CHAPTER 11: WILDFIRE

2022 PLAN UPDATE

Chapter 11: visual and thematic updates were included throughout the chapter, including updates to fonts, colors, and the addition of a cover page.
Page 11-1, paragraph 1: added national-level wildfire data from the National Interagency Fire Center for the years 1983-2021.
Page 11-1: Added Table 11-1: Description of Fuel Types to Section 11.1.
Page 11-2: Table 11-2: Wildfire Events, 2000 to 2020 has been updated with the most recent data from Maryland's DNR Forest Service.
Page 11-3, paragraph 2: added text from Maryland DNR's *2020 Forest Action Plan* indicating why total acres burned by wildfire has decreased overall.
Page 11-3, paragraph 3: Updated Section *11.2 History* with data from the 2021 State Hazard Mitigation Plan.
Page 11-3, paragraph 3: Data from Maryland DNR's *2020 Forest Action Plan* was added discussing Maryland Forest Service response to wildfires in the state between 2009 and 2018.
Page 11-4: Table 11-3: Fire Department Responses has been updated with new local fire incident data from 2016 through 2020.
Page 11-4: Risk rankings from the 2021 State Hazard Mitigation Plan and the Hazard Identification and Risk Assessment completed for this Plan Update were added to Section 11.3. The State ranks wildfire as "medium" risk and Somerset County ranks wildfire as "low" risk. Findings which reflect changes in land use/development depicted in Map 11-2 have been added.
Page 11-7: New mapping of 2020 Land Use/Land Cover for Somerset County from ESRI. This mapping was created to depict development changes in the last decade.
Page 11-9: Added new Figure 11-2: Protect Forests From Harm (PFFH) Wildfire Priority Map.
Page 11-9: Updated Section 11.4 Municipal Perspective to reflect development changes depicted in Map 11-4.
Page 11-11: New mapping, "Community Land Use/Land Cover, 2020" has been created utilizing updated land use data from ESRI.
Page 11-12: Section 11.5 has been updated to include findings from the *2020 Forest Action Plan Part I: Forest Resource Assessment.* The report indicates that Somerset County and its communities have protection plans in place. Figure 11-3: Maryland Communities With Wildfire Protection Plans has been added to illustrate communities within the state with local protection plans.
Page 11-13: Section 11.6 Future Conditions has been added for this plan update.

Chapter 11: Wildfire

11.1 Hazard Profile

A wildfire is defined as any large fire that spreads rapidly and is difficult to extinguish. According to the National Interagency Fire Center (NIFC), wildfires have burned 5.3 million acres of land annually on average since 1983 across the United States. From 1983 to 2021, the U.S. averaged 70,000 wildfires per year. The years with the greatest number of acres burned include 2015, 2017, and 2020; these three years alone totaled over 10 million acres burned.[i] Federal wildfire suppression costs in the United States have spiked from an annual average of about $425 million from 1985 to 1999 to $1.6 billion from 2000 to 2019, according to data from the NIFC.

Most of the acreage involved and the accompanying suppression efforts are located in the western states on land managed by the U.S. Forest Service (USFS), the Bureau of Land Management (BLM), the Bureau of Indian Affairs (BIA), the U.S. Fish and Wildlife Service (USFWS) and the National Park Service (NPS). Unfortunately, in recent years, more private property has been affected by wildfires as urban development encroaches on forest and range land.

Wildfires in the State of Maryland are more limited in extent, with more than 95% burning one acre or less. However, in 1947 more than 5,000 acres burned in Anne Arundel and Baltimore counties and in 2002 one fire burned over 2,000 acres in Somerset County. Occasionally brush fires threaten urban development where homes are built near forest or brush covered land. As more former agriculture land reverts to brush, this problem has the potential to become more prevalent.

Wildfires are fueled by natural cover, including trees, brush, grasses, and crops. Table 11-1 below provides additional information and examples of the most common types of wildfire fuel. Available fuel, topography, and weather provide the conditions that encourage wildfires to spread. Wildfires pose serious threats to human safety and property in rural and suburban areas. They can destroy crops, timber resources, recreation areas, and habitat for wildlife. Wildfires are a growing problem in the wildland/urban interface of the eastern United States, including Maryland.

Table 11-1: Description of Fuel Types

Fuel Type	Description	Example
Ground fuel	This vegetation is close to the ground or lying on the ground. Ground fuels include dead grass and leaves; needles, dead branches, twigs, and logs.	

Table 11-1: Description of Fuel Types		
Fuel Type	**Description**	**Example**
Surface fuel	These plants and trees are closer to the ground but are not actually lying on the ground. They are usually made up of shrubs, grasses, low-hanging branches and anything not located in the high branches of the trees that may burn. They can also be referred to as "ladder fuels," because fire can move from ground fuels to surface fuels, then on to crown fuels.	
Crown/Aerial fuel	Crown fuels are only in the "crowns" or tops, of the trees. They do not touch the ground and are usually the high branches of trees. When a wildfire burns in the tops of the trees, firefighters call it a "crown fire."	
Source: www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5042664.html		

Climatic and meteorological conditions that influence wildfires include solar insulation, atmospheric humidity, and precipitation, all of which determine the moisture content of wood and leaf litter. Dry spells, heat, low humidity, and wind increase the susceptibility of vegetation to fire. Natural and human agents can be responsible for igniting wildfires. Natural agents include lightning, sparks generated by rocks rolling down a slope, friction produced by branches rubbing together in the wind, and spontaneous combustion. Most wildfires in Maryland are caused by humans via improper burning of debris, arson, and accidents from equipment operations.

