5.4.6 Wildfire

This section provides a profile and vulnerability assessment of the wildfire hazard for the Cattaraugus County Hazard Mitigation Plan (HMP).

5.4.6.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, and the probability of future occurrences for the wildfire hazard.

Hazard Description

According to the New York State NYS (HMP), wildfire is defined as an uncontrolled fire spreading through natural or unnatural vegetation that can threaten lives and property if not contained. Wildfires are commonly termed forest fires, brush fires, grass fires, wildland-urban interface (WUI) fires, range fires, or ground fires. Wildfires do not include fires naturally or purposely ignited to manage vegetation for one or more benefits (NYS Division of Homeland Security and Emergency Services [DHSES] 2014). Although destructive fires do not occur annually, the state's fire history shows a cycle of outbreaks that have caused death, property loss, forest destruction, and air pollution (NYS DHSES 2019).

The NYS Forest Ranger force is a division of NYS Department of Environmental Conservation (NYSDEC). It has fought fires and retained records for more than 125 years. Over the past 25 years (1993-2017), division records indicate that rangers suppressed 5,423 wildfires that burned a total of 52,580 acres (NYSDEC 2018). Currently, more than 1,700 fire departments respond to an average of 4,500 wildfires each year. Forest Rangers respond to approximately 3 percent of all wildfires; however, Rangers help contain 33 percent of all wildfire acres (NYSDEC 2018).

Extent

The extent (that is, magnitude or severity) of wildfires depends on weather and human activity. Wildfire behavior and ecological factors that contribute to the severity of wildfires is discussed below.

Wildfire Behavior and Fire Ecology

Fire behavior is defined as the way fuel ignites, flame develops, and fire spreads; this behavior depends on interactions between fuel, weather, and topography. Fire behavior is one of the most important aspects of wildfires because almost all actions in response to a fire depend on how it behaves. Success in pre-suppression planning and actual suppression of wildfires is directly related to how well fire managers understand and can predict fire behavior.

Potential for wildfire and its subsequent development (growth) and severity are controlled by the three principal factors: topography, fuel, and weather. Each of these factors are described below:

Topography – Topography can powerfully influence wildfire behavior. Movement of air over the terrain tends to direct a fire's course. A gulch or canyon can funnel air and act as a chimney, intensifying fire behavior and inducing faster spread. Saddles on ridgetops tend to offer lower resistance to passage of air and draw fires. Solar heating of drier, south-facing slopes produces upslope thermal winds that can complicate behavior. Slope is an important factor. If the percentage of uphill slope doubles, the rate the wildfire spreads will most likely double as well. Terrain can also inhibit wildfires; fire travels downslope much more slowly than upslope, and ridgetops often mark the end of a wildfire's rapid spread (Federal Emergency Management Agency [FEMA] 1997).

Fuel – Fuels are classified by weight or volume (fuel loading) and by type. Fuel loading is a term used to describe the amount of vegetative material available. If the fuel amount doubles, energy released can also double. Each fuel type is given a burn index (an estimate of amount of potential energy that may be released), effort required to ignite a fire in each fuel and expected flame length. Different fuels have different burn qualities, and some burn more easily than others. Grass fires release relatively little energy but can sustain very high rates of spread (FEMA 1997). According to the U.S. Forest Service (USFS), a forest stand may consist of several layers of live and dead vegetation in the understory (surface fuels), mid-story (ladder fuels), and overstory (crown fuels):

- Surface fuels consist of grasses, shrubs, litter, and woody material lying on the ground. Surface fires burn low vegetation, woody debris, and litter. Under the right conditions, surface fires reduce likelihood that future wildfires will grow into crown fires.
- Ladder fuels consist of live and dead small trees and shrubs; live and dead lower branches from larger trees, needles, vines, lichens, mosses; and any other combustible biomass between the top of surface fuels and bottom of overstory tree crowns.
- Crown fuels are suspended above the ground in treetops or other vegetation and consist mostly of live and dead fine material. When historically low-density forests become overcrowded, tree crowns may merge and form a closed canopy. Tree canopies constitute the primary fuel layer in a forest crown fire (USFS 2003).

Fire behavior is strongly influenced by these fuels.

Weather / Air Mass – Weather is the most important factor influencing fire behavior, but it is always changing. Air mass, defined by the National Weather Service (NWS) as a body of air covering a relatively wide area and exhibiting horizontally uniform properties, can affect wildfire through climatic factors that include temperature and relative humidity, local wind speed and direction, cloud cover, precipitation amount and duration, and stability of the atmosphere at the time of the fire (NWS 2009). Extreme weather leads to extreme events, and often a subsidence of severe weather marks the end of a wildfire's growth and the beginning of successful containment. High temperatures and low humidity can produce vigorous fire activity. Fronts and thunderstorms can produce winds that radically and suddenly change in speed and direction, causing similar changes in fire activity. The rate of spread of a fire varies with wind velocity. Winds may play a dominant role in directing the course of a fire. The most damaging firestorms are typically marked by high winds (FEMA 1997).

Several tools are available to estimate fire potential, extent, danger, and growth, including the following:

The ***Wildland Fire Assessment System (WFAS)*** is an Internet-based information system that provides a national view of weather and fire potential, including national fire danger, weather maps, and satellite-derived "greenness" maps (USFS No Date [n.d.]).

The ***Fire Potential Index (FPI)*** is derived by combining information on daily weather and vegetation conditions and can identify areas most susceptible to fire ignition (Burgan et al. 2000).

Fuel Moisture (FM) content measures the quantity of water in a fuel particle expressed as a percent of oven-dry weight of the fuel particles. It is an expression of cumulative effects of past and present weather events used to help evaluate the effects of current or future weather on fire potential (Burgan et al. 2000).

The ***Keetch-Byram Drought Index (KBDI)*** is designed for fire potential assessment and is a number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in deep duff and upper soil layers (USFS n.d.).

The ***Haines Index***, also known as the Lower Atmosphere Stability Index, is a fire weather index based on stability and moisture content of the lower atmosphere that measures potential for existing fires to become large fires (USFS n.d.).

The ***Buildup Index (BUI)*** is a number that reflects combined cumulative effects of daily drying and precipitation in fuels with a 10-day time lag constant (North Carolina Forest Service 2007).

The ***Fire Danger Rating*** in New York State is established using information from the National Fire Danger Rating System (NFDRS) and considers current and antecedent weather, fuel types, and both live and dead fuel moisture. This information is provided by local station managers (USFS n.d.) in each of the ten regions of New York State. Cattaraugus County is in the Southern Tier Fire Rating Danger Area. Table 5.4.6-1 lists fire danger ratings and color codes, also used by the NYSDEC to update its fire danger rating maps, identified later in this section.

