



Chicago  
Wilderness  
Alliance

# **Community Wildfire Preparedness Plan**

June 2024



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# Executive Summary

Chicago Wilderness initiated a study to look at wildland urban intermix/interface (WUI/I) vulnerability in a six-county area surrounding Chicago, Illinois. The counties participating in this study include Cook, DuPage, Kane, Lake, McHenry and Will, which total 2,397,675 acres. These six counties were selected due to: 1) their proximity to the metropolitan Chicago area; 2) their continuity to one another; and, 3) presence of representative fuels with interspersed residential housing. The goal was to develop a process for identifying WUI/I with an analytical template so other entities within the Chicago Wilderness area could utilize the process to initiate their own plans. This study looked at the combined effects of the Risks, Hazards and community Values to determine the Level of Concern (LOC) posed by the potential threat of wildfire to damage structures and infrastructure, or disrupt regional transportation and communication capabilities and to impact a large population with the ensuing smoke. Given the highly urbanized nature of the area, localized concerns related to smoke and disadvantaged community impacts were also assessed.



Active wildland fire and emergency response personnel. Photograpy courtesy of Tim Olk.



**1) RISKS** – Risks are defined as those uses or human activities which have the potential to result in wildland fire ignitions. Whenever there are concentrations of people, activities or events, the potential for ignitions exists. Historical fire data was used to determine the risk assessment for the six-county area.

**2) HAZARDS** – Hazards are defined as the combined effects of fuel type, fuel volatility, and topography on wildland fires in a given area. The purpose of examining hazards is two-fold. First, is to determine the potential for a large fire to result from an unplanned ignition. Second, is to determine the degree of difficulty in suppressing a fire once it has been ignited. Land cover data from the 2021 National Land Cover Database (NLCD) was used to extract locations and types of wildland fuels.

**3) VALUES** – Values are defined as natural or developed areas where loss, interruption of services, or destruction by wildfires would be unacceptable. The term “values” is derived from suppression priorities established for wildland firefighting. These priorities are life, high-value property and natural resources. The 100-m resolution Wildland Urban Interface layer from the United States Geological Survey (USGS) was used to identify these areas.

In this study, Risks are defined based on the number of wildland fire occurrences per acre for the study area over a ten-year period (January 2013 through December 2022), as reported through the National Fire Incident Reporting System (NFIRS). Most wildland fire reports within the data set lack a site specific address. In order to assign a location, each wildland fire was geolocated by the zip code reported for each incident. Some of the records for the City of Chicago did not list zip codes. For these

*“The counties participating in this study include Cook, DuPage, Kane, Lake, McHenry and Will, which total 2,397,675 acres.”*

records, we used a geolocation database from the Environmental Systems Research Institute, Inc. (ESRI) to identify coordinates for the fires, then spatially joined these locations to zip codes. The number of occurrences was then separated by equal intervals into categories of Low, Moderate and High.

Hazards are defined based on the types and volatility of fuel that exists throughout the county. This study utilized the 2021 National Land Cover Database (NLCD). A fuel volatility attribute was assigned to each land cover classification (Table 1).

Values are where residential housing and wildland fuels exist in close proximity. This study utilized 2022 Wildland Urban Interface data from the USGS to identify these locations. Once the Values parameter was established, the

fire occurrence data (Risk) was then combined with fuels data (Hazards). A matrix combining Risks and Hazards variables was developed and applied to the Values variable to determine a cumulative Level of Concern (Table 2).

The sum of the values in the final analysis was then categorized for the potential for wildfires as High  $\geq 7$ ; Moderate = 5 – 6; and, Low  $< 5$ .

Maps were created for the region and each of the six counties to depict each of the input parameters: Risks (see Appendix A-1), Hazards (see Appendix A-2), Values (see Appendix A-3), Smoke (Appendix A-4), Disadvantaged Communities (Appendix A-5), and a final analysis representing overall Level of Concern (see Appendix A-6). In this analysis, 100,367 acres are classified as WUI/I in the six county region, or 4.2% of the of the study area. Of the WUI/I acres

Table 1: Reclassification of land cover types from the 2021 NLCD to fuel hazard levels.

| Land Cover Type              | Hazard Level |
|------------------------------|--------------|
| Open Water                   | Non-wildland |
| Developed, open space        | Non-wildland |
| Developed, low intensity     | Non-wildland |
| Developed, medium intensity  | Non-wildland |
| Developed, high intensity    | Non-wildland |
| Barren land (rock/sand/clay) | Non-wildland |
| Shrub/scrub                  | Moderate     |
| Grassland/herbaceous         | High         |
| Pasture/hay                  | Low          |
| Cultivated crops             | Low          |
| Woody Wetlands               | Moderate     |
| Emergent herbaceous wetlands | High         |

Table 2. Fire Occurrence / Fuel Volatility Matrix

| Occurrence/Volatile Fuels | Fuels High Volatility (5) | Fuels Moderate Volatility (3) | Fuels Low Volatility (1) |
|---------------------------|---------------------------|-------------------------------|--------------------------|
| High Occurrence (3)       | 8                         | 6                             | 4                        |
| Moderate Occurrence (2)   | 7                         | 5                             | 3                        |
| Low Occurrence (1)        | 6                         | 4                             | 2                        |

a majority 82,461 acres or 82.2% ranked as Low Level of Concern. Only 1,643 acres, or 1.6% of the six-county area ranked as High Level of Concern and 16,263 acres, or 16.2% ranked as Moderate Level of Concern.

The purpose of this study was to determine which areas within the six counties are most vulnerable to issues regarding potential losses and smoke impacts from wildland fires. The information presented in this study can empower communities to start looking at potential solutions to the problem with cost effective mitigation opportunities. Recommendations include:

- Better reporting of wildfire occurrence by fire protection agencies, including consistent geo-referencing.
- Maintaining fuel loads within normal ranges through active vegetation management techniques including the use of prescription fire and brush pile burning/fuel reduction of heavy fuels.
- Coordination of wildfire training between agencies.
- Development of minimum wildland training standards for all firefighting personnel.
- Creating defensible space or buffers between volatile wildland fuels and homes.
- Development of pre-suppression plans for areas of high risk for wildfire in coordination with landowners and fire protection agencies.
- Development of smoke mitigation plans that might impact critical transportation corridors and/or aviation assets (i.e., O'Hare and Midway Airports).



Photograph of smoke over Busse Woods in Rolling Meadows, IL.

The intention is to provide this study to cooperating agencies, local fire protection providers, civic groups, and concerned citizens within the six-county study area. The study can help these groups make informed decisions regarding vegetation management in both the wildlands and on private property; develop appropriate response plans to wildland fire occurrence; identify training needs for landowners, land-management agencies and fire departments; identify infrastructure needs; and provide an avenue for continued dialogue among these various groups.

### Maps

The maps referenced in the Chicago Wilderness Community Wildfire Preparedness Plan are available online through a web-based mapping tool that allows users to interact with the data included in this study.

<https://gis.mortonarb.org/portal/apps/webappviewer/index.html?id=28f0dca7d2264b19a1fc7bbf0d9d0681>

# Introduction



Forest Preserves of Cook County prescribed fire signage.

In 2013, Chicago Wilderness undertook a study to investigate wildland fire vulnerability in the wildland-urban intermix / interface (WUI/I) for a six-county area surrounding Chicago, Illinois. The Community Wildfire Preparedness Plan (2013), was last reviewed in 2018 and will now undergo a more substantive modification in 2024. The primary reasons for this modification are three-fold:

1. We have access to 10 years' worth of fire occurrence data made available through the Illinois State Fire Marshal's Office.
2. Geographic Information System (GIS) data has become more refined, and is available in a much higher resolution (more detailed and down to a smaller scale) that will allow us to graphically display findings in more detail.

3. Concerns about smoke and the impacts to disadvantaged populations have become more evident.

The reasons mentioned above have allowed us to perform the analysis with a more robust dataset and produce more detailed maps depicting areas that are potentially susceptible to fire and smoke impacts. The foundation laid by the 2013 Community Wildfire Preparedness Plan (CWPP) is still valid. The goal of this modification is to update the plan with more recent data that has been aggregated over the past decade, and prepare maps that clearly depict areas that are at moderate- to high-risk from wildfire, smoke, and other socioeconomic and environmental justice factors. Another goal of this plan is to look closely at remediation options and outline potential partnerships to help reduce the wildfire risk in the identified areas.

Note: The maps referenced in the Chicago Wilderness Community Wildfire Preparedness Plan are available online through a web-based mapping tool, which can be found at:

<https://gis.mortonarb.org/portal/apps/webappviewer/index>.



Photograph of resident observing the Wauconda grass fire.

# Background

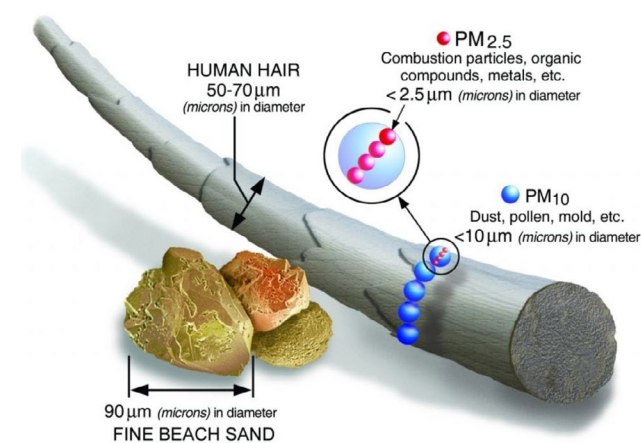
Wildland-Urban Intermix/Interface (WUI/I) are defined as any area where potentially combustible wildland fuels are found adjacent to or in the vicinity of combustible homes, businesses, and other structures. It is a zone where man-made improvements intermix with wildland fuels. In 2003 Congress enacted the Healthy Forests Restoration Act or HFRA. This legislation included statutory incentives for the United States Department of Agriculture, Forest Service (USDA FS) and United States Department of Interior - Bureau of Land Management (USDI BLM) to give consideration to the priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects. The HFRA was the impetus for the 2013 Chicago Wilderness CWPP and its subsequent iterations.

The counties of Cook, DuPage, Kane, Lake, McHenry and Will in Illinois were selected to be the starting or focal point for the foundational plan, with the intention that it could serve as a model that other entities or cooperators can use to initiate their own plans.

**The purpose of this study was to look at the wildland fire risks, the hazardous fuels and the community values that could be potentially at risk from the threat of wildfires and the smoke they produce throughout the selected counties.**

Wildfires—unplanned ignitions in natural cover fuels, and prescribed fires—planned ignitions to meet resource management objectives, both produce smoke. Smoke from these fires (both flaming front and smoldering) produce gaseous emissions and particulates. Gaseous emissions include carbon dioxide (CO<sub>2</sub>), nitrous oxides (NO<sub>x</sub>), Sulphur Dioxide (SO<sub>2</sub>), carbon monoxide (CO), ammonia (NH<sub>3</sub>) and methane (CH<sub>4</sub>).

Particulate matter produced by both types of fires vary in size, but it is particulate matter with a diameter of 2.5 microns or less (PM<sub>2.5</sub>). The US Environmental Protection Agency (EPA) regulates both gaseous and particulate emissions as a matter of public health. While wildfire smoke is not regulated by the EPA by the unplanned nature of the event, prescribed fire is regulated to minimize any negative health effects.



Particulate Matter Diagram.

The fundamental goals of the Community Wildfire Preparedness Plan are to:

- Reduce the vulnerability of the populace and property of residences, businesses and inhabitants to injury and loss resulting from wildland fires;
- Provide prompt, effective and appropriate wildfire suppression responses with all agencies having fire protection responsibilities;
- Enhance mutual-aid capability and effectiveness of fire departments by identifying training needs and providing training opportunities;

*“The purpose of this study was to look at the wildland fire risks, the hazardous fuels and the community values that could be potentially at risk from the threat of wildfires and the smoke they produce throughout the selected counties.”*

- Bring awareness to the necessity of comprehensive land management in densely populated areas, particularly those with disadvantaged communities that stand to be disproportionately impacted by the effects of smoke and fire;
- Promote the use of fuels management mitigation techniques on those areas identified in this study with a Moderate or High Level of Concern from wildfire; and
- Begin to educate the residents and businesspersons regarding their responsibilities for prevention and mitigation of wildland fires in their affected areas.

The Chicago region is highly segregated, and minority and disadvantaged communities have less access to green amenities and are more likely to be negatively impacted by environmental hazards, like interstates and polluting industries. Consequently, these communities often have poorer health outcomes. For example, communities of color tend to have higher rates of diabetes, heart disease, and asthma. Minoritized communities also have lower incomes and are less able to weather financial hardships. Therefore, these communities may experience worse outcomes when exposed to wildfire smoke and would be particularly imperiled by property loss due to wildfire.

The US federal government has recently placed emphasis on improving conditions in disadvantaged communities, as identified through the Council on Environmental Quality's Climate and Economic Justice Screening Tool ([CEJST](#)). In this report's study region, 31% of residents live in census tracts that are considered disadvantaged.

This CWPP is the culmination of months of work. It is a plan, and as such, has to be accepted by various governmental and non-governmental agencies. More importantly, it has to be accepted by the fire protection districts that provide primary emergency response and by the general public. The plan is as much an educational tool as it is a working document. This plan should be reviewed and modified by all affected parties on a 10-year basis.



Photograph of active forest brush pile. Photograph courtesy of Tim Olk.



Buffalo Grove Fire Department, second-alarm brush fire. Photograph courtesy of Tim Olk.

# Methodology



The purpose of the CWPP is to determine the extent and location of WUI/I areas within the six counties surrounding Chicago, IL and then determine the threat potential from wildland fires. The counties participating in this study are Cook, DuPage, Kane, Lake, McHenry and Will. We used a geographic information system (GIS) analysis and readily available data that could be gathered for all six counties to identify how federally-defined WUI/I areas interact with fire risk and fuel loads.

Historically, wildland fires can and often do damage and/or destroy personal property. In addition, the smoke produced from wildland fires has the potential to impact a far greater populace in this highly-urbanized study area. When reviewing the literature and available data, it is generally acceptable to look at fire occurrence, the various fuel types and their associated volatility, and population per given area of land as input variables. These input variables are referred to as Risks, Hazards and Values. Each of these variables will be defined and examined. A numeric rating system for each variable was then employed to complete the analysis. The final output is called the Level of Concern, which assigns a color-coded adjective of Low, Moderate, or High to the wildland urban intermix/interface areas in each county. To give perspective to the WUI/I within the Chicagoland area we looked at populations with Moderate and High Levels of Concern that could be affected by smoke and the percentage of areas that occur in disadvantaged communities.

## Risks

This study looked at wildland fire occurrences for ten years of data from January 1, 2013 through December 31, 2022. These datasets were archived by the Federal Emergency Management



Photograph of wildland fire backburn.

Agency (FEMA), U.S. Fire Administration as part of the National Fire Incident Reporting System (NFIRS). The Illinois data were obtained from the Office of the State Fire Marshal in Springfield, Illinois as a Microsoft Excel spreadsheet. Illinois state law requires all Illinois fire departments to report all fire incidents to the Fire Marshal's office. These reports are then aggregated to the federal level.

The data from NFIRS were filtered for vegetated fuels, including the categories of:

- Brush, or brush and grass mixture fire
- Grass fire
- Natural vegetation fire, other
- Cultivated vegetation, crop fire, other
- Cultivated grain or crop fire
- Cultivated orchard or vineyard fire

*"Fuel volatility is the ease with which a fuel will ignite, how quickly it will spread, and the amount of heat energy released in the burning process."*

- Cultivated trees or nursery stock fire
- Forest, woods or wildland fire

During the period in question the six-county area experienced 23,255 wildland fires.

Most wildland fire reports within the data set lack a site-specific address. To assign a location, each wildland fire was geolocated by the responding Fire Department and the zip code reported for each incident. Some of the records for the City of Chicago did not list zip codes. For these records, we used a geolocation database compiled by Environmental Systems Research Institute, Inc. (ESRI) to identify coordinates for the fires, then spatially joined these locations to zip codes. The number of occurrences were standardized by the area of each zip code (fires per acre), then these values were separated into equal intervals of Low, Moderate, and High rates of occurrence.

The resulting map (see Appendix A-1 WUI/I For All CW Counties, Risk) is not meant to pinpoint wildfire locations, but to find broad areas where the concentration of people, activities or events have resulted in varying levels of risk from wildland fire based on historic fire occurrence data.



Firefighters managing a controlled burn.

## Hazards

In fire prevention terminology, the word hazard is used to describe the relationship between wildland fuels, their volatility, and topographic influences; it should not be confused or used interchangeably as defined by other disciplines. Fuels are the various natural vegetative land cover types found in the wildland arenas. Fuel volatility is the ease with which a fuel will ignite, how quickly it will spread, and the amount of heat energy released in the burning process. The latter provides an indication of how difficult the fire might be to suppress. Topography is the lay of the land including slope, aspect, terrain and shape of the landscape.

The study area is located in a highly urbanized area, but is fortunate to have several large tracts of forested and open natural areas interspersed throughout. The infrastructure provides numerous roads, railroads, and other transportation corridors. Most of the area is supplied with forced main water systems which positively impacts fire suppression efforts. Plant variability in the natural areas is extremely diverse with a wide range of moisture conditions. Topography results in some variations in slope, aspect, and terrain which combine to impact fire spread, direction and intensity.

Each county in the study region has a forest preserve or conservation district. The mission of these organizations is to acquire and hold lands containing forests, prairies, wetlands and associated plant communities or lands capable of being restored to such natural conditions for the purpose of protecting and preserving the flora, fauna, and scenic beauty for the education, pleasure, and recreation of its citizens. Other open space agencies also maintain large tracts of land preserved in native communities. Most notable are several Illinois State Parks and

*“A fire dependent ecosystem needs periodic fire to maintain ecological health.”*

Midewin National Tallgrass Prairie, a 19,000 acre USDA Forest Service parcel located in Will County. These publicly owned areas are actively managed, helping to maintain healthy fuel levels by utilizing acceptable vegetation management techniques. The use of prescribed fire, along with mechanical techniques, provide the best, most cost-effective tool in maintaining fuel loads at manageable levels.

**Most of the native ecosystems found in this area are considered fire dependent.** A fire dependent ecosystem needs periodic fire to maintain ecological health. The exclusion of fire will frequently result in the loss of biodiversity in the system and will increase the vegetation density, increasing fuel loads. Without fire, these areas can quickly develop large amounts of downed woody debris or thatch. Once this occurs, any fire can become catastrophic and very difficult to extinguish, which in turn increases smoke output due to fuels burning for extended periods of time. These situations generally result in the loss of the natural stand due to extreme heat intensities produced by the unprecedented accumulation of fuel.

Homeowners and businesses can inadvertently add to this fuel load by utilizing both native and non-native landscape species around their homes and businesses. Wildland fires can now easily spread from one area to another due to a continuous fuel bed. Adding to this equation is the flammability of many non-native species and the fact that much landscaping includes plantings immediately adjacent to structural foundations. Even the construction materials utilized in many homes and businesses can add to the fuel load. Wood or vinyl siding, wooden decks or porches, stacked firewood and even propane tanks are common in many areas. Each of these can add to the flammability of an



Hazardous heavy fuel loads due to downed woody debris.

area. It should be noted that most structures that are lost as a result of a wildfire are not lost due to direct flame impingement, but rather from ember wash carried by the strong winds associated with these fires. Structures can be ignited even if they are several hundred feet from the main fire front.

