Village	2.8	0.39	13.6%	0.02	0.6%	
Township of Verona	2.8	0.76	27.3%	0.05	1.6%	
Township of West Caldwell	5.1	2.03	40.1%	0.04	0.7%	
Township of West Orange	12.1	5.61	46.3%	0.16	1.3%	
Essex County (Total)	129.7	38.76	29.9%	2.05	1.6%	

Source: NJFFS 2013















#### Figure 4.3.10-3. Wildfire Risk for Essex County







The extent (that is, magnitude or severity) of wildfires depends on 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. This includes the National Fire Danger Rating Systems Buildup Index and the Keetch-Byram Drought Index. Both are used for fire preparedness planning, which includes the following initiatives: campfire and burning restrictions, fire patrol assignments, staffing of fire lookout towers, and readiness status for both observation and firefighting aircraft.

- The *Buildup Index* is a number that 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.
- The *Keetch-Byram Drought Index* (KBDI) is an index used to determining forest fire potential. The drought index 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.

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. 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 as follows:

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.

## Table 4.3.10-3. Fire Danger Rating and Color Code

Source: NJFFS 2018





### **Previous Occurrences and Losses**

Between 1954 and 2019, New Jersey was included in two FEMA fire management assistance (FMA) declarations. Generally, these disasters cover a wide range of the State; therefore, the disaster may have impacted many counties. Essex County was not included in any FMA declarations.

Based on all sources used to research and identify wildfires in the County, there have been no wildfire incidents in Essex County between 2014 and 2019.

## **Probability of Future Occurrences**

Estimating the approximate number of urban fires and wildfires to occur in Essex County is difficult to predict in a probabilistic manner. This is because a number of variable factors impact the potential for a fire to occur and because some conditions (for example, ongoing land use development patterns, location, fuel sources, and construction sites) exert increasing pressure on the WUI zone. Based on available data, urban fires and wildfires will continue to present a risk to Essex County. Given the numerous factors that can impact urban fire and wildfire potential, the likelihood of a fire event starting and sustaining itself should be gauged by professional fire managers on a daily basis.

In Section 4.4, the identified hazards of concern for Essex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records and input from the Steering Committee and Planning Committee, the probability of occurrence for wildfire in the County is considered 'frequent'.

## **Climate Change Impacts**

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. 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 (U.S. Department of Agriculture [USDA] 2012). 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 strikes increases, the potential for wildfires from these strikes also increases (Lee 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 (USDA 2012).

Average annual temperatures have increased by 3°F in New Jersey over the past century (NOAA NCEI 2019). By the 2020s, the average annual temperature in New Jersey is projected to increase by 1.5°F to 3°F above the statewide baseline (1971 to 2000), which was 52.7°F. By 2050, the temperature is projected to increase 3°F to 5°F (Sustainable Jersey Climate Change Adaptation Task Force 2011). As for precipitation, Northern New Jersey's 1971-2000 precipitation average was over five inches (12%) greater than the average from 1895-1970 (Office of New Jersey State Climatologist). Average annual precipitation is projected to increase in the region up to 10% by the 2020s and up to 15% by the 2050s. Most of the additional precipitation is expected to come during the winter months (New York City Panel on Climate Change [NPCC] 2013).

As stated above, according to the temperature projections for Northern New Jersey, including Essex 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 (U.S. EPA 2009).

## 4.3.10.2 Vulnerability Assessment

A spatial analysis was conducted using the NJFFS Wildfire Fuel Hazard spatial layer. For the purposes of the assessment, an asset (population, structures, critical facilities, and lifelines) is considered exposed and potentially vulnerable to the wildfire hazard if it is located in the 'extreme', 'very high' and 'high' wildfire fuel hazard areas. Refer to Section 4.2 for additional details on the methodology used to assess wildfire risk.

## Impact on Life, Health and Safety

As demonstrated by historic wildfire events in New Jersey and other parts of the country, potential losses include impacts to human health and life of residents and responders, structures, infrastructure and natural resources. In addition, 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 and decrease in tourism. 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. Table 5.4.10-7 summarizes the estimated population exposed by municipality.

Based on the spatial analysis, an estimated 478 people, or less than 1-percent of the County's population, are located in the high, very high and extreme wildfire hazard areas. Overall, the City of Newark has the greatest number of populations located in the extreme, very high, and high hazard areas (139 people), while the Township of Fairfield has the greatest percentage of its population exposed (79 people – 1% of the municipal population).