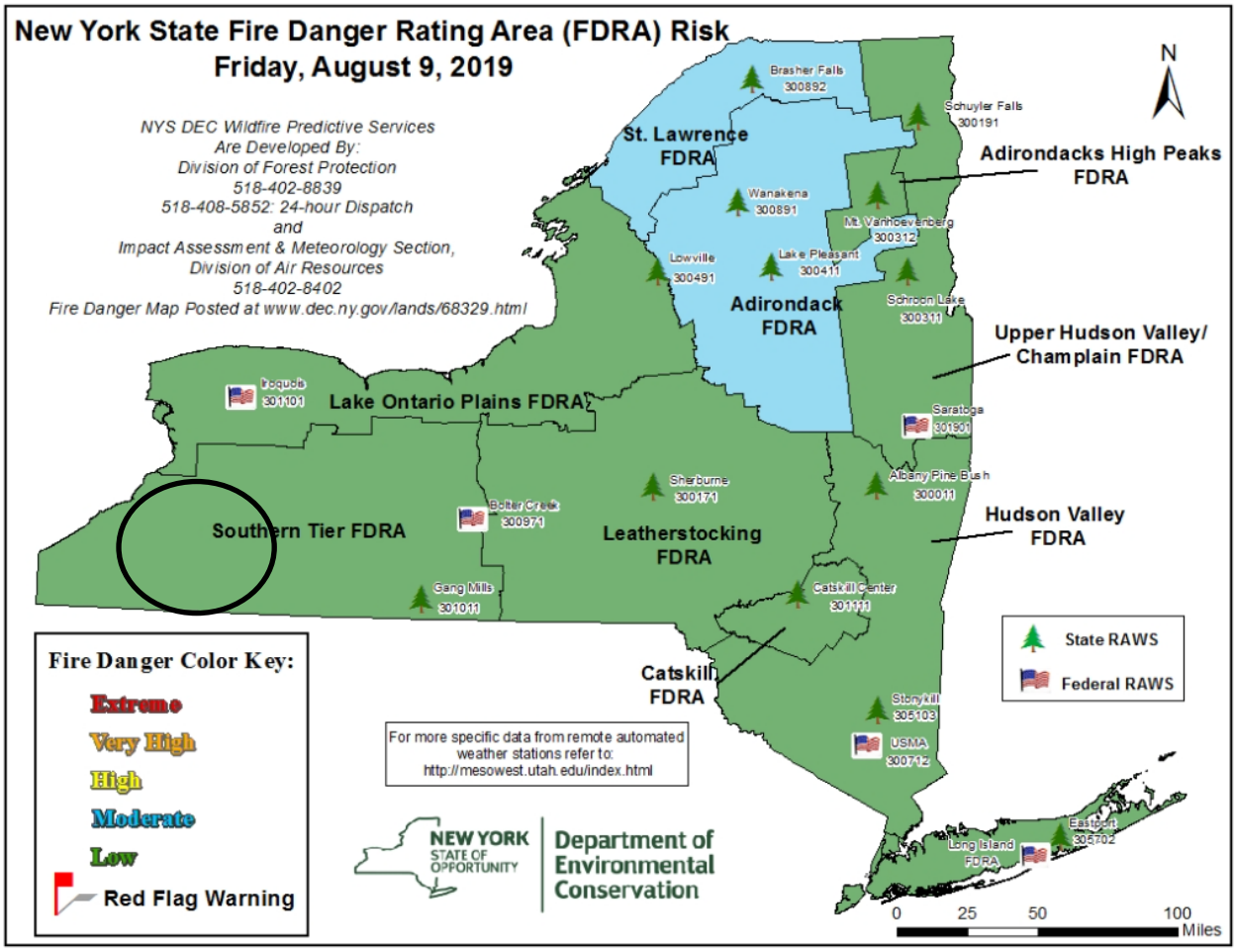
Table 5.4.6-1. Description of Fire Danger Ratings in New York State

Adjective Rating Class and Color Code	Class Description
Red Flag	A short-term, temporary warning, indicating presence of a dangerous combination of temperature, wind, relative humidity, fuel, or drought conditions that can contribute to new fires or rapid spread of existing fires. A Red Flag Warning can be issued at any fire danger level.
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.
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 burn into heavier fuels.
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.
Moderate (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.
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 woodland areas. Fires in open cured grasslands may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.

Source: NYS DHSES 2014

Figure 5.4.6-1 shows Fire Danger Rating Areas (FDRA) in New York State as well the fire danger risk within each area on a specific date (August 9, 2019).

Figure 5.4.6-1. New York State Fire Danger Rating Areas



Source: NYSDEC 2020 Note: The black oval indicates the location of Cattaraugus County.