The 2021 National Land Cover Database (NLCD) was used to identify hazards for this study. This layer characterizes land cover classes using imagery from LandSat8. Land cover types from the 2021 NLCD were recategorized into wildland and non-wildland groups. Non-wildland classifications included barren land, open water, and all developed land cover types. These are areas where there were large amounts of non-flammable materials, paved parking lots, streets, and areas with mostly brick and mortar buildings (see Appendix A-2, WUI For All CW Counties, Hazard). We then assigned a fuel volatility classification to each wildland vegetation type. This volatility rating was based on the ignitability, the potential rate of spread, the resulting fire intensity, and the difficulty of control to suppression resources. Fires in fine fuels spread quickly and are available for

*“It should be noted that most structures that are lost as a result of a wildfire are not lost due to direct flame impingement, but rather from ember wash carried by the strong winds associated with these fires.”*

ignition during portions of every year. Heavy fuels are much slower to ignite and spread and are less available for ignition under normal climatic conditions. Ignition of heavy fuels with the associated intense fire behavior is generally only likely under very unusual circumstances, such as severe drought or canopy collapse resulting from insect, disease, wind and/or ice. When these conditions do occur and a wildfire is ignited, the results can be catastrophic.

Smoke generated and dispersed under different fuel types is highly dependent on weather and atmospheric conditions at the time of ignition. Fires during the growing season produce considerably more smoke than dormant season fires and heavy fuels, once ignited, tend to burn and smolder longer than fine fuels.

Agricultural vegetation can and does react like wildland fuels under certain conditions. For example, during extended periods of drought most agricultural crops will wither and become tinder dry. Fires that originate or impinge upon these crops will spread very rapidly, produce extreme fire behavior conditions, and may be very difficult to suppress. For these reasons, the study felt it was appropriate to include these fuels in the analysis.

Peat and muck soils are partially decomposed vegetative organic matter. They are found mainly in wet depressions and are an accumulation of aquatic and semi-aquatic plants over centuries. The depth of these soils varies from a few inches to more than 25-feet. While there are differences in peat and muck, for our purposes we will treat them the same. Since they are both composed of highly organic material they can dry out and support combustion.

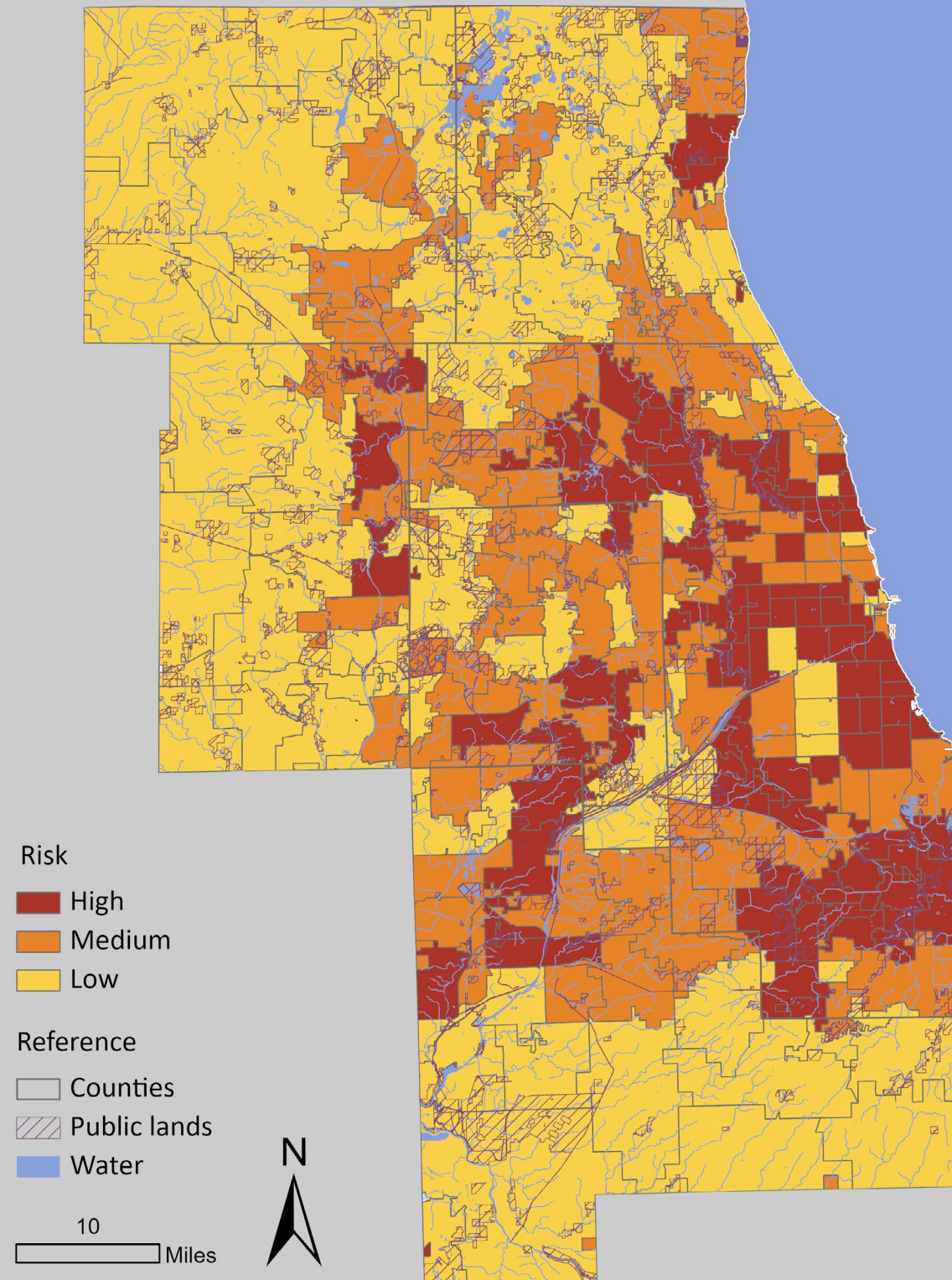
During periods of extended drought, particularly where there is a lowering of the water table, these soils can and will support combustion and they are extremely difficult to suppress, are dangerous to fire suppression personnel, can produce excessive amounts of smoke and are very expensive to extinguish. Whether you are dealing with wildfires, prescribed fires, or both, you should be aware of these soil types and where they are in your area.

This CWPP is not the appropriate place for an in-depth discussion of the hazards associated with peat and muck fires, but since they are a fuel that could ignite and burn, they deserved mention.

**Table 1. Reclassification of land cover types from the 2021 NLCD to fuel hazard levels.**

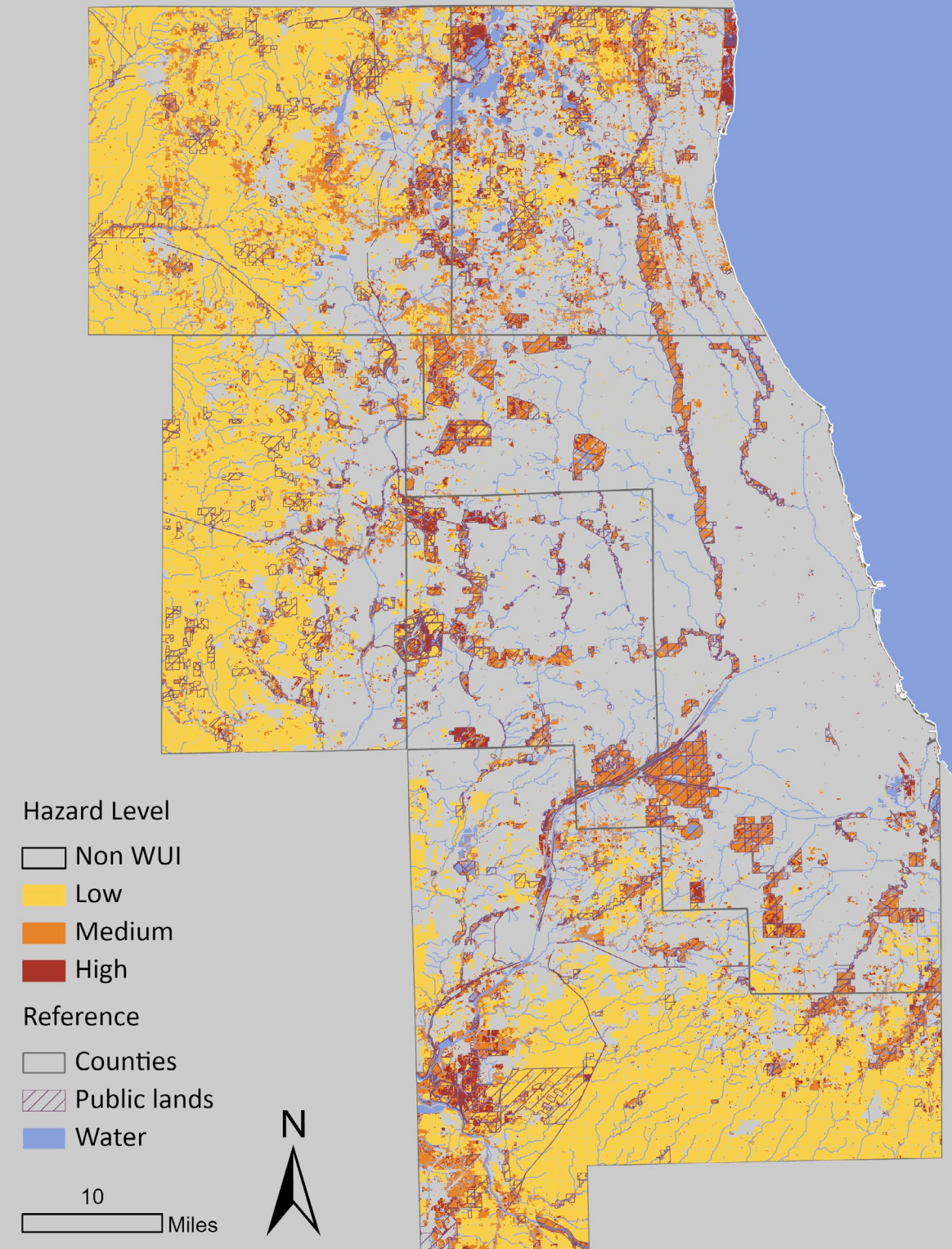
| Land Cover Type              | Hazard Level |
|------------------------------|--------------|
| Open Water                   | Non-wildland |
| Developed, open space        | Non-wildland |
| Developed, low intensity     | Non-wildland |
| Developed, medium intensity  | Non-wildland |
| Developed, high intensity    | Non-wildland |
| Barren land (rock/sand/clay) | Non-wildland |
| Shrub/scrub                  | Moderate     |
| Grassland/herbaceous         | High         |
| Pasture/hay                  | Low          |
| Cultivated crops             | Low          |
| Woody Wetlands               | Moderate     |
| Emergent herbaceous wetlands | High         |

## Risk



Appendix A-1: Risks

## Hazard



Appendix A-2: Hazards

*“For the six-county study area this information indicates where fuels management should be initiated, continued or enhanced.”*

## Values

The USGS published a series of WUI/I layers at varying resolutions in 2022 (Carlson, et al., 2022). The USGS maps were generated using building point locations, offering higher spatial resolution compared to previously developed WUI maps based on U.S. Census Bureau housing density data. Building point locations were obtained from a Microsoft product released in 2018, which classified building footprints based on high-resolution satellite imagery. Maps were also based on wildland vegetation mapped by the 2016 National Land Cover Dataset. The mapping algorithm utilized definitions of the WUI that are consistent with the definition of WUI/I published in the U.S. Federal Register on January 4, 2001. Our study used the finest resolution (100 m) from the 2022 USGS layer to identify WUI/I areas in the six-county region. Wildland intermix and interface would be managed in the same manner, so they were combined.

In the USGS data set two classes of WUI were identified: 1) the intermix, where there is at least 50% vegetation cover surrounding buildings, and 2) the interface, where buildings are within 2.4 km (1.49 mile) of a patch of vegetation at least 5 km<sup>2</sup> (1.93 sq. miles) in size that contains

at least 75% vegetation. Both classes required a minimum building density of 6.17 buildings per km<sup>2</sup> (0.38 sq mile). There are 56,652 houses within WUI/I area and 2,876,977 homes within one mile of hazardous fuels.

## Level of Concern

At this point the study has looked at the three key variables in the wildland-urban intermix/interface equation including Risk (location of wildland fire occurrence), Hazards (wildland vegetation and associated fuel volatility), and Values (areas with high housing density that are near wildlands).

The next step was to look at the risks and hazards within WUI/I areas. To do this, we created numeric values for each of the layers (Table 2). The areas with highest fuel volatility were assigned a five, and the lowest were one. Areas with high fire occurrence were assigned a three, and low were one. We then added these values together to identify the level of concern. Level of concern was then broken into three groups (Table 2):

The sum of the values in the resulting map was then categorized for the potential for wildfires as

High  $\geq 7$ ; Moderate = 5 – 6; and, Low  $< 5$  (see Appendix A-6, WUI For All CW Counties, Level of Concern).

This study does not provide a definitive answer to whether or not a given parcel of land is better or worse off than another parcel. It is intended to show those areas where additional work is needed or where manipulation of the vegetation could reduce the overall threat to structures, infrastructure and impacts to surrounding



Active wildland fire close to adjacent home. Photograph courtesy of Tim Olk.

communities from fire and smoke. The good news is that very few areas computed out as a High Level of Concern. The vast majority of areas actually came out as Low. What the study does indicate is that those areas that are rated as Moderate or High should be the primary areas of focus for various mitigation options.

For the six-county study area this information indicates where fuels management should be initiated, continued or enhanced. For homeowners and businesses it indicates that

there may be opportunities to improve their situational risk by altering or removing certain vegetation, by maintaining a short grass buffer around their properties, or by removing or protecting those high-hazard areas of the home or business that are most vulnerable. To those agencies that provide fire protection services it indicates where the greatest community threats exist, where additional training is needed, and/or where mutual-aid agreements might better serve the community to prevent wildfire damage. The study serves as a guide and should be viewed in that manner.

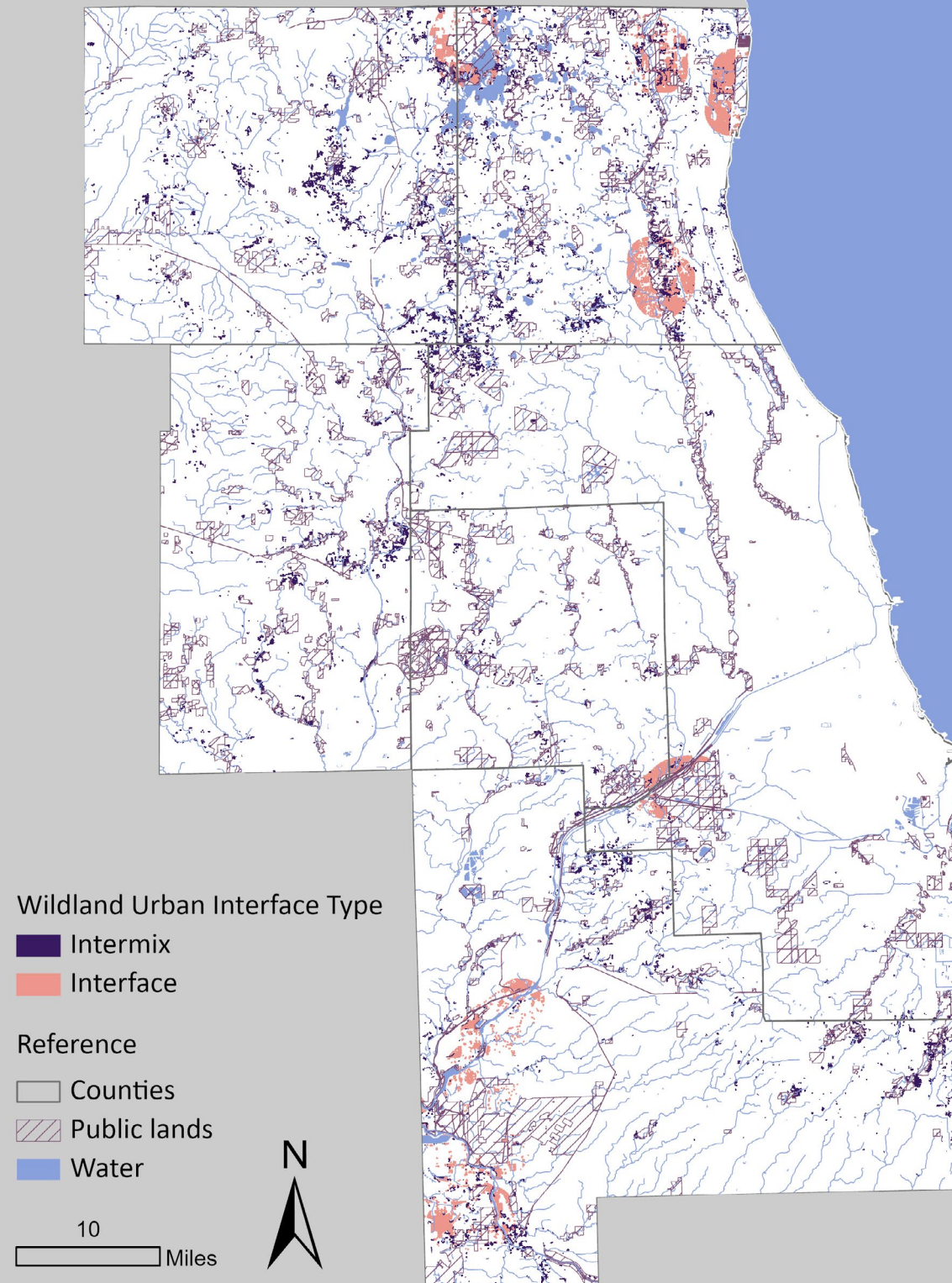


Active wildland fire near adjacent homes in the distance. Photograph courtesy of Tim Olk.

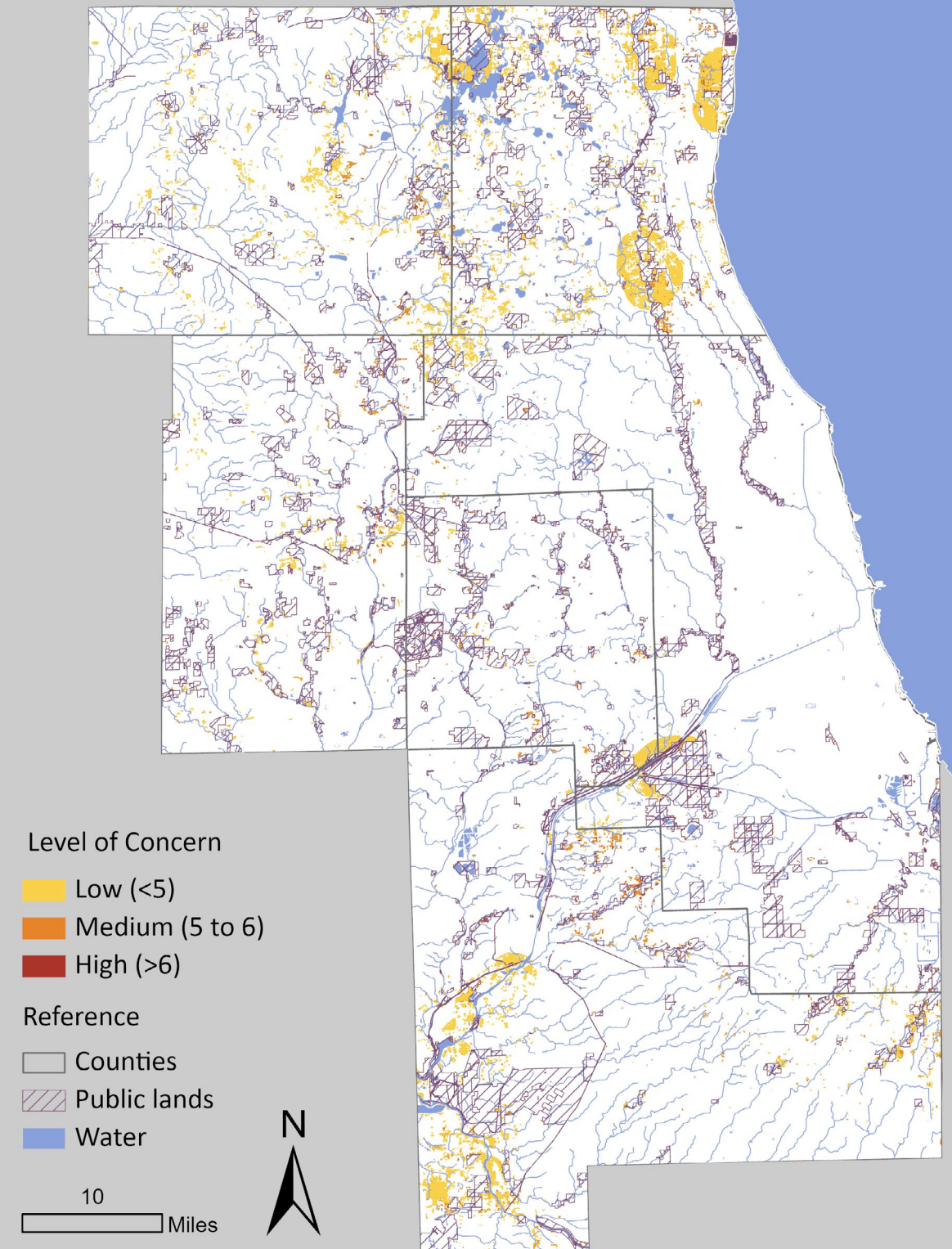
**Table 2. Fire Occurrence / Fuel Volatility Matrix**

| Occurrence/Volatile Fuels | Fuels High Volatility (5) | Fuels Moderate Volatility (3) | Fuels Low Volatility (1) |
|---------------------------|---------------------------|-------------------------------|--------------------------|
| High Occurrence (3)       | 8                         | 6                             | 4                        |
| Moderate Occurrence (2)   | 7                         | 5                             | 3                        |
| Low Occurrence (1)        | 6                         | 4                             | 2                        |

## Wildland Urban Interface



## Level of Concern



## Findings



It is important to look at what drives this analysis. There are three input variables that must be considered: Risk, Hazard, and Values. The first factor is the Values input. If the area in question meets the federal WUI/I definition outlined earlier, then it is considered for further analysis. If the area in question does not meet the definition then that particular area does not undergo further analysis.

