December 2021

FIRE ADAPTED COMMUNITIES

People and communities are prepared to receive, respond to and recover from wildfire.

SAFE, EFFECTIVE WILDFIRE RESPONSE

All jurisdictions coordinate to implement safe, effective, risk-based management decisions.

RESILIENT LANDSCAPES

Landscapes are resilient to fire, insect, and disease disturbances, regardless of jurisdictional boundaries.

POST-FIRE RECOVERY

Preparing communities for inevitable fire effects, through pre-fire planning for post-fire response.

SWCA
ENVIRONMENTAL CONSULTANTS

Union County
Community Wildfire Protection Plan

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EXECUTIVE SUMMARY

This Union County Community Wildfire Protection Plan (UCCWPP) addresses hazards and risks of wildland fire throughout Union County (hereafter referred to as the County) and makes recommendations for fuel reduction projects, public outreach and education, structural ignitability reduction, and fire response capabilities. The County comprises a diverse landscape and land ownership but a population with a common concern: the need to prepare for wildfire to reduce the risk of loss of life and property.

While community members do not experience wildfire on a regular basis, fire is still a concern. Fire managers believe the danger is increasing and that a large fire is possible. This UCCWPP has been developed to assist the County in ensuring that a catastrophic wildfire will be avoided in the future by assessing areas at risk and recommending measures to decrease that risk.

The purpose of the UCCWPP is to assist in protecting human life and reducing property loss due to wildfire throughout the County. A goal of the 2010 Union County Hazard Mitigation Plan was to create and implement a Community Wildfire Protection Plan (CWPP) and develop long-term public education and fire response strategies (Union County 2010).

The plan is the result of a community-wide wildland fire protection planning process and the compilation of documents, reports, and data developed by a wide array of contributors. This plan was compiled in 2021. All versions of the UCCWPP have been developed in response to the federal Healthy Forests Restoration Act (HFRA) of 2003.

The UCCWPP meets the requirements of the HFRA by addressing the following:

1. Having been developed collaboratively by multiple agencies at the state and local levels in consultation with federal agencies and other interested parties.
2. Prioritizing and identifying fuel reduction treatments and recommending the types and methods of treatments to protect at-risk communities and pertinent infrastructure.
3. Suggesting multi-party mitigation, monitoring, and outreach.
4. Recommending measures and action items that residents and communities can take to reduce the ignitability of structures.
5. Soliciting input from the public on the draft UCCWPP.

A group of multijurisdictional agencies (federal, state, and local), organizations, and residents joined together as a Core Team to develop this CWPP. Core Team members have also had many years of experience working in fire management in the County.

The planning process has served to identify many physical hazards throughout the County that could increase the threat of wildfire to communities. The public have been invited to engage in the process at a public event, through community surveys and through review of the draft document. By incorporating public and Core Team input into the recommendations, treatments are tailored specifically for the County. The UCCWPP emphasizes the importance of collaboration among multijurisdictional agencies in order to develop fuels mitigation treatment programs to address wildfire hazards. The County has a committed team of career and volunteer firefighters, who work arduously to protect the life and property of citizens. But, without homeowners taking on some of the responsibility of reducing fire hazards in and around their own homes, these resources are severely stretched. A combination of homeowner and community awareness, public education, and agency collaboration and treatments are necessary to fully reduce wildfire risk.

A significant amount of fire mitigation work has been completed by the County and other stakeholders. These actions include many hazardous fuels reduction projects, prescribed burns, disaster resilience and awareness promotion, enhancing the emergency communication system, and the development of hazard mitigation plans to support emergency management including the safe and effective evacuation of people and animals in the event of a wildfire or other emergencies (Union County 2020).

Some of the highest-risk areas identified in this UCCWPP are communities located within and adjacent to National Forest land and the wildland urban interface (WUI). Federal and state agencies have tirelessly treated these areas, utilizing an active prescribed fire program and mechanical treatments. Treatments to fuels in these high hazard areas contribute to decreasing the likelihood of wildfire's negative impacts on communities in the County WUI. Continued preventive activities are needed, however, to further reduce the negative impacts that wildland fire can have on communities and community members living in the WUI.

The UCCWPP provides background information, a risk assessment, and recommendations. Much of this background information is housed in several appendices to the main document to focus the main document on analysis and action items. Chapter 1 provides a general overview of CWPPs. Chapter 2 presents an overview of the fire environment and specific information about fuel types. Chapter 3 describes the results of the risk assessment and summary of community risk ratings. Chapter 4 provides recommendations with respect to the three primary goals of the National Cohesive Wildland Fire Management Strategy: 1) restore and maintain landscapes, 2) create fire-adapted communities, and 3) improve wildfire response. Recommendations outlined under each goal include action plans and monitoring strategies for implementing fuels reduction projects, reducing structural ignitability, improving fire response capabilities, and initiating public outreach and education. Chapter 5 describes monitoring strategies and details regarding implementation of actions.

The plan does not require implementation of any of the recommendations, but the message throughout this document is that the greatest fire mitigation could be achieved through the joint actions of individual homeowners and local, state, and federal governments. It is important to stress that this document is an initial step in raising public awareness and treating areas of concern and should serve as a tool in doing so.

The UCCWPP should be treated as a live document to be updated annually or immediately following a significant fire event. The plan should continue to be revised to reflect changes, modifications, or new information. These elements are essential to the success of mitigating wildfire risk throughout Union County and will be important in maintaining the ideas and priorities of the plan and the communities in the future.

We would like to formally thank the Core Team and all Stakeholders for contributing their time and expertise throughout the planning process. Your participation has contributed to creating resilient landscapes, implementing public education, reducing structural ignitability, and ensuring safe and effective wildfire response.

CHAPTER 1 – INTRODUCTION

The United States is facing urgent forest and watershed health concerns. While the number of annual wildfires throughout the United States has been slightly decreasing (67,700 fires in 2016 vs. 59,000 fires in 2020), the number of acres burned has been on the rise (Congressional Research Service [CRS] 2021). An average of 7 million acres are burned every year due to wildfire, more than doubling the annual average of acres burned in the 1990s (CRS 2021). Communities are experiencing the most destructive wildfire seasons in history. The 2015 fire season had the most acreage impacted in a single year since 1960 at 10.13 million acres. 2020 was the second most extensive year for wildfire with 10.12 million acres burned (CRS 2021). These statistics demonstrate that wildfires are becoming larger and harder to control.

The U.S. Forest Service (USFS) designates the 20 northeastern states of the United States (including Illinois) the Northeast Region in regard to fire response and the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) (Northeast Regional Strategy Committee [NRSC] 2019). The Northeast Region experiences the largest number of wildfires year after year, with over 11,000 wildfires annually, burning on average 130,000 acres. Most of these fires are small but occur close to homes and values at risk (NRSC 2019). Because of the heightened population density in the Northeast Region, all wildfires have the potential to have devastating impacts on life and property.

While southern Illinois is not a region typically considered at extensive threat from wildfire, under a warming and drying climate regime, and with the growth of development in wildland areas, the area is prone to increased wildfire hazard. The state of Illinois has been identified as a location where wildfire is a critical issue and wildfire management and planning are needed to reduce the relatively high risk of wildland fire (Illinois Forestry Development Council [IFDC] 2019). Furthermore, Union County (the County) was designated as a priority interest for Illinois Department of Natural Resources (IDNR) fire prevention and community fire planning (IFDC 2019).

In order to mitigate fire impacts, communities in fire-prone environments need to have a plan to prepare for, reduce the risk of, and adapt to wildland fire events. Community wildfire protection plans (CWPPs) help accomplish these goals by providing recommendations that are intended to reduce, but not eliminate, the extreme severity or risk of wildland fire.

This document, the 2021 Union County CWPP (UCCWPP), reviews, verifies, and/or identifies potential new priority areas where mitigation measures are needed to protect from wildfire the irreplaceable life, property, and critical infrastructure in the County. This 2021 UCCWPP reviews and presents potential treatments for mitigation of wildfire-related risks in the priority areas but does not attempt to mandate the type and priority for treatment projects that will be carried out by the land management agencies and private landowners. With the responsibility for implementing wildfire mitigation treatments being totally at

the discretion of the landowner, the 2021 UCCWPP will only identify potential treatments and a suggested priority for these projects.

PURPOSE

Union County is one of seven Illinois counties considered top priority for forest fire prevention program implementation (IFDC 2019). Therefore, it is the intent of this 2021 UCCWPP to provide a countywide scale of wildfire risk and protection needs and then bring together all of the responsible wildfire management and suppression entities in the County to address the identified needs and to support these entities in planning and implementing the necessary mitigation measures.

This CWPP planning process involves looking at past fires and treatment accomplishments using the knowledge and expertise of the professional fire managers who work for the various agencies and governing entities in the County. This update process identifies the current local wildfire risks and needs that occur in the County, supporting this with relevant science and literature from the Northeast Region.

GOAL OF A COMMUNITY WILDFIRE PROTECTION PLAN

The goal of a CWPP is to enable local communities to improve their wildfire mitigation capacity, while working with government agencies to identify high fire risk areas and prioritize areas for mitigation, fire suppression, and emergency preparedness. Another goal of the CWPP is to enhance public awareness by helping residents better understand the natural and human-caused risk of wildland fires that threaten lives, safety, and the local economy. The minimum requirements for a CWPP, as stated in the federal Healthy Forests Restoration Act (HFRA), are the following:

Collaboration: Local and state government representatives, in consultation with federal agencies or other interested groups, must collaboratively develop a CWPP (Society of American Foresters [SAF] 2004).

Prioritized Fuel Reduction: A CWPP must identify and prioritize areas for hazardous fuels reduction and treatments and recommend the types and methods of treatment that will protect one or more communities at risk (CARs) and their essential infrastructures (SAF 2004).

Treatments of Structural Ignitability: A CWPP must recommend measures that homeowners and communities can implement to reduce the ignitability of structures throughout the area addressed by the plan (SAF 2004).

NAVIGATION

The plan provides background information, a risk assessment, and recommendations to reduce or mitigate wildfire risk to communities. The CWPP is designed to be used by the residents of the County, as well as stakeholders tasked with forest, fire, and emergency management. Some information is therefore highly technical in order to provide sufficient detail to aid in project implementation.

This CWPP is organized into several chapters, with more detailed information compiled into appendices. Chapter 1 provides an overview of CWPPs and describes the need for a plan; Chapter 2 gives an overview of the fire environment and introduces the reader to fire history information and well as fire response; Chapter 3 describes the methodology for the risk assessment and the results in detail; Chapter 4 outlines the mitigation strategies that could be implemented to reduce wildfire risk under the umbrella of the Cohesive Strategy, including action plans that outline priorities and recommendations for reducing fuels, initiating public education and outreach, reducing structural ignitability, and improving fire response capabilities; and Chapter 5 provides suggested approaches to monitoring actions.

The UCCWPP does not require implementation of any of the recommendations; however, these recommendations may be used as guidelines for the implementation process if funding opportunities become available. The recommendations for fuels reduction projects are general in nature; site-specific planning that addresses location, access, land ownership, topography, soils, and fuels would need to be employed upon implementation. Also, it is important to note that the recommendations are specific to wildland urban interface (WUI) areas and are intended to reduce the loss of life and property. All recommendation tables can be found within Chapter 4.

In developing the UCCWPP, a large amount of background information on the County has been compiled and analyzed, including the CWPP planning process, fire policy, past planning efforts, location and land use data, population, and demographics, climate and weather data, baseline vegetation data, fire regime and baseline conditions, and other supporting background information. This information is presented in Appendix A.

Additional appendices to this CWPP include maps in Appendix B; the Core Team contact list in Appendix C; community descriptions and hazard ratings in Appendix D; the National Fire Protection Association (NFPA) Wildland Fire Risk and Hazard Severity Form 1144 in Appendix E; funding opportunities in Appendix F; a homeowner's guide in Appendix G; community outreach information in Appendix H; and CWPP community survey questions in Appendix I.

ALIGNMENT WITH THE NATIONAL COHESIVE STRATEGY

As part of the 2021 CWPP, the plan has been aligned with the Cohesive Strategy and its Phase III Northeast Regional Action Plan by adhering to the nationwide goal "*to safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire*" (Forests and Rangelands 2014:3).

The primary, national goals identified as necessary to achieving the vision are the following:

Restore and maintain landscapes: Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.

Fire-adapted communities: Human populations and infrastructure can withstand a wildfire without loss of life and property.

Wildfire response: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

For more information on the Cohesive Strategy, please visit: https://www.forestsandrangelands.gov/strategy/documents/strategy/CSPhaseIIINationalStrategyApr2014.pdf

Alignment with these Cohesive Strategy goals is described in more detail in Chapter 4, Mitigation Strategies.

In addition to aligning with the Cohesive Strategy, the CWPP also incorporates information on post-fire recovery, the significant hazards of a post-fire environment, and the risk that post-fire effects pose to communities (Figure 1.1).

In addition to the alignment with the Cohesive Strategy, this plan is also in alignment with other local, state, and federal plans for fire and emergency management. More information on fire policy, the CWPP planning process, and past planning efforts is provided in Appendix A.

Figure 1.1. CWPP incorporating the three primary goals of the Cohesive Strategy and post-fire recovery and serving as holistic plan for fire prevention and resilience.

CORE TEAM

Representatives and stakeholders from various government agencies—along with members of fire departments and local communities—formed a Core Team and participated in decision-making activities that led to the development of the UCCWPP. Stakeholder involvement is critical in producing a meaningful document that included all collaborators' diverse perspectives. The Core Team drives the planning process in its decision-making, data sharing, experience, and communication with community members who are not on the Core Team. The project was kicked off on May 25, 2021; the Core Team met for the first time on June 25, 2021, and convened again on August 27, 2021. In addition, the draft UCCWPP was available for Core Team review from November 17 through December 1, 2021.

The Core Team list is provided in Appendix C.

PROJECT AREA

The project area includes all of Union County as delineated by its geographic and political boundaries, encompassing 413 square miles. The project boundary encompasses several municipalities. The largest municipal area is the county seat of Jonesboro (Figure 1.2). A detailed project overview including topography, roads, population, climate, and vegetation is provided in Appendix A.

LAND OWNERSHIP

Union County has little varied land ownership. The majority of the land is privately owned, followed by USFS, state, and U.S. Fish and Wildlife Service (USFWS) land (Table 1.1, Figure 1.3). Land management strategies and policy direction are summarized in Appendix A.

Table 1.1. Breakdown of Land Ownership in Union County

Land Ownership	Acres	Percentage of the County
Private	154,961.3	57.10%
USFS	104,458.6	38.49%
State	6,669.811	2.46%
USFWS	5,277.503	1.94%
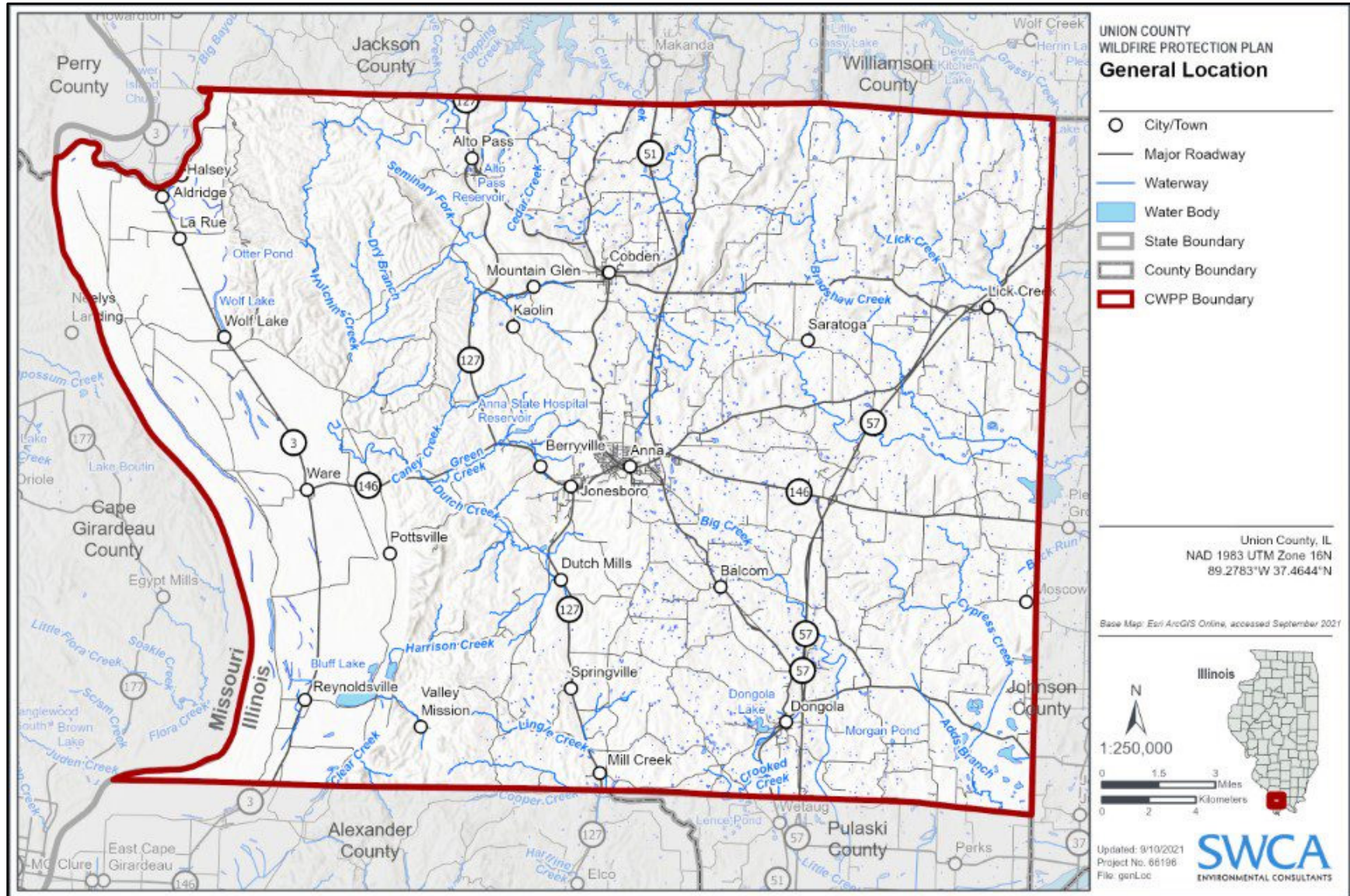
Figure 1.2. Union County general location.
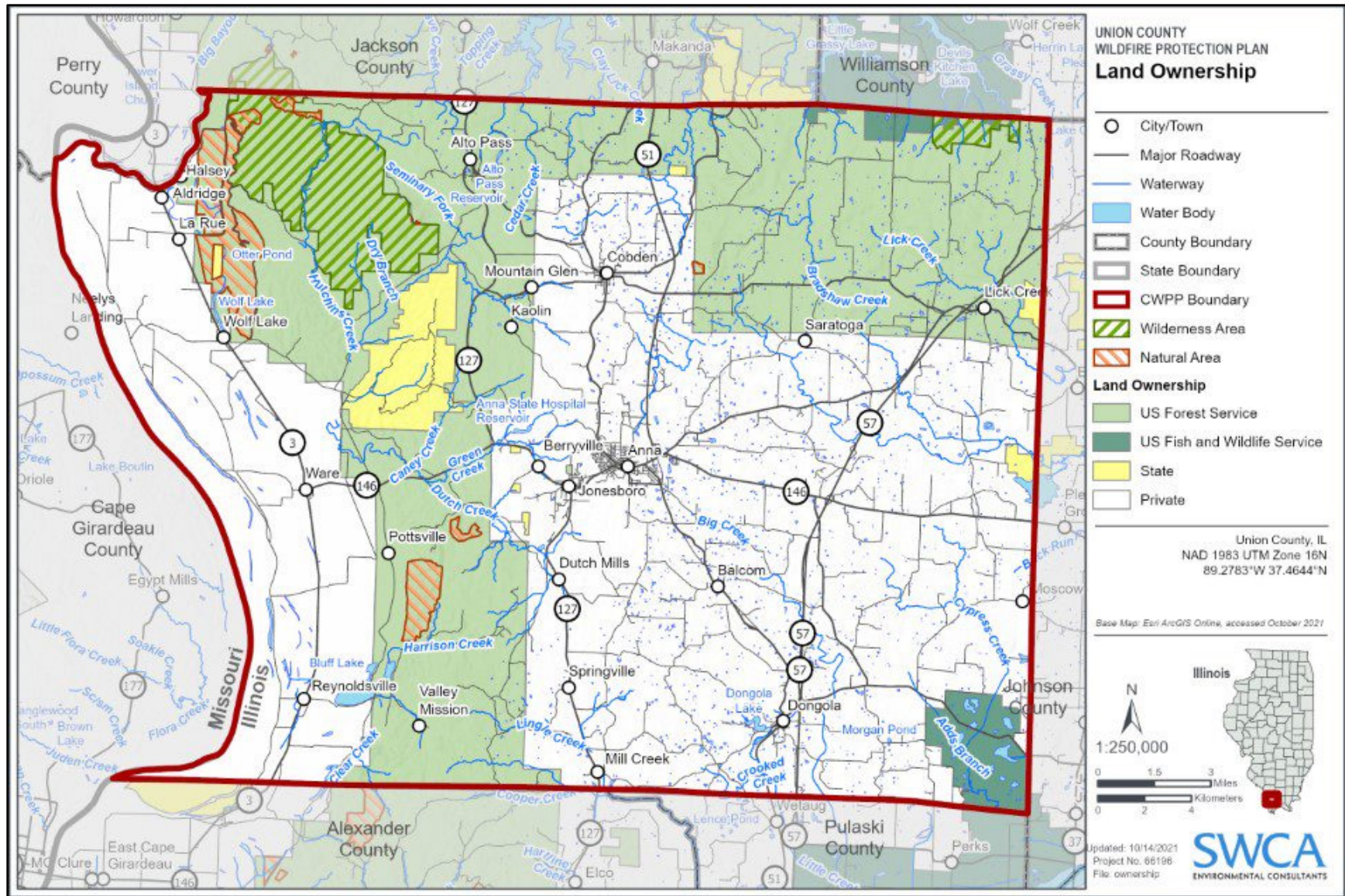
Figure 1.3. Union County land ownership.

PUBLIC INVOLVEMENT

A key element in the CWPP process is the meaningful discussions it generates among community members regarding their priorities for local fire protection and forest management (SAF 2004). In addition to Core Team meetings, the public were invited to engage in the plan at a public event at the Stinson Memorial Library in Anna on June 25 and to partake in a community survey in an article published in the *Gazette Democrat* the week of June 21, 2021. In addition, the draft UCCWPP was made available for public review from November 17 through November 29 and was announced through several different media outlets including newspapers, social media, and both internal and community meetings (see Appendix H).

During subsequent updates to this plan, the County will employ more traditional methods of engagement to ensure community members are able to continue to provide substantive input into the document. Recommendations for future community engagement and outreach are provided in Chapter 4.
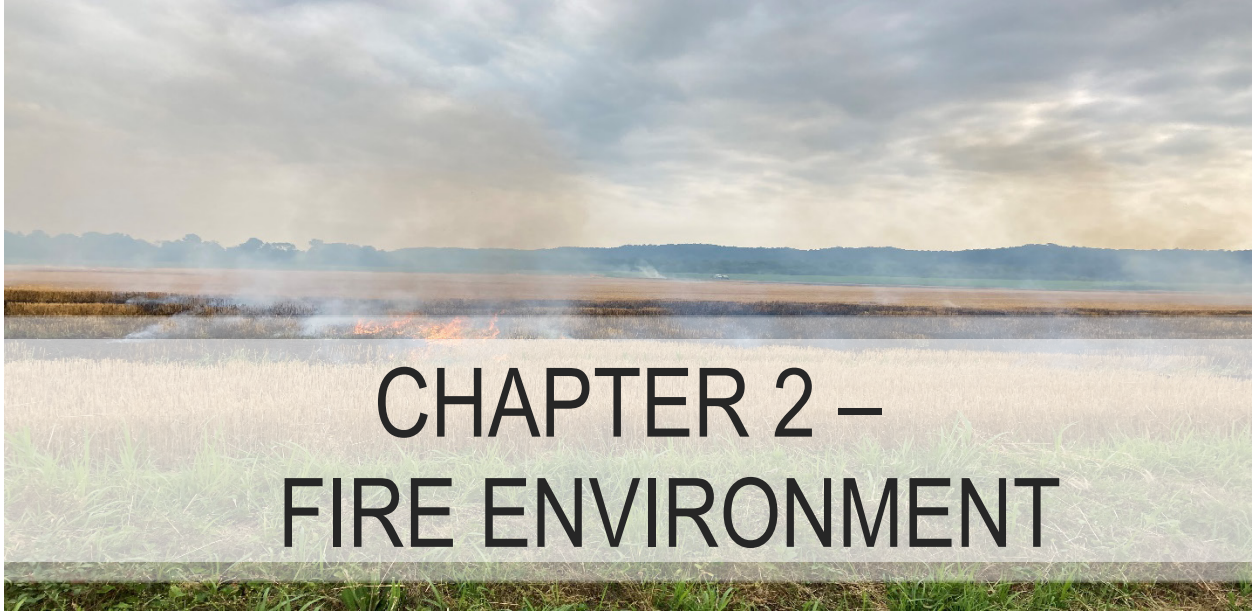
CHAPTER 2 – FIRE ENVIRONMENT

WILDLAND URBAN INTERFACE

A WUI is composed of both interface and intermix communities and is defined as areas where human habitation and development meet or intermix with wildland fuels (U.S. Department of the Interior and U.S. Department of Agriculture [USDA] 2001:752–753). Interface areas include housing developments that meet or are in the vicinity of continuous vegetation. Intermix areas are those areas where structures are scattered throughout a wildland area where the cover of continuous vegetation and fuels is often greater than cover by human habitation.

The WUI creates an environment in which fire can move readily between structural and vegetative fuels, increasing the potential for wildland fire ignitions and the corresponding potential loss of life and property. Human encroachment upon wildland ecosystems within recent decades is increasing the extent of the WUI throughout the country as a whole, which is having a significant influence on wildland fire management practices. Mitigation techniques for fuels and fire management can be strategically planned and implemented in WUI areas; for example, with the development of defensible space around homes and structures (Figures 2.1 and 2.2).