11.2 History

Data for this hazard includes the number of wildfires and acres burned in Somerset County as reported by the Maryland Department of Natural Resources (DNR) Forest Service and is detailed in Table 11-2.

Table 11-2: Wildfire Events, 2000 to 2020		
Year	**Number of Wildfires**	**Acres Burned**
2000	10	15.6
2001	20	127.6
2002	41	2,038.2
2003	1	1.0
2004	9	52.6
2005	13	38.1
2006	14	80.0
2007	24	110.0
2008	16	62.9
2009	12	49.8

Table 11-2: Wildfire Events, 2000 to 2020		
Year	**Number of Wildfires**	**Acres Burned**
2010	10	132.1
2011	8	93.9
2012	9	159.9
2013	5	3.7
2014	1	1.0
2015	16	290.1
2016	2	3.1
2017	5	6.9
2018	0	0.0
2019	1	0.2
2020	1	13.5
Total	**218**	**3,280.2**
Average	**10.9**	**164.01**
Source: Maryland DNR Forest Service		

In terms of number of occurrences, the Maryland Forest Service listed a total of 218 wildfire events affecting Somerset County from 2000-2020. Therefore, Somerset County experiences approximately 10.9 wildfire events per year. In 2002, Somerset County experienced a very large fire that consumed more than 2,000 acres in a wetland area.

As shown in the table above, the number of fires and the acres burned per year has decreased slightly over the years in Somerset County. There are several explanations for the decrease in wildfires, including wildfire awareness in the county, loss of forestland due to development and agriculture, and an increase in response time by fire departments. In relation to increased public awareness of wildfire, Somerset County Department of Emergency Services coordinated with the Forestry Service to have several “fire danger” signs placed throughout the County.

Due to the fact that a large percentage of wildfires are caused by human activities (e.g., burning debris, arson, equipment malfunction), Somerset County’s recent decline in total wildfires is partially attributed to County Ordinance No. 1070 Burn Ban (adopted 2013) and County Ordinance No. 1076 (adopted 2014).

Ordinance No. 1070 “prohibits open burning when climatic conditions indicate the threat of uncontrolled fire in Somerset County.” The burn ban is based upon atmospheric conditions including the “lack of appreciable rainfall, wind conditions, and any other local conditions that may be deemed hazardous.” Ordinance No. 1076 “establishes a fine and procedure for issuance of such fine, for any person who violates any provision of Ordinance No. 1070.” These ordinances may be viewed in full at www.somersetmd.us.

The Maryland DNR indicates the following reasoning for the overall decrease in total acres burned by wildfires: “wildfire acres burned has declined, which is correlated with trends in increased rainfall and increased use of prescribed fire to restore fire-adapted ecosystems and manage wildfire risk.”

According to the *2016 Maryland State Hazard Mitigation Plan Update*, Somerset County has suffered a total of $116,544 in damages from wildfires between 1998 and 2016. Since the publication of the 2016 Plan, no federally declared wildfire events have occurred within the state. Maryland DNR's *2020 Forest Action Plan* indicates that during the period between 2009 and 2018, the Maryland Forest Service responded to an average of 156 wildfire starts which burned 2,100 acres annually throughout the state. The annual area burned during wildfires peaked in 2011, when 8,310 acres burned during 125 separate incidents.[ii]

Table 11-3 includes data from local Fire Departments that have reported the total number of "wildland/brush/grass" fires between 2016 and 2021.

Table 11-3: Fire Department Responses, 2016 to 2021

Year	Total Incidents
2016	0
2017	0
2018	0
2019	5
2020	25
2021	24
Total	**54**
Average	**10.8**

Source: Somerset County Fire Report 2016-2021, www.somerset911.org/stats

11.3 County Perspective

As shown in the *2021 State Hazard Mitigation Plan*, Somerset County has a "Medium" ranking for the wildfire hazard.

As part of this plan update, a Hazard Identification and Risk Assessment (HIRA) was conducted for the wildfire hazard. A composite scoring method was utilized to rank natural hazards, which included five (5) key components: historical impacts (in terms of human lives and property), geographic extent, historical occurrences, future probability, and community perspective.

Based on this method, wildfire was assigned a ranking of "Low" during the 2022 plan update. This represents a decrease compared to wildfire's ranking of "medium" in the 2017 Plan. The decrease in wildfire risk is likely due to the fact that wildfire incidents have been trending downward in Somerset County in recent years (refer to Table 11-1). The future probability of a wildfire event is considered "occasional", as determined by the HIRA.

Note: Full results of the HIRA, including method, are included within *Appendix A: Hazard Identification and Risk Assessment* of this plan.

Wildfires have forced school closings, disrupted telephone services by burning fiber optic cables, damaged railroads and other infrastructure, and adversely affected tourism, outdoor recreation, and hunting.

Table 11-4 illustrates the findings from the 2010 Maryland Land Use/Land Cover Survey. All agriculture, development, barren lands, and forested areas were grouped together to show the relationship between forested areas and development.