Hazard, the type and volatility of fuel, is the second factor that is considered for analysis. Fine fuels, those with a diameter of less than one inch (<1”), represent the greatest hazard. These fuels can rapidly change moisture content due to their high surface area-to-volume ratio. They can be too wet to combust one minute and within the span of a few hours become dry enough to not only ignite, but to spread fire very rapidly. These fine fuels can have rates of spread in excess of 300 feet per minute and have flame lengths in excess of 20 feet. Under these conditions, a flame front can cover a football field in less than one minute. The fuels carry tremendous heat energy and make it extremely difficult for emergency responders to gain control. The good news regarding these fuels is that they burn out quickly and do not require lengthy mop up. In other words, once a fire burns through an area containing fine fuels there is little risk from a rekindle (a fire coming to life that would require additional suppression action) and minimal risk for spotting (embers being carried outside the fire containment area that result in new ignitions). The smoke impact to surrounding communities can be intense depending on the fuel moisture levels, but may be of shorter duration.

Heavy fuels, those with a diameter one inch or greater ( $\geq 1$ ”), represent less of a hazard. These fuels change moisture content very slowly due to their low surface area-to-volume ratio. It takes these fuels days rather than hours to dissipate moisture sufficiently to the point where they will support combustion. Heavy fuels have much slower rates of spread (generally less than 25 feet per minute) with flame lengths under five (5) feet. These fuels typically have much higher fuel loads than fine fuels. Fires in heavy fuels have a much higher intensity (heat energy) that lasts over a longer period of time and therefore the smoke impacts to communities will be longer in duration. These fires generally require extended on-scene response times and there is an increased risk from spotting. Normally wildfires in heavy fuels are less likely to occur due to the slow response times to the loss of moisture. However, under extended drought conditions these fuels can become much more problematic and thus cannot be discounted when reviewing this analysis. Within the woodland settings in the Chicagoland area is an unusually high accumulation of these heavy fuels exacerbated by storm damage, dying ash trees from Emerald Ash Borer and sudden oak death and therefore cannot be dismissed.

Agricultural vegetation, although not normally available for combustion due to the high fuel moisture content, was treated as a wildland fuel for this analysis. Most agriculture crops such as soybeans, corn, wheat, hay, etc. are composed mainly of fine fuels (fuel diameters of less than 1”). Once agricultural crops have completed their growing season, these fuels tend to cure and become available for combustion. These same fuels can become available for combustion at other times such as during a severe, extended

*“Most agriculture crops such as soybeans, corn, wheat, hay, etc. are composed mainly of fine fuels (fuel diameters of less than 1”).”*

drought. If fires are ignited or burn into these fuels, they will burn with great intensities, have significant flaming fronts, and exhibit extremely high rates-of-spread. Smoke impacts are similar to those of fine, native vegetation fuels. For these reasons this fuels classification was included in this study.

In the final analysis if you were to look at several areas that had similar fuels (e.g. they all had light fuels) you may find that one area rates out as High while a similar area rates out as Moderate or Low. This is where consideration of the Risk component in this analysis is influential. Risks are based on historic fire occurrence data. Areas that have a history of numerous wildland fire occurrences will emerge with an increased Level of Concern where those with a lower historic fire occurrence will fall lower on the rating scale given the same fuel volatility ranking. Some potential reasoning for increased wildland fires could be attributed to declining urban socio-economic conditions and whether responding fire departments are career versus volunteer-based organizations. Volunteer-based and combination fire departments may experience higher response times due to personnel being “on-call” and needing to travel to the station prior to dispatching to the scene.

The Level of Concern rating for this analysis is based on both fire occurrence and fuel volatility. Thus, the Level of Concern matrix ranks areas with high and moderate historical fire occurrence and fuels with high volatility (light or fine fuels) as having a High Level of Concern. Areas with a Moderate Level of Concern are those areas that have a low historical fire occurrence but contain high volatility fuels; or areas that have a high or moderate historical fire occurrence

containing moderate volatility fuels (e.g. heavy fuels). Finally, areas classified as Low Level of Concern are those areas that have a low historic fire occurrence with moderate or low volatility fuels.

What is more, the unplanned ignition of vegetative fuels under less than ideal weather and atmospheric conditions has the potential to expose a large number of people to the health hazards of smoke which can drift significant distances. In the six-county region, 3,279,205 residents live within a quarter mile of hazardous vegetation and 7,867,938 residents live within a mile of hazardous vegetation. The smoke impacts may be of greater concern within the highly urbanized area than the spread of fire itself. Smoke induced by upwind fires has a significant detrimental effect on home values, in certain circumstances upwards of a 17% decline (An et al., 2023), and those effects persist for up to three years (Huang & Skidmore, 2024). Smoke is also a particular concern for disadvantaged communities, who tend to have higher rates of asthma and other respiratory diseases. Within the areas that are likely to be affected by smoke, 30% of residents are in disadvantaged neighborhoods.

The goal of this analysis was to look at all three data sets to determine those areas where wildland fires could have a significant impact on homes. Although businesses and infrastructure were not considered in this analysis, both would benefit as well from this Community Wildfire Preparedness Plan. Some examples of critical infrastructure could be electrical sub-stations, critical transportation corridors and major transportation hubs such as O’Hare and Midway Airports.

# Current Situation

In the six-county study area the total land area equals approximately 2,397,675 acres. Our analysis found approximately 1,058,292 acres are vegetated with wildland fuels. Of this, a total of 100,367 acres can be categorized as Wildland Urban Intermix/Interface, or 4.2% percent of the land in the study area. The amount of WUI/I varies from just 1.3% in Cook County to 12.6% in Lake County (see Table 3 County Breakdown by WUI/I).

There are higher rates of reported wildfires within Cook County compared to the other counties. This is a result of the larger human population of the county providing the opportunity for both accidental and intentional ignition of wildland fuels.

The final analysis, Level of Concern, combines data about fuel hazards and fire risk in WUI/I areas. In the six-county region, 1,643 acres (1.6%

of WUI/I area) rate as a High Level of Concern. The vast majority (82%) of WUI/I area has a Low Level of Concern.

The Community Wildfire Preparedness Plan analysis as presented here will allow all cooperating agencies to concentrate on less than one percent (0.74%) of the total land mass of the six-county study area and less than 17% of the total WUI/I acreage to address the most critical fire management concerns. Narrowing down the focus will make it easier for cooperating agencies to utilize scarce resources where they are most needed. However, this plan also contends that within highly-urbanized regions the traditional definition of WUI/I must be considered more broadly. Even if not directly threatened by fire, smoke is a major concern in urban areas in which, due to extreme population densities, millions of people may suffer adverse health and economic impacts from even relatively minor fire events.

Table 3. County summary by WUI/I

| County  | Size (acres) | Number of Fires | Wildland Fuels (acres) | WUI/I (acres) | WUI/I Percent |
|---------|--------------|-----------------|------------------------|---------------|---------------|
| Cook    | 611,610      | 9,994           | 84,602                 | 7,951         | 1.3%          |
| DuPage  | 215,040      | 2,346           | 33,697                 | 4,516         | 2.1%          |
| Kane    | 335,453      | 2,553           | 204,543                | 8,051         | 2.4%          |
| Lake    | 300,247      | 2,512           | 110,805                | 37,831        | 12.6%         |
| McHenry | 391,465      | 1,792           | 289,925                | 17,616        | 4.5%          |
| Will    | 543,860      | 4,058           | 334,720                | 25,561        | 4.7%          |
| Total   | 2,397,675    | 23,225          | 1,058,292              | 101,526       | 4.2%          |

(\* The total number of wildland fire reports from NIFRS utilized for this study was 23,255 during the 10 year study period.)

Table 4. Level of Concern

| County  | Low (acres) | Medium (acres) | High (acres) | Total (acres) |
|---------|-------------|----------------|--------------|---------------|
| Cook    | 5,777       | 2,005          | 252          | 8,034         |
| DuPage  | 2,857       | 1,361          | 177          | 4,395         |
| Kane    | 5,749       | 1,957          | 153          | 7,860         |
| Lake    | 33,130      | 4,144          | 412          | 37,687        |
| McHenry | 15,421      | 1,745          | 168          | 17,334        |
| Will    | 19,527      | 5,051          | 481          | 25,059        |
| Total   | 82,461      | 16,263         | 1,643        | 100,367       |

So does this mean that if a home is within or near an area with a High Level of Concern that it is in imminent danger? Absolutely not! The analysis is intended to alert homeowners so that you can take preventative measures to help ensure that their home is safe. Preventative measures include providing adequate defensible space around homes and businesses and the use of building and landscape materials that are fire resistant. Both of these concepts are discussed later in this report. The goal is to take the output from this analysis and then make informed decisions regarding fuels management and defensible space.

From a land management agency perspective this analysis will indicate where fuels treatment(s) are most needed. It will help prioritize projects to accomplish the most beneficial changes for each land management dollar expended. It may also identify those areas that are environmentally sensitive and where special precautions may be needed during suppression action. With so few acres targeted the opportunity to pre-plan wildfire suppression activities with the local fire protection authorities is not a burdensome requirement.

For fire protection districts and fire departments this study may help identify those areas where additional personnel and/or specialized equipment might be needed on initial dispatch. It might also point out training opportunities for both agencies as part of their pre-planning process and clarify areas that suppression activity will need to be aggressive to protect property. The opportunities afforded by this study are limitless, but it will take a cooperative effort to realize the benefits.



Photograph of active wildland fire on a prescribed burn. Photograph courtesy of Drew Daily.

## Remediation Needs



The primary purpose of this study was to determine which areas of the target counties had the most significant issues regarding potential losses from wildland fires. With identification of areas rated from Low to High, communities can start looking at potential solutions to the problem and look for the most cost effective ways to mitigate the problem. There are three key areas to consider:

- Fire Occurrence and Reporting
- Management of Fuel Loads
- Wildfire Response

### Fire Occurrence and Reporting

A more in-depth look at fire occurrence is warranted. Open space agencies can initiate a cooperative study with the local fire protection districts and fire departments to understand what percentage of fires reported as wildland are in fact reported correctly. It would also be beneficial to determine the main causes of reported wildland fires and the approximate acres involved. Improving the overall frequency and level of detail in fire reporting will help ensure that fires are being reported accurately. By knowing the primary causes of these types of fire starts, communities and agencies will be in a better position to develop and target fire prevention strategies and tactics. Reporting on the approximate size of wildfires also gives authorities a better understanding of the scale of the wildfire issues in the six-county area. Improved reporting of wildland fire incidents will help reach the goal of reducing the actual number of wildland fire ignitions and in turn reduce the overall risk.

Frequently, wildfires do not get reported into NFIRS if they occur on properties owned by land management agencies, and are suppressed

by agency personnel and not fire protection districts. Most agencies record these unplanned ignitions as well as prescribed fires in various forms of proprietary databases, whereas the NFIRS system is only used by fire protection districts and is not available to land management agencies. As a result of this gap, the total number of wildfires in the area is likely under-reported in the NFIRS system. Resolving these reporting issues and streamlining the process will require cooperation from various entities within the fire community.

In addition, this study points out the need to provide more accurate fire location information in the NFIRS report which locates fires by providing the address or generalized zip code. Current technologies allow local fire protection districts and fire departments to accurately pinpoint the exact location of each ignition by providing a latitude and longitude. These coordinates can be obtained using global positioning systems (GPS), United States Geological Survey (USGS) maps, or through the use of applications such as Google Earth. This



Photograph of prescribed and administered woodland flames.  
Photograph courtesy of Tim Olk.

*“A fire dependent ecosystem needs periodic fire to maintain ecological health.”*

data would dramatically improve future updates of this study by standardizing reporting, thereby increasing both the consistency and accuracy of the data and enabling greater levels of location-based analysis.

The Illinois Department of Natural Resources, Conservation Programs, Forestry Resources Section (IDNR-FRS) has developed an on-scene mobile application that fire departments and open space/land management agencies can utilize for wildland fire reporting. This application can overcome some of the wildfire reporting accuracy issues that are present in the NFIRS data including location, attributes about the fire, and inability of land management agencies to independently report wildfire incidents. The application has drop-down menus that make it straightforward to collect dates, county, and cause codes. The IDNR-FRS application is not intended to replace the NFIRS system, but rather to augment it with data that is valuable to open-space/land management agencies that cannot access NFIRS. More research and development will be needed to make this cross-compatible with NFIRS and available to all entities with wildland fire suppression responsibilities.

### Management of Fuel Loads

The second key area to consider is the Hazard side of the equation. By maintaining fuel loads within normal ranges and creating defensible space or buffers between volatile wildland fuels and homes, reducing this key component will result in an overall lowering of the Level of Concern. Fuels can be managed in a number of different ways. Mechanized equipment can be used to cut or mow high-hazard fuels. The problem with this approach is fuel loads have not been reduced, they have simply been

rearranged. Chemicals can be utilized to limit woody stemmed encroachment and to kill unwanted vegetation, but the drawback to chemicals is that they don't reduce fuel loads nor do they alter the arrangement of those fuels. Chemicals may also impact non-target species, may require special licensing for applicators, and some chemicals may linger in the environment for long periods of time. Oftentimes the best way to manage fuels is through the use of prescribed fire. Prescribed burning is defined as “fire applied in a skillful manner, in a definite place, and under exacting weather conditions to achieve specific results”.

The use of prescribed burning is not new. Most of the native ecosystems in the project area are fire dependent. A fire dependent ecosystem needs periodic fire to maintain ecological health. The careful application of fire can reduce the unnatural accumulation of fuel; reduce the amount of woody-stemmed encroachment; favor native tree species by encouraging sprouting; reduce the competition for space and nutrients; provide for rapid nutrient cycling; improve wildlife habitat and help maintain a mosaic of differing successional stages; improve biodiversity; help keep invasive species in check; and, accomplish all of this with less negative impact to the environment and at less cost.

Prescribed fire does not come without some drawbacks. Prescribed burns produce smoke and heat which can be harmful to humans, birds, insects and mammals. Smoke from a prescribed burn can reduce visibility and produce increased particulate matter regulated by the Environmental Protection Agency (EPA). There is also the potential that the prescribed burn can escape and become a wildfire, increasing the likelihood for it to be detrimental to non-

*“The overall goal for smoke management is to minimize any negative impacts to neighbors in or downwind of the burn.”*

target species. When the land manager weighs all the benefits and risks, the use of prescribed fire applied in an appropriate and skillful manner is still one of the safest and most cost effective means for controlling unwanted vegetation and promoting native fire dependent flora that bolsters biodiversity. Prescribed burning allows for the treatment of larger tracts of land producing a savings in both time and money.

**While both wildfires and prescribed fires produce gaseous and particulate emissions, prescribed fires are conducted under conditions that minimize these impacts.**

In many cases emission exposure to persons near a prescribed burn are comparable or less than those associated with operating a lawnmower (Illinois Natural History Survey, 2022). This report goes on to say that most prescribed burns in the CWPP area are under 50-acres. All prescribed burns are conducted under exacting weather conditions considering wind speed and direction, temperature, relative humidity, time of day, and atmospheric stability (ability of the atmosphere to lift and disburse smoke). All burns in this area conducted by most land-management agencies require permitting by the Illinois Environmental Protection Agency. The National Weather Service (NWS) in Romeoville, Illinois has a special “Weather Graph” to help practitioners obtain critical weather data for prescribed burns and can provide “Spot Weather” forecasts for a particular area helping ensure accurate data for the burn. While prescribed burns do produce smoke, they are conducted with great care to minimize impact on air quality and visibility. At the frequency, size and intensity of prescribed burns used to manage natural ecosystems, studies indicate that prescribed fire contributes little if any net greenhouse gas emissions. At the same time practitioners can restore and maintain critical



ABC7 Reporting on smoke from the Canadian wildfires in downtown Chicago, 2023.

habitat that in turn results in positive carbon sequestration and storage overall.

Wildfires can and do produce huge quantities of both gaseous and particulate emissions. In the summer and early fall of 2023 much of the United States was impacted by smoke from fires in Canada. In some cases, this smoke was so severe that the air quality index (AQI) in many major cities was several hundred times over the level considered “Healthy” for humans. These fires were unplanned ignitions covering millions of acres, burning and producing smoke under adverse weather conditions. These fires literally burned for months and adversely impacted millions of individuals across most of North America and in some cases around the globe. In the US alone wildfires burn an average of 7 million acres each year.

As mentioned previously, peat and muck soils will support combustion. These fires are “smoldering” ground fires (sub-surface) and have extremely slow rates-of-spread. The biggest issues with fires in this fuel type comes from the long duration of combustion and the acrid smoke that is omitted. Peat and muck fires can burn for weeks, months or even

*“When deciding on strategy and tactics, emergency response personnel must always take into consideration the values at risk when performing initial attack on a wildland fire.”*

longer. Emissions from these types of fires are unhealthy, very difficult to mitigate and continue 24/7 until the fire is suppressed, there is sufficient rainfall to saturate the deep soils or they simply run out of fuel. Smoke from these fires can be a serious threat to health, can disrupt major transportation hubs, and are extremely dangerous to individuals and equipment taking suppression action.

Smoke Management is part of every prescribed burn plan. The burn plan is generally built around the premise of “where is our smoke going to go, how long will it take to vent the smoke up and out of the area and are there any “affected parties” nearby. Affected parties can include, but is not limited to, hospitals, nursing homes, schools, residents with respiratory issues, transportation corridors and critical infrastructure. Attention is paid to disadvantaged communities since they may not have the ability to depart the area during the burn or may not have heating and air-conditioning systems that can help filter the air. The overall goal for smoke management is to minimize any negative impacts to neighbors in or downwind of the burn.