A CWPP offers land managers the opportunity for collaboration to establish a definition and boundary for the local WUI; to better understand the unique resources, fuels, topography, and climatic and structural characteristics of the area; and to prioritize and plan fuels treatments to mitigate for fire risks. At least 50% of all funds appropriated for projects under the HFRA must be used within the WUI area. For the UCCWPP, the WUI delineation shown in Figure 2.3 was adopted.

Figure 2.1. Example of the WUI in Union County.

Figure 2.2. Example of the WUI in Union County.
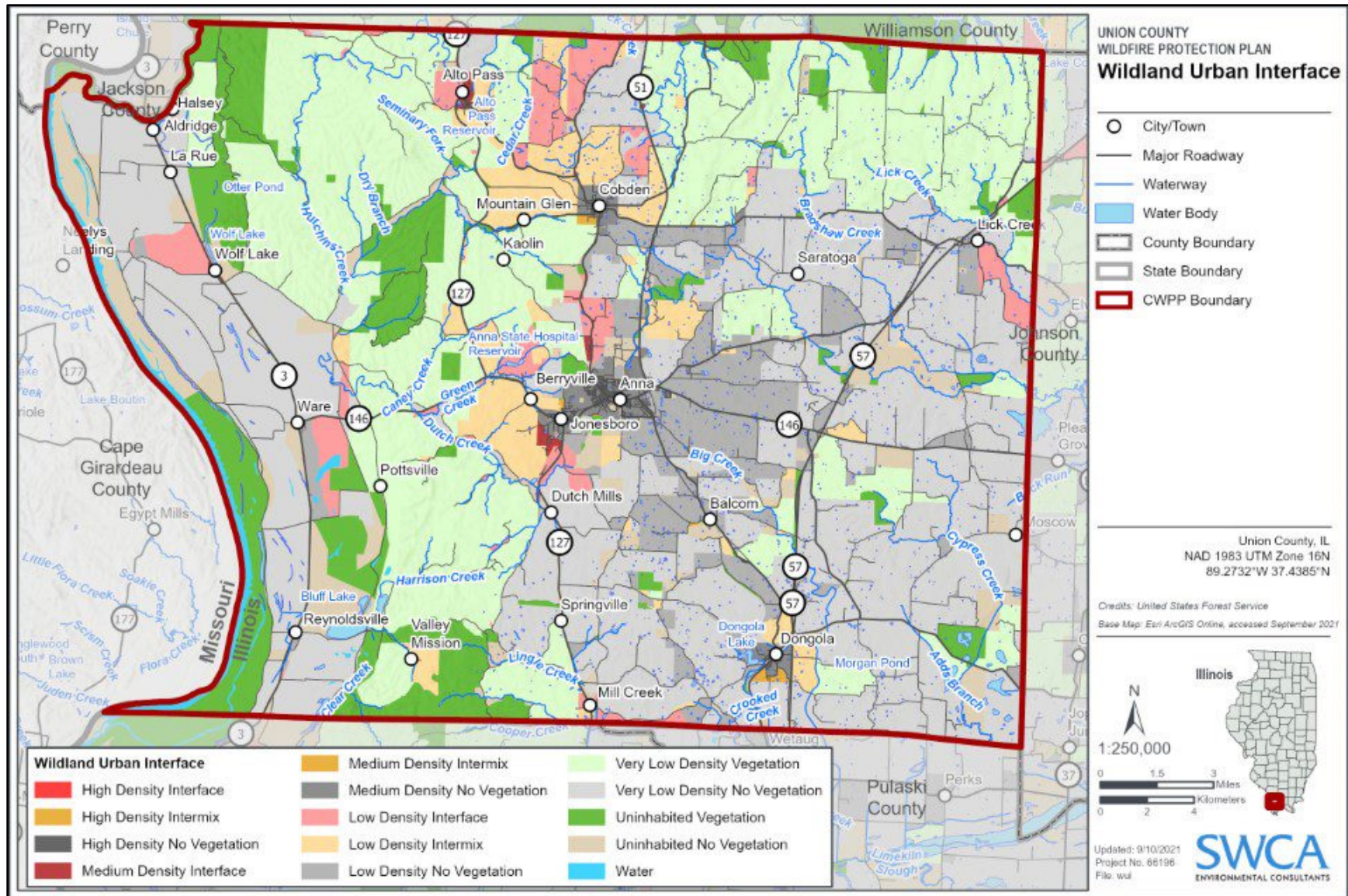
Figure 2.3. WUI delineation for Union County.

LAND USE AND FIRE HISTORY

Fire has played a prominent role in the history of hardwood forests of the eastern United States (Guyette et al. 2002; Pyne 1982; Williams 1989). Pollen studies, tree ring records, General Land Office survey notes, and early explorers' and settlers' accounts all suggest that the landscape of the area experienced fire much more often than is the case now (USFS 2015).

Native Americans are known to have used fire to manipulate habitat, manage fuels, drive game, and maintain clear sightlines (USFS 2015). Analysis of fire scars in tree ring data suggests that the frequency of burning in the region was higher immediately after the area was first settled. Early pioneers may have adopted native practices regarding burning. Pre-settlement fire history records in southern Illinois are limited due to past timber harvesting and rapid decomposition; however, fire is accepted as a common disturbance in the area both pre- and post-settlement (Tikusis 2009). Early pioneers may have adopted native practices regarding burning. The nineteenth century saw significant disturbance as land was cleared for agriculture and timber harvest:

> *Perpetuated for thousands of years by periodic anthropogenic burning in tandem with natural ignitions (Delcourt et al. 1998), these uplands burned with moderate frequency ranging between 2–25 years creating a landscape mosaic regulated by site conditions and land use practices (Robertson and Heikens 1994, Thompson and Dessecker 1997, Batek et al. 1999). Fire suppression policies implemented in the early 20th century have subsequently disrupted the pervasiveness of fire from the uplands of the Shawnee National Forest (Miller 1920, Parker and Ruffner 2004).* (Tikusis 2009:2)

Woodland burning was practiced into the early twentieth century (Miller 1920). As fire frequency declined, woodland stands began to undergo "thicketization" (Archer et al. 2004; Breshears 2006) or closure, resulting in conversion of prairies and savannas to woodlands and then forests (Taft 2008).

Past Fire and Land Management Policies

Beginning in the early 1900s, the policy for handling wildland fire leaned heavily toward suppression. Over the years, other agencies, such as the Bureau of Land Management, the Bureau of Indian Affairs, and the National Park Service, have followed the lead of the USFS and adopted fire suppression as the proper means for protecting the nation from wildfire. As a result, many areas now have excessive fuel buildups, dense and continuous vegetative cover, and tree and shrub encroachment into open grasslands.

Recent Fire Occurrence

The Shawnee National Forest, located east of the County, averaged 29 annual fires from 1981 to 1995, and 26 annual fires from 1981 to 2004 (USFS 2015). An approximately 100-acre fire occurs every 2 years across the Shawnee National Forest as a whole. A 400-acre fire was the largest in the region since the 1980s, but that fire occurred in Jackson County. Most of the County has missed one or more fire return intervals (the intervals that fire would typically occur historically- pre-European arrival)(USFS 2016), and where there are fires, most are suppressed before they gain size, limiting the acres burned. However, given the right conditions, some fires may grow large and become difficult to suppress. Figures 2.4 through 2.6 show fire occurrence over the period of record (1986–2021). Figure 2.7 illustrates that those fires tend to cluster in areas around the Shawnee National Forest. Fire reporting in the Shawnee region is notoriously varied, and therefore, records of fire history are often not considered to be comprehensive. Fire departments throughout the region are focusing on improving fire documentation and reporting, as inability to report actual fire numbers can impact funding for fire response and underrepresent the actual wildfire risk. The fire occurrence history depicted in Figure 2.7 is an important component of the risk assessment discussed in Chapter 4, highlighting the importance that fire reporting plays in fire management planning.

Most fires have occurred within the western half of the County. The eastern half of the County has, in contrast, had very few fires over the last century. Figure 2.7 shows the fire history across the County since 1986.

Fire history data encompassing the period from 1986 through 2021 shows a fluctuating pattern of fire occurrence, with an overall steady increase in number of fires (see Figure 2.4). This data set may reflect changes in capabilities due to funding, periodic drought, or a change in suppression tactics or resources.

Regardless of the underreporting of wildfires in the last few decades, there has been a decline in modern wildfire occurrence compared with fire frequency in the early 1900s (Tikusis 2009). Lack of fire in modern times is listed as one of the major contributors to the successional replacement of oak by mesophytic hardwoods. Prescribed fire has had to replace wildfire in modern forest management in order to promote oak regeneration where other woody vegetation is hindering the long-term persistence of the species (Dey and Fan 2008). The Shawnee National Forest and other partners have been actively encouraging the regeneration of oak habitat through an active prescribed fire and forest management program across the region.

Historic wildfire activity and information regarding fire regime are described in detail in Appendix A.

Ignition Sources

Natural ignitions in this region occur very rarely; however, they are thought to have been an important element of the pre-settlement fire regime, occurring primarily during the driest months in late summer and early fall (Parker and Ruffner 2004). This time frame is also when present-day Shawnee National Forest has some of its highest visitor use rates (USFS 2015). As stated in the Shawnee National Forest Fire Management Plan, fire season officially corresponds to the time between snowmelt and "green up" in the spring (USFS 2015). A second season begins after fine fuels have cured and leaves have withered and fallen but before winter temperatures and precipitation limit fire activity in the winter. Averages of historical fire activity put these dates as February 12 through May 5 for the spring season and October 13 through December 10 for the fall season. Even though most fires occur during these seasons, areas with exposed, grassy fuels dry much quicker than forested areas, allowing fires throughout the year (USFS 2015).

Wildfires occurring in Union County are typically suppressed before they gain any acreage. The majority of fires occur during the spring or fall fire seasons, with limited ignitions occurring during the summer due to frequent rainstorms during that time. Gradual warming temperatures are shortening the fire season but may increase fire behavior. There is a slightly higher tendency for summer fires than there was historically, which coincides with a period of increased visitation by recreationists. These fires tend to exhibit the most intense fire behavior.

Since 1986, the USFS, IDNR, and Union County Fire Department have reported 275 total fires that fell within the UCCWPP planning area (see Figure 2.4). Available fire history information does not always provide fire cause, so the exact number of human versus naturally ignited fires is unavailable.
The majority of fires on private land are detected early and suppressed before they gain acreage; however, given the right conditions, these fires may grow large and become difficult to suppress. This illustrates the importance of working with private landowners to reduce fire occurrence and reduce fuel loads and fire impacts in the WUI (USFS 2015). Raising awareness of the State Fire Protection District Law, which requires landowners to apply for a burn permit prior to burning on land in Union County, would be an important public outreach measure to help reduce the number of wildfires ignited by debris burning.
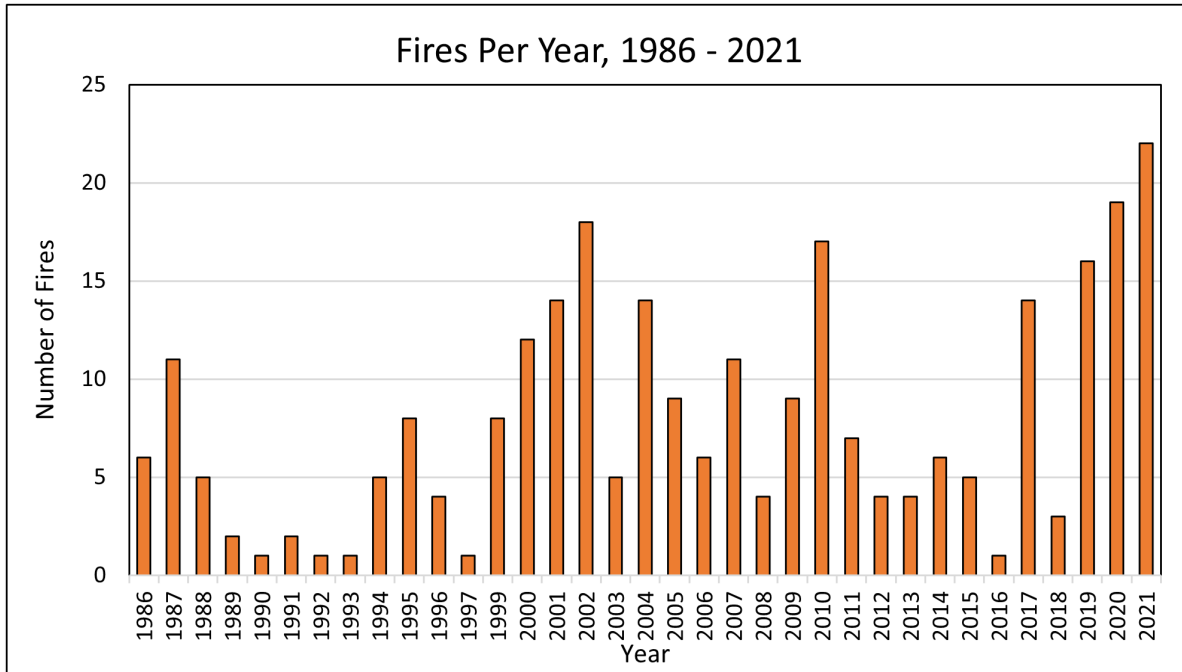
Figure 2.4. Annual wildfire frequency in Union County from 1986 through 2021, based on available data.
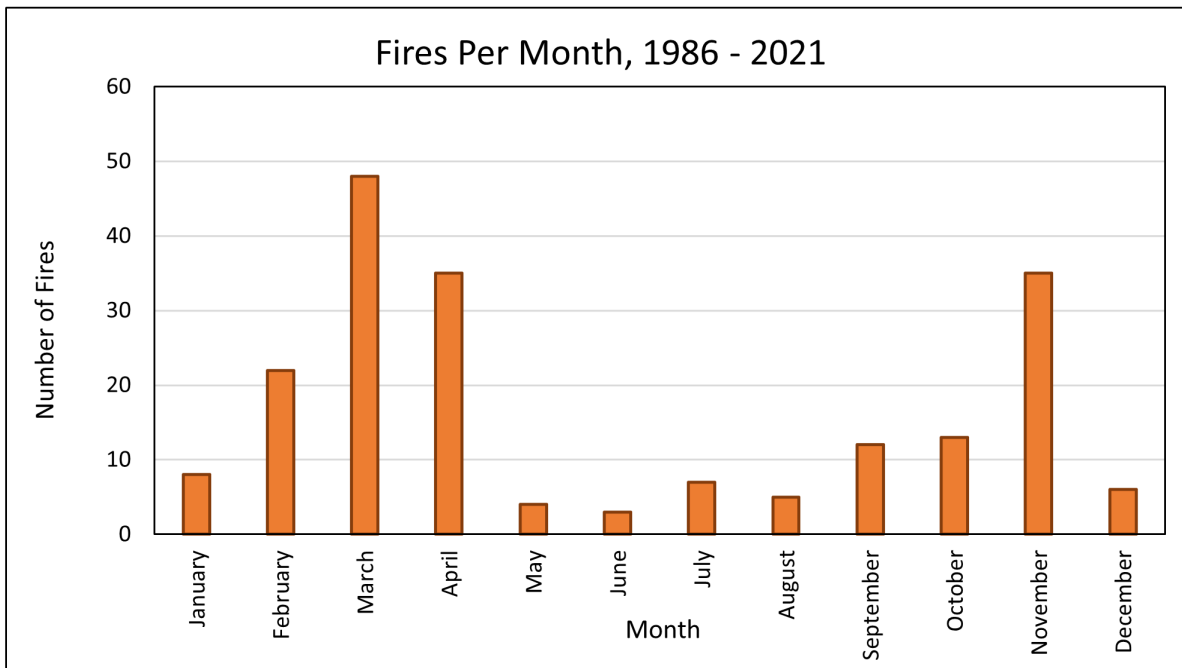
Figure 2.5. Monthly fire frequency in Union County based on data from 1986 through 2021.
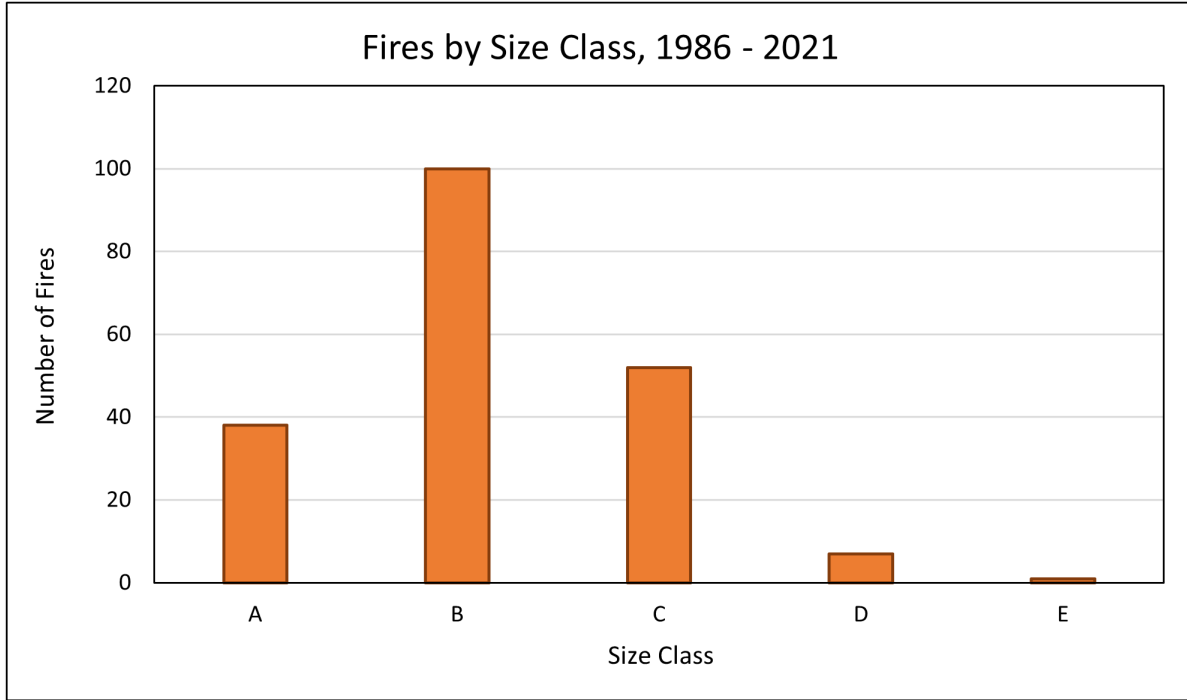
Figure 2.6. Fire size statistics for Union County based on fire history data from 1986 through 2021.

Size Class: A = 0.25 acre or less; B = greater than 0.25 to 10 acres; C = 10 to 100 acres; D = 100 to 300 acres; E = 300 to 1,000 acres; F = 1,000+ acres.
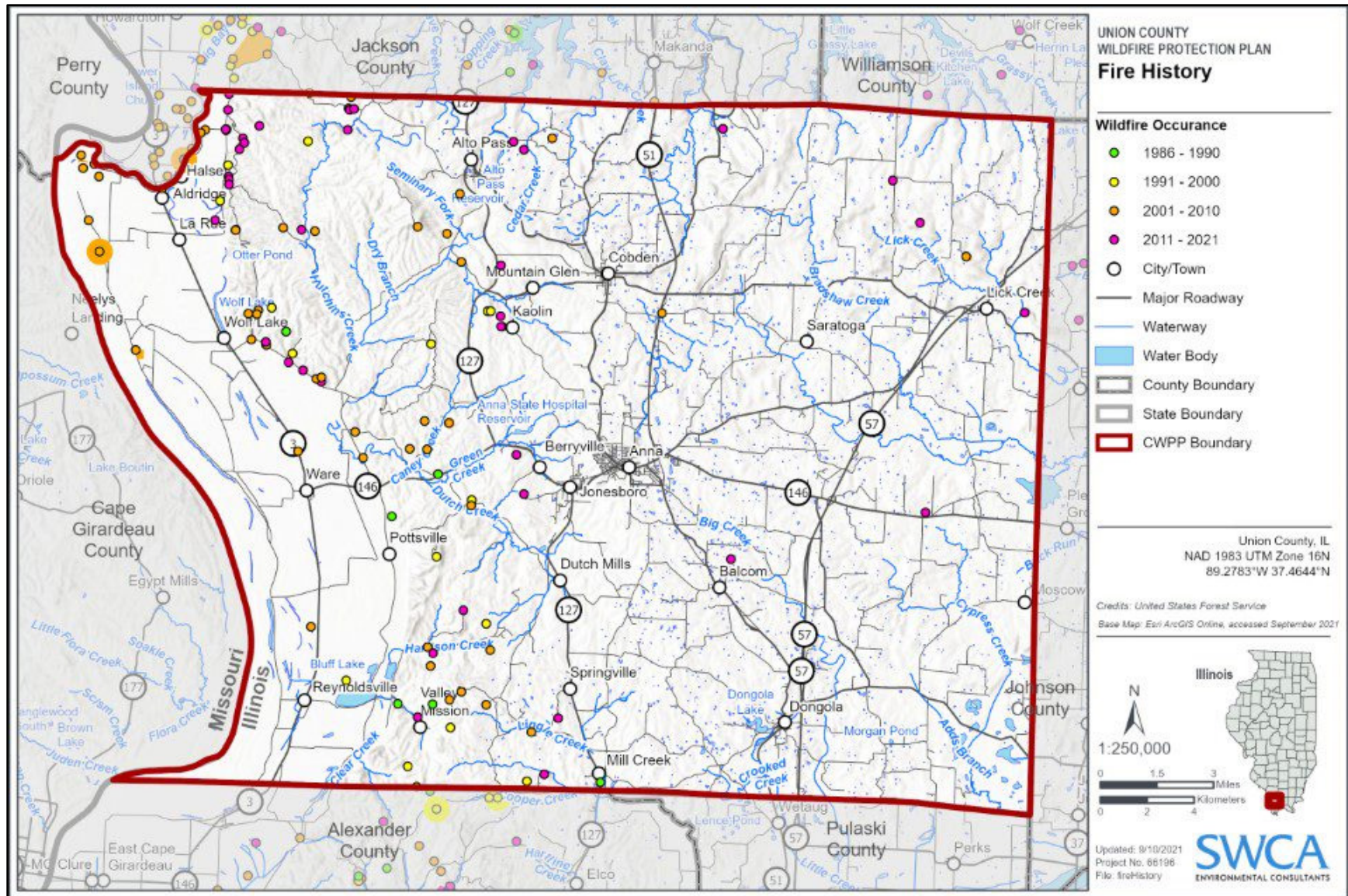
Figure 2.7. Fire history for Union County from 1986 through 2021.

Future Challenges

The world in recent years has experienced significant changes in temperature extremes. Over 70% of the land area on the planet, which was sampled as part of a 2006 study, shows a significant decrease in the occurrence of cold nights and a significant increase in the occurrence of warm nights (Alexander et al. 2006). These statistics indicate an increase in daily minimum temperatures globally. Much of this warming has occurred in the twentieth century (Alexander et al. 2006). Under these greater climatic extremes, fire behavior is expected to become more erratic, with larger flame lengths, increased torching and crowning, and more rapid runs and blowups associated with extremely dry conditions (Brown et al. 2009).

According to the National Interagency Fire Center (NIFC), occurrence of catastrophic wildfires has greatly increased over the last 20 years. Within just the last 10 years, a record number of acreages have burned, and numbers are continually getting larger (NIFC 2021). Exceptional climate extremes are pushing many forest types beyond their disturbance thresholds of sustainability. Interactions between warming trends, drought, insect disease, and extensive and severe wildfire are resulting in increased forest mortality and susceptibility to wildfire.

The WUI is the area where wildfire impacts are the most profound, because of the close proximity between wildland fuels and values at risk.

Although fire suppression is still aggressively practiced, fire management techniques are continually adapting and improving. Due to extensive human developments (homes and farms) and values (residential and commercial structures, historic and natural values) throughout the WUI, suppression will always be a priority. However, it is well accepted that a more dynamic forest mosaic (where oak is restored) means a more resilient forest in the face of climate change (Brandt et al. 2014; Nowacki and Abrams 2015), and therefore, combining mechanical treatments with prescribed fire could help reestablish natural fire regimes and reduce the potential for catastrophic wildfires on public land.

FIRE RESPONSE CAPABILITIES

Planning and Decision Support

As wildfires have continued to grow in size and severity over the last decade, fire managers are needing to institute more robust pre-fire planning and adapt and improve decision-making tools in order to reduce risk to fire responders and the public and assess impacts on ecological processes. Fire managers need to balance having sufficient resources available for fire in the region with the demand for resources to be deployed to other areas as fires ramp up in other regions.

A primary decision tool utilized by fire managers across all agencies is the Wildland Fire Decision Support System (WFDSS), a system that assists fire managers and analysts in making strategic and tactical decisions for fire incidents (WFDSS 2015). WFDSS combines desktop applications for fire modeling into one web-based system. It provides a risk-informed decision process and documentation system for all wildland fires and also introduces economic principles into the fire decision process in order to improve efficiencies while ensuring safe and effective wildfire response.

One intent of WFDSS is to ensure that when fire response decisions are made, they fall in line with agency land and resource management plans. Agencies have recently been moving away from the traditional written fire management plans and instead are developing spatial fire management plans that can be housed within the WFDSS (WFDSS 2015). The Shawnee National Forest, for example, will have all management requirements and strategic objectives for fire management contained within the WFDSS so that, in the event of a fire, incident managers consider this information when making decisions and develop strategic direction for the wildfire incident (WFDSS 2015).

Another tool employed by fire managers in pre-fire planning is the potential operational delineation (POD). PODs combine fire modeling with expertise from local fire practitioners and managers to identify potential locations where fire suppression could be effective (Caggiano et al. 2020; Harden 2020). This concept was tested in northern New Mexico during the 2019 fire season on seven New Mexico fires. The pilot project demonstrated the effectiveness of PODs for decision support. It is anticipated that these

processes will continue to be used in future fire planning across jurisdictions and are recommended for Union County as well.

Local Fire Resources

Local Fire Departments

There is no unified County fire department in Union County; instead, there are six local fire departments: City of Anna Fire and Rescue, Alto Pass Fire Department, Cobden Volunteer Fire Department, Dongola Fire Department, Jonesboro Fire Department, and the Ware-Wolf Lake Fire Department. It is recommended that a more thorough inventory of local fire department resources be developed in the future (see Appendix D).