Table 11-4: Land Use in Acres, 2010

Land Use/Land Cover	Area in Acres	Percent of County (Land Area)
Very Low Density Residential	6,413	3
Low Density Residential	7,650	4
Medium Density Residential	1,465	<1
High Density Residential	337	<1
Commercial	654	<1
Industrial	484	<1
Other Developed Lands/ Institutional/Transportation	1,771	<1
Total Developed Lands	**18,773**	**9**
Agriculture	49,693	24
Forest	82,822	40
Extractive/Barren Lands	128	<1
Wetland	55,572	27
Total Resource Lands	**188,215**	**91**
Total Land Area	**206,988**	**100**

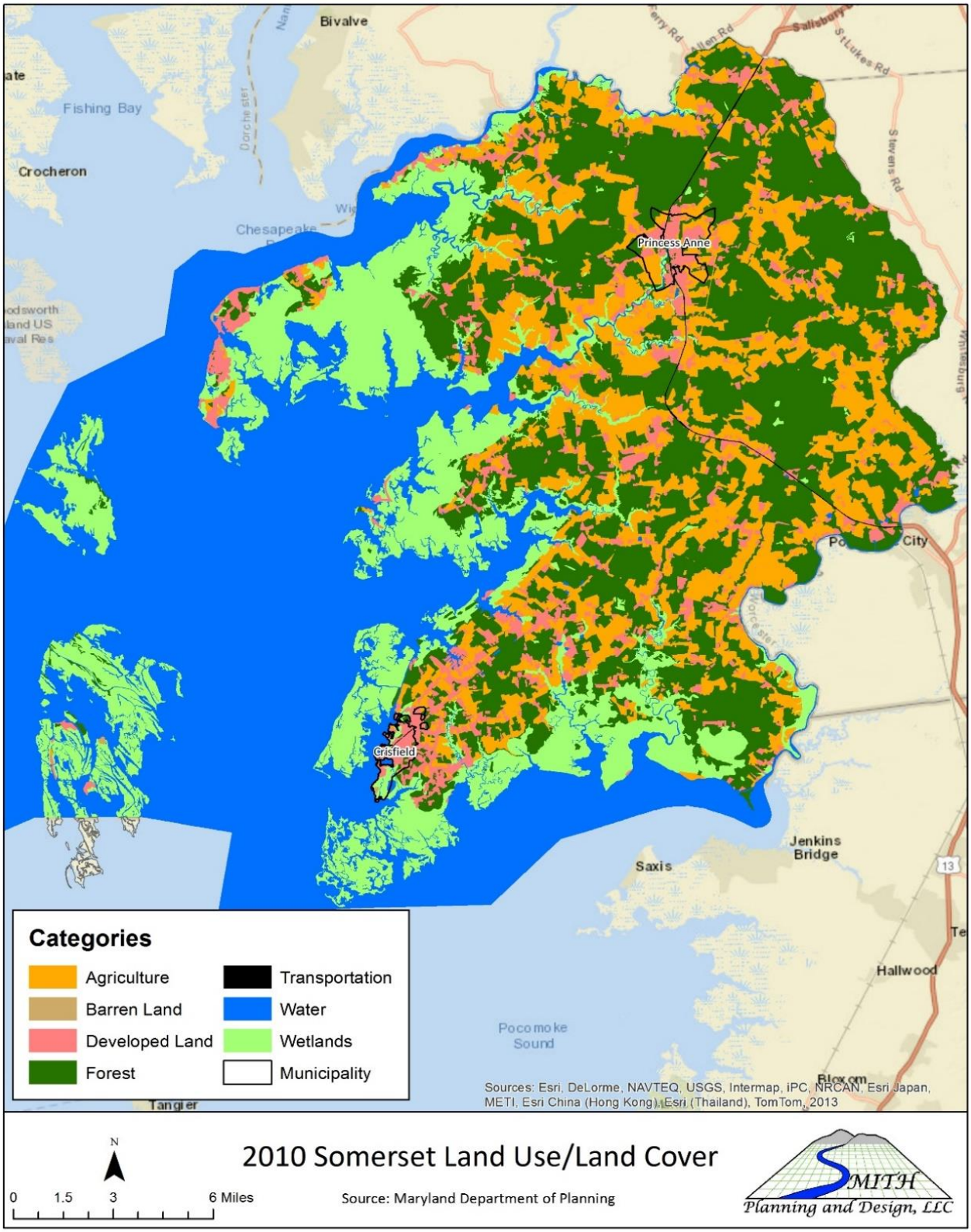
Source: 2010 Maryland Land Use/Land Cover Survey

Map 11-1 was produced using data from the 2010 Maryland Land Use/Land Cover Survey by the Maryland Department of Planning (MDP). All communities and municipalities in Somerset County are near or adjacent to forest land, wetlands, or agricultural land. As urban development extends into these forest or brush covered lands, the possibility of wildfire in urban areas increases as it does throughout the County. Therefore, most areas having a heightened risk of wildfire in the County are on the bordering/outlying area of developments where the wildland/urban interface exists.