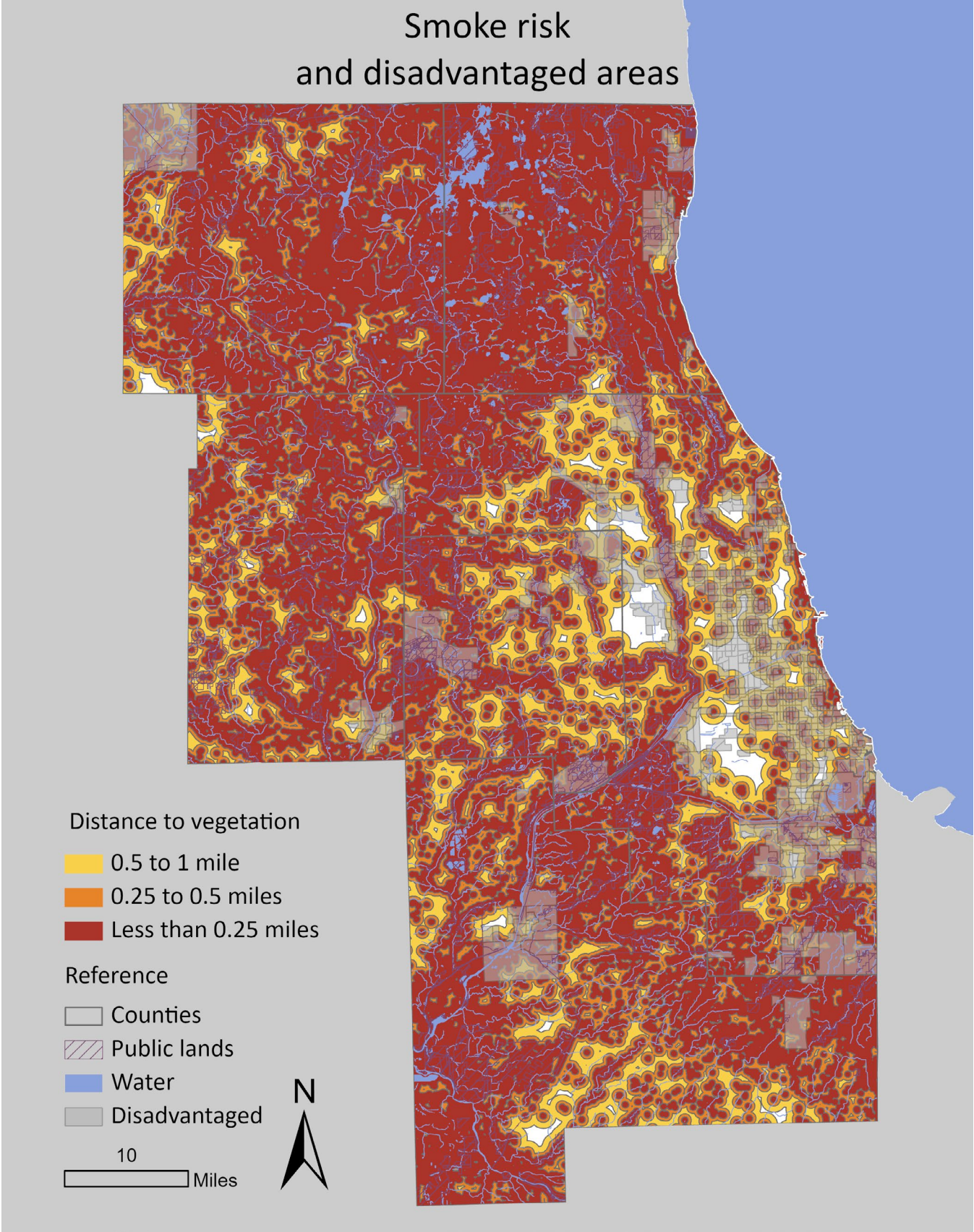
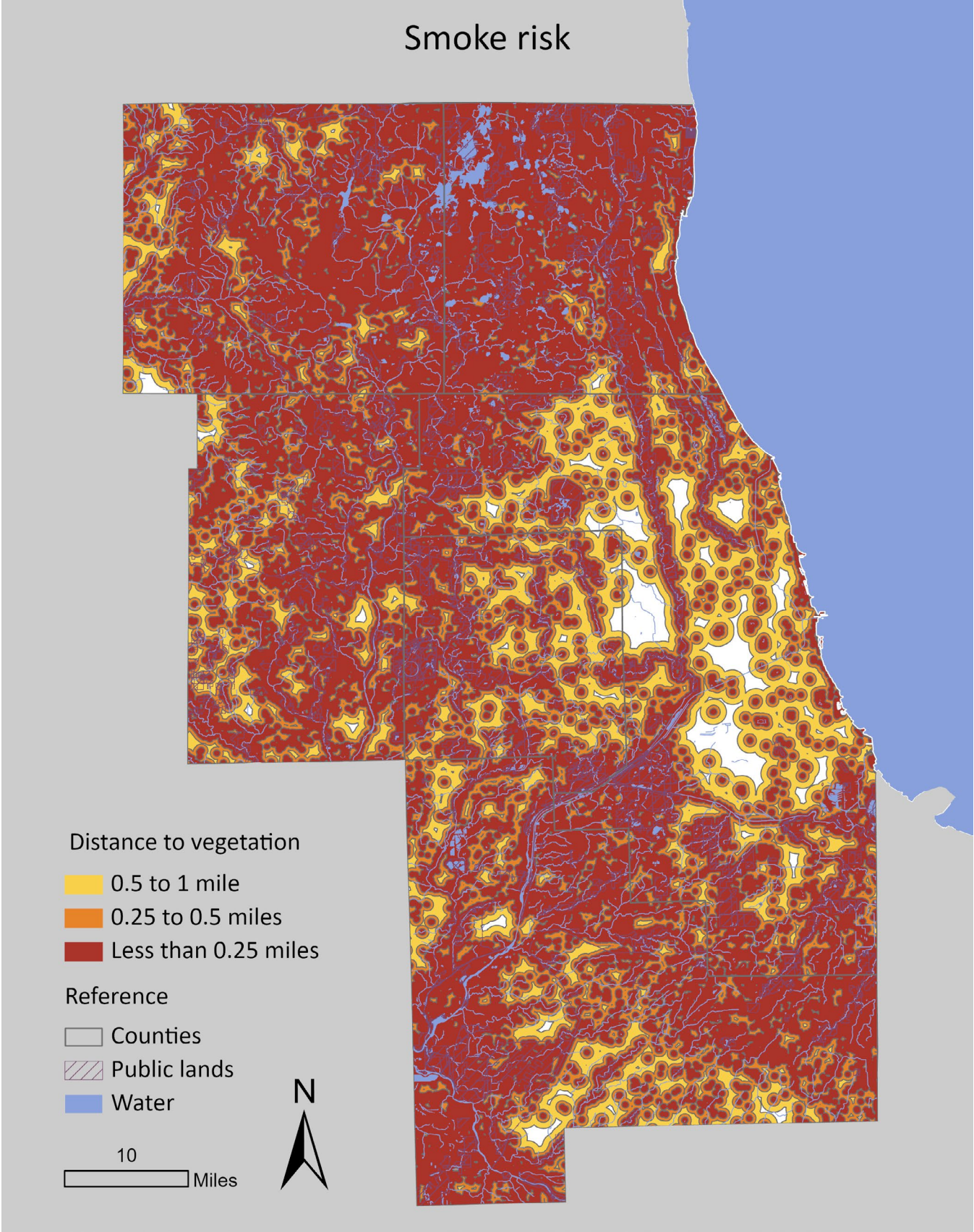
Land managers cannot eliminate smoke from prescribed fire, but they do everything to minimize the impacts! When utilizing fire as a management tool there should be consideration given to developing defensible space or setback standards where wildland fuels are in close proximity to homes and structures. Defensible space is simply an area where the fuel type and fuel load have been altered to change fire behavior. In other words, these areas are created to reduce the rate-of-spread and flame length of an advancing fire. Strips of cool season grasses, mowed or tilled lanes, recreational pathways, fire resistant landscaping and manicured lawns are examples. These types of defensible space will

allow responding fire personnel an advantage allowing them to more easily suppress the wildland fire, but also to protect exposures from intense heat and windblown embers. Setback is simply a term used to define some minimum standard distance between potentially volatile wildland fuels and structures. Some setback standards are defined in housing covenants, others in municipal code, while others are simply handshake agreements that are arrangements made in the interest of both parties. Setback standards should be developed for all areas where housing units are in close proximity to wildland fuels.

Fuels reduction and management, whether through mechanical removal or prescription burning, requires sustained funding with potential additional funding from grants, donations, endowments, foundations, and other sources of revenue. Creating defensible spaces within the WUI/I can be solved through creative land management planning but requires long term master planning and land use planning with the potential for wildfire in mind.



Prospect Heights Fire Department handling a brush fire. Photograph Courtesy of Tim Olk.



*“Properly applied strategy and tactics will help ensure firefighter safety, reduce the threat to homes, businesses and infrastructure, limit environmental damage to natural resources, and save money.”*

Wildfire Response

The final key area is the response of fire protection agencies and personnel to wildfires. In some instances wildfires are occurring in sensitive ecosystems and many times the fire is doing more good than harm. In these cases it would be better to allow the fire to burn from areas with heavy fuel loads or fine, flashy fuels to areas where there is a break in the fuel structure and continuity. Fire intensity and flame lengths in a warm season grass field may move 300+ feet per minute and exhibit flame lengths in excess of 20 feet. Once the fire reaches a transitional area where it either burns into a wooded area, manicured lawn, or an area with reduced fuel loading, the fire will slow down to perhaps less than 25 feet per minute and exhibit flame lengths less than 5 feet. Firefighters and equipment are not put in harm’s way and the fire is much easier to control in these areas. It is not safe, nor prudent to put personnel and equipment in the path of a running wildfire. Many wildfires occur in the spring or fall of the year when soil moistures are high. Fire protection personnel should understand that heavy fire fighting equipment will not be able to drive across these saturated soils. Doing so can put personnel and equipment at risk and the ruts left by the heavy equipment can leave scars on the landscape for decades. Driving into sensitive environmental areas is generally not advisable due to the potential damage inflicted upon the landscape.

When deciding on strategy and tactics, emergency response personnel must always take into consideration the values at risk when performing initial attack on a wildland fire. If there are no high-value structures at risk (homes, businesses, and infrastructure) from a wildland fire, then evaluate the risk / benefit of allowing the fire to burn through these fuels and then

develop tactics to catch the fire where it is more advantageous to the responding resources. This can reduce the exposure of personnel and equipment and at the same time help reduce fuel loads, allow these fire dependent ecosystems to develop, and perhaps prevent long-term environmental damage to the site. In the wildland fire arena this is called Appropriate Management Response (AMR).

It is a natural reaction for fire suppression organizations to respond with massive amounts of personnel and equipment to wildland fires that have the potential to threaten homes, businesses or other high-value property. This massive response increases the complexity of the incident, makes it more difficult to manage, increases the confusion factor due to variable communication capabilities, may put personnel and equipment resources at undue risk, and will escalate the response cost exponentially. Wildland fires can have very high rates-of-spread and exhibit significant flame lengths at the head or down-wind portion of the fire. This is the area where the most damage occurs and where suppression action and particularly structure protection should concentrate. The



Photograph of Wildland firefighting team.

*“The wildland firefighting team is composed of firefighters from various fire departments and agencies that have come together for the mutual benefit of all cooperating agencies.”*

flanks and the rear of this same fire moves much more slowly, has reduced flame lengths, and is easier to suppress. These areas provide great opportunities to establish an anchor point from which to initiate the wildland suppression action. Structure protection equipment and personnel can then be concentrated on the down-wind side (head) of the fire adjacent to threatened structures. The areas surrounding most structures have reduced fuel loads and generally provide defensible space from which the fire departments can take a defensive stand.

**Deploying fire suppression personnel and equipment in the unburned wildland fuels at the head of the fire is extremely dangerous.** If equipment becomes disabled or stuck, if firefighters run out of water, or if a firefighter suffers an injury the result can be disastrous. The key to mitigation is wildland fire training. This training will help develop strategy and tactics appropriate for wildland firefighting and for structural triage for houses in the path of a running wildfire. The training will cover fire behavior and fire weather which is crucial in understanding wildland firefighting and in developing sound strategy and tactics for combating such fires.

**The primary goal when attacking a wildland fire is firefighter and public safety. Second is the protection of high-value property and the final goal is to limit the damage to wildland vegetation and surrounding ecosystems.** Properly applied strategy and tactics will help ensure firefighter safety, reduce the threat to homes, businesses and infrastructure, limit environmental damage to natural resources, and save money. By understanding wildland firefighting strategy and tactics fire departments and fire protection districts will be able to utilize fewer personnel and less equipment. More

importantly it will allow more fire personnel and equipment to remain at the station to handle higher priority structure fires, accidents and other critical-need emergencies. The initial training costs money, but in the long run departments that invest in wildland fire training will reap huge benefits, saving departments and taxpayer’s money, while at the same time reducing the damages caused by wildfires.

Cross-training helps both land management and fire protection agencies in making sound fire suppression decisions. On the minus side of things, training costs agencies in terms of both time and money. The positive side of things is that by looking for opportunities to cross-train, agencies can reduce these negative impacts and in the end may save their agencies hundreds or thousands of dollars in liability and equipment costs.

Most land management agencies are very familiar with both prescribed fire and wildland fire. These same agencies lack the skills to perform structure protection or to consider triage situations. Fire departments and fire protection districts, on the other hand, receive hundreds of hours of training on structural fire



Emergency response personnel at the Wauconda grass fire.

*“Land management agencies should allow their personnel to attend structure fire training particularly training dealing with exposure protection, triage, and mutual-aid response.”*

strategy and tactics, but very few hours on wildland fires. The key is to marry these two groups up and conduct training that will be of benefit to both agencies. Land management agencies should allow their personnel to attend structure fire training particularly training dealing with exposure protection, triage, and mutual-aid response. Land management agencies also have numerous National Wildfire Coordinating Group (NWCG) or locally-developed training courses that could be offered to assisting fire protection districts and fire departments. This type of cross-training can produce tangible benefits to both target agencies.

An example of this type of interagency cooperation is Lake & McHenry County's Specialized Response Team - Wildland (<https://srtillinois.org/teams/wildland-task-force/>). This group has organized and trained a Wildland Firefighting team. This team specializes in wildland fire response in the two-county area. The wildland firefighting team is composed of firefighters from various fire departments and land management agencies that have come together for the mutual benefit of all cooperating agencies. This team has received specialized training and equipment that allows them to more effectively and efficiently respond to wildland fires within their jurisdiction. The individuals on the team frequently participate with the land management agencies on prescription burns, giving them practical experience in wildfire behavior and tactics but also intimate knowledge of wildland areas within their jurisdiction. This group is a model organization and should be given high-priority for expanding to other counties within the Chicagoland area.

Cross-training between wildland fire agencies and fire departments/fire protection districts has been a long standing need. Structural personnel



Prospect Heights Fire Department responding to Brush Fire. Photograph courtesy of Tim Olk.

follow the National Fire Protection Association (NFPA) standards and wildland fire personnel follow the National Wildfire Coordinating Group (NWCG) standards. NWCG has long understood the need to get structural fire personnel trained to some minimum standard since they respond to many wildland fires within their protection area. To that end, NWCG developed what they call “Gap” courses that were intended to provide this training to fire department personnel, understanding that these individuals already had some of the basic knowledge gained through their structural training. The IDNR-FRS, and the Illinois Fire Service Institute offers the “Gap” training course G-130/190 “Wildland Fire Training for Structural Firefighters”.

The Gap course G-130/190 is only one-half of the equation. Wildland fire response personnel need a similar course concerning the structural side of the equation. This training could include, but is not limited to, fire ground management, structure triage, equipment adaptation, complex communication and much more. The key here is to promote the value of cross-training between structural and wildland fire response personnel, and to promote the value in utilizing and developing more cross-training courses.

Table 5. Action Plan

ACTION ITEMS

| CATEGORY                    | GOAL                                                                        | ACTIVITIES                                                                                                                                                                                                                                                                                               |
|-----------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fire Occurrence & Reporting | Improve reporting of wildfire ignition causes                               | May involve better wildfire training to determine ignition location and source.                                                                                                                                                                                                                          |
|                             | Improve reporting of the scale (i.e. number of acres) of wildfire incidents | Promote utilization of widely accessible geospatial software (such as Google Earth) that can be used to approximate acres.                                                                                                                                                                               |
|                             | Improve accuracy of wildfire location reporting                             | Implement reporting standards and protocols. Promote utilization of widely accessible geospatial software (such as Google Earth) that can be used to accurately identify the location of wildfires.                                                                                                      |
|                             | Capture cross-agency wildland fires                                         | Develop cross-agency reporting where land management agencies can feed wildfire information to fire protection districts/agencies for fires suppressed solely by land management agency personnel and for fires on land management agency lands suppressed solely by fire protection districts/agencies. |
| Management of Fuel Loads    | Work to integrate wildfire reporting between platforms                      | Develop cross-agency reporting between land management agencies and IDNR-FRS. Encourage IDNR-FRS to develop reporting to NFIRS.                                                                                                                                                                          |
|                             | Reduce fuel loads in areas with moderate and high Level of Concern          | Increase funding for mechanical removal and/or prescribed burning, prioritizing areas rated based on their Level of Concern.                                                                                                                                                                             |
|                             | Create defensible space in WUI/I areas                                      | Master planning/land use with consideration for wildfire potential.                                                                                                                                                                                                                                      |
| Wildfire Response           | Appropriate response to wildfire by responding personnel                    | Facilitate training in wildfire behavior and appropriate suppression tactics with emergency response personnel.                                                                                                                                                                                          |
|                             | Encourage fire protection district to include wildland fire training        | Develop an avenue for fire protection districts to train all personell on the NWCG G-130/190 courses offered by the Illinois Fire Service Institute.                                                                                                                                                     |
|                             | Facilitate cross-training for wild-fire response                            | Coordination with fire protection districts and local land management agencies.                                                                                                                                                                                                                          |
|                             | Develop pre-suppression plans for areas of high risk for wildfire           | Coordination with fire protection districts and local land management agencies.                                                                                                                                                                                                                          |
|                             | Develop a smoke alert system for airport authorities                        | Develop a process where both fire protection districts/agencies and land-management agencies can alert airport authorities when smoke may impact flight operations.                                                                                                                                      |

# Benefits & Responsibilities

The goals of the Community Wildfire Preparedness Plan are to reduce vulnerability of the populace and property of residences, businesses and inhabitants to injury and loss resulting from wildland fires; to provide prompt, effective and appropriate wildfire suppression responses with all agencies having fire protection responsibilities; to enhance mutual-aid capability and effectiveness of fire departments by identifying training needs and providing training opportunities; to promote the use of fuels management mitigation techniques on those areas identified as High and Moderate in this study; and, to effectively educate the residents and businesspersons regarding their responsibilities for prevention and mitigation of wildland fires in their affected areas.

The most critical outcome of this analysis was the ability to identify those parcels in each of the six-county study area that had the greatest threat potential (Level of Concern). With these areas identified the various user groups can work collectively to mitigate the potential threats. In order for this analysis to be meaningful all affected parties will have to work together. The affected areas are varied and have numerous ownerships. Each affected group will have an assumed role to help implement this plan. By focusing on the areas rated with a High and Moderate Level of Concern it will allow these groups to initiate mitigation work where the risk and potential for loss is the greatest.

**The key to reducing the risk from the threat of wildfire is to maintain fuel loads at manageable levels on the identified areas.** Lands with naturally occurring wildland fuels have a tendency to build up unnatural accumulations of fuel over time without proper resource management. This excess buildup of fuel can be the result of total fire suppression, wind or



North Branch of the Chicago River and Forest Preserves of Cook County with Downtown Chicago in the Distance. Aerial photograph courtesy of Jessyca Malina.

ice storms, insect, disease or fungal outbreaks or simply from natural vegetative cycles. This profusion of fuel contributes significantly to the difficulty in controlling a wildland fire that starts or spreads into these areas and to the overall damage that results from these fires. Managing fuel loads makes it easier for fire suppression agencies to gain control of wildland fires and thus limit the extent of the damage. Typically the greater the volume or amount of fuel, the greater the fire intensity and thus the greater the overall damage.

Accumulation of fuel can be managed in several different ways. The idea is to reduce the fuel load by removing accumulation or buildup of these fuels over time. Fuel reduction can be accomplished by controlling unwanted vegetation through the use of herbicides, mowing, and mechanical removal or through the use of prescribed burning. Each of these fuel management techniques comes with a cost and an associated risk.