Fire response within Union County is dispatched by the Union County Sheriff's Office. Local fire departments are primarily manned by volunteer firefighters. Despite the continuous level of capabilities, ebbs and flows occur within the volunteer service. Recruiting and retaining volunteers is challenging due to the lifestyle and the training requirements one must follow to be a volunteer firefighter. Although several volunteer firefighters are present in the County, not all are available to respond to every fire.

State Fire Resources

Illinois Department of Natural Resources

Within Illinois, the primary agency for fire services is the Office of the State Fire Marshal (OSFM). The OSFM provides arson investigation and fire services expertise and awareness. From there, the IDNR has primary responsibility for fire response on non-federal, non-municipal, and non-private land within the UCCWPP area (Illinois Emergency Management Agency [IEMA] 2019). IDNR wildland firefighters may be dispatched anywhere in the County (IDNR 2021b) or tending to multiple fires at one time. Therefore, in the event of a wildfire on state land, local fire departments or other resources may be used for initial attack under the Illinois Emergency Management Mutual Aid System Agreement. To learn more about the Agreement, please visit the following webpage: https://www.iesma.org/iemmas_agreement.php.

The Illinois Interagency Coordination Center is the dispatch center for all resources managed by Illinois, USFS, USFWS, National Park Service, and The Nature Conservancy that fall within Illinois (Eastern Area Coordination Center [EACC] 2021a)

Federal Fire Resources

Shawnee National Forest

On USFS land, the USFS has the responsibility for initial attack (initial response). The USFS provides wildfire response and management for over 193 million acres of National Forest System land (CRS 2021).

Federal fire response is dispatched and coordinated through the EACC. The EACC authorizes the deployment of fire response resources and provides logistical and resource support, wildfire intelligence, and predictive services to federal and state wildland fire agencies within the eastern area (EACC 2021b). Coordinating information, developing incident management teams, prioritizing resource and support needs, and overseeing the mobilization as a whole is the responsibility of the Eastern Area Coordinating Group, which is made up of lead fire managers from cooperating state and federal agencies (EACC 2021c).

The management of wildfire ignitions for multiple resource objectives (managing naturally burning fires in forests as a tool for helping to restore forest health and mitigating the escalating costs of fire suppression) is practiced on federal land but depends upon a thorough assessment of values at risk in the WUI. Depending on the location and nature of a wildfire, USFS policies outline appropriate management responses to guide district personnel in the application of specific suppression techniques. All large wildfire response would be based on assessment using WFDSS.

Mutual Aid

The wildland fire community is well known for its development of mutual aid agreements at the federal, state, and local levels. Such automatic aid agreements allow for closest forces to respond to an incident as quickly as possible regardless of jurisdiction. Such agreements may also describe how reimbursement will be conducted; state resources responding to wildfires on federal land may have their associated costs reimbursed by the responsible federal agency, and the reverse is true for federal resources suppressing a wildfire on state land.

The Big Rivers Forest Fire Management Compact (BRFFMC) is a cooperative effort between the USFS, state and private forests, Illinois, Indiana, Iowa, and Missouri. The goal of the BRFFMC is to encourage effective fire management through prescribed fire, pre-suppression, and suppression of natural cover fires. In addition, the BRFFMC provides services such as fire prevention, Federal Excess Personal Property training, all-risk response plan development, National Wildlife Coordinating Group training scholarships, and equipment, and promotes fire management and prevention concerns (BRFFMC 2021).

The Shawnee National Forest, IDNR, Midewin National Tallgrass Prairie, USFWS, and the National Park Service came together in support of a Statewide Master Cooperative Agreement. The agreement is a plan of action for wildfire response, prescribed fire support, fire prevention coordination, training, and dispatching executed by the Illinois Interagency Coordination Center. The USFS can play an operational role as a partner in wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance in the WUI setting. Furthermore, the use of agreements between cooperating agencies for fuels reduction is highly encouraged (USFS 2015).

EVACUATION RESOURCES

Short-term, intermediate, and long-term recovery mass care operations, including evacuations, are carried out by the Red Cross in cooperation with the IEMA. The State Emergency Operations Center is the main coordination point for the integration of private, state, and voluntary resources into mass care operations (IEMA 2019).

Road Systems

Much of Union County is accessible via surfaced roads and highways; however, many communities are accessed via unsurfaced roads (Figure 2.8) that slow travel times. These routes may prove hazardous during emergency evacuation, especially where they are adjacent to forested land with vegetation close to or overhanging the road (Figure 2.9). Fuel treatment may be needed along some roads where vegetation is overhanging and could prevent safe evacuation of residents or safe access by emergency responders. Further details on road systems within the County are provided in Appendix A.

Figure 2.8. Example of unsurfaced road.

Figure 2.9. Example of a narrow road with overhanging vegetation.

Horses, Livestock, and Animals

Many rural homeowners have cattle and other large animals and livestock, and pets are common in homes throughout the County. In the event of a wildfire, it is important that residents and fire responders have a plan for evacuation of pets and livestock. Evacuation planning often neglects to describe how animals will be evacuated and where they will be taken. The loading of cattle during a fire and smoke situation and transport of stock vehicles down narrow roads under stressful situations can be very difficult. Public education could emphasize the need to practice loading horses quickly, for example.

There is also a need to pre-identify where animals can be taken, such as county fairgrounds, for large animal shelter. Similarly, locations for small animals such as dogs and cats picked up in the fire area should also be pre-identified, as well as the lead agencies, such as humane societies, that will coordinate this work.

WATER AVAILABILITY AND SUPPLY

Water supply is variable around the County and may be provided by hydrants, wells, cisterns, and ponds. There are hydrants available throughout most towns, but many rural and unincorporated communities lack water for fire suppression. Upgrades at fire stations have been implemented in some communities, including installation of water tanks. Additional water storage is still needed in many areas.

Ponds and rivers could also provide alternative sources for suppression, and many stations have the capability and equipment to draft, but suitable drafting sources are not always known.

Limited water supply can impact International Standards Organization ratings for fire departments, so improvements to water infrastructure have been identified as a priority for this UCCWPP. The hydrant location data set for the County is incomplete, and therefore, mapping is identified as a needed project in this UCCWPP.

PUBLIC EDUCATION AND OUTREACH PROGRAMS

Public education and outreach programs are a common factor in virtually every agency and organization involved with the wildfire issue. Detailed information on these programs is provided in Appendix A.

CHAPTER 3 – WUI HAZARD AND RISK ASSESSMENT
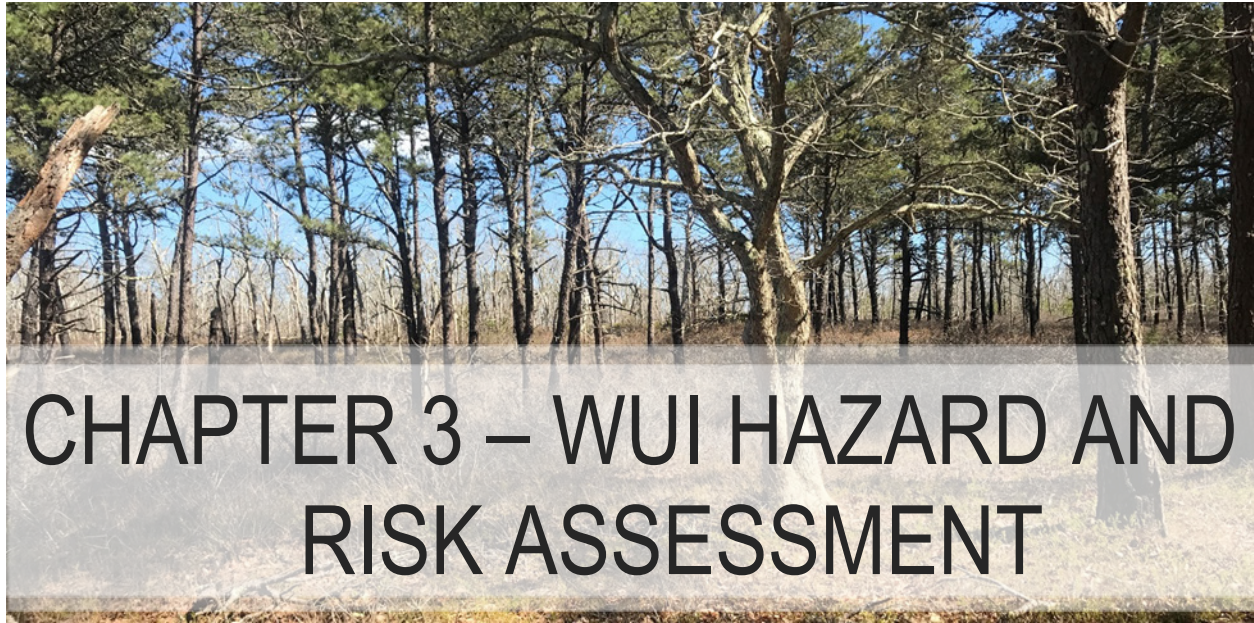
PURPOSE

The purpose of developing the risk assessment model described here is to create a unique tool for evaluating the risk of wildland fires to communities within the WUI areas of Union County. Although many definitions exist for hazard and risk, for the purpose of this document these definitions follow those used by the firefighting community:

> *Hazard* is a fuel complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition and resistance to control.

> *Risk* is defined as the chance of a fire starting as determined by the presence and activity of causative agents (National Wildfire Coordinating Group [NWCG] 1998).

The hazard and risk assessment is twofold and combines a geographic information system (GIS) model of hazard based on fire behavior and fuels modeling technology (Composite Risk-Hazard Assessment) and a Core Team–generated assessment of on-the-ground community hazards and values at risk.

From these assessments, land use managers, fire officials, planners, and others can begin to prepare strategies and methods for reducing the threat of wildfire, as well as work with community members to educate them about methods for reducing the damaging consequences of fire. The fuels reduction treatments can be implemented on both private and public land, so community members have the opportunity to actively apply the treatments on their properties, as well as recommend treatments on public land that they use or care about.

The Union County Hazard Mitigation Plan (HMP) (Union County 2020) lists wildfire hazard as a likely hazard with limited magnitude/severity.

FIRE BEHAVIOR MODEL

OVERVIEW

The wildland fire environment consists of three factors that influence the spread of wildfire: fuels, topography, and weather. Understanding how these factors interact to produce a range of fire behavior is fundamental to determining treatment strategies and priorities in the WUI. In the wildland environment, vegetation is synonymous with fuels. When sufficient fuels for continued combustion are present, the

level of risk for those residing in the WUI is heightened. Fire spreads in three ways: 1) surface fire spread, in which the flaming front remains on the ground surface (in grasses, shrubs, small trees, etc.) and resistance to control is comparatively low; 2) crown fire, in which the surface fire "ladders" up into the upper levels of the forest canopy and spreads through the tops (or crowns) independent of or along with the surface fire, and when sustained is often beyond the capabilities of suppression resources; and 3) spotting, in which embers are lifted and carried with the wind ahead of the main fire and ignite in receptive fuels; if embers are plentiful and/or long range (>0.5 mile), resistance to control can be very high. Crown fire and spotting activity have been a concern for fire managers, particularly under extreme weather conditions. In areas where homes are situated close to timber fuels and/or denser shrubs and trees, potential spotting from woody fuels to adjacent fuels should always be acknowledged.

Treating fuels in the WUI can lessen the risk of intense or extreme fire behavior (Martinson and Omi 2013; Safford et al. 2009). Studies and observations of fires burning in areas where fuel treatments have occurred have shown that the fire either remains on or drops to the surface, thus avoiding destructive crown fire, as long as activity fuels are treated or removed (Graham et al 2004; Pollet and Omi 2002; Prichard et al. 2010; Safford et al. 2012; Waltz et al. 2014). Fuel mitigation efforts therefore should be focused specifically where these critical conditions could develop in or near CARs.

For this plan, an assessment of fire behavior has been carried out using well-established fire behavior models: FARSITE, FlamMap, BehavePlus, and FireFamily Plus housed within the Interagency Fuel Treatment Decision Support System (IFTDSS), as well as ArcGIS Desktop Spatial Analyst tools. Data used in the Composite Risk-Hazard Assessment is largely obtained from LANDFIRE.

Information regarding the modeling approach and components is included in Appendix A.

COMPOSITE RISK-HAZARD ASSESSMENT

The Composite Risk-Hazard Assessment modeling approach uses a weighted sum model, which "stacks" geographically aligned data sets and evaluates an output value derived from each cell value of the overlaid data set in combination with the weighted assessment. In a weighted sum model, the weighted values of each pixel from each parameter data set are added together so that the resulting data set contains pixels with summed values of all the parameters. This method ensures that the model resolution is maintained in the results and thus provides finer detail and range of values for denoting fire risk. Figure 3.1 illustrates the individual data sets and the relative weights assigned within the modeling framework. Figure 3.2 is the risk assessment for the planning area, combining behavior parameters, fire occurrence density, highly valued resources and assets (HVRA), WUI, and distance from fire stations. The risk assessment classifies the planning area into low-, moderate-, and high-risk categories.

Crown Fire Activity
12.5%

Fireline Intensity
12.5%

Flame Length
12.5%

Rate of Spread
12.5%

Fire Occurrence Density
12.5%

Composite Risk Assessment

Highly Valued Resources
12.5%

Wildland Urban Interface
12.5%

Distance from Fire Stations
12.5%
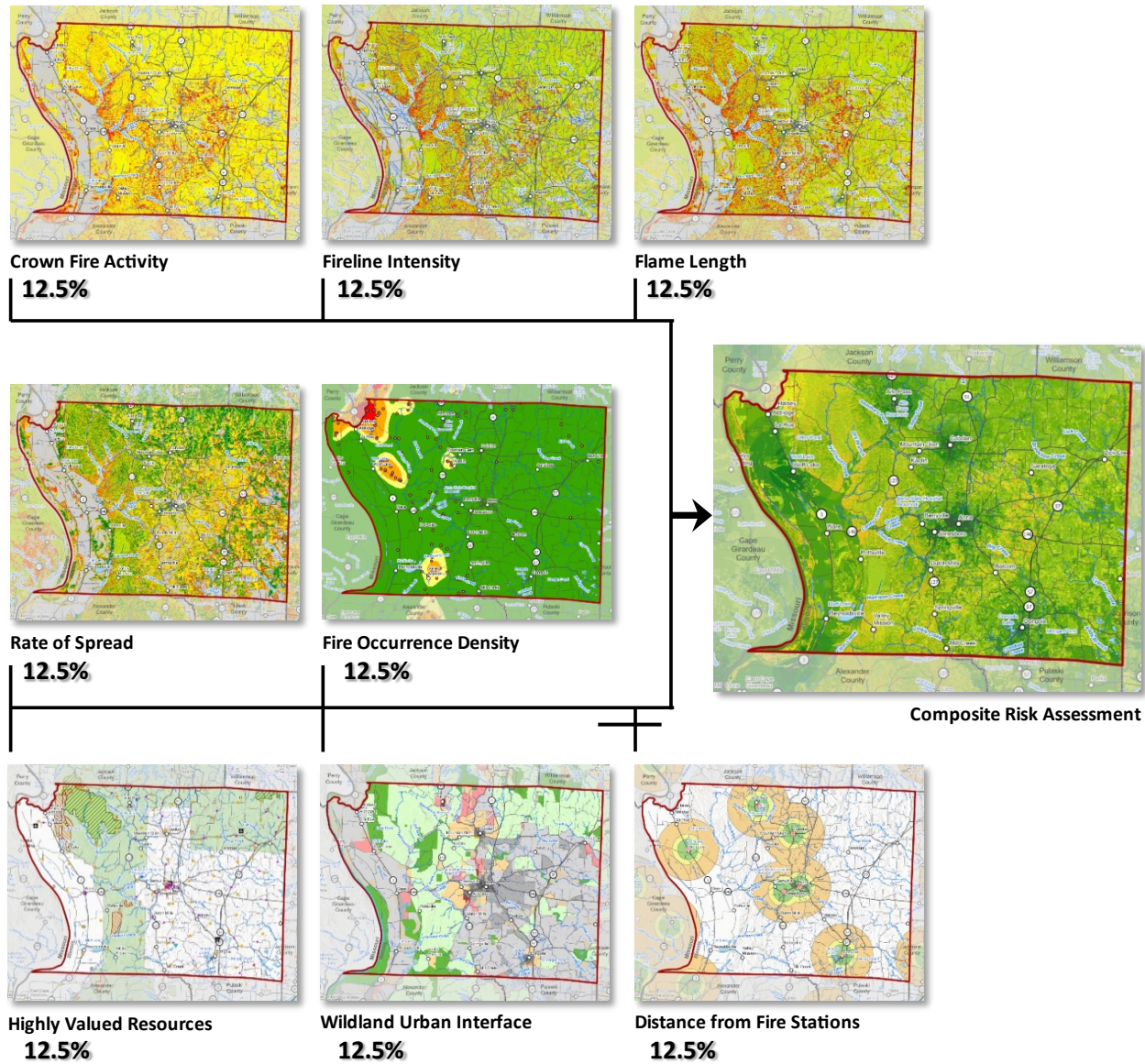
Figure 3.1. Composite Risk-Hazard Assessment overlay process.
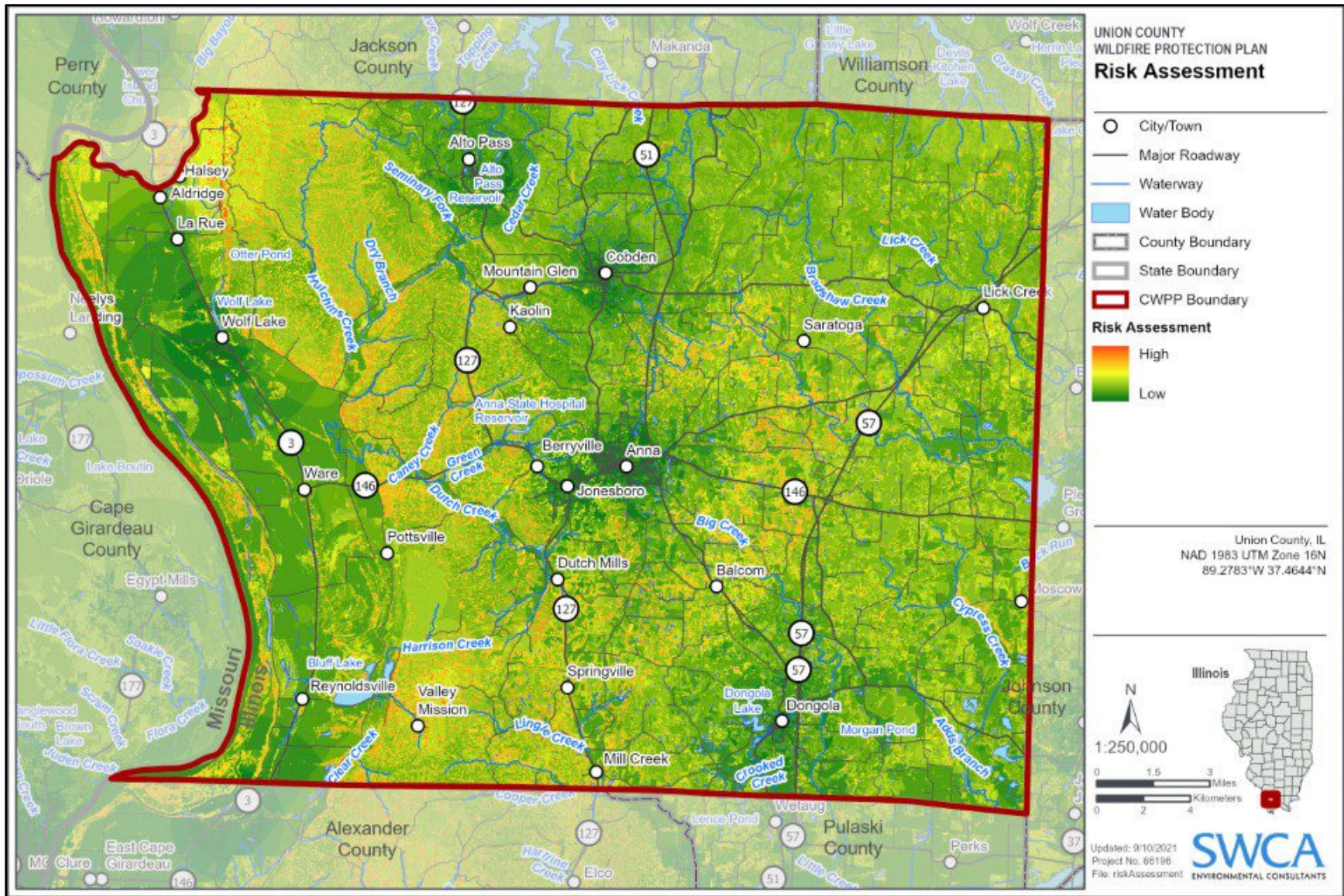
Figure 3.2. Composite Risk-Hazard Assessment.

COMMUNITY HAZARD ASSESSMENTS

The assessments were conducted in summer 2021 using the NFPA Wildland Fire Risk and Hazard Severity Form 1144 (see Appendix E). This form is based on the NFPA Standard for Reducing Structure Ignition Hazards from Wildland Fire 2013 Edition. The NFPA standard focuses on individual structure hazards and requires a spatial approach to assessing and mitigating wildfire hazards around existing structures. It also includes ignition-resistant requirements for new construction and is used by planners and developers in areas that are threatened by wildfire and is commonly applied in the development of Firewise Communities (for more information, see www.firewise.org).

The purpose of the community WUI assessment and subsequent hazard ratings is to identify fire hazard and risks and prioritize areas requiring mitigation and more detailed planning. These assessments should not be seen as tactical pre-suppression or triage plans. The community assessment helps to drive the recommendations for mitigation of structural ignitability, community preparedness, and public education. The assessment also helps to prioritize areas for fuels treatment based on the hazard rating. Each area was rated based on conditions within the community and immediately surrounding structures, including access, adjacent vegetation (fuels), defensible space, adjacent topography, roof and building characteristics, available fire protection, and placement of utilities. Where a range of conditions was less easily parsed out, a range of values was assigned on a single assessment form. Each score was given a corresponding adjective rating of low, moderate, or high.

The CAR hazard ratings from the community assessment and the GIS hazard/risk assessment are provided in Table 3.1. This table also includes a summary of the positive and negative attributes of a community as they relate to wildfire risk. Full CAR descriptions are provided in Appendix D.