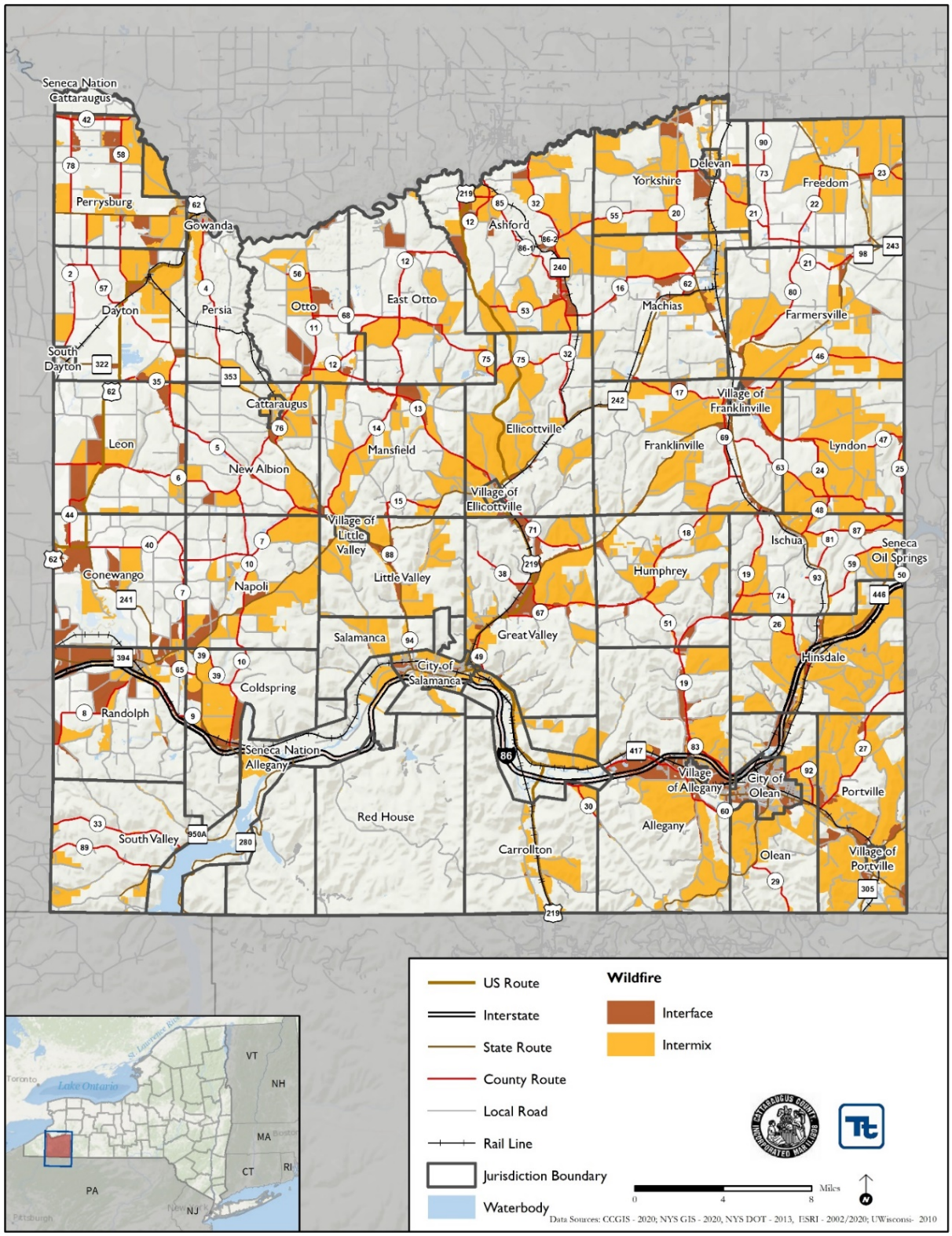
Location

Wildfires occur in Cattaraugus County. Many areas in the county, particularly those that are heavily forested or contain large tracts of brush and shrubs, are prone to fires (NYSDEC 2018). In New York State, NYSDEC's Division of Forest Protection (Forest Ranger Division) is designated as the state's lead agency for wildfire mitigation. The Forest Ranger Division for Cattaraugus County is Region 9: Western New York. The boundaries of the FDRAs do not match the Forest Ranger Division boundaries.

Wildland-Urban Interface in New York State/Cattaraugus County

As shown in Figure 5.4.6-2, the Wildlife-Urban Interface is divided into two categories: interface and intermix. The Interface WUI zone is land that stands between the undeveloped, natural land and developed, urban areas. The Intermix WUI zone is an area where human habitation is mixed with areas of flammable wildland vegetation. Intermix areas have more than one house per 40 acres and have more than 50-percent vegetation. Interface areas have more than one house per 40 acres, have less than 50-percent vegetation, and are within 1.5 miles of an area over 1,235 acres that is more than 75-percent vegetated (Stewart et al. 2007). The California Fire Alliance determined that 1.5 miles is the approximate maximum distance that firebrands can be carried from a wildland fire to the roof of a house. Therefore, even structures not within the forest are at risk from wildfire. Approximately 25.2 percent of the county's land area is within the Intermix WUI, and 21 percent of the land area is within the Interface WUI.

Figure 5.4.6-2. Interface/Intermix WUI Hazard Areas in Cattaraugus County



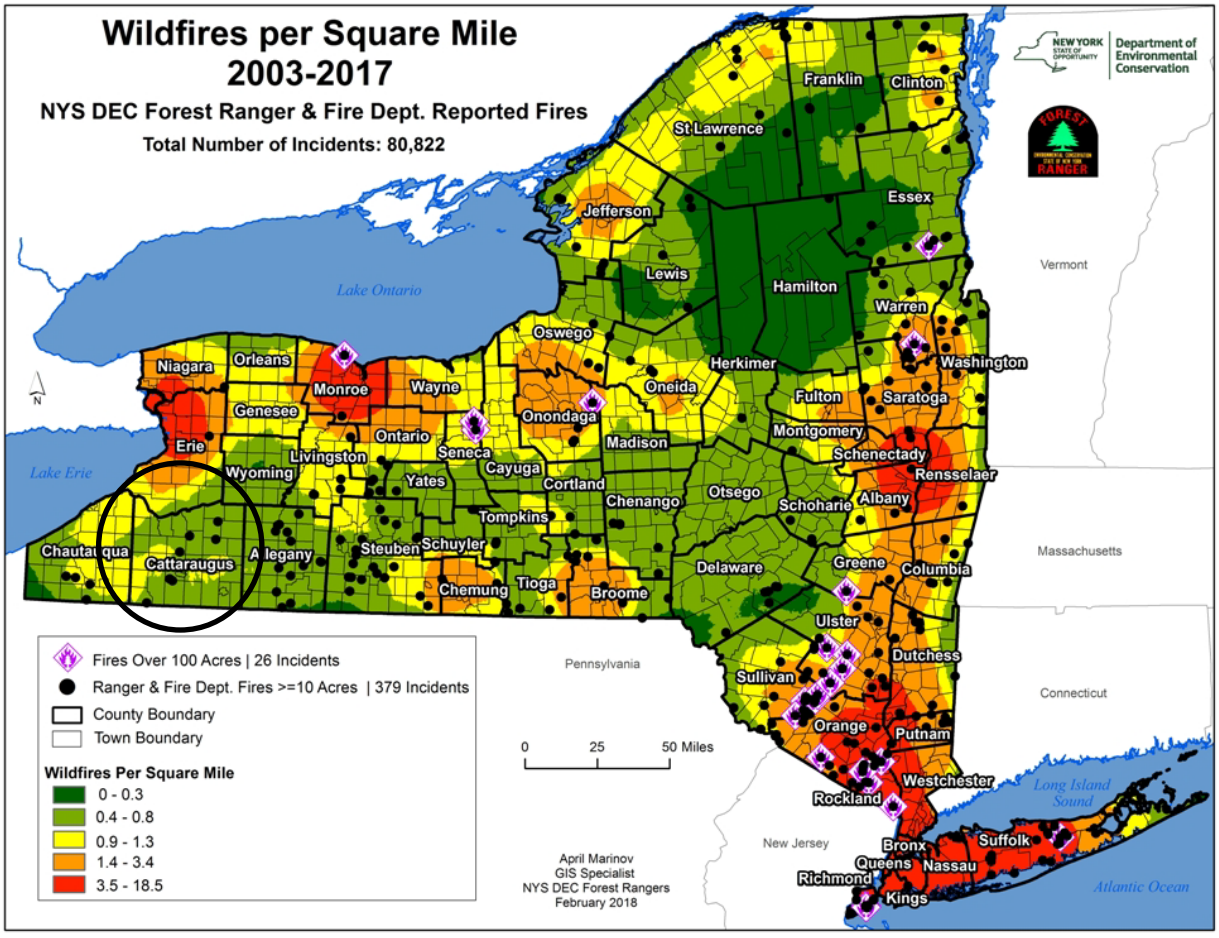
Source: Stewart et al. 2007

Previous Occurrences and Losses

Only limited historical information can be found on previous occurrences and losses associated with wildfires throughout New York State and Cattaraugus County. Between 1954 and 2020, NYS was not included in any wildfire-related major disaster (DR) or emergency (EM) declarations (FEMA 2020).

Determinations of wildfire occurrences in New York State are based on two data sources: the New York State Forest Ranger force, and the New York State Office of Fire Prevention and Control (NYS OFP&C). According to Ranger Division wildfire occurrence data from 1993 through 2017, 95 percent of wildfires in the state were human caused; the remaining 5 percent resulted from lightning. Regarding human-caused fires, debris burning accounted for 33 percent, incendiary fires accounted for 16 percent, campfires accounted for 16 percent, and smoking accounted for 6 percent (NYSDEC 2018). Figure 5.4.6-3 illustrates occurrences of wildfires in NYS between 2003 and 2017 (the most current data available). This figure reveals occurrences of between 0.4 and 1.3 wildfires per square mile from 2003 to 2017 within Cattaraugus County municipalities.