*“Fuel reduction can be accomplished by controlling unwanted vegetation through the use of herbicides, mowing, and mechanical removal or through the use of prescribed burning.”*

Using herbicides to control unwanted vegetation can be cost effective or expensive depending on the chemicals utilized and the method of application. Herbicide application oftentimes requires that the applicator be licensed. There is always the risk of damaging non-target species or impacting off-site areas from drift or movement of the chemical by air or water when handling and applying chemicals. Broadcast spraying of herbicide can be cost effective, but this method of application is more likely to cause non-target species impact. The more selective the type of herbicide used and the method of application can significantly increase the cost. The other downside of chemical control is the fact that the target vegetation is killed, but the dead fuel remains on site and may add to a greater fuel buildup. Mowing or mechanical removal of fuels is a relatively easy way to deal with unwanted vegetation. The issues with this method include it is time consuming, requires specialized equipment and can be costly in terms of personnel and equipment costs. In the case of mowing, the fuels are being rearranged but they are still available for combustion and thus add to the fuel load. Mechanical removal of vegetation from the site does reduce fuel loads, but it is extremely time consuming and costly. Specialized equipment can be used to remove unwanted vegetation, but may not be appropriate for sensitive ecological areas. In such a case, mechanical removal may involve quite a bit of skilled labor, again driving up the cost of application.

The use of prescribed fire to keep fuel loads in check is very fast and cost effective. Use of this natural resource management tool requires specialized training and equipment. Smoke management must be employed and burning must meet certain air quality standards. The user may be required to obtain state, county,

or municipal permitting depending on local regulations. Use of fire is the most natural mechanism in controlling the buildup of natural cover fuel accumulations. Most of the ecosystems in the six-county study area are fire dependent. These systems developed from repeated fire and must have periodic fire to maintain ecological health. The downside to the use of prescribed fire to manage fuel loads is that it requires special training and equipment and the practitioner must manage not only the fire, but the smoke and byproducts of combustion produced.

Even so, the use of prescribed burning is the most cost effective alternative to maintaining fuel loads at acceptable levels. A limiting factor of conducting prescribed fire for many organizations and agencies is the short seasonal time window when fire can be applied effectively. In addition, many of these same organizations and agencies lack qualified staff and sufficient equipment to meet the need given the short seasonal window for prescribed burning. Each fuel classification, fine fuels (< 1” diameter) and heavy fuels (≥ 1” diameter), has



IDNR Fire performing prescribed burn to reduce fuel loads.

*“Wildfires, or unplanned natural or human-caused fires, need to be evaluated as to their potential to do damage, move off-site to private property or high-risk areas, and/or their risk to inflict damage that may take decades or centuries to repair.”*

their own set of prescribed fire parameters in order to consume each classification of fuel. For example, a prescribed fire in fine fuels will generally consume  $\geq 75\%$  of the available fuel load. This can be accomplished under a wide range of weather conditions. Smoke produced from prescribed fire in light fuels is of much shorter duration and is easier to disperse. Heavy fuels, on the other hand, have a much more restrictive set of conditions to burn in order to achieve satisfactory reduction in fuel loading. In most cases it takes some sort of short-term drought conditions to reduce the fuel moisture content in the fuel sufficiently for combustion to occur. Heavy fuels also produce more smoke over a longer period of time. This longer duration smoke can be problematic for individuals with respiratory or health issues. It also requires a more narrowly defined set of weather parameters in order to ensure good smoke lift (ventilation) and dispersal.

The selection of the fuel reduction process will depend upon the ownership. Public agencies may have more choices than private landowners when it comes to managing fuels on WUI/I areas. The key to successful fuels management must come from the various landowners whose land is rated as High regarding the Level of Concern or has property adjacent to such designated lands. No single agency or individual can do this work on their own. This has to be a collective effort to be effective.

Many of the areas identified by this study are environmentally sensitive. These areas may contain threatened and endangered species, or may be riparian areas that protect valuable watersheds and/or they may be part of existing wetlands. In any case, it is imperative that agencies responding to wildland fires do so with an Appropriate Management Response (AMR).

AMR can be a range of tactical options from monitoring to intensive suppression activities depending on the safety of first responders, threat to property damage, weather, topography, fuels, fire behavior and sensitivity of the area in question. Since many of these areas are fire-dependent ecosystems, a wildfire may be doing more good than harm. Wildfires, or unplanned natural or human-caused fires, need to be evaluated as to their potential to do damage, move off-site to private property or high-risk areas, and/or their risk to inflict damage that may take decades or centuries to repair. If the wildfire is determined to do any of the above then they should be suppressed. Otherwise, a strategy of AMR should be implemented.

**Prescribed fire by definition is fire applied in a skillful manner, in a definite place, under exacting weather conditions to achieve specific results.** Wildfires can and often do occur at such time when native vegetation can be severely damaged or killed. Wildfire events do not allow land managers or fire protection personnel the opportunity to control the fire's intensity or residence time (how long the



Forest Preserve personnel performing a prescribed burn at Bluff Spring Fen.

*“The purpose of these pre-suppression plans is to make the fire suppression tactics safer, easier to implement, require fewer fire resources and personnel and be gentler on the environment.”*



Photograph courtesy of Lee Casebere.

flaming front takes to move across an area). For that reason it is imperative to consider the evaluation process outlined above before taking suppression action. Inappropriate suppression action could cause more environmental damage than the wildfire itself. Agencies with fire suppression responsibilities need to understand the sensitivity of these areas and develop suppression plans that take these sensitivities into consideration. Driving heavy fire apparatus into wetland or habitat sensitive areas can leave ruts that may not recover for decades or centuries. Each of the areas identified in this study need to have pre-suppression plans developed so that the landowner and the fire suppression agency know before a fire starts what the plan of action should be. It may be safer and easier to allow a certain area to burn with plans to contain the fire where there is a fuel type change, a road, or other natural barrier that will serve as an appropriate place to set up a defensive position. The purpose of these pre-suppression plans is to make the fire suppression tactics safer, easier to implement, require fewer fire resources and personnel

and be gentler on the environment. The key to success is for land management agencies and fire suppression agencies to agree up front on these pre-suppression strategies.

In addition to developing pre-suppression plans, these same agencies need to consider the benefits of cross-training personnel. Fire suppression agencies are mandated to put the fires out. Land management agencies are oftentimes charged with protecting and enhancing the natural resources on their lands which includes the use of prescribed fire as a management tool. The missions of these two agencies can be in conflict with one another, but that does not have to be the case. Land management agencies can offer training to fire suppression agencies regarding wildland fire tactics, fire ecology, fire behavior, fire weather, safety protocols, and equipment use. Both agencies would benefit from this cross-training and it would help develop the linkage that is often missing. Classroom training could be followed up with field exercises. These field exercises could serve as the basis for developing and implementing the pre-suppression plans on these high-risk areas. Fire suppression agencies can in turn provide training to land management agencies regarding triage and the need to protect the public and infrastructure. Cross-training provides an opportunity for each side to explain their needs and mandates. This cooperation can lead to significant savings for both agencies, provide clear, concise pre-response plans, and provide for firefighter and public safety.

Landowners have a tool as well. Private landowners will know their land, or land adjacent to their homes, have been rated as a High/Moderate Level of Concern. This allows landowners to be proactive and take steps to mitigate the potential threat from wildfire. A

*“In order to allow homeowners the opportunity to make informed decisions the groups that are signatory to this document should make a concerted effort to provide educational materials to these homeowners, provide home inspections to point out steps the landowner can take to mitigate the risk, and/or develop regional, public meetings to spread the word.”*

national program called “FIREWISE” ([www.nfpa.org/Education-and-Research/wildfire/Firewise-USA](http://www.nfpa.org/Education-and-Research/wildfire/Firewise-USA)) can help homeowners take steps to reduce the risk posed by wildfire. The program suggests actions that a landowner can take to mitigate this risk. These steps include managing the vegetation next to and around their homes (creating defensible space); selecting building materials that reduce the risk of windblown embers from a wildfire from igniting their home; managing the location of combustible materials commonly found around homes; and developing a plan-of-action in the event that their home is threatened by wildfire. Most homes that are lost or damaged from wildfires can be saved or have the amount of damage substantially reduced by following the simple steps outlined in FIREWISE. Most homes are not lost from the flaming front of a wildfire, but rather by windblown embers that are carried in front of the main fire and land in receptive fuels on or next to the homes. FIREWISE offers simple solutions to the homeowner that can mitigate these potential losses.

This plan can also be useful for communities. Individual communities may want to adopt



Fire occurring near adjacent homes.  
Photograph courtesy of Tim Olk.

zoning and building regulations that mitigate for wildland fire where appropriate. The 2021 International Wildland-Urban Interface Code is a model of code regulations to mitigate the hazards of wildfires to safeguard public health and safety. The code is developed to bridge the gap between the International Building Code and International Fire Code through provisions that allow flexibility in construction means, methods and materials so as not to increase building costs. The National Fire Protection Association (NFPA) has similar suggestions for developing wildfire regulations. The document, entitled Community Wildfire Safety Through Regulation, A Best Practices Guide for Planners and Regulators (2013), offers suggestions on developing regulations encouraging homeowners and businesses to adopt best management practices for making their homes and businesses more safe from the threat from wildfires ([www.co-co.org/community-wildfire-mitigation-best-practices-toolbox/](http://www.co-co.org/community-wildfire-mitigation-best-practices-toolbox/)).

Educational materials concerning wildfire prevention and mitigation designed to aid natural resource agencies, fire protection districts, communities and homeowners are readily available. The National Interagency Fire Center provides a number of publications concerning prevention and mitigation ([http://www.nifc.gov/prevEdu/prevEdu\\_main.html](http://www.nifc.gov/prevEdu/prevEdu_main.html)).

There are two issues here. First, most homeowners may not realize their house could be threatened by wildfire. This study has provided the opportunity to identify those landowners that may be at risk. In order to allow homeowners the opportunity to make informed decisions the groups that are signatory to this document should make a concerted effort to provide educational materials to these homeowners, provide home inspections to point out steps the

*“Most landowners/homeowners will take the steps necessary to reduce the risk from wildfire if they know they are at risk.”*

landowner can take to mitigate the risk, and/or develop regional, public meetings to spread the word. Most landowners/homeowners will take the steps necessary to reduce the risk from wildfire if they know they are at risk. This study provided the key areas where this work should take place.

This CWPP has provided excellent documentation regarding the location of areas within the six-county study area with a risk for property loss from wildfires. If this plan is to be successful it is imperative that this information be distributed and made available to all affected parties.



McMahon Fen. Photograph courtesy of Joe Occhiuzzo.  
November 25, 2017.



Prescribed burn along wetland. Photograph courtesy of Joe Occhiuzzo. March 23, 2019.

# Climate Change

Although the impacts of climate change were not considered in this analysis, it is important. Illinois is already feeling the effects of climate change and has documented changes in both temperatures and precipitation. Researchers have already collected data indicating that Illinois has become significantly warmer and wetter over the past 120 years of records (Wuebbles, et al., 2021). More frequent heat waves, warmer summer nights, increased precipitation in winter and spring and drier summers will impact fire weather in both the short- and long- term. These changes are likely to alter the number of days when vegetation is available for ignition, the seasonality of those days, and the intensity of fire once ignition takes place. The use of prescription fire to reduce fuel loads and maintain healthy, resilient ecosystems is even more important as a tool to reduce the risk of wildfire and preserve natural areas in the future.

Average daily temperatures have increased by 1-2° F in most of Illinois with the minimum overnight temperatures increasing 3° F. This is especially noticeable in an increase in warm summer nights and a decrease in the number of freezing winter nights.

Table 6. Illinois Temperature Changes for 1990-2019 Relative to 1895-1924

| Season | Average Daily Temperatures | Overnight Minimum Temperatures | Daytime Maximum Temperatures |
|--------|----------------------------|--------------------------------|------------------------------|
| Winter | +2.5                       | +3.0                           | +2.2                         |
| Spring | +1.6                       | +1.8                           | +1.4                         |
| Summer | +0.5                       | +1.7                           | +0.7                         |
| Fall   | +0.8                       | +1.3                           | +0.4                         |

Note: Observed statewide temperature changes (°F) for 1990–2019 relative to 1895–1924 for average overnight minimum temperature, average daily mean temperature, and average daytime maximum temperature for Illinois. Changes are displayed by season. Adapted from “An Assessment of the Impacts of Climate Change in Illinois,” by Wuebbles, et. al, 2021, p. 18. Copyright 2021 by The Nature Conservancy.

With increased temperatures comes increases in evapotranspiration, thus altering rainfall patterns in Illinois. Illinois has gotten wetter in the past 100 years. Average annual precipitation has increased between 10% and 20% in the past century, and the number of rainfall events that exceed two-inches has increased by 40%. Extreme droughts have become less common as a result. And the snowfall season has decreased by two weeks as more precipitation has come in the form of rain.

By the middle of the century, the temperature is projected to increase between 3 – 4° F with precipitation increases of 3 – 6%. Illinois will likely experience increases in extreme high temperatures, a longer growing season and less severe extreme cold. The total precipitation will not be distributed evenly as the climate warms. The winter and spring season will likely be wetter while the summer will likely experience fewer heavy rain events and longer dry spells and/or short-term flash droughts. It is projected that there will be an increase of between 4 – 14° F in average daily temperatures by the end of the century depending on the rise or fall of fossil fuels emissions.

Table 7. Illinois Precipitation Changes for 1990-2019 Relative to 1895-1924

| Season | Precipitation (inches) | Precipitation (% Change) |
|--------|------------------------|--------------------------|
| Winter | +0.54                  | 8.5%                     |
| Spring | +1.33                  | 12.5%                    |
| Summer | +1.55                  | 14.3%                    |
| Fall   | +1.33                  | 15.9%                    |

Note: Observed seasonal average total statewide precipitation changes for 1990–2019 relative to 1895–1924 for Illinois, expressed as a total change (inches) and percent change from the 1895–1924 average. Adapted from “An Assessment of the Impacts of Climate Change in Illinois,” by Wuebbles, et. al, 2021, p. 20. Copyright 2021 by The Nature Conservancy.

Changes in hydrology, agriculture, human health and ecosystems could bring dramatic changes. Some of the significant changes that could impact Illinois ecosystems include (Wuebbles et. al., 2021):

- The speed of the current and predicted climate change will likely hinder the ability of native flora and fauna to adapt or migrate.
- Conditions may enhance and promote the proliferation of some native species, but be detrimental to other native species.
- Conditions are likely to provide advantages to pathogenic insects and non-native plant species that in turn can alter or totally displace native flora and fauna.
- Climate change can amplify the impact of other stresses such as habitat degradation and ecosystems that are already stressed will be less resilient.
- To counteract some of these effects it will be necessary to conserve intact and biologically rich natural ecosystems, initiate large-scale restoration projects and manage connectivity among these areas to help safeguard native plants and wildlife and enhance their ability to adapt to changing conditions.

The impacts from climate change will likely be varied on wildland fire and the need to utilize prescribed fire to help maintain healthy ecosystems. We are already seeing large-scale negative impacts to many of our pristine native ecosystems from the invasion of non-native insects and plants. The viable range of these invasive species may shift as climate and temperatures change, leading to long-ranging management implications. Most of our fire dependent native habitats need periodic fire to return to a functioning, resilient state. The Community Wildfire Preparedness Plan doesn’t directly assess climate change, but it must be considered when looking at the types and amount of natural cover fuels.

**Fire in the wildland is a critical process in restoring and maintaining resilience in the native ecosystems as they adapt to climate change. While some unplanned ignition in the wildland may have some ecosystem benefits, they are likely to have much higher costs in terms of impacts to first responders as well as damage and smoke impacts to communities and infrastructure.** Ideally, fires in the wildland are carefully planned and executed so as to deliver the ecosystem benefits needed while limiting the smoke impacts to communities and infrastructure.

# Glossary of Acronyms



|          |                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------|
| CWPP     | Community Wildfire Preparedness (or Protection) Plan                                            |
| EPA      | Environmental Protection Agency                                                                 |
| ESRI     | Environmental Systems Research Institute, Inc.                                                  |
| FEMA     | Federal Emergency Management Agency                                                             |
| GIS      | Geographic Information System                                                                   |
| HFRA     | Healthy Forests Restoration Act                                                                 |
| IDNR-FRS | The Illinois Department of Natural Resources, Conservation Programs, Forestry Resources Section |
| NASS     | National Agriculture Statistics Service                                                         |
| NASS-CDL | National Agriculture Statistics Service – Cropland Data Layer                                   |
| NFDRS    | National Fire Danger Rating System                                                              |
| NFIRS    | National Fire Incident Reporting System                                                         |
| NFPA     | National Fire Protection Association                                                            |
| NIFC     | National Interagency Fire Center                                                                |
| NWCG     | National Wildfire Coordinating Group                                                            |
| USGS     | United States Geological Survey                                                                 |

|              |                                                                                     |
|--------------|-------------------------------------------------------------------------------------|
| USDA         | United States Department of Agriculture                                             |
| USDA-FS      | United States Department of Agriculture – Forest Service                            |
| USDA-FS-S&PF | United States Department of Agriculture – Forest Service – State & Private Forestry |
| USDI         | United States Department of Interior                                                |
| USDI-BLM     | United States Department of Interior – Bureau of Land Management                    |
| USDI-NPS     | United States Department of Interior – National Park Service                        |
| WUI/I        | Wildland Urban Intermix / Interface                                                 |



Grass fire near adjacent homes. Photograph courtesy of Tim Olk.