Table 3.1. Communities at Risk List with Assessment Summary

Community Polygon	Fire Department	CAR Rating (based on NFPA 1144)	Positive	Negative
Southeast Quadrant	Dongola or Anna Fire Department	53 Moderate	• Ingress/egress: more than one road in and out; good access to highway • Street signs: visible and reflective • Vegetation type: hardwood and agricultural • Slope: mostly flat • Organized response: fire department close to communities • History of fire occurrence: low fire occurrence • Severe fire weather potential: minimal • Separation of adjacent structures: good, large plots	• Building construction: combustible • Water source: limited access in rural areas • Utility placement: aboveground • Deck and fencing: combustible
Old Highway 51N West	Cobden, Jonesboro or Anna Fire Department	101 High	• Street signs: visible and reflective • Separation of adjacent structures: good • Severe fire weather potential: limited • History of fire occurrence: low frequency of previous fires	• Ingress/egress: limited access roads, unsurfaced roads, steeper grade • Road conditions: unsurfaced, slow response • Fire access: limited turnaround • Vegetation type: timber fuels prevalent and surrounding some homes; some extensive forested tracks interface homes • Defensible space: limited • Building construction: combustible • Deck and fencing: combustible • Water source: no water source in rural areas • Organized response: more than 5 miles from station • Utility placement: aboveground

Community Polygon	Fire Department	CAR Rating (based on NFPA 1144)	Positive	Negative
Old Highway 51N East	Cobden or Anna Fire Department	78 High	• Ingress/egress: two or more roads in and out • Street signs: visible and reflective • Slope: minimal slope • History of fire occurrence: minimal recent fires • Severe fire weather potential: limited • Separation of adjacent structures: good, larger lots • Organized response: within 5 miles of a station	• Vegetation type: timber and understory • Defensible space: less than 70-foot clearance • Building construction: combustible • Utility placement: aboveground
Reynoldsville and Surrounds	Ware-Wolf Lake Fire Protection District	56 Moderate	• Ingress/egress: two or more roads in and out; levee road provides access to adjacent forest areas • Vegetation type: grass dominant • Slope: limited • Separation of adjacent structures: good, larger plots • History of fire occurrence: limited • Street signs: visible and reflective • Water source: good/hydrants	• Severe fire weather potential: previous weather anomalies created strong destructive winds • Building construction: combustible • Deck and fencing: combustible • Organized response: greater than 5 miles from station • Utility placement: aboveground

Community Polygon	Fire Department	CAR Rating (based on NFPA 1144)	Positive	Negative
Ware and Surrounds	Ware-Wolf Lake Fire Protection District	70 Moderate	• Ingress/egress: two or more roads in and out • Street signs: visible and reflective • Vegetation: agricultural with timber on far interface • Slope: relatively flat • Separation of adjacent structures: good, larger plots • Water source: hydrants • Fire response: fire station within 5 miles • Helipad in nearby Wolf Lake	• Severe fire weather potential: exposed, potential for strong winds; unique weather phenomenon has occurred in the past, causing forest damage • Deck and fencing: combustible • History of large number of fire calls • History of fire occurrence: high fire frequency (relative to other areas) • Utility placement: aboveground
Wolf Lake and Surrounds	Ware-Wolf Lake Fire Protection District	73 High	• Ingress/egress: two or more roads in and out • Street signs: visible and reflective • Separation of adjacent structures: good, large plots • Slope: minimal- floodplain • Water source: hydrants • Organized response: fire station within 5 miles • Helipad and dip spots	• Vegetation type: timber and understory • Utility placement: aboveground • Deck and fencing: combustible • Severe fire weather potential: exposed, potential strong winds; unique weather phenomenon has occurred in the past, causing forest damage • Building construction: combustible • Values at risk: commercial industry in community • History of fire occurrence: high fire frequency (relative to other areas)

Community Polygon	Fire Department	CAR Rating (based on NFPA 1144)	Positive	Negative
Beach Grove Road	Ware-Wolf Lake Fire Protection District or Alto Pass Fire Department	95 High	• Street signs: visible and reflective • Slope: flat • Separation of adjacent structures: good, large plots	• Ingress/egress: one road in and out; surrounded by forest on both sides • Vegetation type: timber and litter; large expanse of forested land in interface • Topographic features: variable slope in vicinity; channeling of winds • Utility placement: aboveground • Organized response: closest station is Wolf Lake, more than 5 miles away • Building construction: combustible • Deck and fencing: combustible • Water source: none
Alto Pass West	Alto Pass Fire Department	79 High	• Ingress/egress: more than one road in and out • Street signs: visible and reflective • Slope: flat • Separation of adjacent structures: good, large lots • Organized response: within 5 miles of station - Alto Pass Fire Department • Topographic features: flat • History of fire occurrence: limited • Severe fire weather potential: limited	• Vegetation type: timber and litter; large expanse of forested land in interface • Building construction: combustible • Deck and fencing: combustible • Water source: none • Utility placement: aboveground • Values at risk: recreation and tourism

Community Polygon	Fire Department	CAR Rating (based on NFPA 1144)	Positive	Negative
Alto Pass East	Alto Pass Fire Department	75 High	• Ingress/egress: two or more roads in and out • Street signs: visible and reflective • Slope: flat but some homes on ridge - Skyline Drive • Severe fire weather potential: limited • Separation of adjacent structures: good, large lots • Topographic features: flat • History of fire occurrence: minimal	• Vegetation type: timber and understory • Building construction: combustible • Deck and fencing: combustible • Water source: none • Organized response: greater than 5 miles from station • Utility placement: aboveground
Cobden and Surrounds	Cobden Fire Department	60 Moderate	• Ingress/egress: two or more roads, surfaced, low grade • Street signs: visible and reflective • Vegetation type: grass • Slope: minimal • History of fire occurrence: minimal • Severe fire weather potential: minimal • Separation of adjacent structures: good, large lots • Organized response: within 5 miles of a fire department; Cobden has a fire station	• Building construction: combustible • Deck and fencing: combustible • Water source: none • Utility placement: aboveground

Community Polygon	Fire Department	CAR Rating (based on NFPA 1144)	Positive	Negative
Anna and Surrounds	Anna Fire and Rescue Department	39 Low	• Ingress/egress: more than two roads in and out • Road width: greater than 24 feet • Road conditions: surfaced • Fire access: turnarounds good • Street signs: visible and reflective • Vegetation type: urban and low fuel loading vegetation • Slope: flat • History of fire occurrence: low • Severe fire weather potential: minimal • Water source: hydrants • Organized response: within 5 miles of community, fire station in town	• Building construction: combustible • Deck and fencing: combustible • Utility placement: aboveground • Building construction: combustible • Deck and fencing: combustible
Jonesboro and Surrounds	Jonesboro Fire Department	110 High	• Street signs: visible and reflective • Organized response: within 5 miles of Jonesboro Fire Station • Slope: homes situated in relatively flat land at base of slope • Severe fire weather potential: minimal • Separation of adjacent structures: good, large lots • History of fire occurrence: low	• Ingress/egress: one road in and out of some areas • Fire access: narrow and limited turnarounds • Vegetation type: timber and understory • Defensible space: limited • Roofing: some wood shingle or combustible roofing materials • Building construction: combustible • Deck and fencing: combustible • Water source: none • Utility placement: aboveground • Yard maintenance: poor

Community Polygon	Fire Department	CAR Rating (based on NFPA 1144)	Positive	Negative
Mill Creek and Surrounds	Dongola Fire Department	91 High	- Ingress/egress: two or more roads in and out and good access to highway - Street signs: visible and reflective - History of fire occurrence: low (higher fire occurrence to the southwest of the community on USFS land) - Severe fire weather potential: limited - Water source: hydrants	- Fire access: some limited turnarounds in community and narrow roads - Defensible space: limited - Slope: homes located mid-slope - Separation of adjacent structures: limited, smaller lots - Roofing: combustible - Building construction: combustible - Deck and fencing: combustible - Utility placement: above ground - Organized response: station more than 5 miles away; closest station is in Dongola
Highway 127 West	Jonesboro or Dongola Fire Departments	94 High	- Street signs: visible and reflective - Severe fire weather potential: limited - Separation of adjacent structures: good, large lots	- Ingress/egress: one road in and out of some areas - Road conditions: unsurfaced - Slope: variable - Vegetation type: timber understory - Building construction: combustible - Deck and fencing: combustible - Water source: none - Utility placement: aboveground - History of fire occurrence: high (relative to other polygons due to adjacent USFS land)

Community Polygon	Fire Department	CAR Rating (based on NFPA 1144)	Positive	Negative
Lick Creek	Anna or Cobden Fire Departments	76 High	• Ingress/egress: more than two roads in and out • Street signs: visible and reflective • Slope: variable but homes located on primarily flat land • History of fire occurrence: low • Severe fire weather potential: minimal • Separation of adjacent structures: good, large agricultural lots	• Vegetation type: mixture of timber and agricultural • Building construction: combustible • Deck and fencing: combustible • Water source: none in rural areas • Organized response: Cobden is closest fire station; some areas more than 5 miles away • Utility placement: aboveground

VALUES AT RISK

Earlier compilation of the critical infrastructure in the planning area coupled with the community assessments, public outreach, and Core Team input has helped in the development of a list of values at risk from wildland fire. These data are also supplemented with HVRA data, which is a data set that is being gathered nationwide and is available through IFTDSS. In addition to critical infrastructure, values at risk can include natural, social, and cultural resources.

In addition to critical infrastructure, values at risk can also include natural, social, and cultural resources (see Maps 8 and 9 in Appendix B). It is important to note that although an identification of values at risk can inform treatment recommendations, a number of factors must be considered in order to fully prioritize areas for treatment; these factors include appropriateness of treatment, land ownership constraints, locations of ongoing projects, available resources, and other physical, social, or ecological barriers to treatment.

The scope of this CWPP does not allow determination of the absolute natural, socioeconomic, and cultural values that could be impacted by wildfire in the planning area. In terms of socioeconomic values, the impact due to wildfire would cross many scales and sectors of the economy and call upon resources locally, regionally, and nationally.

NATURAL VALUES AT RISK

The UCCWPP planning area has a variety of natural resources of particular concern to land managers, such as rare habitats and listed plant and wildlife species. Examples of natural values identified by the Core Team include the following:

- Public land
- Hunting areas
- Trail systems
- Agricultural land

- Viewsheds
- Wildlife habitat and game species
- Watersheds and water quality (Figure 3.3)

Figure 3.3. Example of a natural value at risk, a pond.

SOCIOECONOMIC VALUES AT RISK

Social values include population, recreation, infrastructure, agriculture, and the built environment. Examples include the following:

- Recreation sites
- Schools
- Fire departments (Figure 3.4)
- Highways

- Churches
- Care homes, senior housing, day care, and other group homes
- Water storage

Figure 3.4. Example of a socioeconomic value at risk, Ware-Wolf Lake Fire Department.

CULTURAL VALUES AT RISK

Many historical landmarks are scattered throughout Union County. Particular values at risk that have been identified by the Core Team in the CWPP planning area are the following:

- Trail of Tears State Forest (IDNR 2021a)
- Landmarks (Figure 3.5)
- Barns
- Historic houses
- Agricultural infrastructure

Figure 3.5. Example of a cultural value at risk, Bald Knob Cross.

CHAPTER 4 – MITIGATION STRATEGIES
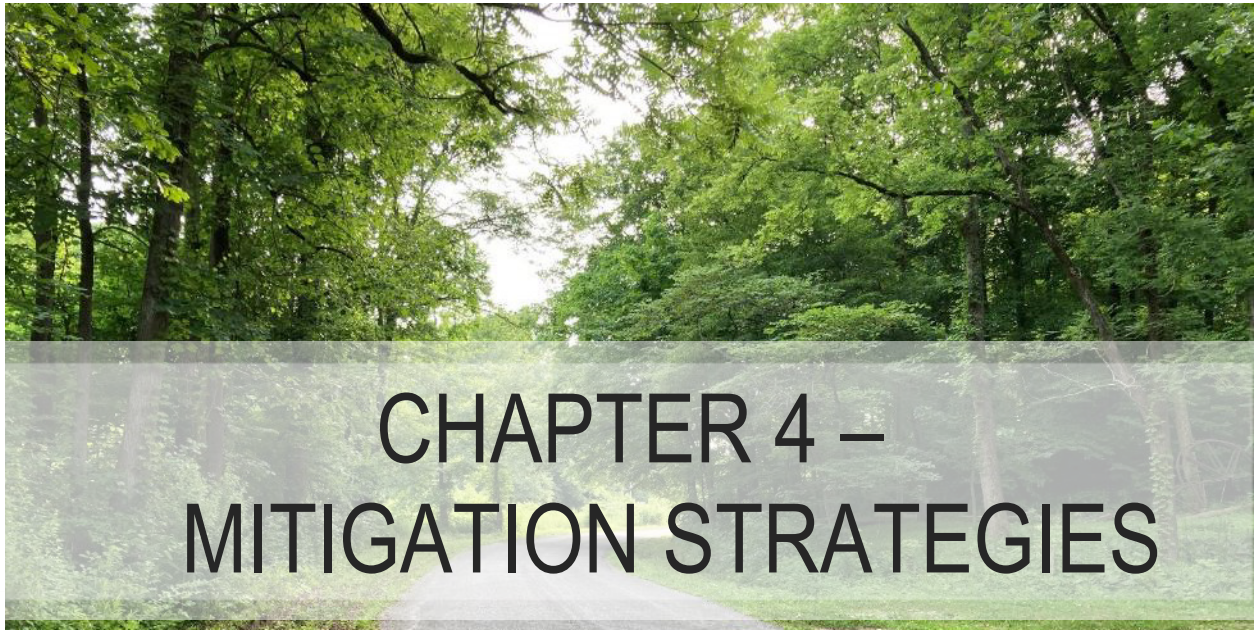
As part of the 2021 CWPP, this plan has been aligned with the Cohesive Strategy and its Phase III Northeast Regional Action Plan by adhering to the nationwide goal "*to safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire*" (Forests and Rangelands 2014:3).

In order to do this, the CWPP recommendations have been structured around the three main goals of the Cohesive Strategy: restoring and maintaining landscapes, fire-adapted communities, and wildfire response.

This chapter provides guidance for implementing recommendations under each Cohesive Strategy goal. Many of these community-specific recommendations can be implemented at the homeowner or community level. Projects requiring large-scale support can be prioritized based on the Community Hazard/Risk Assessments and Composite Risk-Hazard Assessment.

Recommendation matrices (Table 4.1, Table 4.4, and Table 4.5) are used throughout this chapter to serve as an action plan for implementation. Recommendations have been aligned with the strategies in the Illinois Forest Action Plan (IFAP) (IFDC 2019) wherever possible.

COHESIVE STRATEGY GOAL 1: RESTORE AND MAINTAIN LANDSCAPES

Goal 1 of the Cohesive Strategy and the Northeast Regional Action Plan (NRSC 2015) is Restore and Maintain Landscapes: Landscapes across all jurisdictions are resilient to fire and other disturbances in accordance with management objectives. Management options for Goal 1, as outlined in the Northeast Regional Action Plan (NRSC 2015:10) include:

- Regional Option 1A: Expand the use of prescribed fire as an integral tool to meet management objectives in the Northeast.

- Regional Option 1B: Actively manage and increase the extent of fire-dependent ecosystems.

- Regional Option 1C: Focus on mitigating "event" fuels through mechanical treatments and utilizing markets for biomass products to clean up and reduce the potential fire hazard from blowdowns, ice storms, and other forest-damaging events.

In this UCCWPP, recommendations to restore and maintain landscapes focus on vegetation management and hazardous fuel reduction. Detailed information regarding vegetation and fuel types is provided in Appendix A.

RECOMMENDATIONS FOR HAZARDOUS FUEL REDUCTION

Fuels management of public and private land in the WUI is key to the survival of homes during a wildfire event, as well as the means to meet the criteria of Goal 1. Research has shown how fuel treatments in the WUI can change fire behavior to support suppression activities and protect homes (Evans et al. 2015). The importance of fuels management is reflected in policy at the federal level, with the HFRA requiring that federal land management agencies spend at least 50% of their fuels reduction funds on projects in the WUI. One of the major goals of the Core Team is to expand hazardous fuel reduction and mitigation activities.

The purpose of any fuels reduction treatment is to protect life and property by reducing the potential for catastrophic wildfire, as well as to restore landscapes to a sustainable and healthy condition. Fuels should be modified with a strategic approach across Union County to reduce the threat that high-intensity wildfires pose to lives, property, and other values. Pursuant to these objectives, recommendations have been developed in the context of existing and planned fuels management projects. This section provides information on fuel treatment methodologies that can be applied first to protect structures (defensible space), then near community boundaries (fuel breaks, cleanup of adjacent open spaces), and finally in the wildlands beyond community boundaries (larger-scale forest health and restoration treatments).

While not necessarily at odds with one another, the emphasis of each of these treatment types is different. Proximate to structures, the recommendations focus on reducing fire intensity consistent with Firewise and International Fire Code standards. Further into open space areas, treatments will tend to emphasize forest health and increasing resiliency to catastrophic wildfire and other disturbances. Cooperators in fuels management should include federal, state, and local agencies as well as interested members of the public. Federal land management plans focus on these more landscape-level treatments, so the UCCWPP incorporates most federal land management by reference to those land management planning documents. The UCCWPP focuses primarily on projects within or adjacent to WUI areas.

Table 4.1 summarizes the types of treatments recommended throughout the planning area. The majority of the treatments are focused on higher risk areas, as defined by the Composite Risk-Hazard Assessment and Core Team input. Many of these treatment recommendations are general across the communities because similar conditions and concerns were raised by fire responders for all communities that border wildland areas. Tables 4.1, 4.4, and 4.5 also address the requirement for an action plan and assessment strategy by providing monitoring guidelines and a timeline for implementation. This timeline is obviously dependent on available funding and resources, as well as National Environmental Policy Act protocols for any treatments pursued on public land.

The treatment list is by no means exhaustive and should be considered purely a sample of required projects for the future management of the planning area. Many projects may be eligible for grant funds available from federal and/or state sources. A key source of funding for implementing hazardous fuel reduction are funds available through Northeast Regional Action Plan, which is the reason this CWPP tiers to those goals. For an additional list of funding sources, please refer to Appendix F.

Each land management agency has a different set of policies governing the planning and implementation of fuels reduction projects. A thorough assessment of current fuel loading is an important prerequisite for any fuels prescription, and all treatment recommendations should be based on the best possible science. When possible, simultaneously planning for the management of multiple resources while reducing fuels will ensure that the land remains viable for multiple uses in the long term. The effectiveness of any fuel reduction treatment depends on the degree of maintenance and monitoring that is employed. Monitoring will also ensure that objectives are being met in a cost-effective manner.

Fire management cannot be a one-size-fits-all endeavor; this plan is designed to be flexible. Treatment approaches and methods will be site-specific and should be adapted to best meet the needs of the landowner and the resources available (Figure 4.1). Moreover, each treatment recommendation should address protection of values at risk, particularly the protection of threatened and endangered species.

Table 4.1. Recommendations to Create Resilient Landscapes (Fuel Treatments)

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
Increase road maintenance and develop strategic road buffers	Prioritize high risk roadways as delineated in the risk assessment Focus on USFS road system.	Federal and state	Roadway improvements: • Grade and maintain roads to reduce hazards to emergency apparatus (potholes and poor surfacing). Road right-of-way vegetation improvements: • Annual spring maintenance of right-of-way. • Treat surface fuels for a minimum of 10-foot buffer and up to 30 feet where possible. • Trim fuels (limbing-up timber) to allow safe passage of emergency vehicles. • Control for invasive species that may contribute to rapid fire spread (i.e., weeds and grasses).	• Provides for safe and effective wildfire response capabilities. • Creates a strategic fuel break along roadways to create potential firebreak.	Within the next 5 years	H	• Regular maintenance needed to ensure the roads are drivable for emergency response vehicles.	• Pre-disaster Mitigation Grant Program • Specific EPA Grant Programs • Catalog of Federal Funding Sources; Land Resources • Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program • Illinois Natural Areas Stewardship Grant • Hazard Mitigation Grant Program (HMGP) • Emergency Forest Restoration Program (EFRP) • Urban and Community Forestry Grant Program – IL • State and Private Forestry Grant Programs (NASF) • Matching Awards Program
Enhance existing fuel breaks and potential fire containment features	Prioritize high risk areas as delineated in the risk assessment.	County, state, federal	• Increase fuel breaks to double as access within the WUI or difficult to access areas and look for opportunities to widen some public trails to better serve as fuel breaks/fire access roads. • Encourage clearance of an additional width when possible.	• Protect life and property by mitigating fuels, providing defensible space for firefighters protecting structures.	Within 3 years	L	• Rx burn frequency is currently every 3-5 years (roughly). The burns bring in fine fuels which burn faster, so the area is more flammable, but the fires would be less destructive.	• Pre-disaster Mitigation Grant Program • Specific EPA Grant Programs • Catalog of Federal Funding Sources; Land Resources • Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
			• Create additional buffer zones between existing development and the forest, ensuring fire suppression access. • Strategic placement of fuel breaks will help to limit the spread of wildland fire and increase access to difficult areas. Fuel break prescriptions should be site specific depending on the fuel type, topography, soils, and adjacent land management practices. The prescriptions will incorporate the use of best management practices for habitat protection (i.e., protection of vulnerable species and habitat and prevention of invasive species). • Work with adjacent landowners to develop internal capacity to help enhance fire access-through road and trail improvements on those lands. • Prioritize treatments around values at risk including commercial business that might be vulnerable to fire spread and or may increase fire hazards (i.e., Explosive Plant).	• Create a fuel arrangement unlikely to support crown fire • Ensure the protection of vulnerable ecosystems and values at risk.			• Regular maintenance needed to ensure the fuel break remains clear of vegetation. • Monitor for invasive species. • Continued management of fuel breaks	• Illinois Natural Areas Stewardship Grant • Hazard Mitigation Grant Program (HMGP) • EFRP • Urban and Community Forestry Grant Program – IL • State and Private Forestry Grant Programs (NASF) • Matching Awards Program
Increase completion and maintenance of hazardous fuels projects across multiple jurisdictions	Focus mitigation measures within areas of high wildfire risk as delineated in	Local, state, federal	• Collaboratively identify vegetation and fuels management needs based on the risk assessment.	• Create resilient landscapes and address potential for extreme wildfire behavior in	Within 2 years	H	• Set up a standing multi-agency meeting every fall to review accomplishments and address future needs.	• Increase capacity by working collaboratively with volunteer organizations to increase bandwidth and resources for implementation.

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
the risk assessment. Priority: Old Cape Road, Trail of Tears to Pine Hills, East and South of Pine Hills, Bottomlands Reference conceptual fuel treatments delineated collaboratively with the Core Team (Figure 4.1).			• Structure fuel treatment planning around a Potential Operational Delineations (POD) concept. • Develop equipment needs to accomplish work (including maintenance) and seek funding for purchase. • Create an educational tool for land /property owners re: various methods, techniques, and cost for various fuel treatments. • Cultivate and support partnerships with Southern Illinois Prescribed Burn Association (SIPBA), Illinois Prescribed Fire Council (IPFC), non-governmental organizations, and volunteer groups to support implementation of projects. • Build deeper relationships with federal agencies such as the Federal Emergency Management Agency (FEMA). • Utilize drone technology to identify areas of high hazard • Work with IDNR on the Demonstration Project. Potentially use prescribed burn to remove hazardous fuels and support oak regeneration. o Consult the oak regeneration plan: *2021 Oak System Recovery: A vision for sustaining oaks in southern Illinois*	and around the WUI. • Create and maintain accountability with local landowners.				• Pre-disaster Mitigation Grant Program • Specific EPA Grant Programs • Catalog of Federal Funding Sources; Land Resources • Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program • Illinois Natural Areas Stewardship Grant • Hazard Mitigation Grant Program (HMGP) • EFRP • Urban and Community Forestry Grant Program – IL • State and Private Forestry Grant Programs (NASF) • Matching Awards Program • Conservation Innovation Grants (CIGs) • National Interagency Fire Center

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
Protect rare wildlife species habitats through forest management and fuels treatments.	County-wide	Local, state, federal	• Consolidate monitoring efforts to provide a central repository for monitoring data across the region. Build a spatial database of treatments. • Partner with DNR Heritage to prioritize treatment areas and types. • Work with USFWS designations to design treatment plans or protocols for areas with critical habitats and/or special species. • Work with academic institutions to determine whether prescribed burning can be used to enhance bat habitat. • Engage private landowners (and large nature preserves) in monitoring and data sharing to increase scope of research. • Seek funding to continue ongoing monitoring projects for forest treatments on public lands. • Utilize the ongoing Demonstration Project and management practice data to develop habitat management practices that align with fire management objectives.	• Balance the reduction of hazardous fuels with the protection of highly sensitive resources.	Within 2 years	H	• Monitor accomplishments in addressing species protections while reducing wildfire risk.	• Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program • Pre-disaster Mitigation Grant Program • Specific EPA Grant Programs • Catalog of Federal Funding Sources; Land Resources • Illinois Natural Areas Stewardship Grant • Hazard Mitigation Grant Program (HMGP) • EFRP • Urban and Community Forestry Grant Program – IL • State and Private Forestry Grant Programs (NASF) • Matching Awards Program • The National Fire Plan (NFP) • Special Wildlife Funds Grant • U.S. Endowment for Forestry and Communities • Firewise Communities • Environmental Quality Incentives Program (EQIP)
Increase use of prescribed burning where appropriate.	Federal, state, and private lands	USFS, state, and private landowners	• Utilize prescribed burn planning that follows agency and regulator protocols.	• Protect communities and infrastructure	Within 3 years	M	• Carry out inventory each year of number and acreage of	• Funding for Fire Departments and First Responders • Volunteer Fire Assistance Program

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources

			• Closely follow plan prescriptions.
			• Utilize prescribed burn program to provide training for local fire department personnel and volunteers to increase comfort with prescribed fire.
			  ○ SIPBA - http://www.sipba.org/
			  ○ IPFC - https://www.illinoisprescribedfirecouncil.org/
			• Increase scope of private land burning through education and outreach.
			• As much as possible look to increase fall burning to optimize effects.
			• Continue to assess feasibility of the use of prescribed fire in wilderness areas to provide resource benefit and hazardous fuels reduction.
			• Work with IDNR on Demonstration Project.
				by reducing fuel loads.
				• Increase capacity and training for fire departments.
				• Provides ecological benefits.
							prescribed fire completed.
							• Collaboratively set goals for upcoming year, incrementally increasing acreage goals as resources allow.
							• Establish training needs and funding.
								• Fire Management Assistance Grant (FMAG)
								• EFRP
								• Assistance to Firefighters Grants (AFG)
								• Matching Awards Program
								• Firewise Communities
								• Urban and Community Forestry Grant Program - IL

Integrate wildfire management with meeting other resource management objectives	Federal, state, and private lands	USFS, IDNR, DNR Heritage, private landowners	• Maximize funding sources through integrating fuel projects with other land management goals, including ecological restoration, habitat improvements and recreation, such as trail development that doubles as a fuel break. • Prioritize fire department education and training on wildfire mitigation treatments. • Develop public education materials or an educational campaign expressing the	• Restore degraded landscapes to build a more resilient fire environment.	Within 5 years	H	• Carry out a 2-year review of accomplishments in reducing hazardous fuels and success at meeting other resource management objectives. • Celebrate private landowner accomplishments.	• Acres for wildlife program • Private landowner programs • Funding for Fire Departments and First Responders • Volunteer Fire Assistance Program • Fire Management Assistance Grant (FMAG) • EFRP • Assistance to Firefighters Grants (AFG) • Matching Awards Program

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
			importance of private land management. • Work with IDNR and Demonstration Project to use prescribed fire, invasive species control, forest stand improvement, and selective overstory thinning treatments to encourage oak regeneration. ◦ Consult the oak regeneration plan: *2021 Oak System Recovery: A vision for sustaining oaks in southern Illinois*					• Firewise Communities • Acres for Wildlife Grant • Special Wildlife Funds Grant • Specific EPA Grant Programs • Urban and Community Forestry Grant Program – IL • Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program • National Interagency Fire Center • Environmental Quality Incentives Program (EQIP)
Firewise treatments on individual properties/ structures	Federal, state, and private lands Priority: Private lands in high-risk areas of the WUI Emphasis on treatment within 0 to 30 feet of structure	Federal, state, fire departments, and private landowners	• Conduct Firewise Community-based assessments of individual homes. The professional assessment would help identify the most critical actions that an individual could take. Assessments could also include marking trees and shrubs suggested for removal. • Encourage the use of the Firewise home risk assessment tutorial so landowners can examine their own property. • Emphasize defensible space education, focusing on the immediate zone. Provide Firewise educational materials in public spaces, on social media platforms, and via mail or door-flyer.	• Reduce risk of home ignitions. • Empower homeowners to take the most effective actions. • Allow funding to address a larger number of homes.	Within 2 years	H	• Conduct on-site inspections with owners; identify and mark trees or shrubs for removal within the 100-foot safety zone. • Develop a community task force to carry out assessments of properties. • Develop a community education program. This can help mitigate the lack of personnel and funding within land management agencies.	• National Interagency Fire Center • Firewise Communities • Specific EPA Grant Programs

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
			• Encourage participation in IDNR Forest and Conservation Program Benefits for Private Landowners: https://www2.illinois.gov/ dnr/conservation/CREP/ Documents/MoreInfoComp arisonSheet.pdf#search= FARMLAND%20ASSESS MENT					

Continue to expand private forest management plans. Use as tool to increase fuel reduction and habitat restoration.	County-wide	IDNR	• Carry out strategic outreach to private landowners where there is potential to increase landscape level impacts through actions on adjacent properties.
			 • Educate landowners on tax incentives as part of IDNR land assessment rules
			 • Provide details and guidance on appropriate programs:
			    o Conservation Stewardship Program (CSP)
			    o Forest Development Act (FDA)
			    o Conservation Reserve Enhancement Program (CREP)
			 • Partner with other agencies, consultants, or volunteer organizations to facilitate these programs.
			 • Seek additional funding to increase agency capacity to implement programs.
			 • Create a resident "task force" than can assist in conducting site visits for the above programs.
				• Restore degraded landscapes to build a more resilient fire environment.	Within 2 years	H	• Conduct on-site inspections with owners
							 • Work with landowners to develop a land management plan for their property
							 • Provide landowners with restoration and fire prevention educational materials.
								• National Interagency Fire Center
								 • Firewise Communities
								 • Specific EPA Grant Programs
								 • Staffing for Adequate Fire and Emergency Response
								 • National Fire Protection Association
								 • Illinois Natural Areas Stewardship Grant
								 • Environmental Quality Incentives Program (EQIP)