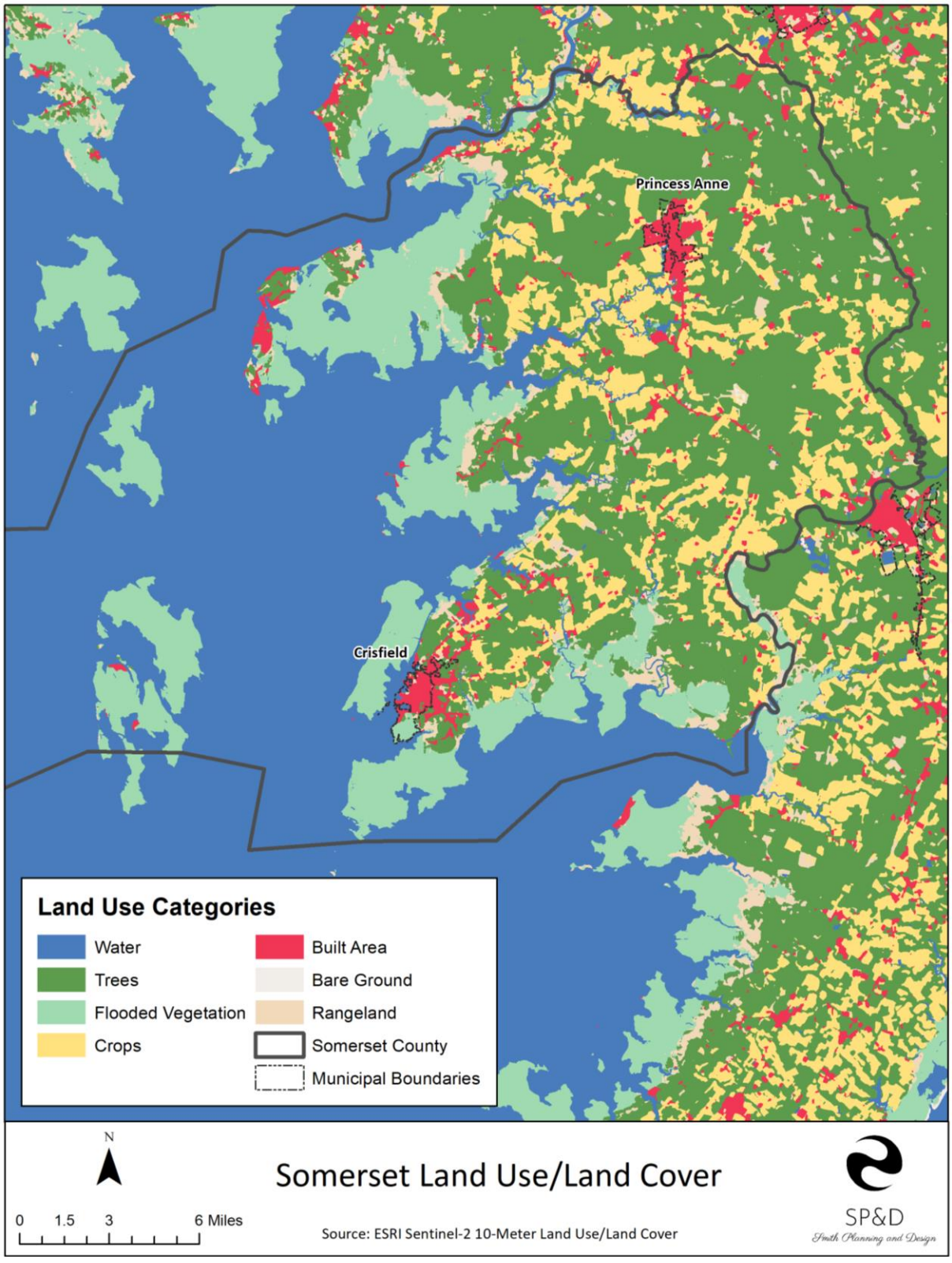
The State is working on updating its land use mapping via the 2020 Land Use Survey; however, at the time of this plan update the data was not available for utilization. Therefore, ESRI's Land Use/Land Cover data has been included to provide a more up-to-date comparison of how land use has changed within Somerset County in the last decade. This land use mapping is updated annually and is provided for the entirety of Earth's surface from 2017-2021. The primary differences between ESRI's 2021 Land Use and Maryland's 2010 Land Use/Land Cover data are the resolution and number of land use classifications. ESRI provides nine (9) land use classifications at 10 meter resolution, while the 2010 state data provides fourteen (14) classifications at approximately 1 meter resolution.

The updated land use depicted on Map 11-2 indicates that Somerset County has retained much of its rural development character in the last decade. Wildfire risk is at its greatest on the boundaries where urban and forested areas meet.