Definitions



|                                 |                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aerial Fuels                    | Standing and supported live and dead combustibles not in direct contact with the ground and consisting mainly of foliage, twigs, branches, stems, cones, bark, and vines.                                                                                                                                                                                                                            |
| Agency                          | An agency is a division of government with a specific function, or a non-governmental organization (e.g. private contractor, business, etc.) that offers a particular kind of assistance. In the Incident Command System, agencies are defined as jurisdictional (having statutory responsibility for incident mitigation), or assisting and/or cooperating (providing resources and/or assistance). |
| Air Pollution                   | The general term referring to the undesirable addition of substances (gases, liquids or solid particles) to the atmosphere that are foreign to the natural atmosphere or are present in quantities exceeding natural concentrations.                                                                                                                                                                 |
| Anchor Point                    | An advantageous location, usually a barrier to fire spread, from which to start constructing a fireline. The anchor point is used to minimize the change of being flanked by the fire while the line is being constructed.                                                                                                                                                                           |
| Appropriate Management Response | Any specific action suitable to meet fire management unit objectives, Typically, the AMR ranges across a spectrum of tactical options (from monitoring to intensive management actions). The AMR is developed by using strategy and objectives identified in the fire management plan.                                                                                                               |
| Arson                           | As common law, the malicious and willful burning of another's dwelling, outhouse or parcel; by most modern statutes, the intentional and wrongful burning of someone else's, or one's own, property. Frequently requires proof of malicious or wrongful intent.                                                                                                                                      |
| Aspect                          | Cardinal direction toward which a slope faces.                                                                                                                                                                                                                                                                                                                                                       |
| Available Resources             | Resources assigned to an incident and available for assignment.                                                                                                                                                                                                                                                                                                                                      |

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Brush                                | A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually a type undesirable for livestock or timber management.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Brush Fire                           | A fire burning in vegetation that is predominantly shrubs, brush and scrub growth.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Build-up                             | The cumulative effects of long-term drying on current fire danger. The increase in strength of a fire management organization. The accelerated spreading of a fire with time. Towering cumulus clouds which may lead to thunderstorms later in the day.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Burn                                 | An area burned over by wildland fire. A reference to a working fire. An injury to flesh caused by a cauterizing source, heat from a fire, or a heated object. To be on a fire. To consume fuel during rapid combustion. A fire in progress or under investigation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Burn Out                             | Setting fire inside a control line to consume fuel between the edge of the fire and the control line.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Burning                              | Decomposition of material by the application of heat and oxidation. Also applied to propellants and other pyrotechnic mixtures, though the property term there is “reacting”. Also often an element of the crime of arson.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Burning Conditions                   | The state of the combined factors of the environment that affect fire behavior in a specified fuel type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Community Wildfire Preparedness Plan | A plan developed in collaborative framework established by the Wildland Fire Leadership Council and agreed to by state, tribal, and local government, local fire department, other stakeholders and federal land management agencies managing land in the vicinity of the planning area. A CWPP identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure and recommends measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection – or all of the above. |

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Containment            | The status of a wildfire suppression action signifying that a control line has been completed around the fire, and any associated spot fires, which can reasonably be expected to stop the fire's spread. The act of controlling hazardous spilled or leading materials.                                                                                                                                                                                                                                                                                    |
| Cooperating Agency     | Any agency supplying assistance including, but not limited to, direct tactical or support functions or resources to the incident control effort (e.g. Red Cross, law enforcement agency, telephone company, etc.).                                                                                                                                                                                                                                                                                                                                          |
| Coordination           | The process of systematically analyzing a situation, developing relevant information, and informing appropriate command authority of viable alternatives for selection of the most effective combination of available resources to meet specific objectives. The coordination process (which can be either intra- or interagency) does not involve dispatch actions, However, personnel responsible for coordination may perform command and dispatch functions within limits established by specific agency delegations, procedures, legal authority, etc. |
| Cover Type             | The designation of a vegetation complex described by dominant species, age, and form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Curing                 | Drying and browning of herbaceous vegetation due to mortality or senescence, and also loss of live fuel moisture content of woody fuel following mechanically-caused mortality (e.g. woody debris slash.)                                                                                                                                                                                                                                                                                                                                                   |
| Dead Fuels             | Fuels with no living tissue in which moisture content is governed almost entirely by absorption or evaporation of atmospheric moisture (relative humidity and precipitation).                                                                                                                                                                                                                                                                                                                                                                               |
| Direct Attack          | Any treatment applied directly to burning fuel such as wetting, smothering, or chemically quenching the fire or by physically separating the burning from unburned fuel.                                                                                                                                                                                                                                                                                                                                                                                    |
| Dormant Season Burning | Prescribed burning early in the dry season before the leaves and undergrowth are completely dry or before the leaves are shed, as an insurance against more sever fire danger later on.                                                                                                                                                                                                                                                                                                                                                                     |
| Drought                | A period of relatively long duration with substantially below-normal precipitation, usually occurring over a large area.                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                             |                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Duff                        | The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.                                                                                                                                                                                                                                   |
| Ecosystem                   | An interacting natural system including all the component organisms together with the abiotic environment and processes affecting them.                                                                                                                                                                                                                                                        |
| Ecosystem Sustainability    | A concept that promotes the use of natural resources to benefit humans while conserving and wisely managing natural ecosystems for the future.                                                                                                                                                                                                                                                 |
| Emergency                   | Any incident which required the response of a fire protection organization's attack units and/or support units.                                                                                                                                                                                                                                                                                |
| Emergency Response Provider | Any federal, state or local emergency public safety, law enforcement, emergency responder, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities. It is any organization responding to an emergency, or providing mutual aid support to such an organization, whether in the field, at the scene or an incident, or operations center. |
| Emission                    | A release of combustion gases and aerosols into the atmosphere.                                                                                                                                                                                                                                                                                                                                |
| Escaped Fire                | Fire which has exceeded or is expected to exceed initial attack capabilities or prescription.                                                                                                                                                                                                                                                                                                  |
| Fine Fuels                  | Fast-drying dead or live fuels, generally characterized by a comparatively high surface area-to-volume ratio, which are less than ¼-inch in diameter, and have a time lag of one hour or less. These fuels (grass, leaves, needles, etc.) ignite readily and are consumed rapidly by fire when dry.                                                                                            |
| Fire                        | Rapid oxidation, usually with the evolution of heat and light; heat, fuel, oxygen and the interaction of the three.                                                                                                                                                                                                                                                                            |
| Fire Behavior               | The manner in which fire reacts to the influences of fuel, weather, and topography.                                                                                                                                                                                                                                                                                                            |
| Fire Dependent              | Plants and vegetation communities which have evolved adaptations such as a reliance on fire as a disturbance agent, protection as a species against the effects of wildland fire, or even a strengthening or enhancement by it.                                                                                                                                                                |

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                                                                                                                                                                                                                                                             |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fire Ecology              | The study of the effects of fire on living organisms and their environment.                                                                                                                                                                                                                                                                                                                                                                                                                                    | Fire Resources        | All personnel and equipment available or potentially available for assignment to incidents.                                                                                                                                                                                 |
| Fire Effects              | The physical, biological, and ecological impacts of fire on the environment.                                                                                                                                                                                                                                                                                                                                                                                                                                   | Fire Season           | Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities.                                                                                                       |
| Fire Front                | The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified, the fire front is assumed to be the leading edge of the fire perimeter.                                                                                                                                                                                                                                                                                                                             | Fire Suppression      | All work and activities connected with control and fire-extinguishment operations, beginning with discovery and continuing until the fire is completely extinguished.                                                                                                       |
| Fire Hazard               | A fuel complex, defined by volume, type condition, arrangement, and location, that determines the degree of ease of ignition and of resistance to control.                                                                                                                                                                                                                                                                                                                                                     | Fire Weather          | Weather conditions which influence fire ignition, behavior, and suppression.                                                                                                                                                                                                |
| Fire Lane                 | Cleared path wide enough to permit single-lane vehicular access in a remote area.                                                                                                                                                                                                                                                                                                                                                                                                                              | Fire Weather Forecast | A weather prediction specially prepared for use in wildland fire operations and prescribed fire.                                                                                                                                                                            |
| Fire Management           | Activities required for the protection of burnable wildland values from fire and the use of prescribed fire to meet land management objectives.                                                                                                                                                                                                                                                                                                                                                                | Firebrand             | Any source of heat, natural or human made, capable of igniting wildland fuels. Flaming or glowing fuel particles that can be carried naturally by wind, convection currents, or by gravity into unburned fuels.                                                             |
| Fire Management Objective | Planned, measurable result desired from fire protection and use based on land management goals and objectives.                                                                                                                                                                                                                                                                                                                                                                                                 | Firebreak             | A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.                                                                                                                                               |
| Fire Management Plan      | A plan which identifies and integrates all wildland fire management and related activities within the context of approved land/resource management plans. It defines a program to manage wildland fires (wildfire, prescribed fire, and wildland fire use). The plan is supplemented by operational plans, including, but not limited to preparedness plans, preplanned dispatch plans, and prevention plans. Fire Management Plans assure that wildland fire management goals and components are coordinated. | Firefighter           | Person whose principal function is fire suppression.                                                                                                                                                                                                                        |
| Fire Pre-suppression      | Activities undertaken in advance of fire occurrence to help ensure more effective fire suppression. Activities includes overall planning, recruitment and training of fire personnel, procurement and maintenance of firefighting equipment and supplies, fuel treatment and creating, maintaining, and improving a system of fuel breaks, roads, water sources, and control lines.                                                                                                                            | Firefighting Forces   | Qualified firefighters, together with their equipment and material, used to suppress wildland fires.                                                                                                                                                                        |
| Fire Prevention           | Activities such as public education, community outreach, law enforcement, engineering, and reduction of fuel hazards that are intended to reduce the incidence of unwanted human-caused wildfires and the risks they pose to life, property or resources.                                                                                                                                                                                                                                                      | Fireline              | The part of a containment or control line that is scraped or dug to mineral soil.                                                                                                                                                                                           |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Fireline Intensity    | The product of the available heat of combustion per unit of ground and the rate of spread of the fire, interpreted as the heat released per unit of time for each unit length of fire edge. The primary unit is the Btu per second per foot (Btu/sec/ft) of the fire front. |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Flame                 | A mass of gas undergoing rapid combustion, generally accompanied by evolution of sensible heat and incandescence. Light given off by burning gasses during the combustion process.                                                                                          |

|                           |                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                          |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flame Height              | The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope.                                                  | Fuel Arrangement     | A general term referring to the spatial distribution and orientation of fuel particles or pieces.                                                                                                                                        |
| Flame Length              | The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface), an indicator of fire intensity.                                                                                                                                                    | Fuel Characteristics | Factors that make up fuels such as compactness, loading, horizontal continuity, vertical arrangement, chemical content, size and share, and moisture content.                                                                            |
| Flaming Front             | That zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing or involves the burning out of larger fuels (greater than about 3-inches in diameter). Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. | Fuel Continuity      | The degree or extent of continuous or uninterrupted distribution of fuel particles in a fuel bed thus affecting a fire's ability to sustain combustion and spread. This applies to aerial fuels as well as surface fuels.                |
| Flammable                 | Easily ignitable and capable of burning and producing flames.                                                                                                                                                                                                                                                      | Fuel Loading         | The amount of fuel present expressed quantitatively in terms of weight or fuel per unit area. This may be available fuel (consumable fuel) or total fuel and is usually dry weight.                                                      |
| Flank Fire                | A firing technique consisting of treating an area with lines of fire set into the wind which burn outward at right angles to the wind.                                                                                                                                                                             | Fuel Management      | Act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire, in support of land management objectives.                        |
| Flanking Fire Suppression | Attacking a fire by working along the flanks either simultaneously or successively from a less active or anchor point and endeavoring to connect two lines at the head.                                                                                                                                            | Fuel Modification    | Manipulation or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control (e.g. lopping, chipping, crushing, piling and burning, etc.)                                           |
| Flanks of a Fire          | The parts of a fire's perimeter that are roughly parallel to the main direction of spread.                                                                                                                                                                                                                         | Fuel Reduction       | Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.                                                                                |
| Flare Up                  | Any sudden acceleration in rate of spread or intensification of the fire. Unlike blowup, a flare-up is of relatively short duration and does not radically change existing control plans.                                                                                                                          | Fuel Size class      | A category used to describe the diameter of down dead woody fuels. Fuels within the same size class are assumed to have similar wetting and drying properties, and to preheat and ignite at similar rates during the combustion process. |
| Flash Fuels               | Highly combustible fine fuels such as grass, leaves, draped pine needles, fern, tree moss, and some kinds of slash, which ignite readily and are consumed rapidly when dry.                                                                                                                                        | Fuel Treatment       | Manipulation or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control (e.g. lopping, chipping, crushing, piling and burning, etc.)                                           |
| Forb                      | A plant with an herbaceous (soft, rather than permanent woody) stem, that is not a grass or grasslike plant.                                                                                                                                                                                                       | Fuel Type            | An identifiable association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause a predictable rate of spread or resistance to control under specified weather conditions.         |
| Fuel(s)                   | Any combustible material, especially petroleum-based products and wildland fuels.                                                                                                                                                                                                                                  |                      |                                                                                                                                                                                                                                          |

|                               |                                                                                                                                                                                                                                                                                          |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Fire Weather Forecast | A forecast, issued daily during the regular fire season to resource management agencies, that is intended for planning of daily fire management activities, including daily staffing levels, prevention programs, and initial attack on wildfires. Also called presuppression forecasts. |
| Grass Fire                    | Any fire in which the predominant fuel is grass or grasslike.                                                                                                                                                                                                                            |
| Greenbelt                     | Landscaped and regularly maintained fuelbreak, usually put to some additional use (e.g. golf course, park, playground, etc.).                                                                                                                                                            |
| Hazard                        | Any real or potential condition that can cause injury, illness or death of personnel, or damage to, or loss of equipment or property.                                                                                                                                                    |
| Hazard Fuel                   | A fuel complex defined by kind, arrangement, volume, condition, and location that presents a threat of ignition and resistance to control.                                                                                                                                               |
| Hazard Reduction              | Any treatment of living and dead fuels that reduces the potential spread or consequences of fire.                                                                                                                                                                                        |
| Head Fire                     | A fire spreading or set to spread with the wind.                                                                                                                                                                                                                                         |
| Head of a Fire                | The most rapidly spreading portion of a fire's perimeter, usually to the leeward or up slope.                                                                                                                                                                                            |
| Heavy Fuels                   | Fuels of large diameter such as snags, logs, large limbwood, which ignite and are consumed more slowly than flash fuels, also called coarse fuels.                                                                                                                                       |
| Herb                          | A plant that does not develop woody, persistent tissue but is relatively soft or succulent and sprouts from the base (perennials) or develops from seed (annuals) each year. Includes grasses, forbs, and ferns.                                                                         |
| Hotspot                       | A particularly active part of a fire.                                                                                                                                                                                                                                                    |
| Human-caused Fire             | Any fire caused directly or indirectly by person(s).                                                                                                                                                                                                                                     |
| Humidity                      | General term referring to the moisture content of the atmosphere.<br>Factors which influence fire behavior and fire effects.                                                                                                                                                             |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Incident              | An occurrence either human-caused or natural phenomenon, that requires action or support by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources.                                                                                                                                                                                                                        |
| Indirect Attack       | A method of suppression in which the control line is located some considerable distance away from the fire's edge. Generally done in the case of a fast-spreading or high-intensity fire and to utilize natural or constructed firebreaks or fuelbreaks and favorable breaks in the topography. The intervening fuel is usually backfired; but occasionally the main fire is allowed to burn to the line, depending on conditions. |
| Initial Attack        | A planned response to a wildfire given the wildfire's potential fire behavior. The objective of initial attack is to stop the fire and put it out in a manner consistent with firefighter and public safety and values to be protected.                                                                                                                                                                                            |
| Jurisdiction          | The range or sphere of authority. Public agencies have jurisdiction at an incident related to their legal responsibilities and authority for incident mitigation. Jurisdictional authority at an incident can be political/geographical (e.g. city, county, state or federal boundary lines), or functional (e.g. police department, health department, etc.).                                                                     |
| Jurisdictional Agency | The agency having land and resource management responsibility for a specific geographical or functional area as provided by federal, state or local law.                                                                                                                                                                                                                                                                           |
| Light (Fine) Fuels    | Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than ¼-inch in diameter and have a timelag of 1-hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.                                                                                                                                                                                            |
| Litter                | The top layer of forest floor, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles; little altered in structure by decomposition.                                                                                                                                                                                                                                                      |
| Local Agency          | Any agency having jurisdictional responsibility for all or part of an incident.                                                                                                                                                                                                                                                                                                                                                    |
| Mop Up                | Extinguishing or removing burning material near control lines, felling snags and trenching logs to prevent rolling after an area has burned, to make a fire safe, or to reduce residual smoke.                                                                                                                                                                                                                                     |

|                                             |                                                                                                                                                                                                                                                                                                                                                 |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mutual Aid                                  | Assistance in firefighting or investigation by fire agencies, without regard for jurisdictional boundaries.                                                                                                                                                                                                                                     | Open Burning                          | Burning of any fuel outdoors without the use of mechanical combustion enhancements.                                                                                                                                                                                                                                                                                                                                                                                               |
| Mutual Aid Agreement                        | Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.                                                                                                                                                                                          | Particle Size                         | The size of a piece of fuel, often expressed in terms of size classes.                                                                                                                                                                                                                                                                                                                                                                                                            |
| National Fire Danger Rating System (NFDRS)  | A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.                                                                                                                                                                                                                       | Particulate Matter                    | Any liquid or solid particles. “Total suspended particulates”, as used in air quality, are those particles suspended in or falling through the atmosphere. They generally range in size (diameter) from 0.1 to 100 microns.                                                                                                                                                                                                                                                       |
| National Fire Protection Association (NFPA) | A private, non-profit organization dedicated to reducing fire hazards and improving fire service.                                                                                                                                                                                                                                               | Partners                              | All agencies and organizations that engage in joint decision making in planning and conducting fire management projects and activities.                                                                                                                                                                                                                                                                                                                                           |
| National Incident Management System (NIMS)  | Emergency management doctrine used across the United States to coordinate emergency preparedness and incident management and response among the public (federal, tribal, state and local government agencies) and private sectors.                                                                                                              | Plan of Attack                        | The selected course of action and organization of personnel and equipment in fire suppression, as applied to a particular fire or to all fires of a specific type.                                                                                                                                                                                                                                                                                                                |
| National Wildfire Coordinating Group (NWCG) | A group formed under the direction of the Secretaries of the Interior and Agriculture to improve the coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend appropriate action, or resolve issues and problems of substantive nature.                                                             | Point of Attack                       | That part of the fire on which work is started when suppression crews arrive.                                                                                                                                                                                                                                                                                                                                                                                                     |
| Native Species                              | A species which is a part of the pre-European settlement fauna or flora of the area in question.                                                                                                                                                                                                                                                | Preignition Phase                     | Preliminary phase of combustion in which fuel elements ahead of the fire are heated, causing fuels to dry. Heat induces decomposition of some components of the wood, causing release of combustible organic gases and vapors.                                                                                                                                                                                                                                                    |
| Natural Barrier                             | Any area where lack of flammable material obstructs the spread of wildfires.                                                                                                                                                                                                                                                                    | Preparedness                          | Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination. Mental readiness to recognize changes in fire danger and act promptly when action is appropriate. The range of deliberate, critical tasks, and activities necessary to build, sustain, and improve the capability to protect against, respond to, and recover from domestic incidents. |
| Natural Fuels                               | Fuels resulting from natural processes and not directly generated or altered by land management practices.                                                                                                                                                                                                                                      | Prescribed Burning or Prescribed Fire | Fire applied in a skillful manner; in a definite place; under exacting weather conditions; and, to achieve specific results.                                                                                                                                                                                                                                                                                                                                                      |
| NWCG Standard                               | A defined behavior, action, process, or equipment type, agreed upon by the National Wildfire Coordinating Group for wildland fire performance, and is necessary to meet consistent, interagency fire management activities.                                                                                                                     | Prescribed Fire Burn Plan             | A plan required for each fire application ignited by management. Plans are documents prepared by qualified personnel, approved by the agency administrator, and include criteria for the conditions under which the fire will be conducted (a prescription). Plan content varies among the agencies.                                                                                                                                                                              |
| Objective                                   | A description of a desired condition; quantified and measured, and where possible, with established time frames for achievements. Specific, achievable, measurable, time-limited results to be achieved through land management practices, either through a description of a desired condition or the degree of desired change in an attribute. |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Presuppression    | Activities in advance of fire occurrence to ensure effective suppression action. Includes planning the organization, recruiting and training, procuring equipment and supplies, maintaining fire equipment and fire control improvements, and negotiation cooperative and/or mutual aid agreements.                                                                                                                                                                                                                | Response                | Movement of an individual firefighting resource from its assigned standby location to another location or to an incident in reaction to dispatch orders or to a reported alarm. Activities that address the short-term, direct effect of an incident, including immediate actions to save lives, protect property, and meet basic human needs, also include the execution of emergency operations plans as well as mitigation activities designed to limit the loss of life, personal injury, property damage, and other unfavorable outcomes. |
| Prevention        | Activities directed at reducing the incidence of fire, including public education, law enforcement, personal contact, and reduction of fuel hazards (fuels management). Actions to avoid an incident, to intervene for the purpose of stopping an incident from occurring or to mitigate an incident's effect to protect life and property. Includes measures designed to mitigate damage by reducing or eliminating risks to persons or property, lessening the potential effects of consequences of an incident. | Responsible Fire Agency | Agency with primary responsibility for fire suppression on any particular land area.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Protecting Agency | Agency responsible for providing direct incident management within a specific geographical area pursuant to its jurisdictional responsibility or as specified and provided by contract, cooperative agreement, etc.                                                                                                                                                                                                                                                                                                | Shrub                   | A woody perennial plant differing from a perennial herb by its persistent and woody stem; and, from a tree by its low stature and habit of branching from the base.                                                                                                                                                                                                                                                                                                                                                                            |
| Rate of Spread    | The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.                                                                                                                                    | Slope Percent           | The ratio between the amount of vertical rise or a slope and horizontal distance as expressed in a percent. One hundred feet of rise in 100 feet of horizontal distance equals 100 percent.                                                                                                                                                                                                                                                                                                                                                    |
| Rear (Of a Fire)  | That portion of a fire spreading directly into the wind or down slope. That portion of a fire edge opposite the head. Slowest spreading portion of the fire edge. Also called the heel.                                                                                                                                                                                                                                                                                                                            | Smoke                   | Small particles of carbon, tar and water vapor resulting from the incomplete combustion of carbonaceous materials such as wood, coal or oil.                                                                                                                                                                                                                                                                                                                                                                                                   |
| Rekindle          | Reignition due to latent heat, sparks, or embers or due to presence of smoke or steam.                                                                                                                                                                                                                                                                                                                                                                                                                             | Smoke Management        | The policies and practices implemented by air and natural resource managers directed at minimizing the amount of smoke entering populated areas or impacting sensitive sites, avoiding significant deterioration of air quality and violations of National Ambient Air Quality Standards, and mitigating human-caused impacts in Class I areas.                                                                                                                                                                                                |
| Reportable Fire   | Any wildfire that required fire suppression to protect natural resources or values associated with natural resources, or is destructive to natural resources.                                                                                                                                                                                                                                                                                                                                                      | Smoke Plume             | The gases, smoke, and debris that rise slowly from a fire while being carried along the ground because the buoyant forces are exceeded by those of the ambient surface wind.                                                                                                                                                                                                                                                                                                                                                                   |
| Resources         | Personnel, equipment, services and supplies available, or potentially available, for assignment to incidents. Personnel and equipment are described by kind and type (e.g. ground, water, air, etc.) and may be used in tactical, support, or overhead capacities at an incident. The natural resources of an area, such as timber, grass, watershed values, recreation values, and wildlife habitat.                                                                                                              | Spot Fire               | Fire ignited outside the perimeter of the main fire by a firebrand.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Spotting                | Behavior of a fire producing sparks or embers that are carried by the wind and which start new fires beyond the zone of direct ignition by the main fire.                                                                                                                                                                                                                                                                                                                                                                                      |
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Stand Replacing Fire    | Fire which kills all or most of the living overstory trees in a forest and initiates forest succession or regrowth. Also explicitly described the nature of fire in grasslands and some shrublands.                                                                                                                                                                                                                                                                                                                                            |