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
			• Create a monitoring program to track accomplishments to support justification for future funding requests					
Address forest health conditions in conjunction with fuel treatment actions. Promote oak	County-wide	All agencies and private landowners	• Develop an oak regeneration guide for private landowners to implement on their lands. Create or advertise oak educational materials so residents know the warning signs of oak insects and diseases and can implement treatment. • Manage activity fuels in a way that reduces forest insect and disease concerns. • Contain outbreaks of diseases through salvage and removal (oak wilt, emerald ash borer). • Build resiliency of remaining trees through stand improvements and habitat restoration designed to ameliorate the impacts of drought. • Consult the oak regeneration plan: *2021 Oak System Recovery: A vision for sustaining oaks in southern Illinois*	• Restore degraded landscapes to build a more resilient fire environment. • Empower landowners to treat or remove/isolate infested or diseased trees.	Within 2 years	H	• Monitor oak mortality and regeneration rates. • Work with landowners to help them understand the importance of oak regeneration and monitor oak mortality and regeneration on private lands.	• Pre-disaster Mitigation Grant Program • Specific EPA Grant Programs • Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program • The National Fire Plan (NFP) • Fire Management Assistance Grant (FMAG) • EFRP • Environmental Quality Incentives Program (EQIP) • Urban and Community Forestry Grant Program – IL • Illinois Natural Areas Stewardship Grant • State and Private Forestry Grant Programs (NASF) • National Interagency Fire Center • Matching Awards Program • Leonardo DiCaprio Foundation Grants • Patagonia Environmental Grants and Support • U.S. Endowment for Forestry and Communities

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
								• Acres for Wildlife Grant
Integrate weed management and invasive species mitigations into forest management (bush honeysuckle, stilt grass, kudzu)	Federal, state, and private lands	Federal, state, and private landowners	• Work with USFS Shawnee National Forest planning team to incorporate weed and invasive species management into the new Shawnee plans. • Partner with agencies and volunteer groups to implement weed and invasive species treatments. • Promote weed and invasive species education and work with residents to implement treatments on private lands, as well as coordinate restoration workdays to assist in treatment implementation on federal and state lands.	• Restore degraded landscapes to build a more resilient fire environment. • Empower landowners to remove and mitigate invasive weeds and species.	Within 5 years	M	• Carry out a 2-year review of accomplishments in reducing hazardous fuels and success at meeting other resource management objectives. • Celebrate private landowner accomplishments.	• Specific EPA Grant Programs • Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program • The National Fire Plan (NFP) • Fire Management Assistance Grant (FMAG) • EFRP • Environmental Quality Incentives Program (EQIP) • Urban and Community Forestry Grant Program – IL • Illinois Natural Areas Stewardship Grant • State and Private Forestry Grant Programs (NASF) • National Interagency Fire Center • Matching Awards Program • Leonardo DiCaprio Foundation Grants • Patagonia Environmental Grants and Support • U.S. Endowment for Forestry and Communities • Acres for Wildlife Grant

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
Develop recommendations to mitigate rapid fire spread in grassland habitat.	County-wide Prioritize high risk areas as delineated in the risk assessment.	Federal, state, and County land management agencies	• Implement mowing perimeters to prevent fires from spreading. • Increase public education on fire behavior and defensible space.	• Protect life and property by mitigating fuels and protecting structures by decreasing fire's ability to spread. • Ensure the protection of vulnerable ecosystems and values at risk.	Within 2 years	M	• Regular maintenance/mowing needed to ensure the fuel break remains clear of vegetation.	• National Interagency Fire Center • Firewise Communities • Specific EPA Grant Programs • Fire Prevention and Safety Grants (FP&S)
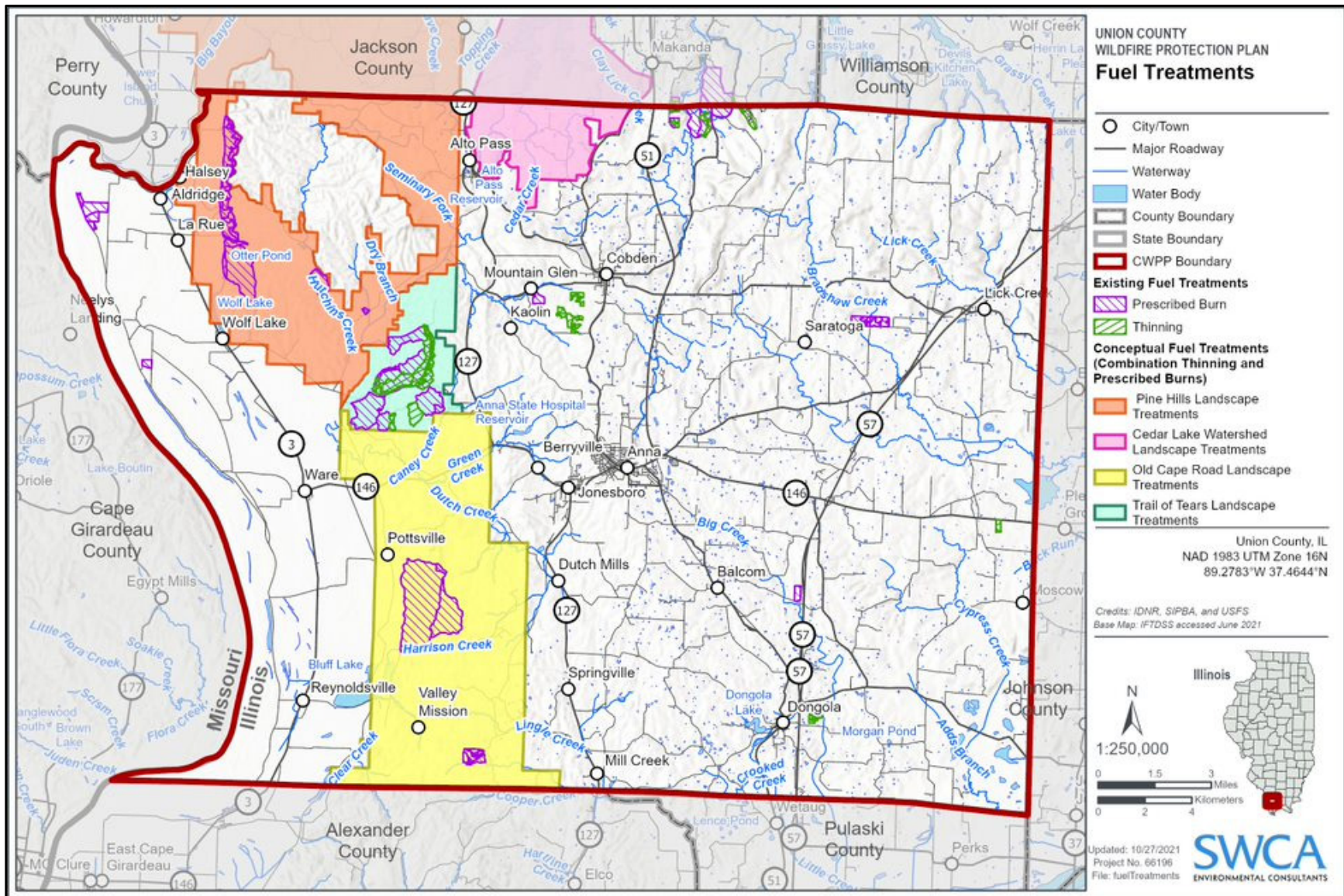
Figure 4.1. Existing and proposed fuel treatments across all jurisdictions.

Fuels Treatment Scales

Defensible Space

Defensible space is perhaps the fastest, most cost-effective, and most efficacious means of reducing the risk of loss of life and property. Although fire agencies can be valuable in providing guidance and assistance, creating defensible space is the responsibility of the individual homeowner (Figure 4.2).
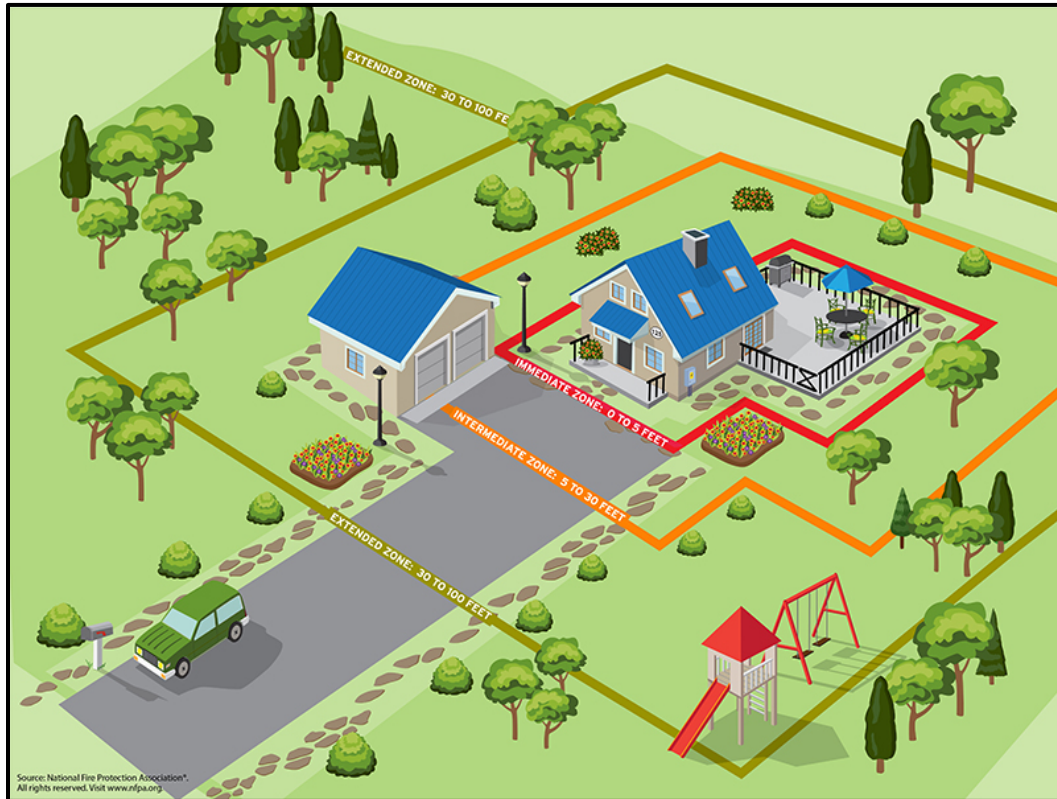
Figure 4.2. Defensible space providing clearance between a structure and adjacent woodland or forest fuels.
Source: Firewise.org.

Effective defensible space consists of creating an essentially fire-free zone adjacent to the home, a treated secondary zone that is thinned and cleaned of surface fuels, and (if the parcel is large enough) a transitional third zone that is basically a managed forest area (Figure 4.2). These components work together in a proven and predictable manner. Zone 1 keeps fire from burning directly to the home; Zone 2 reduces the adjacent fire intensity and the likelihood of torching, crown fire, and ember production; and Zone 3 does the same at a broader scale, keeping the fire intensity lower by maintaining a more natural, historic condition (Figure 4.3).

Three zones for defensible space actions are described. These include:

Zone 1 This zone, which consists of an area of 0 to 30 feet around the structure, features the most intense modification and treatment. This distance is measured from the outside edge of the home's eaves and any attached structures, such as decks. Do not plant directly beneath windows or next to foundation vents. Frequently prune and maintain plants in this zone to ensure vigorous growth and a low growth habit. Remove dead branches, stems, and leaves. Do not store firewood or other combustible materials in this area. Enclose or screen decks with metal screening. Extend gravel coverage under the decks. Do not use areas under decks for storage. Prune low-lying branches (ladder fuels that would allow a surface fire

to climb into the tree) and any branches that interfere with the roof or are within 10 feet of the chimney. In all other areas, prune all branches of shrubs or trees up to a height of 10 feet above ground (or 1/3 the height, whichever is the least).

Zone 2 This zone features fuel reduction efforts and serves as a transitional area between Zones 1 and 3. The size of Zone 2 depends on the slope of the ground where the structure is built. Typically, the defensible space should extend at least 100 feet from the structure. Remove stressed, diseased, dead, or dying trees and shrubs. Thin and prune the remaining larger trees and shrubs. Be sure to extend thinning along either side of your driveway all the way to your main access road. These actions help eliminate the continuous fuel surrounding a structure while enhancing home site safety and the aesthetics of the property. Keep grass and wildflowers under 8 inches in height. Regularly remove leaf and needle debris from the yard.

Zone 3 This area extends from the edge of your defensible space to your property boundaries. The healthiest forest is one that has multiple ages, sizes, and species of trees where adequate growing room is maintained over time, so maintain a distance of at least 10 feet between the tops of trees. Remove ladder fuels, creating a separation between low-level vegetation and tree branches to keep fire from climbing up trees. A greater number of wildlife trees can remain in Zone 3, but regularly remove dead trees and shrubs. Ensure trees in this area do not pose a threat to power lines or access roads.
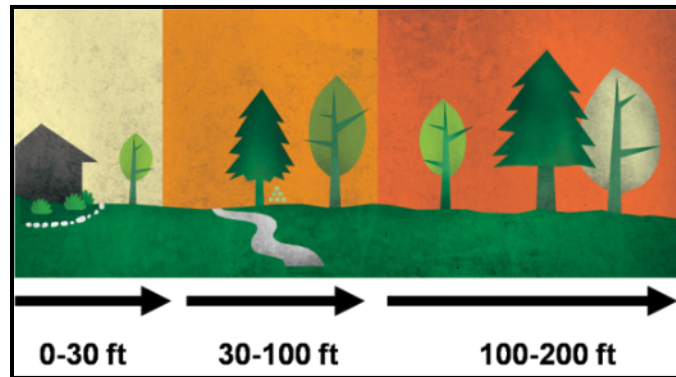
Figure 4.3. Defensible space zones.
Source: www.firewise.org.

It should be emphasized that defensible space is just that—an area that allows firefighters to work effectively and with some degree of safety to defend structures. While defensible space may increase a home's chance of surviving a fire on its own, a structure's survival is not guaranteed, with or without firefighter protection. Nevertheless, when these principles are consistently applied across a neighborhood, everybody benefits.

Specific recommendations should be based on the hazards adjacent to a structure such as slope steepness and fuel type. Firewise guidelines and the Homeowner's Guide (see Appendix G) are excellent resources but creating defensible space does not have to be an overwhelming process. The NFPA offers a free Community Wildfire Risk Assessment Tutorial and an online learning module, Understanding the Wildfire Threat to Homes. Both tools are great resources for learning about, and implementing, defensible space.

Assisting neighbors may be essential in many cases. Homeowners should consider assisting the elderly, sharing ladders for gutter cleaning, and assisting neighbors with large thinning needs. Homeowner actions have been found to also motivate neighbors to act, increasing the scope of the wildfire mitigation across a community (Evans et al. 2015). Adopting a phased approach can make the process more manageable and encourage maintenance (Table 4.2).

The IDNR provides information on wildfire preparedness through its website. For example, news articles during periods of dry and hot weather that discuss wildfire prevention and safety: https://www.dnr.illinois.gov/news/Pages/IDNRUrgesCautiontoPreventWildfires.aspx

Table 4.2. Example of a Phased Approach to Mitigating Home Ignitability

Year	Project	Actions
1	Basic yard cleanup (annual)	Dispose of clutter in the yard and under porches. Remove dead branches from yard. Mow and rake. Clean off roofs and gutters. Remove combustible vegetation near structures. Coordinate disposal as a neighborhood or community. Post 4-inch reflective address numbers visible from road.
2	Understory thinning near structures	Repeat basic yard cleanup. Limb trees up to 6–10 feet. Trim branches back 15 feet from chimneys. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
3	Understory thinning on private property along roads and drainages	Limb trees up to 6–10 feet. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
4	Overstory treatments on private property	Evaluate the need to thin mature or diseased trees. Prioritize and coordinate tree removal within neighborhoods to increase cost effectiveness.
5	Restart defensible space treatment cycle	Continue the annual basic yard cleanup. Evaluate need to revisit past efforts or catch those that were bypassed.

Fuel Breaks and Open Space Cleanup

The next location priority for fuels treatments should be the WUI. This may be the outer margins of a town or an area adjacent to occluded open spaces such as a park. Fuel breaks (also known as shaded fuel breaks) are strips of land where fuel (for example, living trees and brush, dead branches, leaves, or downed logs) has been modified or reduced to limit the fire's ability to spread rapidly. Fuel breaks should not be confused with firebreaks, which are areas where vegetation and organic matter are removed down to mineral soil. Shaded fuel breaks may be created to provide options for suppression resources or to provide opportunities to introduce prescribed fire. In many cases, shaded fuel breaks may be created by thinning along roads. This provides access for mitigation resources and firefighters, as well as enhancing the safety of evacuation routes.

Larger-scale Treatments

Farther away from WUI communities, the emphasis of treatments often becomes broader. While reducing the buildup of hazardous fuels remains important, other objectives are often included, such as forest health and resiliency to catastrophic wildfire and climate change considerations. Wildfires frequently burn across jurisdictional boundaries, sometimes on landscape scales. As such, these larger treatments need to be coordinated on a strategic level. This requires coordination between projects and jurisdictions, as is currently occurring.

Land managers have carried out numerous forest restoration projects across Union County and the southern Illinois region, and have ongoing projects planned on public land that are designed to reduce hazardous fuels to protect communities and resources, while restoring the declining oak-hickory forest community (Figure 4.4 and Figure 4.5). Consideration is needed as part of the wider planning process for landscape level fuel reduction, as to the condition of wilderness areas throughout the Shawnee National Forest and the Trail of Tears State Forest, and the need to implement restoration actions to enhance forest heath in the wilderness.

Figure 4.1 above shows existing fuel treatments that have been completed or planned across the County. This information was provided by the Core Team. The reader is referred to agency websites and the Federal Register (https://www.federalregister.gov/) for the latest information on planned or ongoing actions on federal land within the County.

Public support for landscape projects can often be mixed because some individuals or communities do not perceive the treatments to be effective (Evans et al. 2015). Building public trust is therefore important, and this includes ensuring that federal, state, and local agencies engage the community early and often in the planning process and that science is used to support fuel treatment planning and management decisions.

Figure 4.4. Unit within the Trail of Tears State Forest, pre-thinning treatment.
Photo credit: IDNR

Figure 4.5. Unit within the Trail of Tears State Forest, post-thinning treatment.
Photo credit: IDNR

Fuel Treatment Methods

Since specifics of the treatments are not provided in detail in Table 4.1, different fuels reduction methods are outlined in the following narrative.

Several treatment methods are commonly used, including manual treatments, mechanized treatments, and prescribed fire (Table 4.3). This brief synopsis of treatment options is provided for general knowledge; specific projects will require further planning. The appropriate treatment method and cost will vary depending on factors such as the following:

- Diameter of materials
- Proximity to structures
- Acreage of project
- Fuel costs
- Steepness of slope
- Area accessibility
- Density of fuels
- Project objectives

It is imperative that long-term monitoring and maintenance of all treatments is implemented. Post-treatment rehabilitation such as seeding with native plants and erosion control may be necessary.

Table 4.3. Summary of Fuels Treatment Methods

Treatment	Comments
Machine mowing	Appropriate for large, flat, grassy areas on relatively flat terrain.
Prescribed fire	Can be very cost effective.
	Ecologically beneficial.
	Can be used as training opportunities for firefighters.
	May require manual or mechanical pretreatment.
	Carries risk of escape, which may be unacceptable in some WUI areas.
	Unreliable scheduling due to weather and smoke management constraints.
Brush mastication	Brush species tend to re-sprout vigorously after mechanical treatment.
	Frequent maintenance of treatments are typically necessary.
	Mastication tends to be less expensive than manual (chainsaw) treatment and eliminates disposal issues.
Timber mastication	Materials up to 10 inches in diameter and slopes up to 30% can be treated.
	Eliminates disposal issues.
	Environmental impact of residue being left on-site is still being studied.
Manual treatment with chipping or pile burning	Requires chipping, hauling, pile burning of slash in cases where lop and scatter is inappropriate.
	Pile burning must comply with smoke management policy.
Feller buncher	Mechanical treatment on slopes more than 30% or of materials more than 10 inches in diameter may require a feller buncher rather than a masticator.
	Costs tend to be considerably higher than those of a masticator.

Manual Treatment

Manual treatment refers to crew-implemented cutting with chainsaws. Although it can be more expensive than mechanized treatment, crews can access many areas that are too steep or otherwise inaccessible with machines. Treatments can often be implemented with more precision than prescribed fire or mechanized methods allow. Merchantable materials and firewood can be removed, while nonmerchantable materials are often lopped and scattered, chipped, or piled and burned on-site. Care should be exercised to not increase the fire hazard by failing to remove or treat discarded material in a site-appropriate manner.

Strategic timing and placement of fuels treatments is critical for effective fuels management practices and should be prescribed based on the conditions of each particular treatment area. Some examples of this would be to place fuel breaks in areas where the fuels are heavier and in the path of prevailing winds and to mow grasses just before they cure and become flammable. Also, burning during the hotter end of the prescription is important since hotter fires are typically more effective at reducing heavy fuels and shrub growth. In areas where the vegetation is sparse and not continuous, fuels treatments may not be necessary to create a defensible area where firefighters can work. In this situation, where the amount of fuel to carry a fire is minimal, it is best to leave the site in its current condition to avoid the introduction of exotic species.

Mechanized Treatments

Mechanized treatments include mowing, mastication (ground-up timber into small pieces), and whole tree felling. These treatments allow for more precision than prescribed fire and are often more cost-effective than manual treatment.

Mowing, including all-terrain vehicles and tractor-pulled mower decks, can effectively reduce grass fuels adjacent to structures and along highway rights-of-way and fence lines. For heavier fuels, several different masticating machines can be used, including drum- or blade-type masticating heads mounted on machines and ranging in size from a small skid-steer to large front-end loaders. Some masticators can grind standing timber up to 10 inches in diameter. Other masticators are more effective for use in brush or surface fuels. Mowing and mastication do not actually reduce the amount of on-site biomass but alter the fuel arrangement to a less combustible profile.

For existing fuel breaks, maintenance is crucial, especially in areas of encroaching shrubs or trees. In extreme risk areas, more intensive fuels treatments may be necessary to keep the fire on the ground surface and reduce flame lengths. Within the fuel break, shrubs should be removed, and the branches of trees should be pruned from the ground surface to a height of 4 to 8 feet, depending on the height of the fuel below the canopy, and thinned with a spacing of at least two to three times the height of the trees to avoid movement of an active fire into the canopy.

Mechanical shears mounted on feller bunchers are used for whole tree removal. The stems are typically hauled off-site for utilization while the limbs are discarded. The discarded material may be masticated, chipped, or burned in order to reduce the wildfire hazard and to speed the recycling of nutrients.

Prescribed Burning

Prescribed burning is also a useful tool to reduce the threat of extreme fire behavior by removing excessive standing plant material, litter, and woody debris while limiting the encroachment of shrubby vegetation (Figures 4.6 and 4.7). Where possible, prescribed fire could occur on public land since fire is ecologically beneficial to this fire-adapted vegetation community and wildlife habitat. Permits for open burning are issued by the Illinois Environmental Protection Agency (IEPA), Division of Air Pollution Control, Permit Section. All federal and state agencies must comply with state burning regulations (CAA Sec. 118) (IEPA 2019). In addition to the IEPA regulations, during specific drought fire-risk conditions (typically February, March, April, October, and November), Union County may require that any and all burn permits are issued by an IDNR-designated fire warden. Furthermore, all IDNR fire programs must be implemented by a Certified Burn Boss and follow the requirements of the accompanying burn plan, which must be approved prior to the burn (IFDC 2019). Land managers are already cooperating to implement prescribed burning in Union County.

All prescribed fire operations will be conducted in accordance with federal and state laws and regulations. Public safety would be the primary consideration in the design of any prescribed burn plan so as to not negatively impact the WUI. The areas to be burned would occur within fuel breaks or appropriate fire lines (USFS 2015). Agency use of prescribed fire on public land would be carried out within the confines of the agency's fire management planning documents and would require individual prescribed burn plans that are developed for specific burn units and consider smoke management concerns and sensitive receptors within the WUI. Smoke monitors could be placed in areas where smoke concerns have been raised in the past.

Following any type of fuels reduction treatment, post-treatment monitoring should continue to ensure that management actions continue to be effective throughout the fire season. The vegetation within this ecosystem can change rapidly in response to drought or moisture from year to year and during the course of the season, so fuels treatments should be adjusted accordingly.

Several re-entries may be needed to meet full resource management objectives, so a solid maintenance plan is needed to ensure success.

Impacts of Prescribed Fire on Communities

Managing smoke from prescribed fires is becoming an important part of planning for prescribed burning. The State of Illinois has smoke management guidelines that must be followed by landowners planning to use prescribed burning on their properties. In 2009, the IEPA released the Illinois Smoke Management Plan (IEPA 2009). Described in the plan are ways in which fire can be used as a land management plan, compliance and responsibilities, environmental laws and regulations, authorization and preparation of

burning, actions to minimize smoke impacts, identification of smoke sensitive populations, weather considerations, surveillance and enforcement, and more (IEPA 2009). The plan suggests utilizing different firing or ignition techniques to minimize smoke emissions while accomplishing burn objectives (IEPA 2009). To learn more about firing techniques, visit the EFIRE Fire Techniques webpage: https://efire.cnr.ncsu.edu/efire/fire-techniques/.

In addition, the NWCG released the NWCG Smoke Management Guide for Prescribed Fire in 2020 (NWCG 2020). This plan is designed to act as a guide to all those who use prescribed fire. Smoke management techniques, air quality regulations, public perception of prescribed fire, foundational science behind prescribed fire, modeling, smoke tools, air quality impacts, and more are all discussed in this plan. The document is meant to pair with NWCG's Interagency Prescribed Fire Planning and Implementation Procedures Guide for planning and addressing smoke when prescribed fire is used (NWCG 2020). To view the plan, please visit: https://www.nwcg.gov/sites/default/files/publications/pms420-3.pdf.