Figure 5.4.6-3. Wildfire Occurrences in New York State, 2003-2017



Source: NYSDEC 2018. Note: The black oval indicates the location of Cattaraugus County.

Probability of Future Occurrences

According to the NYS Forest Ranger Division, wildfire occurrence data from 2003 to 2018 have shown that NYS, including Cattaraugus County, is susceptible to wildfires. Forty-seven percent of all fire department response to wildfires occur from March 15 through May 15. Beginning in 2010, NYS enacted revised open-

burning regulations that ban brush burning statewide during this time period. Forest Ranger data indicate that this new statewide ban resulted in 74 percent fewer wildfires caused by debris burning in upstate New York from 2010 to 2012. Forest Ranger and fire department historical fire occurrence data recorded after the new burn ban regulations were enacted in 2010 will serve as a benchmark for analyses of wildfire occurrence (NYS DHSES 2014).

Nationally, wildfire risk is increasing, and wildfire experts point to the following four reasons:

- The way forests were handled in the past allowed fuel in the form of fallen leaves, branches, and plant growth, to accumulate. Now this fuel is lying around the forest with potential to "feed" a wildfire.
- Increasingly hot, dry weather has occurred and will continue to occur within the United States.
- Weather patterns across the country are changing.
- More homes are built within WUI areas, meaning that homes are built closer to wildland areas where wildfires can occur (NYS DHSES 2014).

Annual small wildfires likely will occur throughout Cattaraugus County. However, advanced methods of wildfire management and control and better understanding of fire ecosystems should reduce the number of devastating fires in the future (NYS DHSES 2014).

Hazards of concern identified for Cattaraugus County were ranked in Section 5.3. Probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records and input from the Planning Partnership, probability of occurrence of wildfire within the county is considered "rare" (between 1 and 10% annual probability of a hazard event occurring, as presented in Table 5.4.6-2).

Climate Change Impacts

Climate change can make forests more susceptible to wildfires due to changing precipitation patterns, in addition to the projected temperature increases. Climate also affects frequency and severity of many forest disturbances, such as infestations, invasive species, wildfires, and storm events.

Each region within NYS, as defined by the Integrated Assessment for Effective Climate Change in New York State (ClimAID), contains attributes that climate change will affect. Cattaraugus County is part of ClimAID Region 3: The Southern Tier. In ClimAID Region 3, temperatures are estimated to increase between 4.4 to 6.3 ºF by the 2050s and 5.7 to 9.9 ºF by the 2080s (baseline of 47.5 ºF) (NYS Energy Research and Development Authority [NYSERDA] 2014). Extreme heat events and heat waves are also projected to increase, as listed in Table 5.4.6-2 below. Prolonged heat waves are likely to generate a greater number of wildfires. Stronger winds from larger storms may lead to more fallen branches for wildfires to consume. Increases in rain and snow events prime forests for fire by supporting growth of more fuel. Drought and warmer temperatures lead to drier forest fuels (NYS DHSES 2014).

Table 5.4.6-2. Extreme Event Projections for ClimAID Region 3

Event Type (2020s)	Low Estimate (10th Percentile)	Middle Range (25th to 75th Percentile)	High Estimate (90th Percentile)
Days over 90 degrees Fahrenheit (°F) - (8 days)	15	17-21	23
Number of Heat Waves - (0.7 heat waves)	2	2 to 3	3
Duration of Heat Waves - (4 days)	4	4 to 5	5
Days below 32°F - (133 days)	119	122 to 130	134

Source: NYSERDA 2014

Fire potential depends on climate variability, local topography, and human intervention. Climate change can affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot, dry spells create highest fire risk. With temperatures increasing in New York State, wildfire danger may intensify with warming and drying of vegetation. When climate alters fuel loads and fuel moisture, the susceptibility of forest to wildfires is changed. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

5.4.6.2 Vulnerability Assessment

To understand risk, a community must evaluate the assets that are exposed and vulnerable in the identified hazard area. A spatial analysis was conducted using the University of Wisconsin 2010 Wildland-Urban Interface/Intermix 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 in the Interface or Intermix WUI hazard areas.

Impact on Life, Health, and Safety

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 persons living 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 5.4.6-3 summarizes the estimated population exposed to the wildfire hazard by jurisdiction.

Based on the analysis, an estimated 66,384 residents, or approximately 86.8 percent of the county's population, are in the Interface and Intermix WUI hazard areas. Overall, the City of Olean has the greatest number of individuals located in the wildfire hazard areas (25,685 persons).

Of the population exposed, the most vulnerable include the economically disadvantaged and the population over age 65. Cattaraugus County is home to 12,222 persons in poverty and 14,046 persons over 65 years old (American Community Survey 2018). 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. Smoke and air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly, and those with respiratory and cardiovascular diseases. 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 breathing, odor, and reduction in visibility.

Table 5.4.6-3. Estimated Population Located in the Interface/Intermix WUI Hazard Areas in Cattaraugus County

Jurisdiction	Population (American Community Survey 5-Year 2014 - 2018) *	Estimated Population Exposed				
		Wildfire Interface	% of Total	Wildfire Intermix	% of Total	Total Interface/ Intermix WUI Hazard Area
Allegany (T)	5,741	3,080	53.6%	1,746	30.4%	6,159
Allegany (V)	1,922	1,785	92.9%	137	7.1%	3,570

Jurisdiction	Population (American Community Survey 5-Year 2014 - 2018) *	Estimated Population Exposed				
		Wildfire Interface	% of Total	Wildfire Intermix	% of Total	Total Interface/ Intermix WUI Hazard Area
Ashford (T)	2,192	521	23.8%	1,000	45.6%	1,042
Carrollton (T)	1,429	181	12.7%	743	52.0%	362
Cattaraugus (V)	959	285	29.7%	655	68.3%	569
Coldspring (T)	672	155	23.1%	244	36.3%	310
Conewango (T)	1,653	367	22.2%	467	28.3%	733
Dayton (T)	1,352	190	14.0%	495	36.6%	380
Delevan (V)	1,007	160	0.0%	437	0.0%	320
East Otto (T)	1,055	82	7.8%	323	30.6%	165
Ellicottville (T)	877	157	17.9%	557	63.5%	314
Ellicottville (V)	283	192	67.8%	90	31.7%	384
Farmersville (T)	1,075	112	10.4%	493	45.9%	224
Franklinville (T)	1,303	246	18.8%	582	44.7%	491
Franklinville (V)	1,575	1,330	84.4%	243	15.4%	2,659
Freedom (T)	2,276	180	7.9%	869	38.2%	360
Gowanda (V)	1,805	1,241	68.8%	448	24.8%	2,482
Great Valley (T)	1,689	619	36.7%	650	38.5%	1,239
Hinsdale (T)	2,074	476	22.9%	1,223	59.0%	951
Humphrey (T)	860	94	11.0%	295	34.2%	188
Ischua (T)	731	82	11.2%	349	47.8%	163
Leon (T)	1,114	342	30.7%	323	29.0%	683
Little Valley (T)	664	163	24.5%	341	51.3%	325
Little Valley (V)	1,180	710	60.2%	452	38.3%	1,420
Lyndon (T)	718	13	1.8%	504	70.2%	26
Machias (T)	2,380	134	5.6%	762	32.0%	267
Mansfield (T)	810	60	7.3%	437	54.0%	119
Napoli (T)	1,218	154	12.6%	545	44.7%	308
New Albion (T)	1,009	89	8.9%	389	38.5%	179
Olean (C)	13,805	12,842	93.0%	960	7.0%	25,685
Olean (T)	2,183	344	15.7%	1,493	68.4%	688
Otto (T)	797	158	19.9%	307	38.5%	317
Perrysburg (T)	1,598	258	16.1%	807	50.5%	516
Persia (T)	653	35	5.3%	268	41.0%	69
Portville (T)	2,630	613	23.3%	1,804	68.6%	1,226
Portville (V)	965	644	66.8%	321	33.2%	1,289
Randolph (T)	2,476	1,034	41.8%	859	34.7%	2,069
Red House (T)	42	0	0.0%	6	15.4%	0
Salamanca (C)	5,553	3,859	69.5%	1,673	30.1%	7,718
Salamanca (T)	447	13	2.9%	205	45.8%	26
South Dayton (V)	673	0	0.0%	67	9.9%	0
South Valley (T)	276	8	2.8%	101	36.7%	15
Yorkshire (T)	2,762	186	6.7%	1,140	41.3%	372
Cattaraugus County (Total)	**76,483**	**33,192**	**43.4%**	**25,809**	**33.7%**	**66,384**