|                                 |                                                                                                                                                                                                                                                             |                                                                                                                                             |                                                                                                                                                                                                                                                                                                          |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Strategy                        | The general plan or direction selected to accomplish incident objectives.                                                                                                                                                                                   | Volunteer Firefighter                                                                                                                       | Legally enrolled firefighter under the fire department organization laws who devotes time and energy to community fire service without compensation other than Worker’s Compensation or other similar death and injury benefits.                                                                         |
| Structure                       | A constructed object, usually a free-standing building above ground.                                                                                                                                                                                        |                                                                                                                                             |                                                                                                                                                                                                                                                                                                          |
| Structure Fire                  | Fire originating in and burning any part or all of any building, shelter, or other structure.                                                                                                                                                               | Water Source                                                                                                                                | Any strategically located supply of water that is readily available for pumps, tanks, trucks, camp use, etc.                                                                                                                                                                                             |
| Suppression                     | All the work of extinguishing or confining a fire beginning with its discovery.                                                                                                                                                                             | Wildfire                                                                                                                                    | An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects and all other wildland fires where the objective is to put the fire out.                                                                              |
| Surface Fire                    | Fire that burns loose debris on the surface, which includes dead branches, leaves, and low vegetation.                                                                                                                                                      |                                                                                                                                             |                                                                                                                                                                                                                                                                                                          |
| Surface Fuel                    | Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low structure living plants.                                                                               | Wildfire Suppression                                                                                                                        | An appropriate management response to wildfire, escaped wildland fire use, or prescribed fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire.                                                                                                 |
| Tactics                         | Deploying and directing resources on an incident to accomplish the objectives designated by strategy.                                                                                                                                                       | Wildland                                                                                                                                    | An area in which development is essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.                                                                                                                     |
| Uncontrolled Fire               | Any fire which threatens to destroy life, property, or natural resources, and (a) is not burning within the confines of firebreaks, or (b) is burning with such intensity that it could not be readily extinguished with ordinary tools commonly available. | Wildland Fire                                                                                                                               | Any non-structure fire that occurs in the wildland. Three distinct types of wildland fires have been defined and include wildfire, wildland fire use, and prescribed fire.                                                                                                                               |
| Understory Burning              | Prescribed burning under a forest canopy.                                                                                                                                                                                                                   | Wildland Fire Use                                                                                                                           | The application of the appropriate management response to naturally-ignited wildland fires to accomplish specific resource management objectives in pre-defined designated areas outlined in Fire Management Plans. Operational management is described in the Wildland Fire Implementation Plan (WFIP). |
| Vegetation Regeneration         | Development of new above ground plants from surviving plant parts, such as by sprouting from a root crown or rhizomes. Even if plants form their own root system, they are still genetically the same as the parent plant.                                  | Wildland-Urban Intermix/Interface                                                                                                           | The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.                                                                                                                                                                  |
| Vegetation Reproduction         | Establishment of a new plant from a seed that is a genetically distinct individual.                                                                                                                                                                         | Wind                                                                                                                                        | The horizontal movement of air relative to the surface of the earth.                                                                                                                                                                                                                                     |
| Volatility                      | The tendency of a substance to vaporize.                                                                                                                                                                                                                    |                                                                                                                                             |                                                                                                                                                                                                                                                                                                          |
| Volunteer Fire Company          | A fire department company or a response unit, the members of which are not paid.                                                                                                                                                                            |                                                                                                                                             |                                                                                                                                                                                                                                                                                                          |
| Volunteer Fire Department (VFD) | A fire department of which some or all members are unpaid.                                                                                                                                                                                                  | * Definitions taken from the “Glossary of Wildland Fire Terminology”, July 2012; A Publication of the National Wildfire Coordinating Group. |                                                                                                                                                                                                                                                                                                          |

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Kenneth W. Jolly  
Digitally signed by Kenneth W. Jolly  
Date: 2025.02.06 15:29:27 -06'00'

Alan A. Wax  
Date: 2025.02.06 15:29:27

The above entities mutually agree to the contents of this Community Wildfire Preparedness Plan. Additional parties, included at the end of the Appendices, have also co-signed their support for this document.

Appendices

Maps were created for the region and each of the six counties to depict each of the input parameters: Risks (see Appendix A-1), Hazards (see Appendix A-2), Values (see Appendix A-3), Smoke (Appendix A-4), Disadvantaged Communities (Appendix A-5), and a final analysis representing overall Level of Concern (see Appendix A-6).

In this analysis, 100,367 acres are classified as WUI/I in the six county region, or 4.2% of the of the study area. Of the WUI/I acres a majority 82,461 acres or 82.2% ranked as Low Level of Concern. Only 1,643 acres, or 1.6% of the six-county area ranked as High Level of Concern and 16,263 acres, or 16.2% ranked as Moderate Level of Concern.

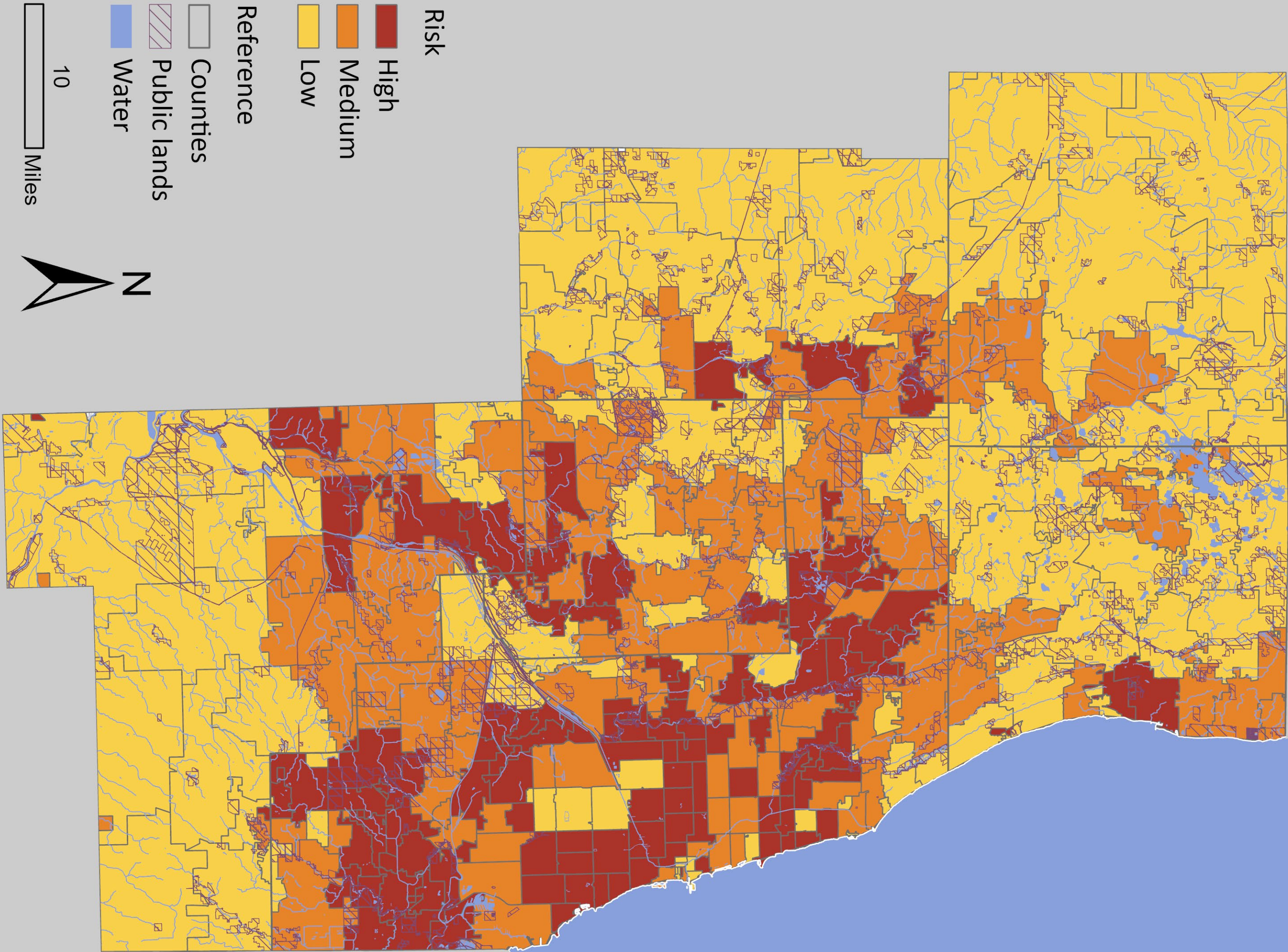


Photograph courtesy of Eric Menigat. March 26, 2019.

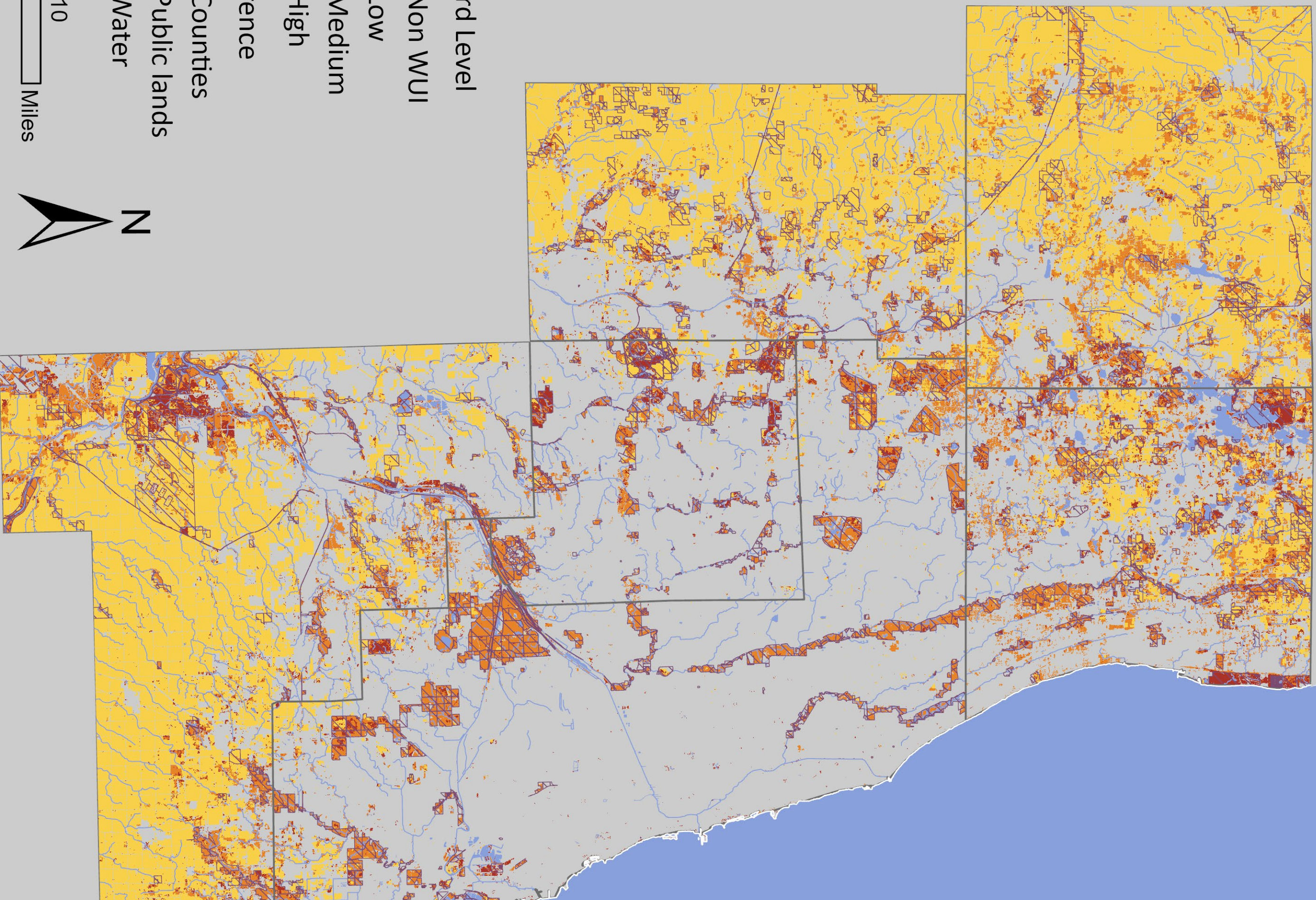


Prospect Heights Fire Department box alarm for brush fire.  
Photograph courtesy of Tim Olk.

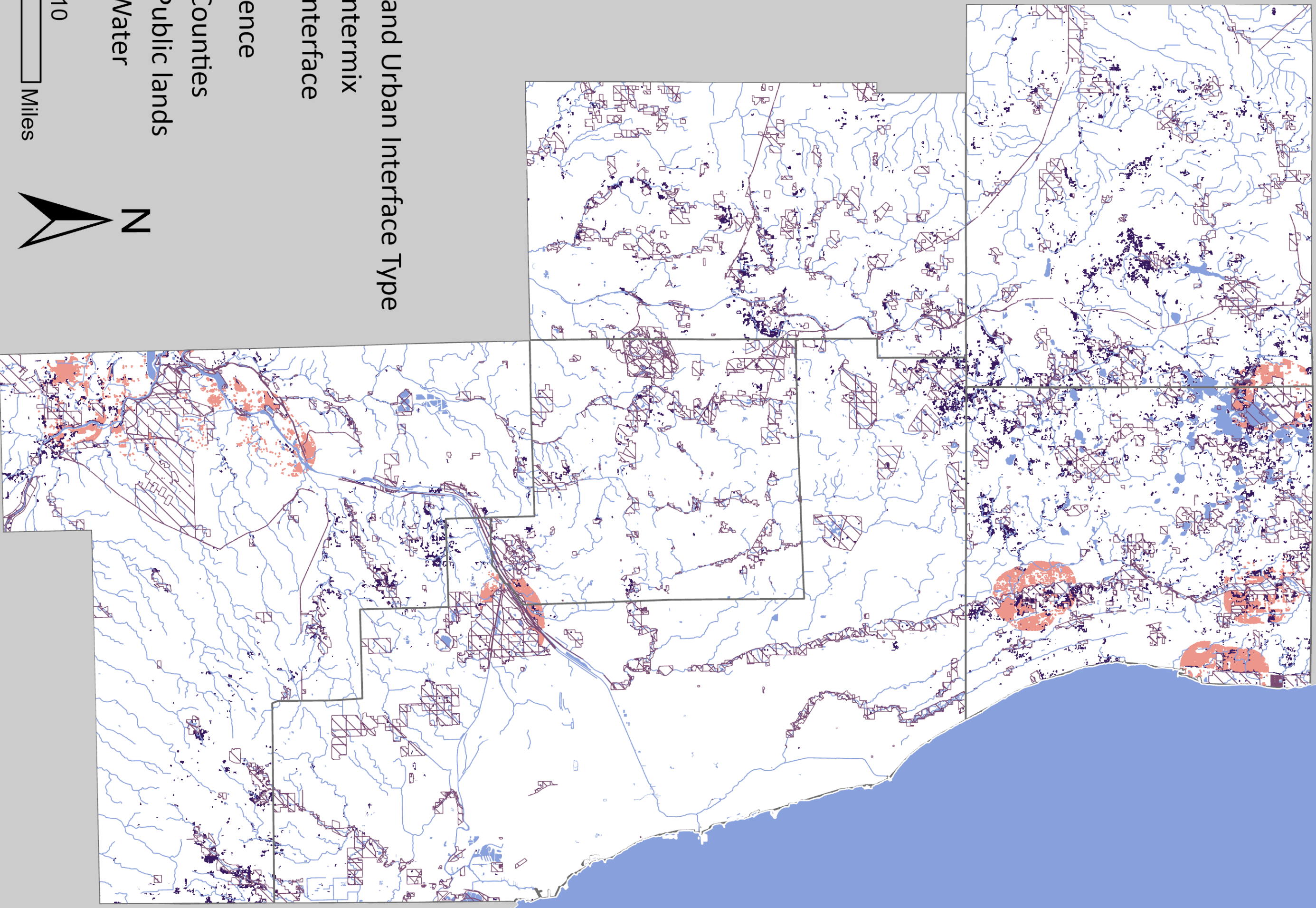
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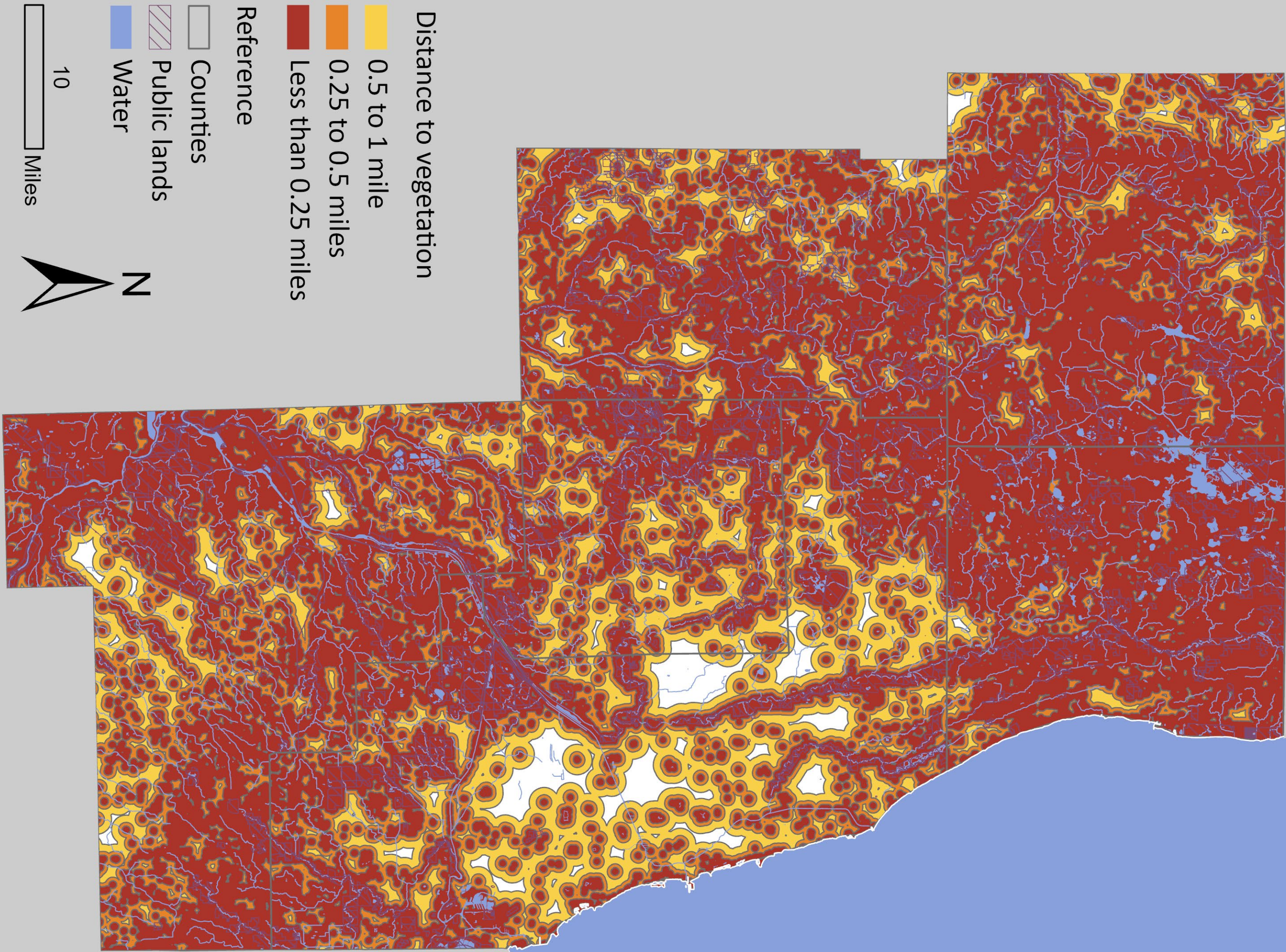
# Hazard