Map 11-1: Somerset Land Use/Land Cover, 2010

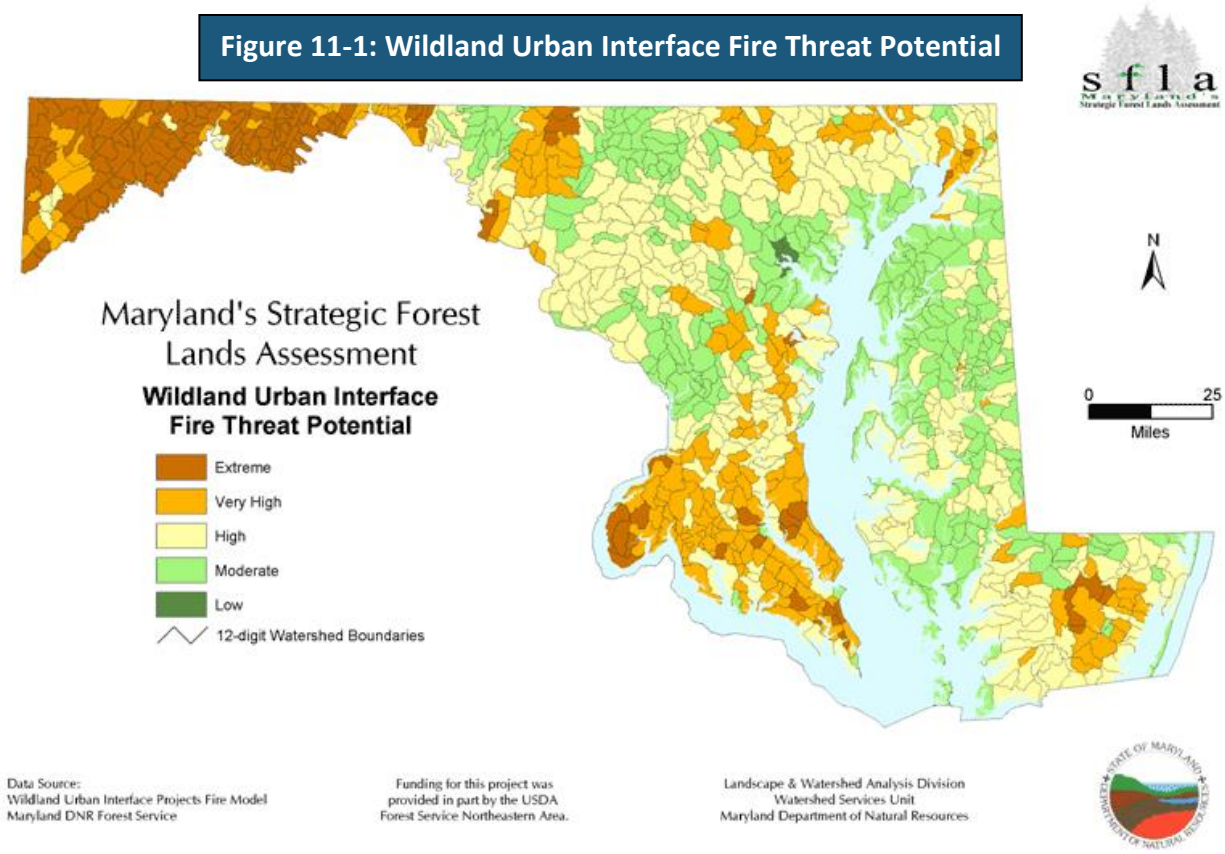


Map 11-2: Somerset Land Use/Land Cover, 2020



Maryland's Strategic Forest Lands Assessment is conducted by the Maryland Department of Natural Resources with financial assistance from the United States Department of Agriculture Forest Service and is composed of many types of vulnerability studies applying to the forests of Maryland. Figure 11-1, depicted below, shows one of the studies conducted on wildland/urban interface fire threat potential. Somerset County is shown to be in the moderate to very high Wildland Urban Interface Fire Threat Potential.

Figure 11-1: Wildland Urban Interface Fire Threat Potential



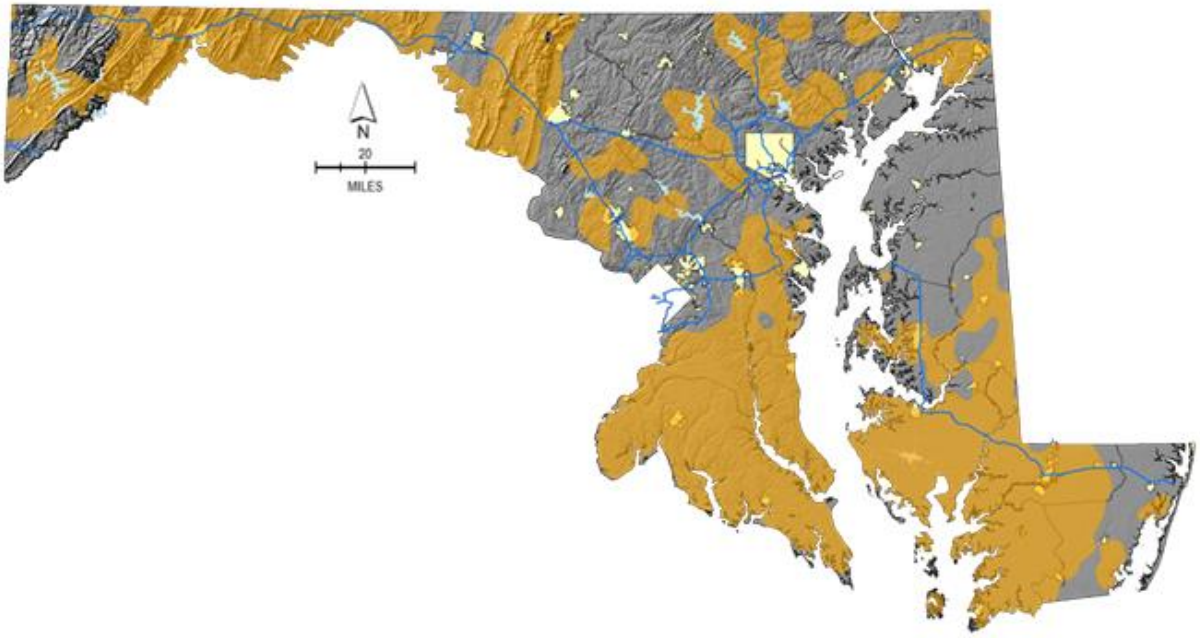
Source: Maryland DNR Forest Service.