Source: American Community Survey 2018; University of Wisconsin 2010

** Please note, due to the estimated boundaries of villages and towns within Cattaraugus County, there is a small discrepancy of approximately 400 people reported in the 2018 American Community Survey versus the population data used in the geographic information system (GIS) spatial analysis. A rough estimate was made based on land area for The Village of Gowanda; approximately 60 percent of the Village of Gowanda remains within Cattaraugus County. Therefore, an assumption was made that 60 percent of the reported population for the Village of Gowanda remains in Cattaraugus County. The population of the Village of Gowanda that resides in Cattaraugus County was subtracted from the Town of Persia. Tribal nations and reservation areas are not included in this population analysis.*

Notes: % = Percent, C = City, T = Town, V = Village

Impact on General Building Stock

The most vulnerable structures to wildfire events are those within Interface/Intermix WUI hazard area. 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. To estimate the buildings exposed to the wildfire hazard, the Interface/Intermix WUI hazard areas were overlaid upon the updated building inventory at the structure level. The replacement cost value of the structures with centers in the Interface and Intermix WUI hazard areas were totaled (Table 5.4.6-4 and Table 5.4.6-5, respectively). Overall, 28,226 buildings with a replacement cost value of $27.9 billion is exposed to the wildfire hazard areas in Cattaraugus County.

Table 5.4.6-4. Building Stock Replacement Cost Value and Building Count within the Interface WUI Hazard Area in Cattaraugus County

Jurisdiction	Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed			
			Number of Buildings - Wildfire Interface	% of Total	Replacement Cost Value of Buildings - Wildfire Interface	% of Total
Allegany (T)	2,455	$1,995,224,472	1,316	53.6%	$1,081,771,292	54.2%
Allegany (V)	639	$754,717,827	580	90.8%	$660,340,722	87.5%
Ashford (T)	1,075	$922,022,498	276	25.7%	$326,838,039	35.4%
Carrollton (T)	626	$348,432,403	87	13.9%	$61,414,475	17.6%
Cattaraugus (V)	410	$625,337,729	143	34.9%	$297,891,316	47.6%
Coldspring (T)	448	$313,395,045	103	23.0%	$93,401,140	29.8%
Conewango (T)	1,019	$1,141,077,674	185	18.2%	$203,706,131	17.9%
Dayton (T)	700	$591,736,768	103	14.7%	$83,580,406	14.1%
Delevan (V)	285	$348,026,561	47	16.5%	$36,334,346	10.4%
East Otto (T)	597	$438,642,865	53	8.9%	$45,746,801	10.4%
Ellicottville (T)	1,649	$1,598,675,883	290	17.6%	$318,783,433	19.9%
Ellicottville (V)	496	$660,648,036	350	70.6%	$524,832,421	79.4%
Farmersville (T)	741	$419,542,828	80	10.8%	$60,264,065	14.4%
Franklinville (T)	970	$553,691,738	173	17.8%	$94,639,937	17.1%
Franklinville (V)	621	$634,263,362	532	85.7%	$576,918,044	91.0%
Freedom (T)	1,252	$986,939,932	88	7.0%	$51,296,182	5.2%
Gowanda (V)	672	$699,071,287	506	75.3%	$592,591,224	84.8%
Great Valley (T)	1,359	$906,431,658	489	36.0%	$255,190,669	28.2%
Hinsdale (T)	1,112	$667,353,019	250	22.5%	$173,554,551	26.0%
Humphrey (T)	483	$296,687,949	67	13.9%	$68,794,269	23.2%
Ischua (T)	521	$288,127,010	63	12.1%	$38,482,336	13.4%
Leon (T)	817	$915,671,381	238	29.1%	$267,755,296	29.2%
Little Valley (T)	452	$358,002,270	117	25.9%	$111,844,450	31.2%
Little Valley (V)	404	$561,442,185	235	58.2%	$258,900,545	46.1%
Lyndon (T)	545	$424,831,663	12	2.2%	$9,815,398	2.3%
Machias (T)	1,407	$880,491,464	92	6.5%	$70,181,224	8.0%
Mansfield (T)	778	$689,267,836	71	9.1%	$100,962,832	14.6%

Jurisdiction	Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed			
			Number of Buildings - Wildfire Interface	% of Total	Replacement Cost Value of Buildings - Wildfire Interface	% of Total
Napoli (T)	725	$514,455,736	87	12.0%	$50,945,674	9.9%
New Albion (T)	671	$471,572,394	60	8.9%	$52,873,929	11.2%
Olean (C)	4,941	$7,169,192,523	4,562	92.3%	$6,490,493,821	90.5%
Olean (T)	1,018	$750,434,377	173	17.0%	$138,992,587	18.5%
Otto (T)	514	$376,418,830	102	19.8%	$67,782,358	18.0%
Perrysburg (T)	901	$642,404,678	154	17.1%	$120,594,015	18.8%
Persia (T)	315	$231,207,770	12	3.8%	$6,836,108	3.0%
Portville (T)	1,372	$1,044,666,295	337	24.6%	$342,494,393	32.8%
Portville (V)	351	$346,884,521	243	69.2%	$280,025,846	80.7%
Randolph (T)	1,116	$1,284,336,162	468	41.9%	$727,482,661	56.6%
Red House (T)	329	$127,341,670	0	0.0%	$0	0.0%
Salamanca (C)	2,307	$4,706,213,138	1,605	69.6%	$3,425,338,146	72.8%
Salamanca (T)	304	$177,314,009	8	2.6%	$5,113,068	2.9%
South Dayton (V)	236	$244,313,568	0	0.0%	$0	0.0%
South Valley (T)	341	$138,238,926	10	2.9%	$6,762,348	4.9%
Yorkshire (T)	1,525	$1,259,882,782	101	6.6%	$88,663,102	7.0%
Cattaraugus County (Total	**39,499**	**$38,504,630,718**	**14,468**	**36.6%**	**$18,270,229,599**	**47.4%**

