

WILDFIRE

HAZARD PROFILE

Description

A wildfire is an uncontrolled fire that spreads with fuel provided by vegetation, exposing and possibly consuming structures (FEMA, 2004). Wildfire is a serious and growing hazard over much of the United States. Wildfires pose a great threat to life and property, particularly when they move from forest or rangeland into developed areas. An average of 5 million acres burns every year in the United States as a result of wildfires, causing millions of dollars in damage (FEMA, 2005). The potential for wildfire is influenced by several factors including the presence of fuel, an area's topography, and air mass. Fuel may include living and dead vegetation on the ground, along the surface as brush and small trees, and aerial fuel including tree canopies. Topography includes both slope and elevation. The air mass includes temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration, and the stability of the atmosphere at the time of the fire. Wildfires are ignited by lightning and, most frequently, by human activity including smoking, campfires, equipment use, and arson. The Village Planning Committee considers the wildfire hazard to be of concern.

Location and Extent

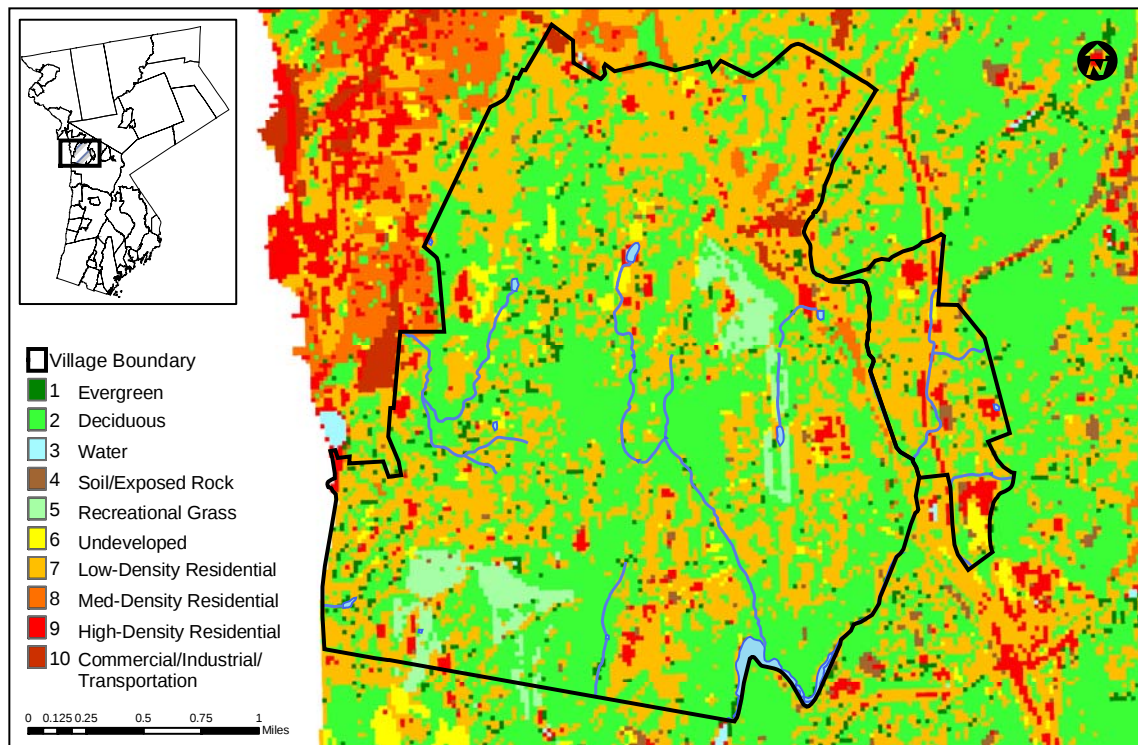
Figure 5-33 shows residential areas adjacent to evergreen/deciduous vegetation, recreational grass (golf courses/parks) or undeveloped land in the Village. It may be assumed that any evergreen/deciduous vegetation, recreational grass (golf courses/parks) or undeveloped area is susceptible to wildfire; however the risk to life and property is greatest in those areas where forested areas adjoin urbanized areas (high density residential, commercial and industrial) or wildland/urban interface (WUI). All such areas within the Village are vulnerable to urban and wild fires.

There are three different classes of wildland fires including surface fires, ground fires, and crown fires. Surface fires are the most common type and burn along the floor of a forest, moving slowly and killing or damaging trees. Ground fires are usually started by lightning and burn on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees (FEMA, 1993).