Figure 11-1 represents only a single component of the greater "Protect Forests From Harm (PFFH) Wildfire Priority Map." Figure 11-2 (next page), which is part of the *2020 Forest Action Plan*, highlights areas within Maryland where the following three conditions are met:

1. Wildfire is historically prevalent;
2. Wildfire has the potential to cause great harm to people and property, and;
3. Where fuels and other conditions can increase the likelihood and intensity of wildfire.

Somerset County, including all of its municipalities, are within the wildfire priority area as depicted in orange in Figure 11-2, meaning they meet the three aforementioned qualifications. Full statewide results of the analysis are depicted in Figure 11-2.

Figure 11-2: Protect Forest From Harm (PFFH) Wildfire Priority Map



Source: 2020 Forest Action Plan Part I: Forest Resource Assessment.

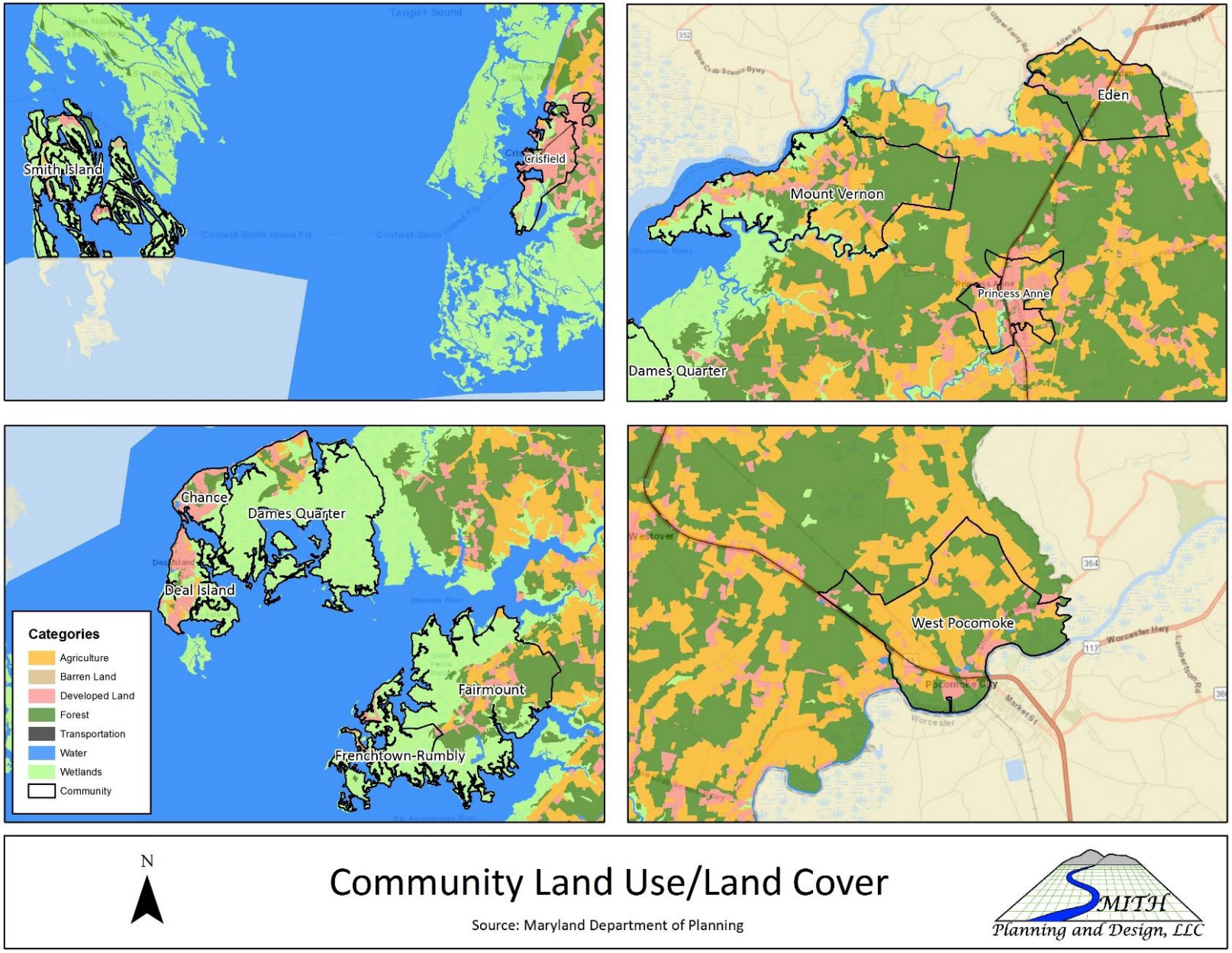
11.4 Municipal Perspective

As shown throughout the mapping in this chapter, especially Maps 11-3 and 11-4 on the following pages, there are areas in Somerset County that are at higher wildfire risk. These areas include the municipality of Princess Anne and the communities of Eden and West Pocomoke. These areas are at higher risk due to the large tracts of forestland surrounding and encompassing them. Due to Princess Anne's increased wildfire risk, the Critical and Public Facilities located in and around the Town, and particularly the Essential Facilities (i.e., Emergency Operation Center(s), Fire and Rescue Stations, Police, Schools, and Medical facilities), may also be at increased wildfire risk due to their location.