Source: American Community Survey 2018; University of Wisconsin, 2010
Notes: % = Percent, C = City, T = Town, V = Village

Table 5.4.6-5. Building Stock Replacement Cost Value and Building Count within the Intermix WUI Hazard Area in Cattaraugus County

Jurisdiction	Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed			
			Number of Buildings - Wildfire Intermix	% of Total	Replacement Cost Value of Buildings - Wildfire Intermix	% of Total
Allegany (T)	2,455	$1,995,224,472	741	30.2%	$486,152,948	24.4%
Allegany (V)	639	$754,717,827	51	8.0%	$53,042,512	7.0%
Ashford (T)	1,075	$922,022,498	455	42.3%	$288,986,398	31.3%
Carrollton (T)	626	$348,432,403	319	51.0%	$188,172,065	54.0%
Cattaraugus (V)	410	$625,337,729	259	63.2%	$260,731,705	41.7%
Coldspring (T)	448	$313,395,045	164	36.6%	$113,425,567	36.2%
Conewango (T)	1,019	$1,141,077,674	241	23.7%	$198,435,609	17.4%
Dayton (T)	700	$591,736,768	216	30.9%	$138,367,798	23.4%
Delevan (V)	285	$348,026,561	122	42.8%	$156,860,060	45.1%
East Otto (T)	597	$438,642,865	170	28.5%	$109,127,723	24.9%
Ellicottville (T)	1,649	$1,598,675,883	1,027	62.3%	$1,009,845,095	63.2%
Ellicottville (V)	496	$660,648,036	135	27.2%	$112,473,144	17.0%

Jurisdiction	Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed			
			Number of Buildings - Wildfire Intermix	% of Total	Replacement Cost Value of Buildings - Wildfire Intermix	% of Total
Farmersville (T)	741	$419,542,828	341	46.0%	$168,024,329	40.0%
Franklinville (T)	970	$553,691,738	426	43.9%	$205,875,501	37.2%
Franklinville (V)	621	$634,263,362	86	13.8%	$56,410,600	8.9%
Freedom (T)	1,252	$986,939,932	445	35.5%	$306,664,644	31.1%
Gowanda (V)	672	$699,071,287	158	23.5%	$98,790,478	14.1%
Great Valley (T)	1,359	$906,431,658	511	37.6%	$300,981,120	33.2%
Hinsdale (T)	1,112	$667,353,019	656	59.0%	$387,057,192	58.0%
Humphrey (T)	483	$296,687,949	162	33.5%	$81,325,154	27.4%
Ischua (T)	521	$288,127,010	241	46.3%	$117,603,965	40.8%
Leon (T)	817	$915,671,381	165	20.2%	$137,588,092	15.0%
Little Valley (T)	452	$358,002,270	218	48.2%	$150,103,523	41.9%
Little Valley (V)	404	$561,442,185	141	34.9%	$187,342,558	33.4%
Lyndon (T)	545	$424,831,663	364	66.8%	$179,711,138	42.3%
Machias (T)	1,407	$880,491,464	409	29.1%	$201,583,213	22.9%
Mansfield (T)	778	$689,267,836	383	49.2%	$275,937,317	40.0%
Napoli (T)	725	$514,455,736	285	39.3%	$152,062,925	29.6%
New Albion (T)	671	$471,572,394	230	34.3%	$130,360,233	27.6%
Olean (C)	4,941	$7,169,192,523	312	6.3%	$198,563,996	2.8%
Olean (T)	1,018	$750,434,377	684	67.2%	$421,395,907	56.2%
Otto (T)	514	$376,418,830	183	35.6%	$128,375,745	34.1%
Perrysburg (T)	901	$642,404,678	421	46.7%	$272,963,162	42.5%
Persia (T)	315	$231,207,770	95	30.2%	$54,400,239	23.5%
Portville (T)	1,372	$1,044,666,295	927	67.6%	$631,460,123	60.4%
Portville (V)	351	$346,884,521	106	30.2%	$65,383,460	18.8%
Randolph (T)	1,116	$1,284,336,162	371	33.2%	$332,785,710	25.9%
Red House (T)	329	$127,341,670	6	1.8%	$4,032,503	3.2%
Salamanca (C)	2,307	$4,706,213,138	667	28.9%	$775,576,362	16.5%
Salamanca (T)	304	$177,314,009	145	47.7%	$82,976,286	46.8%
South Dayton (V)	236	$244,313,568	22	9.3%	$20,923,046	8.6%
South Valley (T)	341	$138,238,926	111	32.6%	$46,170,288	33.4%
Yorkshire (T)	1,525	$1,259,882,782	587	38.5%	$348,555,825	27.7%
Cattaraugus County (Total	**39,499**	**$38,504,630,718**	**13,758**	**34.8%**	**$9,636,605,259**	**25.0%**

Source: American Community Survey 2018 (ACS 2014-2018); University of Wisconsin, 2010
Notes: % = Percent, C = City, T = Town, V = Village

Impact on Critical Facilities

It is recognized that several critical facilities are in the wildfire hazard area and are also vulnerable to the threat of wildfire. Majority of the critical facilities exposed to the wildland urban interface/intermix hazard areas are religious facilities and bridges. Table 5.4.6-6 summarizes critical facilities located within the wildfire hazard areas by jurisdiction. Overall, 697 critical facilities are exposed to the Interface/Intermix WUI hazard areas. A

total of 435 of the 697 critical facilities are considered lifelines for the county. The City of Olean has the greatest number of critical facilities built in the Interface/Intermix WUI hazard areas (i.e., 97). The exposed lifelines are categorized into FEMA lifeline groupings and are summarized in Table 5.4.6-7. Table 5.4.6-8 and Table 5.4.6-9 summarize the distribution of the critical facilities exposed to the Interface and Intermix WUI hazard areas, respectively.