Of the population exposed, the most vulnerable include the economically disadvantaged and the population over age 65. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on net economic impacts on their families. The population over age 65 is also more vulnerable because they are more likely to seek or need medical attention that may not be available due to isolation during a wildfire event, and they may have more difficulty evacuating. In the high/very high/extreme NJFFS fuel hazard boundaries, there are approximately 82 people over the age of 65 and 30 people below the poverty level.

		Estimated Population Exposed		
Municipality	American Community Survey (2013-2017) Population	Extreme, Very High and High	% of Total Exposed	
Township of Belleville	36,383	0	0.0%	
Township of Bloomfield	48,892	0	0.0%	
Borough of Caldwell	8,032	0	0.0%	
Township of Cedar Grove	12,638	62	<1%	
City of East Orange	65,151	0	0.0%	
Borough of Essex Fells	2,095	3	<1%	
Township of Fairfield	7,671	79	1.0%	
Borough of Glen Ridge	7,668	0	0.0%	
Township of Irvington	54,715	0	0.0%	
Township of Livingston	29,955	6	<1%	
Township of Maplewood	24,706	0	0.0%	

## Table 4.3.10-4. Estimated Vulnerable Population





		Estimated Population Exposed		
Municipality	American Community Survey (2013-2017) Population	Extreme, Very High and High	% of Total Exposed	
Township of Millburn	20,387	9	<1%	
Township of Montclair	38,572	39	<1%	
City of Newark	282,803	139	<1%	
Borough of North Caldwell	6,637	16	<1%	
Township of Nutley	28,829	0	0.0%	
City of Orange Township	30,731	0	0.0%	
Borough of Roseland	5,907	3	<1%	
Township of South Orange Village	16,503	33	<1%	
Township of Verona	13,585	7	<1%	
Township of West Caldwell	10,932	14	<1%	
Township of West Orange	47,609	69	<1%	
Essex County (Total)	800,401	478	<1%	

Sources: American Community Survey 5-year Estimate, 2017; NJFFS, 2009

### **Impact on 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 5.4.10-8 summarizes the estimated building stock inventory located in the hazard area by municipality. Less than 1-percent (\$221 million) of the County's replacement cost value is located in the extreme/very high/high hazard area. The Township of Fairfield has the greatest number of buildings in the wildfire hazard area (32 structures – less than 1-percent of its total), while the Township of West Orange has the greatest replacement cost value located in the hazard area (\$76 million – less than 1-percent of its total).

#### Table 4.3.10-5. Building Stock Replacement Value Located in Wildfire Fuel Hazard Ranking Zones

			Estimated Building Stock Exposed			
Municipality	Number of Buildings	Total Replacement Cost Value (RCV)	Number of Buildings - Extreme, Very High, and High	% of Total	RCV - Extreme, Very High, and High	% of Total
Township of Belleville	7,910	\$4,483,250,138	0	0.0%	\$0	0.0%
Township of Bloomfield	11,720	\$6,021,089,887	0	0.0%	\$0	0.0%
Borough of Caldwell	1,738	\$1,183,204,981	0	0.0%	\$0	0.0%
Township of Cedar Grove	3,944	\$3,008,045,785	19	0.5%	\$32,371,269	1.1%
City of East Orange	7,908	\$6,090,766,912	0	0.0%	\$0	0.0%
Borough of Essex Fells	766	\$527,629,662	1	0.1%	\$102,270	0.0%
Township of Fairfield	3,121	\$6,082,819,367	32	1.0%	\$35,586,309	0.6%
Borough of Glen Ridge	2,256	\$1,095,474,263	0	0.0%	\$0	0.0%
Township of Irvington	7,934	\$5,384,838,816	0	0.0%	\$0	0.0%
Township of Livingston	9,795	\$7,691,376,811	2	0.0%	\$2,526,898	0.0%
Township of Maplewood	6,738	\$3,575,395,600	0	0.0%	\$0	0.0%