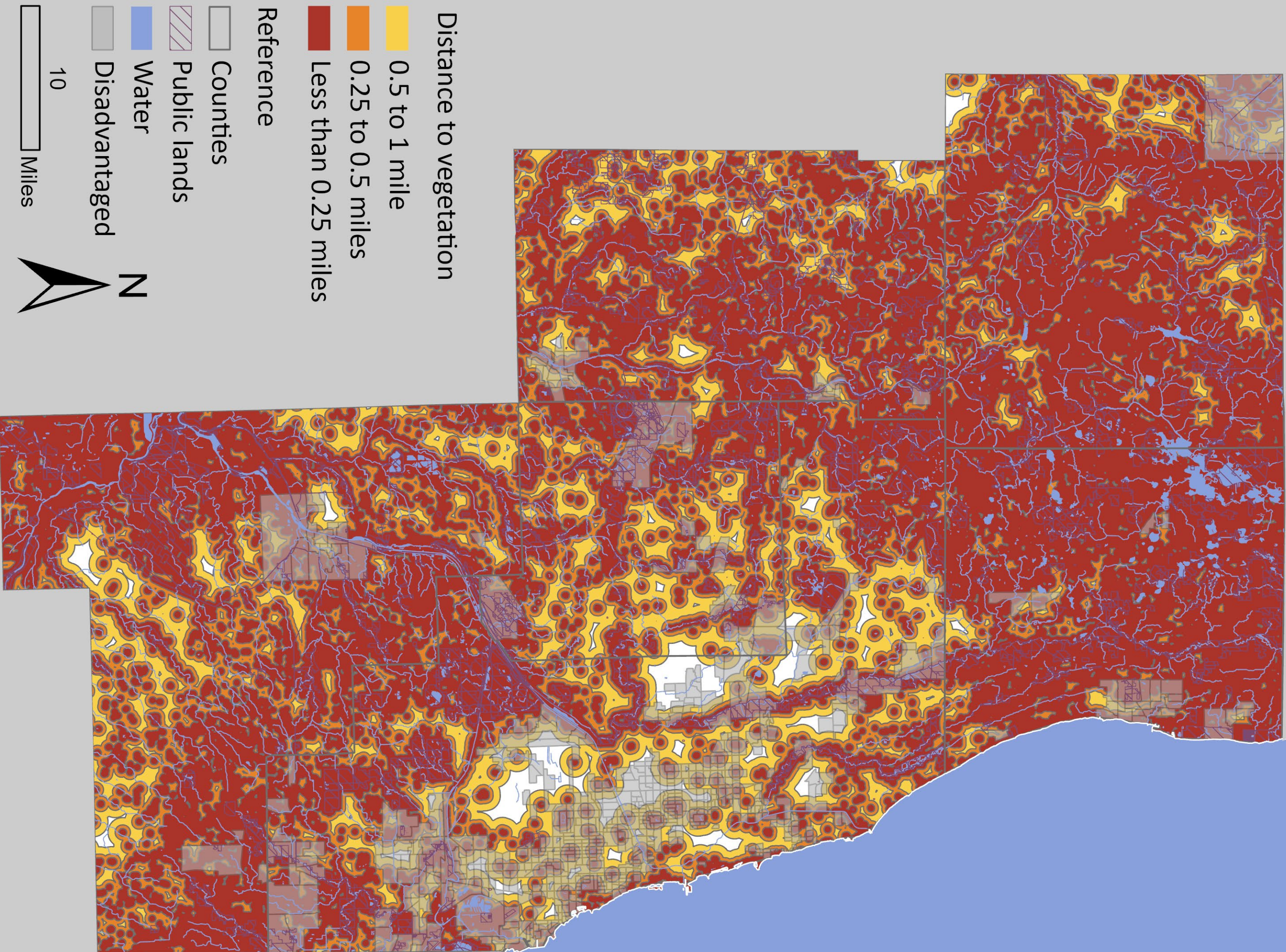
# Wildland Urban Interface



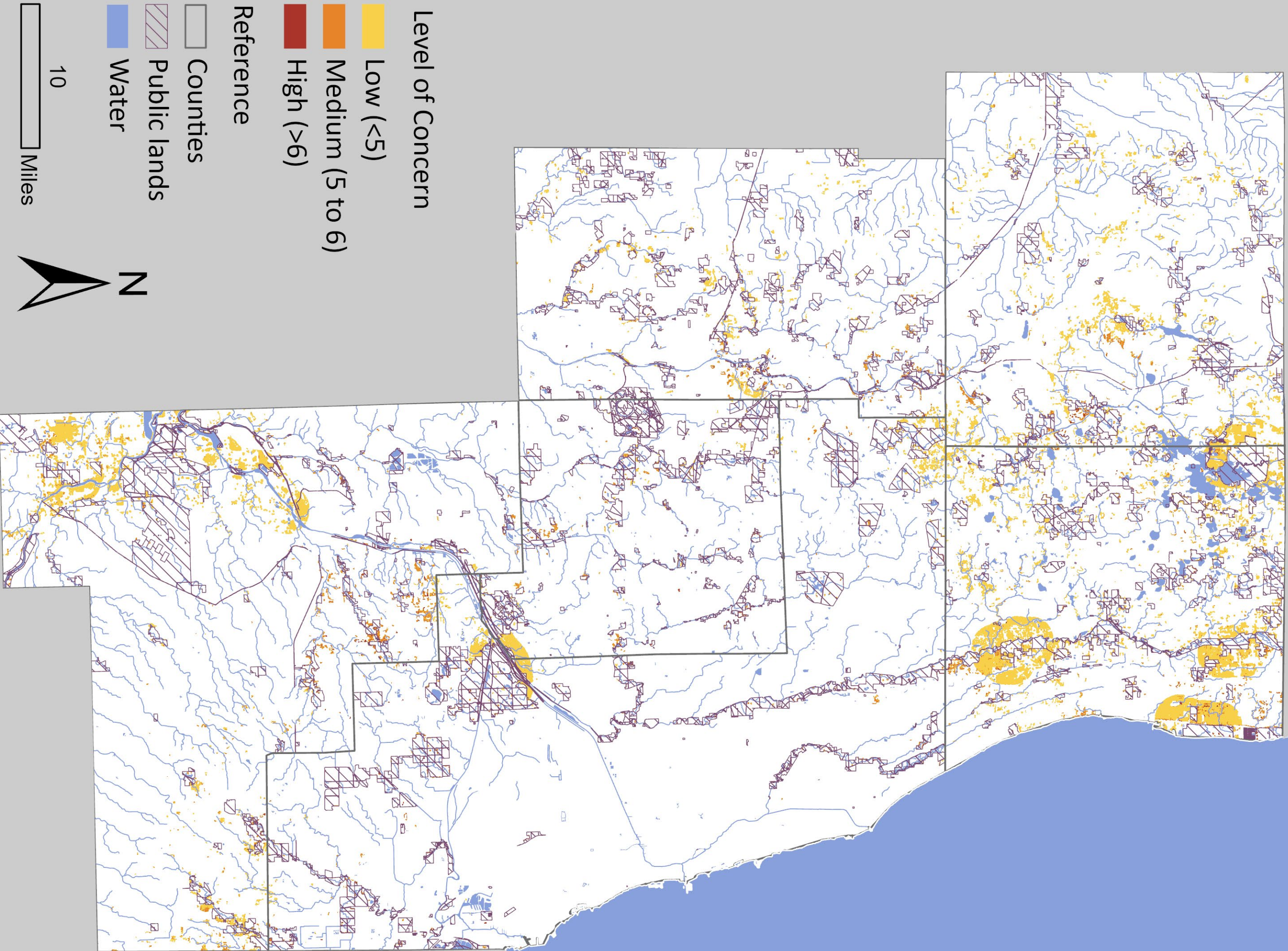
# Smoke risk



# Smoke risk and disadvantaged areas



# Level of Concern





Operations and Public Safety Facility  
19808 West Grand Avenue  
Lake Villa, Illinois 60046  
847-367-6640  
LCFPD.org

November 8, 2024

Re: Chicago Wilderness Community Wildfire Preparedness Plan

To Whom It May Concern:

I am writing in support of the Chicago Community Wildfire Preparedness plan, which was collaboratively developed for a portion of the Chicago Wilderness region comprising Cook, DuPage, Kane, Lake, McHenry and Will counties. This approach recognizes that the wildfire risk profile of the six-county region is interconnected, as they share many common landscape and social features that relate to wildfire risk. The plan will act as a multi-year guiding document to facilitate implementation of present and future fire hazard mitigation measures.

I recognize that the Chicago Wilderness Community Wildfire Preparedness Plan is intended as a recommendation and imposes no obligations on the signatories. Collaborators may use the risk analyses and implementation recommendations from this Community Wildfire Preparedness Plan to spark action on their properties and within their communities.

We mutually agree with the contents of this Community Wildfire Preparedness Plan.

Pati Vitt  
Director of Natural Resources

11/08/2024  
Date



November 20, 2024

John McCabe, President  
Illinois Prescribed Fire Council  
8772 S. Lowden Road  
Franklin Grove, IL 61031

**Re: Chicago Wilderness Alliance Community Wildfire Preparedness Plan**

Dear Mr. McCabe (John):

On behalf of the McHenry County Conservation District Board of Trustees, I am writing in support of the *Chicago Community Wildfire Preparedness Plan*, which was collaboratively developed for the six-county Illinois portion of the Chicago Wilderness Alliance containing the counties of Cook, DuPage, Kane, Lake, Will, and McHenry. The plan correctly identifies the interspersed types of natural and developed resources we value, and the wildfire risks unique to the region. These valuable resources and their related risks illustrate the importance of community planning. We understand the plan will provide guidance for agencies to implement fire hazard mitigation over the course of multiple years through this partnership planning effort.

The District acknowledges that the Chicago Wilderness Alliance's *Community Wildfire Preparedness Plan* serves as a set of recommended practices rather than mandatory requirements for its signatories. Collaborators are welcome to leverage the plan's risk analyses and implementation strategies as they see fit for their respective properties and communities.

We express our mutual agreement with the goals and recommendations outlined in the *Community Wildfire Preparedness Plan* and extend our appreciation for the thoughtful effort invested in developing this document for the region.

Yours in Conservation,  
McHENRY COUNTY CONSERVATION DISTRICT

Elizabeth S. Kessler, MBA, CPRE  
Executive Director



35580 Naperville Road  
P.O. Box 5000  
Wheaton, IL 60189

630.933.7200  
Fax 630.933.7204  
TTY 800.526.0857  
[dupageforest.org](http://dupageforest.org)

December 3, 2024

Chicago Wilderness Alliance

Re: Chicago Wilderness Community Wildfire Preparedness Plan

I am writing in support of the Chicago Community Wildfire Preparedness plan, which was collaboratively developed for a portion of the Chicago Wilderness region comprising Cook, DuPage, Kane, Lake, McHenry and Will counties. This approach recognizes that the wildfire risk profile of the six-county region is interconnected, as they share many common landscape and social features that relate to wildfire risk. The plan will act as a multi-year guiding document to facilitate implementation of present and future fire hazard mitigation measures.

I recognize that the Chicago Wilderness Community Wildfire Preparedness Plan is intended as a recommendation and imposes no obligations on the signatories. Collaborators may use the risk analyses and implementation recommendations from this Community Wildfire Preparedness Plan to spark action on their properties and within their communities.

We mutually agree with the contents of this Community Wildfire Preparedness Plan.

Erik Neidy  
Director of Natural Resources  
Forest Preserve District of DuPage County  
[eneidy@dupageforest.org](mailto:eneidy@dupageforest.org)



December 3, 2024

To Whom It May Concern,

On behalf of the Forest Preserves of Cook County, I am proud to express our full support for the Chicago Wilderness Alliance Community Wildfire Preparedness Plan (CWPP). This thoughtfully developed plan represents a critical step forward in addressing wildfire risk across the interconnected landscapes of Cook, DuPage, Kane, Lake, McHenry, and Will counties—key areas within the Chicago Wilderness region.

The CWPP recognizes that our region’s wildfire risks are not isolated but shared due to common landscape features, ecological systems, and community structures. By providing a multi-year framework, the plan equips local governments, landowners, and conservation organizations with the tools to collaboratively mitigate wildfire hazards. It aligns with our commitment to ecological stewardship, public safety, and the preservation of the natural beauty and biodiversity within Cook County.

The Forest Preserves of Cook County stands ready to engage with this plan, leveraging its insights to enhance our existing fire management practices and foster greater collaboration across the region.

We mutually agree with the goals and principles outlined in the Chicago Wilderness Alliance Community Wildfire Preparedness Plan and look forward to working with our partners to ensure the safety, resilience, and ecological health of our communities and natural areas.

Sincerely,

Eileen Figel  
Interim General Superintendent  
Forest Preserves of Cook County

**TONI PRECKWINKLE**  
**President**

**Board of Commissioners**

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**Interim General Superintendent**

Eileen Figel



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Andrew Hawkins  
Forest Preserve District of Will County  
17540 W. Laraway Road  
Joliet IL 60433

Re: Chicago Wilderness Community Wildfire Preparedness Plan

I am writing in support of the Chicago Community Wildfire Preparedness plan, which was collaboratively developed for a portion of the Chicago Wilderness region comprising Cook, DuPage, Kane, Lake, McHenry and Will counties. This approach recognizes that the wildfire risk profile of the six-county region is interconnected, as they share many common landscape and social features that relate to wildfire risk. The plan will act as a multi-year guiding document to facilitate implementation of present and future fire hazard mitigation measures.

I recognize that the Chicago Wilderness Community Wildfire Preparedness Plan is intended as a recommendation and imposes no obligations on the signatories. Collaborators may use the risk analyses and implementation recommendations from this Community Wildfire Preparedness Plan to spark action on their properties and within their communities.

We mutually agree with the contents of this Community Wildfire Preparedness Plan.

  
Andrew Hawkins  
Director of Conservation Programs

12/5/2024  
Date



Patrick Chess  
Forest Preserve District of Kane County  
1996 S. Kirk Road  
Suite 320  
Geneva, IL 60134

Re: Chicago Wilderness Community Wildfire Preparedness Plan

I am writing in support of the Chicago Community Wildfire Preparedness plan, which was collaboratively developed for a portion of the Chicago Wilderness region comprising Cook, DuPage, Kane, Lake, McHenry and Will counties. This approach recognizes that the wildfire risk profile of the six-county region is interconnected, as they share many common landscape and social features that relate to wildfire risk. The plan will act as a multi-year guiding document to facilitate implementation of present and future fire hazard mitigation measures.

I recognize that the Chicago Wilderness Community Wildfire Preparedness Plan is intended as a recommendation and imposes no obligations on the signatories. Collaborators may use the risk analyses and implementation recommendations from this Community Wildfire Preparedness Plan to spark action on their properties and within their communities.

We mutually agree with the contents of this Community Wildfire Preparedness Plan.

  
Patrick Chess  
Director of Natural Resources

12/11/24  
Date



Dear Members of the Chicago Wilderness Alliance,

On behalf of the Executive Board of the Metropolitan Fire Chiefs Association of Illinois, we extend our support to the Chicago Wilderness Alliance and commend your commitment to enhancing wildfire education, training, and awareness within the fire agencies of the six Illinois counties of Cook, DuPage, Kane, Lake, McHenry, and Will.

Your comprehensive approach to reducing injury and loss from wildfires, fostering effective wildfire response, and enhancing mutual aid capabilities is both admirable and essential. The initiatives you have implemented to educate the public on prevention and mitigation are critical in building a safer and more resilient community.

We recognize the significant impact that wildfire training and awareness programs have in preparing our fire agencies to respond efficiently and effectively to wildfire incidents. Your efforts not only equip our personnel with the necessary skills and knowledge but also promote a culture of proactive preparedness and community engagement.

The Executive Board of the Metropolitan Fire Chiefs Association of Illinois is proud to support the Chicago Wilderness Alliance in your mission to safeguard our communities and natural resources. We are confident that through our continued partnership and collaboration, we can achieve the shared goal of reducing wildfire-related risks and enhancing the overall safety and well-being of our residents.

Having given our Executive Board's support, we will be bring the information on your initiative to our February 2025 meeting and seek a vote of support from our general membership.

Thank you for your dedication and tireless efforts in this crucial endeavor. We look forward to working together and supporting your initiatives to create a safer and more resilient Illinois.

Sincerely,

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew Dina".

Andrew Dina  
President  
Metropolitan Fire Chiefs Association of Illinois



Illinois  
Department of  
**Natural  
Resources**

JB Pritzker, Governor • Natalie Phelps Finnie, Director  
One Natural Resources Way • Springfield, Illinois 62702-1271

[www.dnr.illinois.gov](http://www.dnr.illinois.gov)

February 6, 2025

John McCabe  
Director of Resource Management  
President, Illinois Prescribed Fire Council  
Forest Preserves of Cook County  
536 N. Harlem Avenue  
River Forest, IL 60305

Re: Chicago Wilderness Community Wildfire Preparedness Plan

Dear Mr. McCabe:

It is my pleasure to provide this letter for the State of Illinois Department of Natural Resources (IDNR) Forestry Division in support of the Chicago Community Wildfire Preparedness Plan (CWPP). We understand this CWPP was collaboratively developed for a portion of the Chicago Wilderness region comprising Cook, DuPage, Kane, Lake, McHenry and Will counties, in recognition that the wildfire risk profile of the six-county region is interconnected. The plan will act as a multi-year guiding document to facilitate implementation of present and future fire hazard mitigation measures.

We understand that the Chicago Wilderness CWPP is intended as a recommendation and imposes no obligations on the signatories, and that collaborators may use the risk analyses and implementation recommendations from this CWPP to spark action on their properties and within their communities.

We mutually agree with the contents of this CWPP and express our thanks to the dedicated professionals who developed this Plan.

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth W. Jolly".

Kenneth Jolly  
Illinois Forestry Division Chief / State Forester  
Illinois Dept. of Natural Resources Forestry Division