Table 5.4.6-6. Critical Facilities in the Wildland Urban Interface/Intermix Hazard Areas in Cattaraugus County

Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to Wildland urban Intermix/Interface Hazard Area			
			Critical Facilities	% of Total Critical Facilities	Lifelines	% of Total Lifelines
Allegany (T)	54	28	33	61.1%	17	60.7%
Allegany (V)	17	10	17	100.0%	10	100.0%
Ashford (T)	41	30	30	73.2%	21	70.0%
Carrollton (T)	43	15	21	48.8%	12	80.0%
Cattaraugus (V)	21	12	19	90.5%	10	83.3%
Coldspring (T)	16	13	6	37.5%	4	30.8%
Conewango (T)	28	24	9	32.1%	5	20.8%
Dayton (T)	23	14	15	65.2%	8	57.1%
Delevan (V)	17	8	9	52.9%	7	87.5%
East Otto (T)	24	17	5	20.8%	5	29.4%
Ellicottville (T)	22	17	8	36.4%	6	35.3%
Ellicottville (V)	17	11	8	47.1%	3	27.3%
Farmersville (T)	19	14	13	68.4%	10	71.4%
Franklinville (T)	21	18	16	76.2%	14	77.8%
Franklinville (V)	27	16	25	92.6%	14	87.5%
Freedom (T)	35	26	17	48.6%	13	50.0%
Gowanda (V)	28	20	24	85.7%	16	80.0%
Great Valley (T)	26	19	16	61.5%	11	57.9%
Hinsdale (T)	37	25	27	73.0%	16	64.0%
Humphrey (T)	16	13	10	62.5%	7	53.8%
Ischua (T)	18	15	10	55.6%	8	53.3%
Leon (T)	32	29	11	34.4%	8	27.6%
Little Valley (T)	12	10	7	58.3%	5	50.0%
Little Valley (V)	26	19	23	88.5%	16	84.2%
Lyndon (T)	12	10	6	50.0%	5	50.0%
Machias (T)	28	17	6	21.4%	6	35.3%
Mansfield (T)	20	16	12	60.0%	11	68.8%
Napoli (T)	14	11	7	50.0%	5	45.5%
New Albion (T)	19	18	6	31.6%	6	33.3%

Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to Wildland urban Intermix/Interface Hazard Area			
			Critical Facilities	% of Total Critical Facilities	Lifelines	% of Total Lifelines
Olean (C)	113	51	97	85.8%	41	80.4%
Olean (T)	33	22	21	63.6%	14	63.6%
Otto (T)	17	13	9	52.9%	7	53.8%
Perrysburg (T)	20	14	13	65.0%	8	57.1%
Persia (T)	7	6	1	14.3%	0	0.0%
Portville (T)	21	15	17	81.0%	11	73.3%
Portville (V)	19	10	19	100.0%	10	100.0%
Randolph (T)	47	36	37	78.7%	27	75.0%
Red House (T)	9	6	0	0.0%	0	0.0%
Salamanca (C)	64	37	46	71.9%	23	62.2%
Salamanca (T)	4	3	2	50.0%	1	33.3%
South Dayton (V)	17	7	1	5.9%	1	14.3%
South Valley (T)	8	7	4	50.0%	3	42.9%
Yorkshire (T)	34	23	14	41.2%	10	43.5%
Cattaraugus County (Total)	**1,126**	**745**	**697**	**61.9%**	**435**	**58.4%**

Source: Cattaraugus County GIS 2020; University of Wisconsin, 2010

Table 5.4.6-7. Lifelines Exposed to the Wildland urban Interface/Intermix Hazard Areas

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Exposed to Wildland urban Interface/Intermix Hazard Areas
Communications	10	0
Energy	94	31
Food, Water, Shelter	90	22
Health and Medical	50	25
Safety and Security	208	95
Transportation	293	54
Cattaraugus County (Total)	**745**	**227**

Source: Cattaraugus County GIS 2020; University of Wisconsin, 2010; FEMA 2020

Table 5.4.6-8. Distribution of Critical Facilities in the Wildland Urban Interface Hazard Area by Type and Jurisdiction

Jurisdiction	Facility Types																				
	Ambulance	Bridge	College/University	Correctional Institution	Dam	DPW	Electric/Power	EMS	Fire Station	Hazmat	Highway Barn	Hospital/Medical Center	Library	Municipal Hall	Police	Polling Place	Potable Water	Primary Education	Religious	Senior Facility	Wastewater
Allegany (T)	0	4	0	0	0	0	0	0	0	8	2	2	0	0	0	1	0	1	4	0	0
Allegany (V)	0	0	0	0	0	0	1	1	1	0	1	0	1	2	1	2	1	1	4	0	0
Ashford (T)	0	3	0	0	0	0	1	0	0	1	3	0	0	1	0	1	1	1	2	0	0
Carrollton (T)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	2	0	0
Cattaraugus (V)	1	0	0	0	0	0	0	0	1	1	0	0	1	2	0	0	0	1	4	0	0
Coldspring (T)	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0
Conewango (T)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Dayton (T)	0	1	0	0	0	0	0	0	1	0	2	1	0	1	0	1	0	0	0	0	0
Delevan (V)	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
East Otto (T)	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Ellicottville (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ellicottville (V)	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0
Farmersville (T)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Franklinville (T)	0	5	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	0
Franklinville (V)	0	1	0	0	0	0	4	1	1	4	2	1	1	1	1	1	0	2	5	0	0
Freedom (T)	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Gowanda (V)	0	2	0	0	0	0	3	0	1	2	1	1	1	1	0	0	3	0	5	1	0
Great Valley (T)	0	4	0	0	0	0	1	1	1	1	1	0	0	1	0	1	0	0	3	0	0
Hinsdale (T)	0	3	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	1	1	0	0
Humphrey (T)	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Ischua (T)	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0

Jurisdiction	Facility Types																				
	Ambulance	Bridge	College/University	Correctional Institution	Dam	DPW	Electric/Power	EMS	Fire Station	Hazmat	Highway Barn	Hospital/Medical Center	Library	Municipal Hall	Police	Polling Place	Potable Water	Primary Education	Religious	Senior Facility	Wastewater
Leon (T)	0	3	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	2	0	0
Little Valley (T)	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Valley (V)	0	3	0	1	0	0	0	0	1	1	1	1	1	1	1	1	0	0	3	0	0
Lyndon (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Machias (T)	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Mansfield (T)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Napoli (T)	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0
New Albion (T)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Olean (C)	1	0	2	0	0	0	11	1	2	14	2	2	1	0	1	5	5	4	34	2	1
Olean (T)	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Otto (T)	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Perrysburg (T)	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2	0	1	0	0	0
Persia (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portville (T)	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Portville (V)	0	0	0	0	0	0	0	1	1	0	3	0	1	1	1	1	0	1	6	0	0
Randolph (T)	0	2	0	0	2	0	1	0	1	0	4	3	0	0	0	0	0	1	6	0	1
Red House (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Salamanca (C)	0	0	0	0	0	1	2	0	0	1	1	2	1	0	0	3	0	1	14	0	5
Salamanca (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Dayton (V)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Valley (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yorkshire (T)	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

Jurisdiction	Facility Types																				
	Ambulance	Bridge	College/University	Correctional Institution	Dam	DPW	Electric/Power	EMS	Fire Station	Hazmat	Highway Barn	Hospital/Medical Center	Library	Municipal Hall	Police	Polling Place	Potable Water	Primary Education	Religious	Senior Facility	Wastewater
Cattaraugus County (Total)	**2**	**54**	**2**	**1**	**4**	**2**	**31**	**7**	**15**	**36**	**30**	**13**	**8**	**19**	**6**	**26**	**14**	**16**	**107**	**3**	**8**

Source: Cattaraugus County GIS 2020; University of Wisconsin, 2010; FEMA 2020

Notes: C = City, T = Town, V = Village

Table 5.4.6-9. Distribution of Critical Facilities in the Wildland Urban Intermix Hazard Area by Type and Jurisdiction