			Estimated Building Stock Exposed			
Municipality	Number of Buildings	Total Replacement Cost Value (RCV)	Number of Buildings - Extreme, Very High, and High	% of Total	RCV - Extreme, Very High, and High	% of Total
Township of Millburn	6,437	\$5,241,567,136	3	0.0%	\$1,314,971	0.0%
Township of Montclair	9,436	\$5,845,976,130	11	0.1%	\$10,591,516	0.2%
City of Newark	43,085	\$40,970,549,425	13	0.0%	\$13,311,804	0.0%
Borough of North Caldwell	2,095	\$1,727,767,442	5	0.2%	\$5,140,141	0.3%
Township of Nutley	7,945	\$3,841,553,722	0	0.0%	\$0	0.0%
City of Orange Township	3,890	\$3,520,865,708	0	0.0%	\$0	0.0%
Borough of Roseland	1,794	\$1,955,487,279	1	0.1%	\$6,477,522	0.3%
Township of South Orange Village	4,188	\$2,877,374,186	11	0.3%	\$18,056,328	0.6%
Township of Verona	4,113	\$2,213,338,613	2	0.0%	\$8,372,455	0.4%
Township of West Caldwell	3,730	\$3,533,044,820	5	0.1%	\$10,550,659	0.3%
Township of West Orange	11,845	\$8,358,783,858	17	0.1%	\$76,136,926	0.9%
Essex County	162,388	\$125,230,200,542	122	0.1%	\$220,539,068	0.2%

Sources: Microsoft, 2018, Open Street Map, 2019; NJOIT, 2018; NJFFS, 2009

## **Impact on Critical Facilities**

In Essex County, there is one critical facility (school) located in the wildfire hazard area. The school is located in the Township of West Orange in a high fuel hazard area. According to the Township this school is hydrant service to this school.

Roads and bridges in 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. Areas surrounding any dams located in wooded areas or other areas adjacent to the wildfire hazard areas are particularly vulnerable to additional impacts from a wildfire. Wildfires may not directly impact dams, but it can create conditions in which dams can be obstructed or damaged by falling tree debris and cause potential flooding in the area.

### **Impact on 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. Wildfires can cost thousands of taxpayer dollars to suppress and control and 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.

Wildfire can also severely impact roads and infrastructure. NJ-27 and NJ-124, which service the southern communities of Essex County are exposed to portions of the wildfire hazard area. This should be considered for evacuation route purposes since it serves as the major north/south corridor in the interior of the County. No major utilities such as power generation facilities are located in the wildfire hazard area.

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





## Future Changes that May Impact Vulnerability

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

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

## **Projected Development**

As discussed in Section 3 (County Profile), areas targeted for future growth and development have been identified across the county. It is anticipated that any new development and new residents in the extreme, very high or high fuel hazard areas will be exposed to the wildfire hazard.

New development could be affected by the wildfire hazard if located in the identified hazard areas and mitigation measures are not considered during design, development and maintenance of the property. Each municipality identified areas of recent development and proposed development in their community. Developments that could be located using an address or Parcel ID were geocoded and overlain with the NJFFS high, very high, and extreme wildfire hazard areas to determine exposure to wildfire. There are 3 recent and proposed developments vulnerable to the wildfire hazard; this represents approximately 1.07 percent of the 28 identified developments. Refer to Section 3 (County Profile), and Volume II Section 9 for potential new development in Essex County; and Figure 5.4.6-13 for a map of proposed new development and the NJFFS boundaries for Essex County.

## Projected Changes in Population

According to population projections from the State of New Jersey Department of Labor and Workforce Development, Essex County will experience an increase in population through 2034 (approximately 40,000 people between 2017 and 2034). As population grows, people may expand out towards areas adjacent to or within the wildfire hazard area. The mix of additional structures, ornamental vegetation, and wildland fuels may cause erratic fire behavior, and could potentially increase risk to life, property, and economic welfare in vulnerable areas throughout the County. Refer to Section 3 (County Profile which includes a discussion on population trends for the County.

### Climate Change

As discussed earlier, temperatures are anticipated to increase, 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 have the potential to increase the likelihood of a wildfire. The increased potential combined with stronger winds can increase the County's vulnerability. If stronger winds occur near a wildfire and emergency services are unable to initially contain the event, the fast-moving fire can spread to nearby developments. This can directly impact the County's population and built environment in the vicinity of the fire, and also indirectly affect those served by utility infrastructure that can be damaged by a fire.

### **Change of Vulnerability Since 2015 HMP**

The entire County continues to be vulnerable to the wildfire hazard. Several differences exist between the 2015 HMP and this update. For this plan update, an updated general building stock based upon replacement cost value from MODIV tax assessment data and 2019 RS Means, and an updated critical facility inventory were used to assess the County's risk to the hazard areas; further lifelines were identified. In addition, the 2017 American Community Survey population estimates were used and estimated at a structural level as compared to the 2015





plan which evaluated exposure using 2010 U.S. Census blocks. The NJFFS Wildfire Fuel Hazard spatial layer has not been updated since the last HMP. I Changes in exposure are attributed to increases in population and new development.









Source: NJDEP