The severity of a wildfire also depends on the environmental conditions present to start and sustain its life. The type of fuel (vegetation or a structure), its "burning qualities" and moisture level influence wildfire behavior and intensity (FEMA, 2004). For example, pitch pine, oak and ericaceous shrubs are extremely volatile fuels that burn with high intensity. Grassland fires tend to be less intense than pitch pine scrub oak fuels under similar weather conditions, but burn quickly and respond quickly to changes in weather. Grassland fires travel at a high rate of speed and experience high intensity surface fire behavior. The power of this fuel is often underestimated (Kurtz, 2006). The weather and topography can change the speed at which fire travels and its severity and duration. The slope and terrain affects the movement of air and fire; the greater the slope, the more quickly a fire can travel (FEMA, 2004; NYS, 2004).

According to the NYS Plan, NY is most vulnerable to wildfire hazard events from "the end of the snow pack until leaf out and the end of August."

Figure 5-50. Land Cover in the Village of Briarcliff Manor



Source: Westchester County – GIS

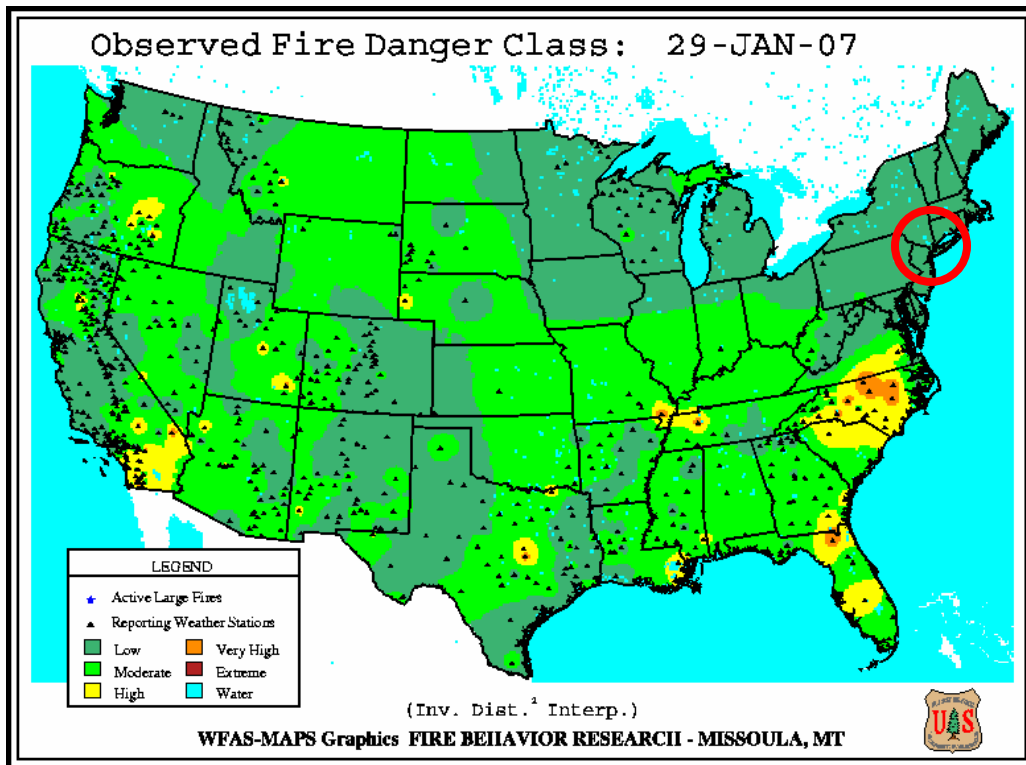
According to the Village’s Fire Chief, they have never had any brushfires or wildfire events that they could not control.

There are several tools available to estimate fire potential, danger and growth. The United States Forest Service’s Wildland Fire Assessment System (WFAS) has created a Fire Danger Rating level system that compiles data on current and antecedent weather, fuel type, and live and dead fuel moisture. Table 5-25 provides the adjective class ratings developed to normalize the rating classes across different fuel models, indexes, and station locations used by station managers across the country. Figure 5-34 is an example of an Observed Fire Danger map provided daily by the WFAS website.

Table 5-37. Wildland Fire Assessment System Fire Danger Rating and Color Code System

Fire Danger Rating and Color Code	Description
Low (L) (Dark Green)	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (M) (Light Green or 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 (H) (Yellow)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (VH) (Orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (E) (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash 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.