Jurisdiction	Facility Types																				
	Bridge	Correctional Institution	County Office	Dam	DPW	Electric/Power	EMS	EOC	Fire Station	Hazmat	Highway Barn	Hospital/Medical Center	Library	Municipal Hall	Police	Polling Place	Potable Water	Primary Education	Radio Tower	Religious	Senior Facility	Wastewater
Allegany (T)	2	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	1	0	1	2	0	0
Allegany (V)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ashford (T)	6	0	0	0	0	1	1	0	2	2	1	0	0	0	0	1	0	0	0	2	0	0
Carrollton (T)	3	0	0	0	0	0	1	0	2	5	1	0	0	1	0	0	1	0	0	1	0	0
Cattaraugus (V)	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	0	2	0	0
Coldspring (T)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Conewango (T)	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	1	0	0
Dayton (T)	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0
Delevan (V)	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	1	0	0
East Otto (T)	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

Jurisdiction	Facility Types																					
	Bridge	Correctional Institution	County Office	Dam	DPW	Electric/Power	EMS	EOC	Fire Station	Hazmat	Highway Barn	Hospital/Medical Center	Library	Municipal Hall	Police	Polling Place	Potable Water	Primary Education	Radio Tower	Religious	Senior Facility	Wastewater
Ellicottville (T)	2	0	0	1	0	1	1	0	0	0	0	0	1	0	0	0	2	0	0	1	0	0
Ellicottville (V)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Farmersville (T)	5	0	0	2	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	2	0	0
Franklinville (T)	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Franklinville (V)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Freedom (T)	4	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	3	0	0	1	0	0
Gowanda (V)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
Great Valley (T)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Hinsdale (T)	4	0	0	0	0	2	0	0	1	4	0	0	0	0	0	0	1	0	0	4	2	0
Humphrey (T)	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Ischua (T)	3	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Leon (T)	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
Little Valley (T)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Little Valley (V)	2	1	1	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	1	0	0
Lyndon (T)	2	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0
Machias (T)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Mansfield (T)	7	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Napoli (T)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
New Albion (T)	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Olean (C)	0	0	0	0	0	4	0	0	0	1	0	1	0	0	0	0	2	0	0	1	0	0
Olean (T)	2	0	0	0	0	9	0	0	0	3	0	0	0	1	0	2	0	0	0	1	0	0
Otto (T)	3	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0

Jurisdiction	Facility Types																					
	Bridge	Correctional Institution	County Office	Dam	DPW	Electric/Power	EMS	EOC	Fire Station	Hazmat	Highway Barn	Hospital/Medical Center	Library	Municipal Hall	Police	Polling Place	Potable Water	Primary Education	Radio Tower	Religious	Senior Facility	Wastewater
Perrysburg (T)	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	1	0	0	3	0	1
Persia (T)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portville (T)	4	0	0	0	0	1	1	0	1	2	0	0	0	0	0	1	0	0	0	2	0	0
Portville (V)	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
Randolph (T)	2	0	0	0	0	2	1	0	2	1	0	0	1	1	0	1	1	0	0	1	0	3
Red House (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Salamanca (C)	0	0	0	0	0	4	0	0	0	1	0	1	1	0	0	1	3	0	0	1	0	3
Salamanca (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
South Dayton (V)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
South Valley (T)	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Yorkshire (T)	4	0	0	1	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0
Cattaraugus County (Total)	**79**	**1**	**1**	**5**	**2**	**31**	**10**	**1**	**16**	**24**	**10**	**2**	**3**	**12**	**3**	**16**	**25**	**1**	**3**	**39**	**2**	**7**

Source: Cattaraugus County GIS 2020; University of Wisconsin, 2010; FEMA 2020

Notes: C = City, T = Town, V = Village

Impact on the 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 and decrease in tourism. Wildfires can cost thousands of taxpayer dollars to suppress and control and can involve hundreds of operating hours on fire apparatus and thousands of volunteer hours from the volunteer firefighters. There are also many direct and indirect costs to local businesses that excuse volunteers from working to fight these fires.

Impact on the Environment

According to the USFS, post-fire runoff polluted with debris and contaminates can be extremely harmful to ecosystem and aquatic life (USFS 2020). Studies show that urban fires are more harmful to the environment compared to forest fires (USFS 2020). The age and density of infrastructure within Cattaraugus 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.

Cascading Impacts on Other Hazards

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.

Future Changes That May Impact Vulnerability

Understanding future changes that effect vulnerability in the county can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. Changes in the natural environment and built environment and how they interact can also provide insight about ways to plan.

Projected Development

As discussed in Section 4, areas targeted for future growth and development have been identified across the county. Any areas of growth located in the Interface/Intermix WUI hazard areas could be at risk. The maps in each jurisdictional annex (Section 9 of this HMP) show the new development project areas and their proximity to the Interface/Intermix WUI hazard areas.

Projected Changes in Population

According to the U.S. Census Bureau, the population in Cattaraugus County has decreased by approximately 5.3 percent between 2010 and 2018 (U.S. Census Bureau 2020). Estimated population projections provided by the 2017 Cornell Program on Applied Demographics indicates that the county's population will continue to decrease into 2040, reducing total population to approximately 63,500 persons (Cornell Program on Applied Demographics 2017). While less people will reside in the county, those that remain may move into areas that are susceptible to wildfire events. Section 4, County Profile, provides additional discussion on population trends.

Climate Change

As discussed above, most studies project that the State of New York will see an increase in average annual temperatures and precipitation. Changes in temperature can influence how fire interacts with the surrounding natural habitat and built environment. Fire interacts with climate and vegetation (fuel) in predictable ways. Understanding the climate/fire/vegetation interactions is essential for addressing issues associated with climate change that include:

- 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 (USFS 2020).

It is projected that higher summer temperatures will likely increase the high fire risk by 10 to 30 percent. Fire occurrence and/or area burned could increase across the United States due to the increase of lightning activity, the frequency of surface pressure and associated circulation patterns conductive to surface drying, and fire-weather conditions, in general, which is conductive to severe wildfires. Warmer temperatures will also increase the effects of drought and increase the number of days each year with flammable fuels and extending fire seasons and areas burned (USFS 2020).

Future changes in fire frequency and severity are difficult to predict. Global and regional climate changes associated with elevated greenhouse gas concentrations could alter large weather patterns, thereby affecting fire-weather conducive to extreme fire behavior (USFS 2020).

Change of Vulnerability Since the 2014 HMP

Overall, this vulnerability assessment uses a more accurate and updated building inventory than that used in the 2014 HMP. This information provides more accurate exposure and potential loss estimates for Cattaraugus County.

For this HMP, the 2010 Interface/Intermix WUI data from the University of Wisconsin were referenced to determine areas within Cattaraugus County that are vulnerable to wildfires. Population statistics have also been updated using the 5-Year 2014-2018 American Community Survey Population Estimates (American Community Survey 2018). The general building stock was updated using RS Means 2019 building valuations that estimated replacement cost value for each building in the inventory. Updated 2018 building stock data downloaded from Microsoft were used to update the user-defined facility inventory and critical facility inventory dataset. Parcel information from the Cattaraugus tax assessor was used to update building attributes, such as year built, number of stories, basement type, property class, and square footage.