The Illinois Pollution Control Board and the IEPA regulate open burning in the state. Land managers must complete an open burn permit application that outlines standard conditions for open burning. Please see the following for more information on burn permitting: https://www2.illinois.gov/epa/topics/forms/air-permits/Pages/default.aspx.

Prescribed fires can have impacts on air quality that may impact local communities. Impacts on a regional scale are typically only acute when many acres are burned on the same day, which is rare in this region. Local problems are occasionally acute due to the large quantities of smoke that can be produced in a given area during a short period of time. Residents with respiratory problems may be impacted during these burning periods since smoke consists of small particles of ash, partly consumed fuel, and liquid droplets that are considered air pollutants. Other combustion products include invisible gases such as carbon monoxide, carbon dioxide, hydrocarbons, and small quantities of nitrogen oxides. Oxides of nitrogen are usually produced at temperatures only reached in piled or windrowed slash or in very intense wildfires that are uncommon in the region. In general, prescribed fires produce inconsequential amounts of these gases.

Effects of smoke can be managed by burning on days when smoke will blow away from smoke-sensitive areas. Precautions are taken when burning near populated areas, highways, airports, and other smoke-sensitive areas. Any smoke impact downwind is considered before lighting a fire. Smoke management is a significant component of all prescribed burn plans. Other mitigating actions include alerting the public of upcoming burning activities, including the purpose, best conditions for ensuring good smoke dispersal, duration, size, and location of projects. Local radio, newspapers, social media, and TV can provide broad coverage for alerts. Land management agencies in the project area consistently work with concerned citizens regarding smoke management and attempt to provide solutions such as the placement of smoke monitors at sensitive sites.

Burning across Borders

The Shawnee National Forest has, for the last 12 years, been using Participating Agreements, under the Wyden Authority, to enlarge burn units onto non-federal lands to expand the benefits of prescribed fire to those lands, capitalize on the economy of scale, and use existing features as control lines to speed or improve burn preparation and implementation. Building a network of private landowners and collaborating and informing those landowners has required development of an extensive network of organizations, including the IDNR, Southern Illinois Prescribed Burn Association (SIPBA), the River to River Cooperative Weed Management Area (CWMA), and Shawnee Resource Conservation and Development, Inc (RC&D).

Figure 4.6. Forested area showing the results of prescribed fire (left side of the road) compared to an untreated stand (right side of the road).

Photo credit: IDNR

Figure 4.7. Example of a backing fire used during a prescribed burn.

Photo credit: IDNR

Thinning and Prescribed Fire Combined

Combining thinning and prescribed fire can be the most effective treatment (Graham et al. 2004). In forests where fire exclusion or disease has created a buildup of hazardous fuels, prescribed fire cannot be safely applied, and pre-burn thinning is required. The subsequent use of fire can further reduce residual fuels and reintroduce this ecologically imperative process.

Management of Non-native Plants

The USDA maintains a list of noxious weeds rated from A to C based on the current degree of infestation of the species and the potential for eradication (USDA 2010). Fuel treatment approaches should always consider the potential for introduction or proliferation of invasive non-native species as a result of management actions.

The River to River CWMA is a partnership between 13 federal and state agencies, organizations, and universities aimed at coordinating efforts and programs for addressing the threat of invasive plants in southern Illinois (River to River CWMA 2019a). The River to River CWMA is an active stakeholder in the CWPP planning process. The Nature Conservancy, in partnership with the IDNR, and the USFS Northeast Area State and Private Forestry Program developed the Southern Illinois Invasive Species Strike Team (ISST) (formally known as the Southern Illinois Exotic Plant Strike Team) to control exotic plants in state parks, state nature preserves, and adjacent private lands that serve as pathways onto these properties (River to River CWMA 2019b). Both the River to River CWMA and ISST are active partners in land management in Union County and should continue to play a significant role in planning and implementing invasive species control. Lands are treated by both the River to River CWMA and ISST using chemical treatment, manual treatment, and prescribed fire, with the methodology depending on the land ownership, resource issues, target species, and project objectives (River to River CWMA 2019a).

Non-native species found within the project area include Japanese chaff flower (*Achyranthes japonica*), Japanese knotweed (*Polygonum cuspidatum*), garlic mustard (*Alliaria petiolata*), sericea lespedeza (*Lespedeza cuneata*), cutleaf teasel (*Dipsacus laciniatus*), common teasel (*Dipsacus fullonum*), Japanese hop (*Humulus japonicus*), Chinese yam (*Dioscorea oppositifolia*), Oriental bittersweet (*Celastrus orbiculatus*), winter creeper (*Euonymus fortunei*), Japanese honeysuckle (*Lonicera japonica*), Amur honeysuckle (*Lonicera maackii*), autumn olive (*Elaeagnus umbellata*), privet (*Ligustrum* spp.), burningbush (*Euonymus alatus*), multiflora rose (*Rosa multiflora*), princesstree (*Paulownia tomentosa*), Callery pear (*Pyrus calleryana*), tree of heaven (*Ailanthus altissima*), Japanese stiltgrass (*Microstegium vimineum*), reed canarygrass (*Phalaris arundinacea*), and common reed (*Phragmites australis*) (Lamaster and Seaton 2020).

Fuel Breaks

Fire behavior in the CWPP planning area has been modeled using FlamMap. This assessment provides estimates of flame length and rate of spread; the information should be used by land managers when prescribing treatments. Land managers are cautioned, however, that fuel breaks will not always stop a fire under extreme fire behavior or strong winds; these should only be seen as a mitigating measure and not a fail-safe method for fire containment. Furthermore, fuel break utility is contingent upon regular maintenance, as regrowth in a fuel break can quickly reduce its effectiveness and vegetation in this ecosystem is known to quickly re-sprout and reestablish. Maintenance of existing breaks could be more cost efficient than installation of new features.

It is not possible to provide a standard treatment prescription for the entire landscape because fuel break dimensions should be based on the local fuel conditions and prevailing weather patterns. For example, in some areas, clearing an area too wide could open the landscape to strong winds that could generate more intense fire behavior and/or create wind throw.

Strategic placement of fuel breaks is critical to prevent fire from moving from wildland fuels into adjacent neighborhoods. For effective management of most fuels, fuel breaks should be prescribed based on the conditions in each treatment area. Some examples of this would be to place fuel breaks in areas where fuels are heavier or in areas with easy access for fire crews. In areas where the vegetation is

discontinuous, fuel treatments may not be necessary. In this situation, it is best to leave the site in its current condition to avoid the introduction of more flammable, exotic species, which may respond readily following disturbance.

Well-managed fuels reduction projects often result in ecological benefits to wildlife and watershed health. Simultaneously, planning and resource management efforts should occur when possible while reducing fuels to ensure that the land remains viable for multiple uses in the long term. The effectiveness of any fuels reduction treatment will increase over time with a maintenance and monitoring plan. Monitoring will also ensure that objectives are being met in a cost-effective manner.

COHESIVE STRATEGY GOAL 2: FIRE-ADAPTED COMMUNITIES

Goal 2 of the Cohesive Strategy/Northeast Regional Action Plan (NRSC 2015) is Fire-Adapted Communities: Human populations and infrastructure can withstand a wildfire without loss of life and property. Management options for Goal 2 as outlined in the Northeast Regional Action Plan (NRSC 2015:11) include:

- Regional Option 2A: Focus on promoting and supporting local adaptation activities to be taken by communities such as increasing capacity of volunteer fire departments, passing ordinances, developing CWPPs, and joining Firewise Communities/USA® or other similar programs.

- Regional Option 2B: Focus on directing hazardous fuel treatments in the WUI. Treatments of WUI land should provide a broader area of effective protection and reduced risk.

- Regional Option 2C: Focus on promoting and supporting prevention programs and activities (targeting them toward reducing when and where fires occur).

In this CWPP, recommendations for fire-adapted communities include public education and outreach actions and actions to reduce structural ignitability.

RECOMMENDATIONS FOR PUBLIC EDUCATION AND OUTREACH

Just as environmental hazards need to be mitigated to reduce the risk of fire loss, so do the human hazards. Lack of knowledge, lack of positive actions, and negative actions all contribute to increased risk of loss in the WUI. Many Union County residents perceive themselves to be at low or medium risk of wildfire because of the low incidence of wildfire starts over the last several decades. However, it is important to continually raise awareness of fire risk and improve fire education, particularly since the County is composed of such a vast area of forested public land that historically would have undergone more frequent wildfire (McCaffrey 2004; Winter and Fried 2000).

Table 4.4 lists recommendations for improving public education and outreach.

Many residents could benefit from greater exposure to the [Firewise Communities](#) (NFPA 2021), [Fire Adapted Communities](#) (Fire Adapted 2021), and [Ready, Set, Go!](#) (Ready Set Go! 2021) programs. Workshops demonstrating and explaining Firewise Communities principles have been suggested to increase homeowner understanding of home protection from wildfire. Greater participation in these programs could improve local understanding of wildfire and, in turn, improve protection and preparedness.

Other methods to improve public education include increasing awareness about fire department response and fire department resource needs; providing workshops at demonstration sites showing Firewise Communities landscaping techniques or fuels treatment projects; organizing community cleanups to remove green waste; publicizing availability of government funds for thinning and prescribed burning; and, most importantly, improving communication between homeowners and local land management agencies to improve and build trust, particularly since the implementation of fuel treatments and better maintenance of existing treatments needs to occur in the interface between public and private lands.

Recommendations for improving public education and outreach, along with measures to reduce structural ignitability, are included in Table 4.4.

Union County does not currently offer many wildland fire education or outreach programs. It is recommended the County implement more programs in the near future to involve the community in land management goals and objectives.

RECOMMENDATIONS FOR REDUCING STRUCTURAL IGNITABILITY

Table 4.4 provides a list of community-based recommendations to reduce structural ignitability that should be implemented throughout the UCCWPP planning area. Reduction of structural ignitability depends largely on public education that provides homeowners the information they need to take responsibility for protecting their own properties. A list of action items that individual homeowners can follow can be found below. Carrying out fuels reduction treatments on public land may only be effective in reducing fire risk to some communities; however, if homeowners have failed to provide mitigation efforts on their own land, the risk of home ignition remains high, and firefighter lives are put at risk when they carry out structural defense.

Preparing for wildland fire by creating defensible space around the home is an effective strategy for reducing structural ignitability. Studies have shown that burning vegetation beyond 120 feet of a structure is unlikely to ignite that property through radiant heat (Butler and Cohen 1996), but fire bands that travel independently of the flaming front have been known to destroy houses that had not been impacted by direct flame impingement. Hardening the home to ignition from embers, including maintaining vent coverings and other openings, is also strongly advised to protect a home from structural ignitability.

Removing weeds and debris within a 30-foot radius and keeping the roof and gutters of a home clean are two methods for creating defensible space. Educating people about the benefits of properly maintaining their properties—pruning and trimming trees and shrubs, removing trees and other vegetation where warranted, and using Firewise landscaping methods—is also essential for successful home protection.

It is important to note that no two properties are the same. Homeowners and communities are encouraged to research which treatments would have the most effect for their properties. Owners of properties on steep slopes, for example, should be aware that when constructing defensible space, they have to factor in slope and topography, which would require extensions to the conventional 30-foot recommendations. A number of educational programs are now available to homeowners through programs like Ready, Set, Go! (http://www.wildlandfirersg.org), Firewise (www.firewise.org), and the Northeast Wildfire Preparedness Resource Guide (NRSC 2019). In addition, the NFPA offers a free Community Wildfire Risk Assessment Tutorial and an online learning module, Understanding the Wildfire Threat to Homes. Both tools are great resources for learning about, and implementing, defensible space and structural ignitability mitigation actions. More detailed information on reducing structural ignitability can also be found in Appendix G.

Some structural ignitability hazards are related to homes being in disrepair, vacant or abandoned lots, and minimal yard maintenance. In order to influence changes in homeowner behavior, County ordinances may be needed.

Table 4.4. Recommendations for Creating Fire Adapted Communities (Public Education and Outreach and Reducing Structural Ignitability)

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
Identify vulnerable populations located in the WUI	County-wide Prioritize high risk areas as delineated in the risk assessment.	Fire departments, community leaders	• The County needs to identify vulnerable populations (elderly, disabled, low income) who may need additional help to mitigate home hazards and to evacuate during a wildfire. • Seek grant opportunities to support assistance for vulnerable populations. • Set up a network – phone tree- for elderly assistance • Local Departments - get location- flag addresses – folks who need assistance • Coordinate with residents or volunteer groups to have volunteer workdays, focusing on aiding vulnerable community members.	• Protect life and property of the most vulnerable members of the community.	Within 2 years	H	• Annual review of number of actions taken to address vulnerable populations	• Pre-disaster Mitigation Grant Program • Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program • Catalog of Federal Funding Sources; Land Resources • Emergency Management Performance Grant (EMPG) • Regional Catastrophic Preparedness Grants • Urban and Community Forestry Grant Program – IL • Illinois Natural Areas Stewardship Grant • State and Private Forestry Grant Programs (NASF) • National Fire Protection Association

Identify priority ignition concerns.	Prioritize high risk areas as delineated in the risk assessment. Primarily private lands	Public agencies, fire departments, County emergency management	• Utilize fire history data to identify areas with frequent fire starts and develop strategy to reduce incidence of ignitions.
			• Convene a working group to develop strategies to promote the use of defensible space and home hardening:
			   o Education campaign
			   o Signage
			   o Homeowner fire response or land management plans
			   o Law enforcement
				• Reduce unnecessary ignition.	Within 3 years	H	• Annual evaluation of priority ignition concerns.
							• 5-year re-run of risk assessment to determine success in mitigating hazards.
							• Review fire history data on a 2-year frequency to monitor trends.
								• Firewise Communities
								• National Interagency Fire Center
								• Illinois Natural Areas Stewardship Grant

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
Enhance evacuations	All communities where appropriate. Prioritize high risk areas as delineated in the risk assessment.	Fire department County emergency management	• Identify parcel-owners along primary evacuation routes. • Seek grant opportunities to support priority project implementation. • Provide community members with evacuation protocols. • Promote the use of Union County's emergency alert system, Hyper-Reach. • Develop a plan to effectively utilize a Community Emergency Response Team (CERT) program. • Identify the evacuation needs for vulnerable populations in the County. • Identify evacuation protocols for pets and livestock.	• Fuel treatments adjacent to roads can reduce fire behavior along important travel routes used for ingress by emergency vehicles and egress by residents. • Protect life and lessen high risk fire behavior along important roads.	Within 2 years	H	• Annual Maintenance • Annual updates to education and evacuation materials.	• Pre-disaster Mitigation Grant Program • Firewise Communities • Emergency Management Performance Grant (EMPG) • Regional Catastrophic Preparedness Grants • State and Private Forestry Grant Programs (NASF)
Implement a comprehensive education campaign	All communities where appropriate. Prioritize high risk areas as delineated in the risk assessment.	The County, fire departments, private landowners	• Offer hands-on workshops to highlight individual home vulnerabilities and how-to techniques to reduce ignitability of common structural elements. • Increase education through community training classes as well as YouTube videos on defensible space, fire safe landscaping, structural hardening components, and WUI building construction requirements. • Create or purchase wildfire education documents to distribute. • Create educational materials on evacuations.	• Reduce wildfire risk through community action. • Protect communities and infrastructure by raising awareness of local citizens and those traveling in the area about actions that can prevent fires.	Within 2 years	H	• Yearly updates to the materials	• Ready, Set, Go! Grants • Fire Prevention and Safety grant • Pre-disaster Mitigation Grant Program • Specific EPA Grant Programs • Firewise Communities • Fire Management Assistance Grant (FMAG) • Urban and Community Forestry Grant Program – IL • Illinois Natural Areas Stewardship Grant • National Interagency Fire Center • Patagonia Environmental Grants and Support

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
			• Focus on events that draw all populations from the region with a focus on populations at risk • Ensure that all interactions result in follow up engagement by collecting contact information for residents interested in action. • Provide a printed list of mitigation measures to homeowners. Utilize Ready, Set, GO! Literature. Utilize list of actions broken down by cost. • Use existing signage to spread seasonally adjusted fire prevention messages along highways and in public open space areas to reduce human ignitions. • Promote the use of existing electronic signs at firehouses and other locales to display fire prevention information, safety messages, and fire danger ratings linked to safety actions. • Convey to a homeowner – what are the fire departments looking at when triaging home? Have homeowners go through the list ahead of time.					• U.S. Endowment for Forestry and Communities
Increase Structure Hardening	County-wide Prioritize high risk areas as delineated in the risk assessment.	Fire departments, private landowners	• Continue to develop and adopt the latest building standards and codes. • Retrofit existing structures. • Research and utilize new law to help with retrofits.	• Reduce wildfire risk and loss of structures through home hardening and community education.	Within 3 years	M	• Annual updates to standards as necessary.	• Pre-disaster Mitigation Grant Program • Specific EPA Grant Programs • Firewise Communities • Fire Management Assistance Grant (FMAG)

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
			• Develop a home inspection program which includes information on risk reduction. • Promote the use of tax breaks as incentives for structure hardening. • Send surveys to homeowners to inform the fire department and other groups about public perceptions of risk, as well as priority areas in which to focus efforts. • Open a line of dialogue between the fire department and residents regarding actions they can take to reduce their wildfire risk. • Target efforts on areas with older construction. • Have a fair or meeting that is with vendors-electricians, property management companies, yard service, tree service. In person or virtual. • Partner with the Red Cross to promote use and maintenance of smoke alarm and carbon monoxide alarms. • Outreach to local companies that do landscaping. Offer training on creating fire adapted communities as they work with clients on gardening. • Provide education on what species to plant.					• Urban and Community Forestry Grant Program – IL • Illinois Natural Areas Stewardship Grant • National Interagency Fire Center • Patagonia Environmental Grants and Support • U.S. Endowment for Forestry and Communities

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources

Improve enforcement of Defensible Space standards.	Private land
	
	Prioritize high risk areas as delineated in the risk assessment.
		Fire departments, private landowners	• Create a defensible space program. Include pre-determined inspection frequency and education/outreach efforts.
			• Develop staffing plan to support enforcement and seek funding to implement the plan – may need to rely on volunteers and private landowners.
			• Educate homeowners on real actions that could mitigate their wildfire hazard and risk via NFPA programs:
			  o https://www.nfpa.org/ Public-Education/Fire-causes-and-risks/ Wildfire/Firewise-USA/Online-learning-opportunities/ Community-Wildfire-Risk-Assessment-Tutorial and
			  o https://www.nfpa.org/-/media/Files/Firewise/ Get-started/ FirewiseCommAssess .ashx
			• Promote awareness of tax incentives for defensible space actions and land management plans via IDNR Forest and Conservation Programs with benefits for Private Landowners: https://www2.illinois.gov/ dnr/conservation/CREP/ Documents/MoreInfoComp arisonSheet.pdf#search= FARMLAND%20ASSESS MENT
				• Reduce loss of life and structures through defensible space.	Within 2 years	H	• Annual program evaluation and updates as necessary.	• Firewise Communities
								• Pre-disaster Mitigation Grant Program
								• Fire Prevention and Safety Grants (FP&S)
								• Fire Management Assistance Grant (FMAG)
								• EFRP
								• Illinois Natural Areas Stewardship Grant
								• National Interagency Fire Center
								• U.S. Endowment for Forestry and Communities

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
			• Work with insurance companies to determine the potential to provide incentives for defensible space associated with reduced insurance premiums. • Increase green waste pickup/disposal options.					

Improve sustainability of mitigation actions by residents.	County-wide	County, private landowners	• To encourage engagement in mitigation actions and sustain engagement, entities should:
			  o Provide recognition and incentives
			  o Assist and facilitate actions by providing services for treating and removing slash
			  o Identify barriers to engagement and address
			• Partner with non-governmental organizations and volunteer organizations to increase manpower
			• Promote and encourage homeowner education programs and materials such as NFPA, Firewise, and the Fire Adapted Communities Learning Network
			• Track progress and identify areas requiring support
				• Increase sustainability for mitigation actions and combat fatigue amongst residents.	Within 3 years	H	• Annual evaluation of program effectiveness and updates as necessary.
							• Accomplishment tracking through platform created to track cross-boundary concerns.
							• Regularly update content to keep messaging fresh and relevant.
								• Firewise Communities
								• National Interagency Fire Center
								• State and Private Forestry Grant Programs (NASF)

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
Increase staffing to address wildfire mitigation workload.	Prioritize understaffed programs that provide the most impact.	IDNR	• Create a full-time position to focus on wildfire mitigation, community relations, community education, coordinating with resident groups and implementing actionable items. Pursue continuous and repeat interactions with residents.	• Reduce wildfire risk through greater capacity in the County for wildfire projects.	Within 3 years	H	• Annual assessment of capacity needs.	• Pre-disaster Mitigation Grant Program • Staffing for Adequate Fire and Emergency Response • Funding for Fire Departments and First Responders
Improve agency coordination on outreach efforts for both private and public audience.	County-wide	All agencies, insurance brokers	• Agency coordinated meeting to ensure a consistent message. • Develop a platform for raising cross-boundary issues. • Engaging insurance agency in dialogue. • Provide incentives for mitigation actions. • Work with the Big Rivers Forest Fire Management Compact (BRFFMC) to coordinate on messaging for fire prevention.	• Provides a consistent message regarding wildfire activity, fire prevention goals, actions for homeowners. • Reduce redundancy and improve efficiency. • Align insurance company requirements with County codes and ordinances. • Possible incentives of homes that have completed wildfire mitigation.	Within 3 years	H	• Annual agency coordination meeting to assess priorities and action items.	• N/A

Action Items for Homeowners to Reduce Structural Ignitability

Low or No Cost Investment (<$50)	Regularly check fire extinguishers and have a 100-foot hose available to wet perimeter.
	Maintain defensible space for 30 feet around home. Work with neighbors to provide adequate fuels mitigation in the event of overlapping property boundaries.
	Make every effort to keep lawn mowed and green during fire season.
	Screen vents with non-combustible meshing with mesh opening not to exceed nominal ¼-inch size.
	Ensure that house numbers are easily viewed from the street.
	Keep wooden fence perimeters free of dry leaves and combustible materials. If possible, non-combustible material should link the house and the fence.
	Keep gutters free of vegetative litter. Gutters can act as collecting points for fire brands and ashes.
	Store combustible materials (firewood, propane tanks, grills) away from the house; in shed, if available.
	Clear out materials from under decks and/or stacked against the structure. Stack firewood at least 30 feet from the home, if possible.
	Reduce your workload by considering local weather patterns. Because prevailing winds in the area are often from the west-southwest, consider mitigating hazards on the west corner of your property first, then work around to cover the entire area.
	Seal up any gaps in roofing material and enclose gaps that could allow fire brands to enter under the roof tiles or shingles.
	Remove flammable materials from around propane tanks.
Minimal Investment (<$250)	When landscaping in the home ignition zone (approximately 30 feet around the property), select non-combustible plants, lawn furniture, and landscaping material. Combustible plant material like junipers and ornamental conifers should be pruned and kept away from siding. If possible, trees should be planted in islands and no closer than 10 feet to the house. Tree crowns should have a spacing of at least 18 feet when within the home ignition zone. Vegetation at the greatest distance from the structure and closest to wildland fuels should be carefully trimmed and pruned to reduce ladder fuels, and density should be reduced with approximately 6-foot spacing between trees crowns.
	Box in eaves, attic ventilation, and crawl spaces with non-combustible material.
	Work on mitigating hazards on adjoining structures. Sheds, garages, barns, etc., can act as ignition points to your home.
	Enclose open space underneath permanently located manufactured homes using non-combustible skirting.
	Clear and thin vegetation along driveways and access roads so they can act as a safe evacuation route and allow emergency responders to access the home.
	Purchase or use a National Oceanic and Atmospheric Administration weather alert radio to hear fire weather announcements.

Moderate to High Investment (>$250)	Construct a non-combustible wall or barrier between your property and wildland fuels. This could be particularly effective at mitigating the effect of radiant heat and fire spread where 30 feet of defensible space is not available around the structure.
	Construct or retrofit overhanging projections with heavy timber that is less combustible.
	Replace exterior windows and skylights with tempered glass or multilayered glazed panels.
	Invest in updating your roof to non-combustible construction. Look for materials that have been treated and given a fire-resistant roof classification of Class A. Wood materials are highly combustible unless they have gone through a pressure-impregnation fire-retardant process.
	Construct a gravel turnaround in your driveway to improve access and mobilization of fire responders.
	Treat construction materials with fire-retardant chemicals.
	Install a roof irrigation system.
	Replace wood or vinyl siding with nonflammable materials.
	Relocate propane tanks underground.

COHESIVE STRATEGY GOAL 3: WILDFIRE RESPONSE

Goal 3 of the Cohesive Strategy/Northeast Regional Action Plan is Wildfire Response:
All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions. Management options for Goal 3, as outlined in the Northeast Regional Action Plan (NRSC 2015:11) include:

- Regional Option 3A: Improve the organizational efficiency and effectiveness of the wildland fire community (pre-suppression and preplanning, administration). Areas to address include:

- Developing memorandums of understanding and memorandums of agreement.

  o Standardizing and streamlining training.
  o Ensuring radio compatibility and interoperability.
  o Identifying appropriate suppression and detection responsibilities regardless of land ownership through agreements or contracts.
  o Sharing personnel (co-funding or contracting).

- Regional Option 3B: Increase the local response capacity for initial attack of wildfires.

- Regional Option 3C: Further develop shared response capacity for extended attack and managing wildfire incidents with long-duration fire potential.

This section provides recommended actions that jurisdictions could undertake to improve wildfire response.

RECOMMENDATIONS FOR IMPROVING FIRE RESPONSE CAPABILITIES

The Union County community is dependent on hard-working volunteer firefighters to provide fire response, and many of these volunteers also have full-time employment outside of their firefighting responsibilities. Educating the public in order to reduce dependence on fire departments is essential because these resources are often stretched thin due to limited personnel.

Table 4.5 provides recommendations for improving firefighting capabilities. Many of these recommendations are general in nature as similar issues exist across all departments and all communities.