Figure 5-51. Example of an Observed Fire Danger Class Map

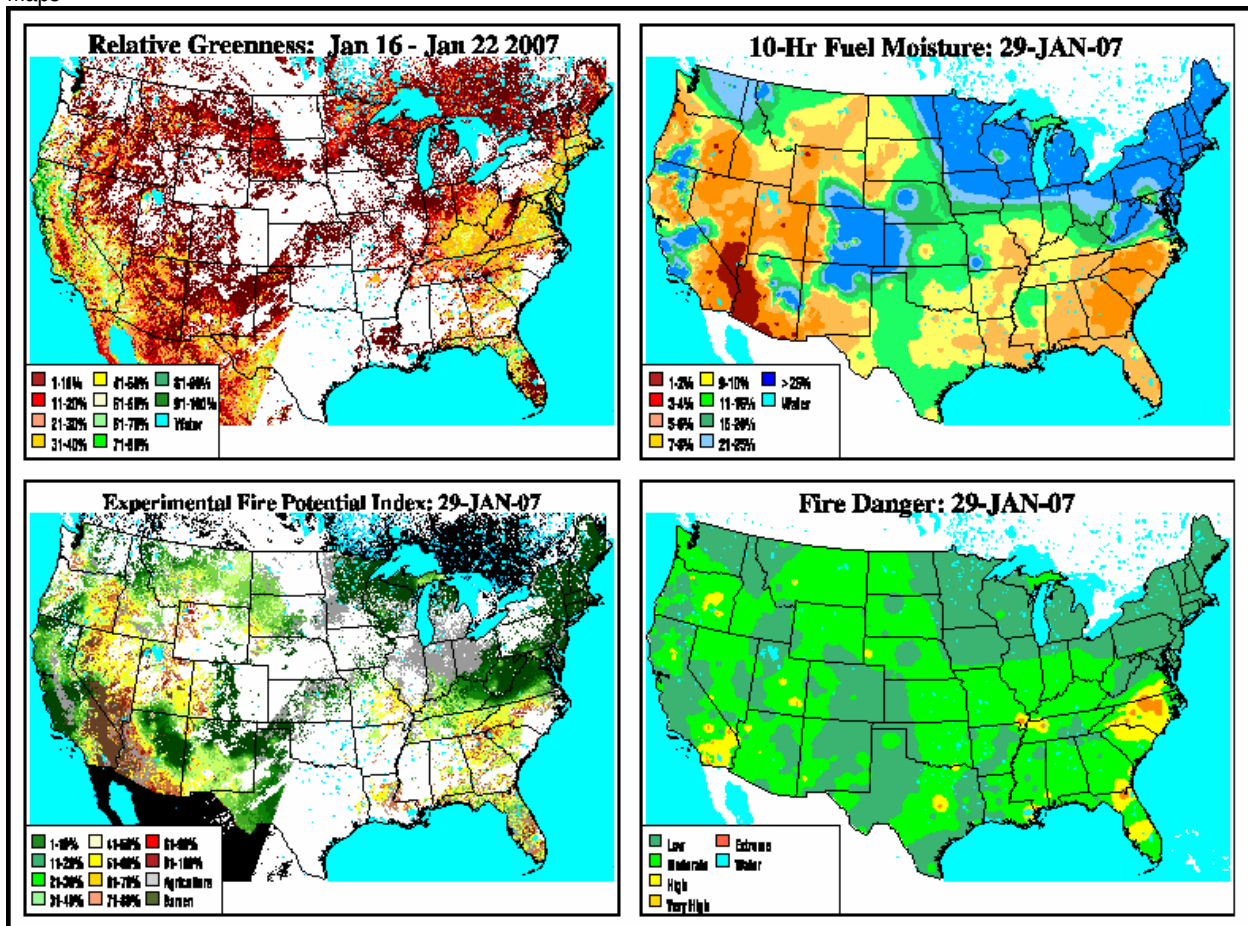


Source: U.S. Forest Service Wildland Fire Assessment System (<http://www.wfas.net/content/view/17/32/>). Notes: The circle indicates the study area for this plan.

The Haines Index is used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire. The Haines Index can range between 2 and 6. The drier and more unstable the lower atmosphere is, the higher the index.

The United States Forest Service's WFAS also provides the Observed Experimental Fire Potential maps on its website; these are updated daily. These experimental Fire Potential Index maps use satellite derived Relative Greenness, a National Fire Danger Rating (NFDR) System fuel model map, and an interpolated 10-hour time lag map as inputs to weight the relative influence of live and dead vegetation to fire potential. The scale ranges from 0 (low) to 100 (high). Except for the 10-hour moisture content, the calculations used in the NFDR System are not part of the Fire Potential Index. Figure 5-35 is an example of the Relative Greenness, 10-hour Fuel Moisture, Experimental Fire Potential Index and Fire Danger maps provided by WFAS for the date of January 29, 2007. The rating on this day for the Village is a low observed danger (a larger version of the observed danger map is included as Figure 5-34).