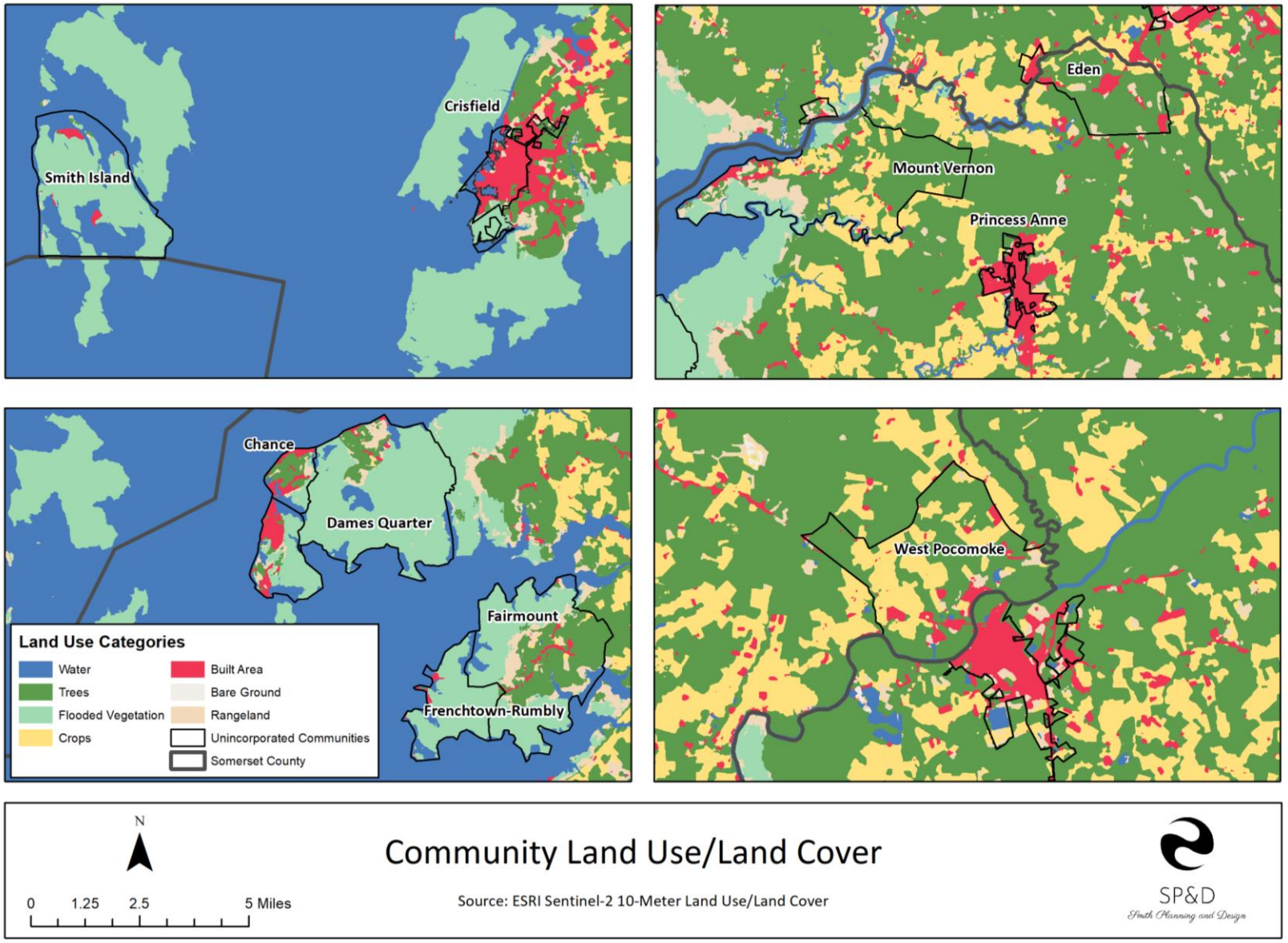
The areas in the western part of the County such as Deal Island, Smith Island, Dames Quarter, Mount Vernon, Fairmount, Frenchtown-Rumbly, and the municipality of Crisfield are at a lower wildfire risk due to the large amounts of wetlands located in this area of the County.

Areas indicating developed land interfacing with forested land are most prominent in Eden and West Pocomoke as shown on Map 11-4. There are no Essential Facilities located near either of these areas.