Table 4.5. Recommendations for Safe and Effective Wildfire Response

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
Coordinate needed water infrastructure improvements for fire response	Southeast Quadrant, Old Highway 51 West and East, Beach Grove Road, Alto Pass West and East, Cobden and Surrounds, Jonesboro and Surrounds, Highway 127 West, Lick Creek North	County, fire departments, water districts	• Develop a coordinated approach between the fire department and water district to identify needed improvements to the water distribution system, initially focusing on areas of highest wildfire hazard as determined in the risk assessment and areas with limited water pressure or no existing water supply. • Initiate a detailed study of feasible locations for water development improvements. • Install hand pumps or other methods independent of the grid for accessing private well water. • Annual meeting of water districts to identify needs. • Use grant programs to increase water storage capabilities and fire response water storage equipment.	• Improve fire-fighting response if water is more readily available. • Alleviates public and agency concern for limited water supply in some WUI areas	Within 2 years	H	• Convene annually • Document number of meetings held • Document number of actions taken	• Pre-disaster Mitigation Grant Program • Volunteer Fire Assistance Program • CIGs • Fire Prevention and Safety Grants (FP&S) • Small Equipment Grant Program • Urban and Community Forestry Grant Program – IL • Illinois Natural Areas Stewardship Grant • GSA-Federal Excess Personal Property • Catalog of Federal Funding Sources; Water Resources
Address equipment, personal protective equipment, and communication needs	County-wide	County, fire departments	• Apply for funding to acquire needed structural and wildland PPE, suppression gear, communication devices, etc. that meet current safety standards. • Apply for funding to upgrade communication devices to digital.	• Improve the safety of firefighters and improve their ability to respond to fires by having working communication devices and equipment.	Within 2 years	H	• Continuously log fires with IDNR to increase funding chances. • Maintain a running list of wildland PPE needs. • Actively apply for funding programs.	• CIGs • Funding for Fire Departments and First Responders • Volunteer Fire Assistance Program • Small Equipment Grant Program • Urban and Community Forestry Grant Program – IL

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
								• State and Private Forestry Grant Programs (NASF) • GSA-Federal Excess Personal Property
Develop strategies to enhance safe wildfire response in areas with poor ingress and egress.	Prioritize high risk areas as delineated in the risk assessment.	State and federal agencies, fire departments	• Address narrow access concerns for wildfire apparatus through road improvements, new egress points, or development of response plans. • Identify alternative apparatus for access into narrow areas. • Identify potential areas that threaten entrapment of response crews and develop response plans, safety zones, and/or vegetation buffers. • Identify areas with limited all-weather access and develop response plan.	• Improve fire-fighting response if smaller more agile vehicles are available to navigate narrow unimproved roads	Within 2 years	H	• Maintain vegetation buffers if implemented.	• CIGs • Funding for Fire Departments and First Responders • Volunteer Fire Assistance Program • Small Equipment Grant Program • Urban and Community Forestry Grant Program – IL • State and Private Forestry Grant Programs (NASF) • GSA-Federal Excess Personal Property • Pre-disaster Mitigation Grant Program • Specific EPA Grant Programs • Catalog of Federal Funding Sources; Land Resources • Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program • Illinois Natural Areas Stewardship Grant • Hazard Mitigation Grant Program (HMGP) • EFRP • Matching Awards Program

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
Implement wildfire response trainings within local fire departments	County-wide	Fire departments	• Utilize the Annual Fire Academy in Carterville for trainings. • Work with state and federal agencies to conduct trainings. • Work with the BRFFMC to promote interagency wildfire education and workshops. • Host county-wide fire department training sessions.	• Improve firefighting response in the event of a wildland fire.	Within 3 years	H	• Maintain a system which keeps track of what training programs firefighters have completed, such as the Office of the Illinois State Fire Marshal training tracker tool: https://www2.illinois.gov/sites/sfm/CurrentFocus/Pages/New-Training-Tracking-Tool-for-Illinois-Firefighters.aspx	• National Wildlife Coordinating Group training scholarships • Funding for Fire Departments and First Responders • Volunteer Fire Assistance Program • State and Private Forestry Grant Programs (NASF) • Esri • Assistance to Firefighters Grants (AFG)
Solidify a coordination plan for all fire departments (County, State, and Federal)	County-wide	All agencies	• Initiate an annual pre-season coordinated training/wildland fire drills to improve communication between departments. • Develop Unified Command and communication plans • Develop WUI pre-plans and accompanying evacuation plans for high-risk communities as identified in the risk assessment. • Implement mock evacuations on communities identified as high risk. • Develop protocols to address weaknesses.	• Facilitates communication and collaboration between jurisdictions	Within 3 years	H	• Initiate a standing annual review and annual meetings of departments. • At meeting set goals and review goals	• Pre-disaster Mitigation Grant Program • National Wildlife Coordinating Group training scholarships • Funding for Fire Departments and First Responders • Volunteer Fire Assistance Program • State and Private Forestry Grant Programs (NASF) • Esri • Assistance to Firefighters Grants (AFG) • Emergency Management Performance Grant (EMPG) • Regional Catastrophic Preparedness Grants • Urban and Community Forestry Grant Program – IL • Illinois Natural Areas Stewardship Grant

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
								• State and Private Forestry Grant Programs (NASF)
Increase the number of "red-carded" individuals in all fire departments	County-wide	Fire departments	• NWCG Basic Wildland Fire Fighting and Fire Behavior, S-130/S-190 classes to all personnel every Fall with an option to attend on weekends. • Provide minimum wildland PPE for all firefighters.	• Provide for safe and effective wildfire response	Within 8 years	L	• Annual review of training opportunities and barriers to attendance	• CIGs • Funding for Fire Departments and First Responders • Volunteer Fire Assistance Program • Small Equipment Grant Program • Urban and Community Forestry Grant Program – IL • State and Private Forestry Grant Programs (NASF) • GSA-Federal Excess Personal Property

Develop and coordinate an online comprehensive emergency preparedness, response, and recovery plan for wildfire for the whole Shawnee Region.	Regional (all counties with Shawnee NF lands)	Fire departments and County emergency management agencies	• Create an online dashboard for use by emergency management agency decision support. This dashboard can be utilized for all emergencies, such as flooding, rather than just wildfire.
			• Dashboard would be created in a Story Map or "Hub" format and would include:
			  ○ Break dashboard into sections of the emergency management cycle: preparedness, response, recovery
			  ○ Identify roles and responsibilities for each agency/partner under each section of the cycle
				• Improve fire response and readiness.	Within 5 years	M	• Would be an active and live platform, updated in real time and reviewed on an annual basis	• Pre-disaster Mitigation Grant Program
								• National Wildlife Coordinating Group training scholarships
								• Funding for Fire Departments and First Responders
								• Volunteer Fire Assistance Program
								• State and Private Forestry Grant Programs (NASF)
								• Esri
								• Assistance to Firefighters Grants (AFG)
								• Emergency Management Performance Grant (EMPG)
								• Regional Catastrophic Preparedness Grants

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
			o Include BMPs for each section of the cycle o Include coordination plan for interagency communications before, during and after an event o Include a tracking module to track actions needed and status o include a funding matrix to support implementation of actions o Align actions as closely as possible with County and State HMPs					• Urban and Community Forestry Grant Program – IL • Illinois Natural Areas Stewardship Grant • State and Private Forestry Grant Programs (NASF) • Matching Awards Program
Be proactive in addressing future wildfire challenges with climate change.	County and adjacent jurisdictions	County, state, federal	• Convene a working group tasked with the following: o Assess impact of climate change on wildfire potential through modeling of fire behavior under various climate scenarios. o Establish fuel treatment plans to mitigate climate related influences on wildfire risk in existing vegetation communities. o Establish plans and build infrastructure for water supply needs to alleviate future drought or flood emergencies.	• Enhance wildfire response as conditions change.	Within 2 years	M	• Meet annually to review plans and assess status of wildfire risk. • Re-run the fire behavior analysis to determine change in wildfire risk.	• Pre-disaster Mitigation Grant Program • Specific EPA Grant Programs • Catalog of Federal Funding Sources; Water Resources • Catalog of Federal Funding Sources; Land Resources • Flood Mitigation Assistance (FMA) Grant • Emergency Management Performance Grant (EMPG) • Fire Management Assistance Grant (FMAG) • EFRP • Environmental Quality Incentives Program (EQIP) • Emergency Watershed Protection Program

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Timeline for Action	Priority (HML)	Monitoring/ Maintenance Requirements	Funding Sources
			o Promote and distribute climate change educational materials.					• Urban and Community Forestry Grant Program – IL • Illinois Natural Areas Stewardship Grant • Matching Awards Program • Patagonia Environmental Grants and Support • Leonardo DiCaprio Foundation Grants • U.S. Endowment for Forestry and Communities
Reduce incidence of frequent ignitions	Prioritize high risk areas as delineated in the risk assessment and fire history mapping	State agencies, County, private landowners	• Utilize fire history data to identify areas with frequent fire starts and develop strategy to reduce incidence of ignitions. • Convene a working group to develop strategies to reduce ignitions: o Education campaign o Signage o Fire response plans o Law enforcement	• Reduce ignition frequency	Within 3 years	H	• Review fire history data on a 2-year frequency to monitor trends.	• Firewise Communities • National Interagency Fire Center • Illinois Natural Areas Stewardship Grant

POST-FIRE RESPONSE AND REHABILITATION

Federal, state, and local post-fire response is often overlooked during the wildfire planning process. Fires in the County are typically contained before they gain size; however, having a plan that outlines steps for agencies, municipalities, and counties to follow would streamline post-fire recovery efforts and reduce the inherent stress to the community in the event that a large wildfire does impact the County.

There are many facets to post-fire recovery, including but not limited to:

- Ensuring public health and safety—prompt removal of downed and hazard trees, addressing watershed damage, and mitigating potential flooding.

- Rebuilding communities and assessing economic needs—securing the financial resources necessary for communities to rebuild homes, business, and infrastructure.

- Restoring the damaged landscape—restoration of watersheds, soil stabilization, and tree planting.

- Reducing fire risk in the future—identifying hazard areas and implementing mitigation.

Recovery of the vegetated landscape is often more straightforward than recovery of the human environment. Assessments of the burned landscape are often well-coordinated through the use of interagency crews who are mobilized immediately after a fire to assess the post-fire environment and make recommendations for rehabilitation efforts.

For the community impacted by fire, however, there is often very little planning at the local level to guide return after the fire. Residents impacted by the fire need assistance making insurance claims; finding temporary accommodation for themselves, pets, and livestock; rebuilding or repairing damaged property; removing debris and burned trees; stabilizing the land for construction; mitigating potential flood damage; repairing infrastructure; reconnecting to utilities; and mitigating impacts to health. Oftentimes, physical impacts can be mitigated over time, but emotional impacts of the loss and change to surroundings are long-lasting and require support and compassion from the community.

AFTER THE FIRE

Returning Home

First and foremost, follow the advice and recommendations of emergency management agencies, fire departments, utility companies, and local aid organizations regarding activities following the wildfire. Do not attempt to return to your home until fire personnel have deemed it safe to do so.

Even if the fire did not damage your house, do not expect to return to normal routines immediately. Expect that utility infrastructure may have been damaged and repairs may be necessary. When you return to your home, check for hazards, such as gas or water leaks and electrical shorts. Turn off damaged utilities if you did not do so previously. Request that the fire department or utility companies turn the utilities back on once the area is secured. Similarly, water supply systems may have been damaged; do not drink from the tap until you have been advised that it is safe to do so. Finally, keep a "fire watch"; look for smoke or sparks in houses and other buildings.

Note any changes of address with the U.S. Postal Service, banks, utilities, credit card companies, and newspapers. If you do stay elsewhere, try to locate any legal documents, medications, valuables, etc. before relocating (Coalitions & Collaboratives, Inc. [COCO], 2021).

If your home is safe to enter, vacuum all surfaces, clean any airflow filters, and remove soot and smoke from walls if possible. Clean all mattresses and kitchenware. Any perishables exposed to heat should not be consumed (COCO 2021).

For additional post-fire safety information, see https://aftertheflames.com/.

Insurance Claims

Your insurance agent is your best source of information as to the actions you must take in order to submit a claim. Your insurance claim process will be much easier if you photographed your home and valuable possessions before the fire and kept the photographs in a safe place away from your home. Most if not all of the expenses incurred during the time you are forced to live outside your home could be reimbursable. These could include, for instance, mileage driven, lodging, and meals. Keep all records and receipts. Don't start any repairs or rebuilding without the approval of your claims adjuster (COCO 2021). Beware of predatory contractors looking to take advantage of anxious homeowners wanting to rebuild as quickly as possible. Consider all contracts very carefully, take your time to decide, and contact your insurance agent with any questions. If it appears to be a large loss, consider whether you should hire a public adjuster that is licensed by the state department of insurance who will represent and advocate for you as the policyholder in appraising and negotiating the claimant's insurance claim to ensure you get the best outcome and recovery from your insurance company. Most public adjusters charge a small percentage of the settlement that is set by the state and primarily they appraise the damage, prepare an estimate and other claim documentation, read the policy of insurance to determine coverages, and negotiate with the insurance company's claims handler. If you are not insured, contact the American Red Cross (COCO 2021): https://www.redcross.org/get-help/disaster-relief-and-recovery-services/recovering-financially.html.

Community Safety: Post-Fire Floods and Debris Flows

There are numerous natural hazards after a wildfire. Perhaps most dangerous are potential flash floods and landslides following rainfall in a burned area upstream from a community. Wildfires increase risk of flooding because burned soil is unable to absorb rainfall and it becomes hydrophobic. Even small rainfall can cause a flash flood, transporting debris and damaging homes and other structures. Listen and look for emergency updates, weather reports, and flash flood warnings. Develop an emergency plan with your family and avoid areas likely to flood (National Oceanic and Atmospheric Administration 2015). Checklists to prepare for flooding are available at:
https://www.wrh.noaa.gov/lox/hydrology/files/DebrisFlowSurvivalGuide.pdf.

The Illinois Department of Public Health Flood Preparedness page is available at:
https://dph.illinois.gov/topics-services/emergency-preparedness-response/flooding-preparedness.

Furthermore, a post-flood best practices guide can be found here:
http://www.dph.illinois.gov/sites/default/files/AfterTheFlood_web.pdf.

Mobilizing Your Community

When your community is safe and capable of monitoring potential storms, coordination for recovery efforts can begin. Depending on community size, one person or a team of post-fire coordinators can be appointed to work directly with agencies or teams helping with wildfire response. It is important that this person have demonstrated management and computer skills, community knowledge, and experience with federal and state agencies. The post-fire coordinator(s) can delegate any identified recovery tasks or needs to volunteers; however, it may be helpful to specifically appoint a volunteer coordinator.

The recovery coordinator should become familiar with representatives from local, state, and government agencies that will be helping with coordination or funding of post-fire recovery. The following resources may be helpful for the post-fire and volunteer coordinators (Coalition for the Upper South Platte [CUSP] 2016):

- IEMA
- IDNR
- Federal Emergency Management Agency (FEMA)
- American Red Cross
- Continuing Authorities Program & Emergency Flood Protection: U.S. Army Corps of Engineers
- Emergency Watershed Protection Program: Natural Resources Conservation Service (NRCS)

- Food Assistance and Farm Service Agency: USDA

- Conservation Districts

- USFS

- NRCS, including Earth Team

- Disaster Distress Helpline

- After the Flames - compilation of post-fire resources- https://aftertheflames.com/resources/

The following should be considered when assessing community needs (COCO 2021):

- Are there paid staff that will be dedicated to helping with recovery?

- Who is familiar with the Incident Command System (ICS)? Who has technical skills to help with post-fire treatments? Which community members will be able to write grants and apply for assistance? Who has accounting skills? Management skills?

- How much money will the community need? How can you acquire it?

- How will the community address immediate needs such as shelter, food, and health care? Counseling and mental health?

Any large wildfire will also involve an ICS, an appropriately sized team assigned to aid in post-fire recovery. Learn more at: https://www.nps.gov/articles/wildland-fire-incident-command-system-levels.htm

Communication

After a team is assembled and immediate tasks are identified, find the best way to spread information in your community. You may distribute flyers, set up a voicemail box, work to find pets or livestock that have been displaced, develop a mailing list for property owners, hold regular public meetings, etc. It is important that a long-term communications plan is developed (CUSP 2016). Communication ideas include (COCO 2021):

- Newspaper communications with emergency information (and phone numbers for emergency services) on flooding, landslides, and debris flows.

- Published information about ongoing flood and landslide mitigation projects.

- Information about safe flooding responses: stay out of the car and off the roads, escape to dry land as soon as possible, do not attempt to cross flowing water.

- Remind residents to listen to weather reports and remain aware of rainfall. Be alert for changes in water flow and stay away from areas prone to landslides and flooding.

- Information on volunteer needs and planned repair projects.

Post-Fire Rehabilitation and Resources

Post-fire land rehabilitation is critical to protect your community from flooding, erosion, and debris flows. Your community response coordinator can identify a team of federal, state, and local agencies to assess impacts and prioritize areas for treatment (COCO 2021). It is important that this treatment team include experts such as foresters, engineers, and hydrologists (CUSP 2016).

Examples of potential post-fire treatments include (COCO 2021):

- Hillside stabilization (for example, placing bundles of straw parallel to the slope to slow erosion)

- Hazard tree cutting

- Felling trees perpendicular to the slope contour to reduce runoff

- Mulching areas seeded with native vegetation

- Stream enhancements and construction of catchments to control erosion, runoff, and debris flows

- Fencing people (and livestock) out of unstable areas

- Planting or seeding native species to limit spread of invasive species

The effectiveness of various treatments is described at:
https://www.fws.gov/fire/downloads/ES_BAR/Post-Fire_Hillslope_Treatment_Synthesis.pdf.

Additional post-fire rehabilitation information can be found at:

- https://aftertheflames.com/resources/

- https://www2.illinois.gov/ready/after/Pages/Disaster-Recovery.aspx

- https://www.ready.gov/wildfires

- https://www.fs.usda.gov/science-technology/fire/after-fire

Specific Treatment Details

Hillslope Treatments

Cover Applications:

- Dry mulch provides immediate ground cover to reduce erosion and downstream flow.

- Wet mulch (hydromulch) provides immediate cover to hold moisture and seeds on slopes using a combination of organic fibers, glue, suspension agents, and seeds (most effective on inaccessible slopes).

- Slash spreading provides ground cover to reduce erosion by felling trees in burned areas.

- Seeding reduces soil erosion over time with an application of native seed mixtures (most successful in combination with mulching). Breaking up and loosening topsoil to break down the hydrophobic layer on top of the soil is also effective.

Erosion Barrier Applications:

- Erosion control mat: organic mats staked on the soil surface to provide stability for vegetation establishment.

- Log erosion barrier: trees felled perpendicular to the hillslope to slow runoff.

- Fiber rolls (wattles): rolls placed perpendicular to the hillslope to reduce surface flows and reduce erosion.

- Silt fencing: permeable fabric fencing installed parallel to the slope contour to trap sediment as water flows down the hillslope.

Channel Treatments

- Check dam: small dams built to trap and store sediment in stream channels.

- In-channel tree felling: felling trees in a staggered pattern in a channel to trap debris and sediment.

- Grade stabilizer: structures made of natural materials placed in ephemeral channels for stabilization.

- Stream bank armoring: reinforcing streambanks with natural materials to reduce bank cutting during stream flow.

- Channel deflector: an engineered structure to direct flow away from unstable banks or nearby roads.

- Debris basin: constructed to store large amounts of sediment moving in a stream channel.

Road and Trail Treatments

- Outsloping and rolling dips (water bars) alter the road shape or template to disperse water and reduce erosion.
- Overflow structures protect the road by controlling runoff and diverting stream flow to constructed channels.
- Low water stream crossing: culverts replaced by natural fords to prevent stream diversion and keep water in the natural channel.
- Culvert modification: upgrading culvert size to prevent road damage.
- Debris rack and deflectors: structure placed in a stream channel to collect debris before reaching a culvert.
- Riser pipes filter out debris and allow the passage of water in stream channels.
- Catchment-basin cleanout: using machinery to clean debris and sediment out of stream channels and catchment basins.
- Trail stabilization: constructing water bars and spillways to provide drainage away from the trail surface.

Additional information on treatments can be found at https://aftertheflames.com/.

Timber Salvage

Many private landowners may decide to harvest trees killed in the fire, a decision that can be highly controversial. Any remaining trees post-fire can be instrumental for soil and wildlife habitat recovery. Furthermore, burned soils are especially susceptible to soil compaction and erosion. Therefore, timber salvage must be performed by professionals. Several programs assist landowners with timber salvage, including the NRCS Environmental Quality Incentives Program (EQIP) (CUSP 2016).

Invasive Species Management and Native Revegetation

Wildfire provides opportunity for many invasive species to dominate the landscape because many of these species thrive on recently burned landscapes. It is imperative that landowners prevent invasive establishment by eradicating weeds early, planting native species, and limiting invasive seed dispersal (CUSP 2016).

Planting native seeds is an economical way to restore a disturbed landscape. Vegetation provides protection against erosion and stabilizes exposed soils. In order to be successful, seeds must be planted during the proper time of year and using correct techniques. Use a native seed mixture with a diversity of species and consider the species' ability to compete with invasive species. Before planting, the seedbed must be prepared with topsoil and by raking to break up the hydrophobic soil layer. If you choose to transplant or plant native species, consider whether the landscape has made a sufficient recovery to ensure the safety of the individuals (CUSP 2016).

Long-Term Community Recovery

On non-federal land, recovery efforts are the responsibility of local governments and private landowners. Challenges associated with long-term recovery include homes that were severely damaged or were saved but are located in high-severity burn areas. Furthermore, homes saved but located on unstable slopes or in areas in danger of flooding or landslides present a more complicated challenge. Economically, essential businesses that were burned or were otherwise forced to close pose a challenge to communities of all sizes. Given these complications, rebuilding and recovery efforts can last for years, with invasive species control and ecosystem restoration lasting even longer (CUSP 2016). It is critical that a long-term plan is in place and there is sufficient funding and support for all necessary ecosystem and community recovery (COCO 2021).

CHAPTER 5 – MONITORING AND EVALUATION STRATEGY

Developing an action plan and an assessment strategy that identifies roles and responsibilities, funding needs, and timetables for completing highest-priority projects is an important step in organizing the implementation of the UCCWPP. Table 4.1 in the previous section identifies tentative timelines and monitoring protocols for fuels reduction treatments, the details of which are outlined below. Progress should be tracked for all recommendations however, in order to ensure that the document is serving the needs of the communities it is designed to protect.

All stakeholders and signatories to this CWPP desire worthwhile outcomes. We also know that risk reduction work on the ground, for the most part, is often not attainable in a few months—or even years. The amount of money and effort invested in implementing a plan such as this requires that there be a means to describe, quantitatively or qualitatively, if the goals and objectives expressed in this plan are being accomplished according to expectations.

This section will present a suite of recommended CWPP monitoring strategies intended to help track progress, evaluate work accomplished, and assist planners in adaptive management.

The strategies outlined in this section consider several variables:

- Do the priorities identified for treatment reflect the goals stated in the plan? Monitoring protocols can help address this question.

- Will there be ecological consequences associated with fuels work? Concerns include soil movement and/or invasive species encroachment post-treatment. Relatively cost-effective monitoring may help clarify changes.

- Vegetation will grow back. Thus, fuel break maintenance and fuels modification in both the home ignition zone and at the landscape scale require periodic assessment. Monitoring these changes can help decision-makers identify appropriate treatment intervals.

As the CWPP evolves over time, there may be a need to track changes in policy, requirements, stakeholder changes, and levels of preparedness. These can be significant for any future revisions and/or addendums to the CWPP.

Table 5.1 identifies recommended monitoring strategies, both quantifiable and non-quantifiable, for assessing the progress of the CWPP and increasing sustainability. It must be emphasized that these strategies are 1) not exhaustive and 2) dependent on available funds and personnel to implement them.

There are many resources for designing and implementing community based, multi-party monitoring that could support and further inform a monitoring program for the CWPP (Egan 2013), such as the Let the Sun Shine In (LSSI), Forest Restoration and Management webpage. Multiparty monitoring involves a diverse group consisting of community members, community-based groups, regional and national interest groups, and public agencies. This approach increases understanding of the effects of restoration efforts and trust among restoration partners. Multiparty monitoring may be more time-consuming due to the collaborative nature of the work; therefore, a clear and concise monitoring plan must be developed.

Table 5.1. Recommended Monitoring Strategies

Strategy	Task/Tool	Lead	Remarks
Project tracking system	Online web app to track hazardous fuels projects spatially, integrating wildfire risk layer to show progress toward wildfire hazard and risk reduction. Web app would include attribute tables that outline project details	County	Interactive tool will be easily updated and identify areas that require additional efforts.
Photographic record (documents pre- and post-fuels reduction work, evacuation routes, workshops, classes, field trips, changes in open space, treatment type, etc.)	Establish field global positioning system (GPS) location; photo points of cardinal directions; keep photos protected in archival location	Core Team member	Relatively low cost; repeatable over time; used for programs and tracking objectives
Number of acres treated (by fuel type, treatment method)	GPS/GIS/fire behavior prediction system	Core Team member	Evaluating costs, potential fire behavior
Number of home ignition zones/defensible space treated to reduce structural ignitability	GPS	Homeowner	Structure protection
Number of residents/citizens participating in any CWPP projects and events	Meetings, media interviews, articles	Core Team member	Evaluate culture change objective
Number of homeowner contacts (brochures, flyers, posters, etc.)	Visits, phone	Agency representative	Evaluate objective
Number of jobs created	Contracts and grants	Core Team member	Evaluate local job growth
Education outreach: number, kinds of involvement	Workshops, classes, field trips, signage	Core Team member	Evaluate objectives
Emergency management: changes in agency response capacity	Collaboration	Agency representative	Evaluate mutual aid
Codes and policy changes affecting CWPP	Qualitative	Core Team	CWPP changes
Number of stakeholders	Added or dropped	Core Team	CWPP changes
Wildfire acres burned, human injuries/fatalities, infrastructure loss, environmental damage, suppression and rehabilitation costs	Wildfire records	Core Team	Compare with 5- or 10-year average

An often overlooked but critical component of fuel treatment is monitoring. It is important to evaluate whether fuel treatments have accomplished their defined objectives and whether any unexpected outcomes have occurred. In addition to monitoring mechanical treatments, it is important to carry out comprehensive monitoring of burned areas to establish the success of fuels reduction treatments on fire

behavior, as well as monitoring for ecological impacts, repercussions of burning on wildlife, and effects on soil chemistry and physics. Adaptive management is a term that refers to adjusting future management based on the effects of past management. Monitoring is required to gather the information necessary to inform future management decisions. Economic and legal questions may also be addressed through monitoring. In addition, monitoring activities can provide valuable educational opportunities for students.