Figure 5-52. Relative Greenness, 10-hour Fuel Moisture, Experimental Fire Potential Index, and Fire Danger Maps



Source: U.S. Forest Service Wildland Fire Assessment System (<http://www.wfas.net/content/view/25/40/>).

Impacts to human health and safety and property from major urban fires are often severe and direct. Fires have significant community-wide impacts, especially when lives and homes are claimed. Fires can also have significant economic impacts, especially if major transportation routes are closed.

Short-term effects of wildfires could include destruction of timber, forest, wildlife habitats, scenic vistas, and watersheds. Long term effects could include reduced access to recreational areas; destruction of community infrastructure and cultural and economic resources (USGS 2006).

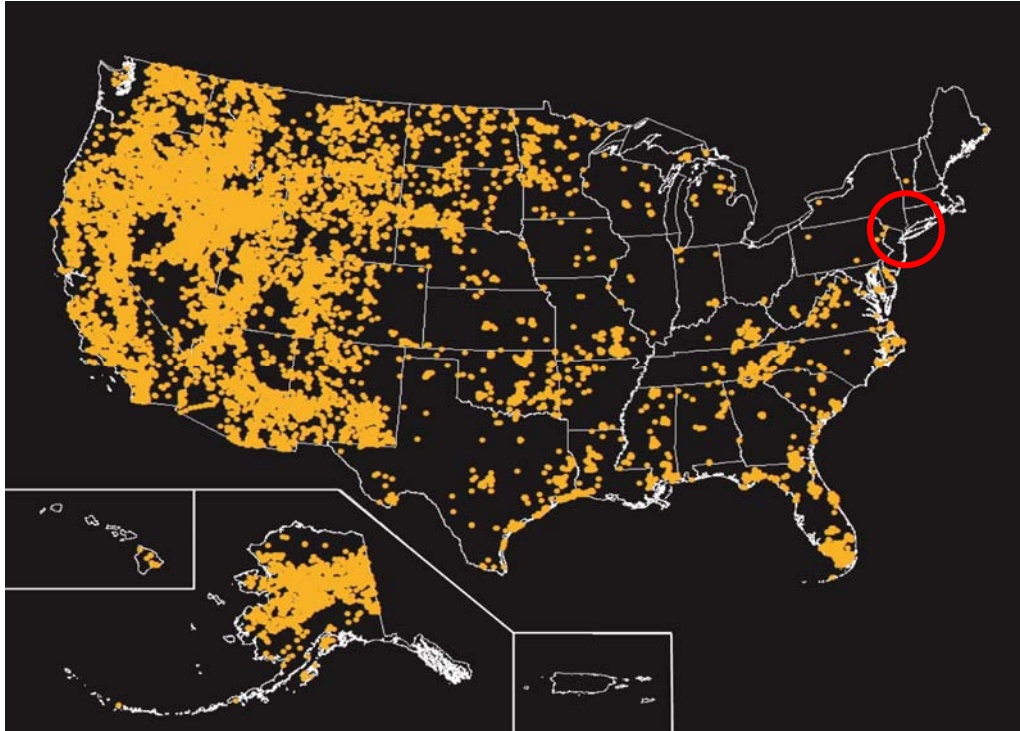
Previous Occurrences and Losses

NOAA's NCDC maintains records of wild and forest fires for WC from 1950 to 2006. According to the NCDC website, no significant wildfires were reported for WC or the Village during this period. The climate of WC is not conducive to large-scale drought and dry climate vegetation that are primary causes of the massive and highly destructive wildfires that occur periodically in the western United States.

NFIRS fire call data, as available, could serve to identify losses associated with vegetative fires that have occurred in WC. As this information becomes available, it will be incorporated into subsequent revisions of this Plan.

As identified in Figure 5-36, USGS has mapped locations throughout the U.S. that experienced wildfires greater than 250 acres, from 1980 to 2003. This map indicates that no such wildfires have taken place within the vicinity of WC.

Figure 5-53. Wildfires Impacting Greater than 250 Acres within the United States (1980 to 2003)



Source: Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, National Park Service, and the USGS National Atlas.; <http://www.usgs.gov/hazards/wildfires/>. Notes: This map shows locations that experienced wildfires greater than 250 acres, from 1980 to 2003. Map not to scale. The circle indicates the study area.

According to the NYS HMP, wildfires in NYS have been limited since 1995, with fire events noted in the following counties: Suffolk (1995, 2001), Washington (2001), Schenectady (2001), Rensselaer (2001), and Adirondacks (2002). According to the Village's Fire Chief, the Village has not suffered from any brushfires or wildfire events that could not be locally controlled.