Map 11-3: Community Land Use/Land Cover, 2010



Map 11-4: Community Land Use/Land Cover, 2020



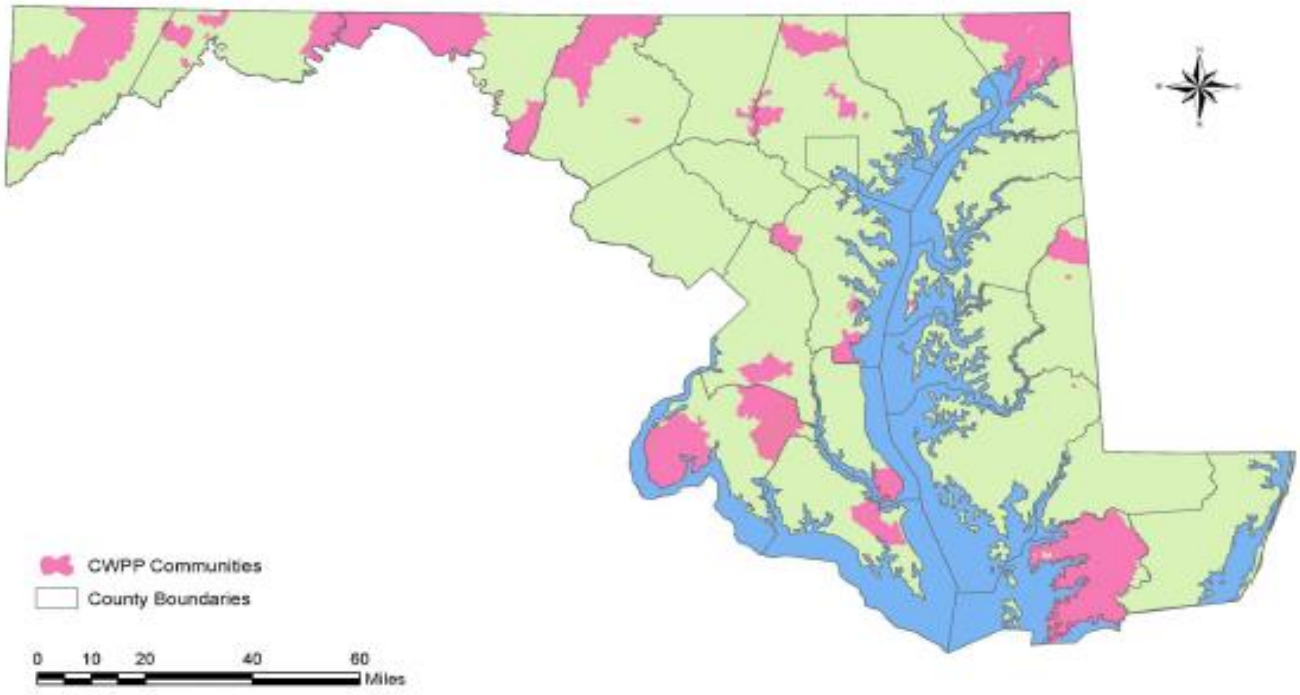
11.5 Mitigation Efforts

As noted previously, the Maryland Department of Natural Resources is the lead agency in forest fire suppression in the State. Through the years, this agency has developed working relationships with Somerset County agencies, including Emergency Services, to coordinate resources in order to suppress and control wildfires. Local volunteer fire companies, police, and the Sheriff's office assist with fire suppression and traffic control in fire situations. The County Roads Department would also provide traffic control assistance during a major wildfire situation, particularly if detours are needed.

The *2020 Forest Action Plan Part I: Forest Resource Assessment* indicates that Somerset County is one of several areas in Maryland with a Community Wildfire Protection Plan (see Figure 11-2). A Community Wildfire Protection Plan (CWPP) analyzes the wildfire risk in a community, and helps guide the efforts of the community residents, homeowner's associations, developers, and the local fire department in mitigating their wildfire risk.

This plan is an important step in raising awareness and coordinating community efforts. There are currently 81 CWPPs covering 1,180 rural communities, communities located in the Wildland Urban Interface, and government properties across the state (Figure 11-3). These plans have been focused in areas identified in the Maryland Wildland Fire Assessment Atlas as having elevated fire risk.[iii] More information about community wildfire protection planning is available at the DNR's Firewise website.

Figure 11-3: Maryland Communities with Wildfire Protection Plans



11.6 Future Conditions

The Maryland DNR indicates that wildfires are a common occurrence in the State. During a typical year the Maryland Forest Service responds to an average of 123 wildfires that burn more than 1,780 acres of forest, brush, and grasses. Fire departments respond to over 5,000 wildfire incidents per year.

While wildfires occur in every month in the State, they peak in the spring and fall seasons. During these seasons the leaves from deciduous trees have fallen to the ground, which allows sunlight and wind to reach the forest floor and dry out the fuel (i.e., leaves). Additionally, relative humidity tends to be drier during the spring and fall, which when combined with wind can create the conditions that allow a wildfire to spread quickly.

Climate change is also expected to play a role in increasing the frequency and intensity of wildfires across the United States and in Maryland. An article written for the New York Times, in which the article references a United Nations report, suggests the following:

> "In a moderate scenario for global warming, the likelihood of extreme, catastrophic fires could increase by up to a third by 2050 and up to 52 percent by 2100, the report estimates. If emissions are not curbed and the planet heats up more, wildfire risks could rise by up to 57 percent by the end of the century."[iv]

As determined in *Section 10.2*, Somerset County experiences 10.9 wildfire events annually. Based on the moderate scenario for global warming, which predicts an increase in major wildfires of up to a third by 2050, Somerset County's total annual wildfires could increase by 3.6 events per year, for a total of 14.5 wildfires annually.

The U.N. report urges governments to become even more proactive about wildfire hazards. Of every dollar spent in the United States on managing wildfires, almost 60 cents goes toward immediate firefighting responses, according to research cited in the report. Much less is spent on reducing fire risks in advance and helping communities recover in ways that could make them more resilient.[v]

[i] National Interagency Coordination Center, www.nifc.gov/fire-information/statistics/wildfires
[ii] Maryland Department of Natural Resources 2020 Forest Action Plan, Part I: Forest Resource Assessment.
[iii] Maryland Department of Natural Resources 2020 Forest Action Plan, Part I: Forest Resource Assessment.
[iv] www.nytimes.com/2022/02/23/climate/climate-change-un-wildfire-report.html
[v] www.unep.org/resources/report/spreading-wildfire-rising-threat-extraordinary-landscape-fires