Probability of Future Events

The Planning Committee evaluated hazards of concern and ranked them. Based on historical records and input from the Planning Committee, the probability of occurrence for wildfire events in the Village is considered rare (likely to occur less than once every 30 years). The overall ranking of this hazard assigned by the Planning Committee was low. The NYS HMP includes a similar ranking process for hazards that affect the State. The probability of occurrence, or likelihood of the event, is one parameter used in this ranking process. The NYS HMP rated this hazard as one that is frequent with a limited potential impact on population and a substantial potential impact on property. The NYS HMP states that the likelihood of future events is difficult to predict for this hazard.

VULNERABILITY ASSESSMENT

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the wildfire hazard, those areas of the Village that are located in or near open land areas that provide fuel for a wildfire are most vulnerable to this hazard. The following text evaluates and estimates the potential impact of the wildfire hazard on the Village including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact, including: (1) impact on life, safety and health of Village residents, (2) general building stock, (3) critical facilities and infrastructure, and (4) economy
- Impact on new buildings, critical facilities and infrastructure
- Further data collections that will assist understanding of this hazard over time
- Overall vulnerability conclusion

Overview of Vulnerability

Wildfire hazards can impact significant areas of land, as evidenced by major wildfires that have occurred in the western United States over the past several years. Urban areas that interface with wildfire hazard events and areas have the potential for greater damage to infrastructure, loss of life, and strain on existing healthcare facilities and emergency responders due to their higher structural and population densities. Areas of land use prone to wildfire include areas that are wooded or forested and open land that can include grasses and brush that provide fuel sources.

Data and Methodology

Data available regarding the fire hazard included input from the Planning Committee, NOAA's NCDC databases, the NYS HMP and the HAZNY documentation for this area. The methodology for evaluating this hazard included review of open land areas that provide a potential fuel source for wildfires, developed areas near these open lands that are at the interface of the wildland fire hazard area, and consideration of the potential likelihood of wildfire in this area based on past events.

Impact on Life, Health and Safety, General Building Stock, Critical Facilities, Infrastructure and the Economy

As demonstrated by historic wildfire events in other parts of the State and country (for example, the 1995 Sunrise Fires on Long Island), potential losses include human health and life of residents and responders, structures, and natural resources. In addition, wildfire events can have major economic impacts on a community, ranging from the initial loss of structures and the subsequent loss of revenue from destroyed business and decreased tourism.

For the purposes of this HMP, all structures in the Village are at some risk of being destroyed or seriously damaged by a fire; those located near areas that provide fuel for a wildfire are considered to be at greater risk. However, fire response systems are strong and well prepared to deal with fire events. Therefore, major losses are not anticipated in relation to a wildfire event in the area.

Due to insufficient data, a full loss estimate was not completed for the wildfire hazard. Per FEMA 386-2, "Understanding Your Risks – Identifying Hazards and Estimating Losses", the guidance indicates "current standard loss estimation tables [for structures and contents] do not exist for wildfires."

Impact on New Buildings, Critical Facilities and Infrastructure

As identified in Section 4, “Village Profile – Future Development”, at this time the Village anticipates residential and limited business development within the Scarborough Road Corridor, which will require improvements to utilities and infrastructure in the area. The presence of steep slopes throughout this area could exacerbate the development (spread) of wildfires.

Additional Data and Next Steps

Data regarding the construction of structures in the study area, such as primary building materials used (e.g., wood versus brick, fire detection equipment, age, etc.), proximity to fast burning/high intensity vegetative communities (e.g., Pitch Pine, Scrub Oak) and availability of fire suppression infrastructure should be identified for further evaluation.

The FEMA fuel model maps do not provide sufficient information to refine the exposure assessment conducted above or to locate the urban-wildfire interface areas. Additionally, historic wildfire extent maps were not readily available and will be required to identify the geographic locations where wildfires have taken place in the past and areas prone to wildfires. Such data can be developed over time; however, based on past incidents and the climate of the region, collection of this data is a lower priority than data collection for more prevalent hazard categories.

Overall Vulnerability Assessment

Buildings constructed of wood are generally more likely to be impacted than buildings constructed with bricks or concrete. While it is not possible to predict when and where a fire will start, the local fire departments are well-equipped and prepared to respond to fires as they arise. Large-scale wildfires are considered unlikely to occur in the area due to the amount of moisture stored in the vegetation and the amount of precipitation that the area receives annually. The status of fire risk in the Village will continue to be monitored and ongoing and new mitigation efforts to prevent fires and control them when they arise will continue to be developed.