The monitoring of each fuel's reduction project would be site-specific, and decisions regarding the timeline for monitoring and the type of monitoring to be used would be determined by project. Monitoring and reporting contribute to the long-term evaluation of changes in ecosystems, as well as the knowledge base about how natural resource management decisions affect both the environment and the people who live in it.

The most important part of choosing a monitoring program is selecting a method appropriate to the people, place, and available time. Several levels of monitoring activities meet different objectives, have different levels of time intensity, and are appropriate for different groups of people. They include the following:

Minimum—Level 1: Pre- and Post-project Photographs

Appropriate for many individual homeowners who conduct fuels reduction projects on their properties.

Moderate—Level 2: Multiple Permanent Photo Points

Permanent photo locations are established using rebar or wood posts, global positioning system (GPS)-recorded locations, and photographs taken on a regular basis. Ideally, this process would continue over several years. This approach might be appropriate for more enthusiastic homeowners or for agencies conducting small-scale, general treatments.

High—Level 3: Basic Vegetation Plots

A series of plots can allow monitors to evaluate vegetation characteristics such as species composition, percentage of cover, and frequency. Monitors then can record site characteristics such as slope, aspect, and elevation. Parameters would be assessed pre- and post-treatment. The monitoring agency should establish plot protocols based on the types of vegetation present and the level of detail needed to analyze the management objectives.

Intense—Level 4: Basic Vegetation Plus Dead and Downed Fuels Inventory

The protocol for this level would include the vegetation plots described above but would add more details regarding fuel loading. Crown height or canopy closure might be included for live fuels. Dead and downed fuels could be assessed using other methods, such as Brown's transects (Brown 1974), an appropriate photo series (Ottmar et al. 2000), or fire monitoring (Fire Effects Monitoring and Inventory System [FIREMON]) plots.

IDENTIFY TIMELINE FOR UPDATING THE CWPP

The HFRA allows for maximum flexibility in the CWPP planning process, permitting the Core Team to determine the time frame for updating the CWPP; it is suggested that a formal revision be made on the fifth anniversary of signing and every 5 years following. The Core Team members are encouraged to meet on an annual basis to review the project list, discuss project successes, and strategize regarding project implementation funding. If possible, the CWPP revision should coincide with the revision of the County HMP. A goal of the 2010 HMP was to create and implement the CWPP and develop long-term public education and fire response strategies (Union County 2010). This CWPP content should be incorporated into the County HMP for consistency.

IMPLEMENTATION

The UCCWPP makes recommendations for prioritized fuels reduction projects and measures to reduce structural ignitability and carry out public education and outreach. Implementation of fuels reduction projects need to be tailored to the specific project and will be unique to the location depending on available resources and regulations. On-the-ground implementation of the recommendations in the UCCWPP planning area will require development of an action plan and assessment strategy for completing each project. This step will identify the roles and responsibilities of the people and agencies involved, as well as funding needs and timetables for completing the highest-priority projects (SAF 2004). Information pertaining to funding is provided in Appendix F.

ABBREVIATIONS AND ACRONYMS

BRFFMC	Big Rivers Forest Fire Management Compact
CAR	community at risk
CERT	Community Emergency Response Team
CIG	Conservation Innovation Grant
COCO	Coalitions & Collaboratives, Inc.
Cohesive Strategy	National Cohesive Wildland Fire Management Strategy
County	Union County
CRS	Congressional Research Service
CUSP	Coalition for the Upper South Platte
CWMA	Cooperative Weed Management Area
CWPP	community wildfire protection plan
EACC	Eastern Area Coordination Center
EFRP	Emergency Forest Restoration Program
EMPG	Emergency Management Performance Grant
EQIP	Environmental Quality Incentives Program
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
FMAG	Fire Management Assistance Grant
FMU	Fire Management Unit
FP&S	Fire Prevention and Safety
GIS	geographic information system
GOPR	Governor's Office of Planning and Research
GPS	global positioning system
HFRA	Healthy Forests Restoration Act
HMGP	Hazard Mitigation Grant Program
HMP	hazard mitigation plan
HVRA	highly valued resources and assets
IBHS	Insurance Institute for Business and Home Safety
ICS	Incident Command System
IDNR	Illinois Department of Natural Resources
IEMA	Illinois Emergency Management Agency
IEOP	Illinois Emergency Operations Plan
IEPA	Illinois Environmental Protection Agency
IFAP	Illinois Forest Action Plan

IFDC	Illinois Forestry Development Council
IFTDSS	Interagency Fuel Treatment Decision Support System
IPFC	Illinois Prescribed Fire Council
ISST	Invasive Species Strike Team
LSSI	Let the Sun Shine In
NFP	National Fire Plan
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NRCS	Natural Resources Conservation Service
NRSC	Northeast Regional Strategy Committee
NWCG	National Wildfire Coordinating Group
OSFM	Office of the State Fire Marshal
POD	potential operational delineation
RC&D	Shawnee Resource Conservation and Development, Inc
SAF	Society of American Foresters
SIPBA	Southern Illinois Prescribed Burn Association
SWCA	SWCA Environmental Consultants
UCCWPP	Union County Community Wildfire Protection Plan
USDA	U.S. Department of Agriculture
USFA	U.S. Fire Administration
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WFDSS	Wildland Fire Decision Support System
WUI	wildland urban interface

GLOSSARY OF TERMS

Aspect: Cardinal direction toward which a slope faces in relation to the sun (NWCG 2021a).

Active Crown Fire: A crown fire in which the entire fuel complex is involved in flame, but the crowning phase remains dependent on heat released from surface fuel for continued spread. An active crown fire presents a solid wall of flame from the surface through the canopy fuel layers. Flames appear to emanate from the canopy as a whole rather than from individual trees within the canopy. Active crown fire is one of several types of crown fire and is contrasted with **passive crown fires**, which are less vigorous types of crown fire that do not emit continuous, solid flames from the canopy.

Available Canopy Fuel: The mass of canopy fuel per unit area consumed in a crown fire. There is no post-frontal combustion in canopy fuels, so only fine canopy fuels are consumed. We assume that only the foliage and a small fraction of the branchwood is available (Twisp 2021).

Available Fuel: The total mass of ground, surface, and canopy fuel per unit area available fuel consumed by a fire, including fuels consumed in post-frontal combustion of duff, organic soils, and large woody fuels (Twisp 2021).

Backfiring: Intentionally setting fire to fuels inside a control line to contain a fire (Twisp 2021).

Biomass: Organic material. Also refers to the weight of organic material (e. g., biomass roots, branches, needles, and leaves) within a given ecosystem (Twisp 2021).

Burn Severity: A qualitative assessment of the heat pulse directed toward the ground during a fire. Burn severity relates to soil heating, large fuel and duff consumption, consumption of the litter and organic layer beneath trees and isolated shrubs, and mortality of buried plant parts.

Canopy: The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand. Where significant height differences occur between trees within a stand, formation of a multiple canopy (multi-layered) condition can result.

Chain: Unit of measure in land survey, equal to 66 feet (20 meters) (80 chains equal 1 mile). Commonly used to report fire perimeters and other fireline distances. Popular in fire management because of its convenience in calculating acreage (example: 10 square chains equal 1 acre) (New Mexico Future Farmers of America 2021).

Climate adaptation: An adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (GOPR 2020).

Climate Change: A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (GOPR 2020).

Community Assessment: An analysis designed to identify factors that increase the potential and/or severity of undesirable fire outcomes in WUI communities.

Communities at Risk: Defined by the Healthy Forest Restoration Act of 2003 as "Wildland-Urban Interface Communities within the vicinity of federal lands that are at high risk from wildfire" (GOPR 2020).

Community Emergency Response Team (CERT): The CERT program educates volunteers about disaster preparedness for the hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT offers a consistent, nationwide approach to volunteer training and organization that

professional responders can rely on during disaster situations, allowing them to focus on more complex tasks.

Community Wildfire Protection Plan (CWPP): A planning document that seeks to reduce the threat to life and property from wildfire by identifying and mitigating wildfire hazards to communities and infrastructure located in the WUI. Developed from the Healthy Forest Restoration Act of 2003. Addresses issues such as wildfire response, hazard mitigation, community preparedness, or structure protection.

Conditional Surface Fire: A potential type of fire in which conditions for sustained conditional surface fire active crown fire spread are met but conditions for crown fire initiation are not. If the fire begins as a surface fire, then it is expected to remain so. If it begins as an active crown fire in an adjacent stand, then it may continue to spread as an active crown fire (Twisp 2021).

Contain: A tactical point at which a fire's spread is stopped by and within specific contain features, constructed or natural; also, the result of stopping a fire's spread so that no further spread is expected under foreseeable conditions. For reporting purposes, the time and date of containment. This term no longer has a strategic meaning in Federal wildland fire policy (Twisp 2021).

Control: To construct fireline or use natural features to surround a fire and any control spot fires therefrom and reduce its burning potential to a point that it no longer threatens further spread or resource damage under foreseeable conditions. For reporting purposes, the time and date of control. This term no longer has a strategic meaning in Federal wildland fire policy (Twisp 2021).

Cover type: The type of vegetation (or lack of it) growing on an area, based on cover type minimum and maximum percent cover of the dominant species, species group or non-living land cover (such as water, rock, etc.). The cover type defines both a qualitative aspect (the dominant cover type) as well as a quantitative aspect (the abundance of the predominant features of that cover type) (Twisp 2021).

Creeping Fire: A low intensity fire with a negligible rate of spread (Twisp 2021).

Crown Fire: A fire that advances at great speed from crown to crown in tree canopies, often well in advance of the fire on the ground (National Geographic Society 2021).

Defensible Space: An area around a structure where fuels and vegetation are modified, cleared, or reduced to slow the spread of wildfire toward or from a structure. The design and distance of the defensible space is based on fuels, topography, and the design/materials used in the construction of the structure.

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.

Environmental Conditions: That part of the fire environment that undergoes short-term changes: weather, which is most commonly manifest as windspeed, and dead fuel moisture content (Twisp 2021).

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area. When escape routes deviate from a defined physical path, they should be clearly marked (flagged).

Evacuation: The temporary movement of people and their possessions from locations threatened by wildfire.

Fire Adapted Communities: A community that collaborates to identify its wildfire risk and works collectively on actionable steps to reduce its risk of loss. This work protects property and increases the safety of firefighters and residents (USFA 2021a).

Fire Behavior: The manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena as determined by the interaction of fuels, weather, and topography (Frames 2021).

Fire Break: Areas where vegetation and organic matter are removed down to mineral soil.

Fire Environment: The characteristics of a site that influence fire behavior. In fire modeling the fire environment is described by surface and canopy fuel characteristics, windspeed and direction, relative humidity, and slope steepness (Twisp 2021).

Fire Frequency: A broad measure of the rate of fire occurrence in a particular area. For historical analyses, fire frequency is often expressed using the fire return interval calculation. For modern-era analyses, where data on timing and size of fires are recorded, fire frequency is often best expressed using fire rotation.

Fire Hazard: The potential fire behavior or fire intensity in an area, given the type(s) of fuel present, including both the natural and built environment, and their combustibility (GOPR 2020).

Fire Hazard Severity Zone: Defined based on vegetation, topography, and weather (temperature, humidity, and wind), and represents the likelihood of an area burning over a 30- to 50-year time period without considering modifications such as fuel reduction efforts (GOPR 2020).

Fire History: The chronological record of the occurrence of fire in an ecosystem or at a specific site. The fire history of an area may inform planners and residents about the level of wildfire hazard in that area.

Fire Intensity: A general term relating to the heat energy released in a fire.

Fireline Intensity: Amount of heat release per unit time per unit length of fire front. Numerically, the product of the heat of combustion, quantity of fuel consumed per unit area in the fire front, and the rate of spread of a fire, expressed in kilowatts per minute. This expression is commonly used to describe the power of wildland fires, but it does not necessarily follow that the severity, defined as the vegetation mortality, will be correspondingly high (Twisp 2021).

Fire Prevention: Activities such as public education, community outreach, planning, building code enforcement, engineering (construction standards), and reduction of fuel hazards that is intended to reduce the incidence of unwanted human-caused wildfires and the risks they pose to life, property, or resources (GOPR 2020).

Fire Regime: A measure of the general pattern of fire frequency and severity typical to a particular area or type of landscape. The regime can include other metrics of the fire, including seasonality and typical fire size, as well as a measure of the pattern of variability in characteristics.

Fire Regime Condition Class: A function of the degree of fire regime condition class departure from historical fire regimes resulting in alterations of key ecosystem components such as composition structural stage, stand age, and canopy closure (Twisp 2021).

Fire Return Interval: Number of years (interval) between two successive fires in a designated area.

Fire Severity: A qualitative measure of the immediate effects of fire on the fire severity ecosystem. It relates to the extent of mortality and survival of plant and animal life both aboveground and belowground and to loss of organic matter. It is determined by heat released aboveground and belowground. Fire severity is dependent on intensity and residence time of the burn. For trees, severity is often measured as percentage of basal area removed. An intense fire may not necessarily be severe (Twisp 2021).

Fire Risk: "Risk" takes into account the intensity and likelihood of a fire event to occur as well as the chance, whether high or low, that a hazard such as a wildfire will cause harm. Fire risk can be determined by identifying the susceptibility of a value or asset to the potential direct or indirect impacts of wildfire hazard events (GOPR 2020).

Flammability: The relative ease with which fuels ignite and burn regardless of the quantity of the fuels.

Flame Length: The length of flames in the propagating fire front measured along the slant of the flame from the midpoint of its base to its tip. It is mathematically related to fireline intensity and tree crown scorch height (Twisp 2021).

Foliar Moisture Content: Moisture content (dry weight basis) of live foliage, expressed as a percent. Effective foliar moisture content incorporates the moisture content of other canopy fuels such as lichen, dead foliage, and live and dead branchwood (Twisp 2021).

Forest Fire: Uncontrolled burning of a woodland area (National Geographic Society 2021).

Fuel Break: A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled (NWCG 2021b).

Fuel Complex: The combination of ground, surface, and canopy fuel strata (Twisp 2021).

Fuel Condition: Relative flammability of fuel as determined by fuel type and environmental conditions.

Fuel Continuity: A qualitative description of the distribution of fuel both horizontally and vertically. Continuous fuels readily support fire spread. The larger the fuel discontinuity, the greater the fire intensity required for fire spread (Twisp 2021).

Fuel Loading: The volume of fuel in a given area generally expressed in tons per acre. Dead woody fuel loadings are commonly described for small material in diameter classes of 0 to 0.25, 0.25 to 1, and 1 to 3 inches and for large material greater than 3 inches (Twisp 2021).

Fuel Management/Fuel Reduction: Manipulation or removal of fuels to reduce the likelihood of ignition and to reduce potential damage in case of a wildfire. Fuel reduction methods include prescribed fire, mechanical treatments (mowing, chopping), herbicides, biomass removal (thinning or harvesting or trees, harvesting of pine straw), and grazing. Fuel management techniques may sometimes be combined for greater effect.

Fuel Model: A set of surface fuel bed characteristics (load and surface-area-to- fuel model volume-ratio by size class, heat content, and depth) organized for input to a fire model (Twisp 2021).

Fuel Modification: The manipulation or removal of fuels (i.e., combustible biomass such as wood, leaves, grass, or other vegetation) to reduce the likelihood of igniting and to reduce fire intensity. Fuel modification activities may include lopping, chipping, crushing, piling and burning, including prescribed burning. These activities may be performed using mechanical treatments or by hand crews. Herbicides and prescribed herbivory (grazing) may also be used in some cases. Fuel modification may also sometimes be referred to as "vegetation treatment" (GOPR 2020).

Fuel Moisture Content: This is expressed as a percent or fraction of oven dry fuel moisture content weight of fuel. It is the most important fuel property controlling flammability. In living plants, it is physiologically bound. Its daily fluctuations vary considerably by species but are usually above 80% to 100%. As plants mature, moisture content decreases. When herbaceous plants cure, their moisture content responds as dead fuel moisture content, which fluctuates according to changes in temperature, humidity, and precipitation (Twisp 2021).

Fuel Treatment: The manipulation or removal of fuels to minimize the probability of ignition and/or to reduce potential damage and resistance to fire suppression activities (NWCG 2021g). Synonymous with fuel modification.

Grazing: There are two types of grazing: 1) traditional grazing, and 2) targeted grazing. Traditional grazing refers to cattle that are managed in extensive pastures to produce meat. Targeted grazing involves having livestock graze at a specific density for a given period of time for the purpose of managing vegetation. Even though both kinds of grazing manage fuel loading in range and forested lands, targeted grazing is different in that its sole purpose is to manage fuels. Targeted grazing is done by a variety of livestock species such as sheep, goats, or cows (University of California Agriculture and Natural Resources 2019).

Ground Fire: Fire that burns organic matter in the soil, or humus; usually does not appear at the surface (National Geographic Society 2021).

Ground Fuels: Fuels that lie beneath surface fuels, such as organic soils, duff, decomposing litter, buried logs, roots, and the below-surface portion of stumps (Twisp 2021).

Hazard: Defined generally as an event that could cause harm or damage to human health, safety, or property (GOPR 2020).

Hazardous Areas: Those wildland areas where the combination of vegetation, topography, weather, and the threat of fire to life and property create difficult and dangerous problems.

Hazardous Fuels: A fuel complex defined by type, arrangement, volume, condition, and location that poses a threat of ignition and resistance to fire suppression (NWCG 2021h).

Hazardous Fuels Reduction: Any strategy that reduces the amount of flammable material in a fire-prone ecosystem. Two common strategies are mechanical thinning and controlled burning (Twisp 2021).

Hazard Reduction: Any treatment that reduces the threat of ignition and spread of fire.

Highly Valued Resources and Assets (HVRAs): Landscape features that are influenced positively and/or negatively by fire. Resources are naturally occurring, while assets are human-made (IFTDSS 2021a).

Ignition: The action of setting something on fire or starting to burn.

Incident: An occurrence or event, either natural or person-caused, which requires an emergency response to prevent loss of life or damage to property or natural resources (Twisp 2021).

Influence Zone: An area that, with respect to wildland and urban fire, has a set of conditions that facilitate the opportunity for fire to burn from wildland fuels to the home and/or structure ignition zone (NWCG 2021c).

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property and prevent further extension of the fire.

Ladder Fuels: Fuels that provide vertical continuity allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease.

Litter: Recently fallen plant material that is only partially decomposed and is still discernible.

Manual Treatments: Felling and piling of fuels done by hand. The volume of material generated from a manual fuel treatment is typically too small to warrant a biomass sale; therefore, collected material is disposed of by burning or chipping. The work can be performed by either a single individual or a large

organized crew with powered equipment (University of California Agriculture and Natural Resources 2021a).

Mechanized Treatments: Mechanical treatments pulverize large continuous patches of fuel to reduce the volume and continuity of material. Mechanical treatments can be applied as either mastication or chipping treatments. Both treatments shred woody material, but mastication leaves residue on-site while chipping collects the particles for transportation off site. Similar to hand treatments, mechanical treatments can target specific areas and vegetation while excluding areas of concern. In addition, mechanical treatment is easily scalable to large areas (>30 acres) with little added cost (University of California Agriculture and Natural Resources 2021b).

Mitigation: Action that moderates the severity of a fire hazard or risk.

Mutual Aid: Assistance in firefighting or investigation by fire agencies, irrespective of jurisdictional boundaries (NWCG 2021j).

Native Revegetation: The process of replanting and rebuilding the soil of disturbed land (e.g., burned) with native plant species (USDA 2005).

Native Species: A species that evolved naturally in the habitat, ecosystem, or region as determined by climate, soil, and biotic factors (USDA 2005).

National Cohesive Wildland Fire Management Strategy: A strategic push to work collaboratively among all stakeholders and across all landscapes, using best science, to make meaningful progress towards the three goals:

- Resilient Landscapes
- Fire Adapted Communities
- Safe and Effective Wildfire Response

Vision: To safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a nation, to live with wildland fire (Forests and Rangelands 2021).

Overstory: That portion of the trees in a forest which forms the upper or uppermost layer.

Passive Crown Fire: A type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods. Passive crown fire encompasses a wide range of crown fire behavior, from occasional torching of isolated trees to nearly active crown fire. Passive crown fire is also called torching or candling. A fire in the crowns of the trees in which trees or groups of trees torch, ignited by the passing front of the fire. The torching trees reinforce the spread rate, but these fires are not basically different from surface.

Prescribed Burning: Any fire ignited by management actions under specific, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. Usually, a written, approved prescribed fire plan must exist, and National Environmental Policy Act requirements must be met, prior to ignition (USFS 2021c).

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 (NWCG 2021d).

Resilience: The capacity of any entity (an individual, a community, an organization, or a natural system) to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience (GOPR 2020).

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.

Safety Element: One of the seven mandatory elements of a local general plan (a county plan that forms the foundation for future development), the safety element must identify hazards and hazard abatement provisions to guide local decisions related to zoning, subdivisions, and entitlement permits. The element should contain general hazard and risk reduction strategies and policies supporting hazard mitigation measures (GOPR 2020).

Slash: Debris left after logging, pruning, thinning, or brush cutting. Slash includes logs, chips, bark, branches, stumps, and broken trees or brush that may be fuel for a wildfire.

Slope Percent: The ratio between the amount of vertical rise of a slope and horizontal distance as expressed in a percent. One hundred feet of rise to 100 feet of horizontal distance equals 100% (NWCG 2021e).

Suppression: The most aggressive fire protection strategy, leading to the total extinguishment of a fire.

Surface Fire: A fire that typically burns only surface litter and undergrowth (National Geographic Society 2021).

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 stature living plants.

Structural Ignitability: The ability of structures (such as homes or fences) to catch fire.

Topography: The arrangement of the natural and artificial physical features of an area.

Total Fuel Load: The mass of fuel per unit area that could possibly be consumed in a hypothetical fire of the highest intensity in the driest fuels (Twisp 2021).

Tree Crown: The primary and secondary branches growing out from the main stem, together with twigs and foliage.

Understory: Low-growing vegetation (herbaceous, brush, or reproduction) growing under a stand of trees. Also, that portion of trees in a forest stand below the overstory.

Understory Fire: A fire burning in the understory, more intense than a surface fire with flame lengths of 1–3 meters (Twisp 2021).

Values and Assets at Risk: The elements of a community or natural area considered valuable by an individual or community that could be negatively impacted by a wildfire or wildfire operations. These values can vary by community and can include public and private assets (natural and manmade) such as homes, specific structures, water supply, power grids, natural and cultural resources, community infrastructure, and other economic, environmental, and social values (GOPR 2020).

Vulnerable Community: Communities that experience heightened risk and increased sensitivity to natural hazard and climate change impacts and have less capacity and fewer resources to cope with, adapt to, or recover from the impacts of natural hazards and increasingly severe hazard events because of climate change. These disproportionate effects are caused by physical (built and environmental), social, political, and/or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality (GOPR 2020).

Wildfire: Generally defined as any unplanned fire in a "wildland" area or in the WUI (GOPR 2020).

Wildfire Exposure: During fire suppression activities, an exposure is any area/property that is threatened by the initial fire, but in National Fire Incident Reporting System, a reportable exposure is any fire that is caused by another fire, i.e., a fire resulting from another fire outside that building, structure, or vehicle, or a fire that extends to an outside property from a building, structure, or vehicle (USFA 2020).

Wildfire Influence Zone: A wildland area with susceptible vegetation up to 1.5 miles from the interface or intermix WUI (GOPR 2020).

Wildland: Those unincorporated areas covered wholly or in part by trees, brush, grass, or other flammable vegetation (GOPR 2020).

Wildland Fire: Fire that occurs in the wildland as the result of an unplanned ignition (GOPR 2020).

Wildland Fuels (aka fuels): Fuel is the material that is burning. It can be any kind of combustible material, especially petroleum-based products, and wildland fuels. For wildland fire, it is usually live or dead plant material, but can also include artificial materials such as houses, sheds, fences, pipelines, and trash piles. In terms of vegetation, there are six wildland fuel types (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.) The six wildland fuel types are (NWCG 2021f):

6. Grass
7. Shrub
8. Grass-Shrub
9. Timber Litter
10. Timber-Understory
11. Slash-Blowdown

Wildland Urban Interface (WUI): The zone of transition between unoccupied land and human development. It is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels (USFA 2021b). In the absence of a CWPP, Section 101 (16) of the HFRA defines the WUI as " (I) an area extending ½ mile from the boundary of an at-risk community; (II) an area within 1 ½ miles of the boundary of an at-risk community, including any land that (1) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community; (2) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or (3) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; (III) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuels reduction to provide safer evacuation from the at-risk community." A CWPP offers the opportunity to establish a localized definition and boundary for the WUI (USFS 2021d).

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APPENDIX A:

Community and CWPP Background Information

CONTENTS

Figures

Tables

PLANNING PROCESS

The Society of American Foresters (SAF), in collaboration with the National Association of Counties and the National Association of State Foresters, developed a guide entitled *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland Urban Interface Communities* (SAF 2004) to provide communities with a clear process in developing a community wildfire protection plan (CWPP). The guide outlines eight steps for developing a CWPP and has been followed in preparing the Union County CWPP (UCCWPP):

Step One: Convene Decision-makers. Form a Core Team made up of representatives from the appropriate local governments, local fire authorities, and state agencies responsible for forest management.

Step Two: Involve Federal Agencies. Identify and engage local federal representatives and contact and involve other land management agencies as appropriate.

Step Three: Engage Interested Parties. Contact and encourage active involvement in plan development from a broad range of interested organizations and stakeholders.

Step Four: Establish a Community Base Map. Work with partners to establish a base map(s) defining the community's wildland urban interface (WUI) and showing inhabited areas at risk, wildland areas that contain critical human infrastructure, and wildland areas at risk for large-scale fire disturbance.

Step Five: Develop a Community Risk Assessment. Work with partners to develop a community risk assessment that considers fuel hazards; risk of wildfire occurrence; homes, businesses, and essential infrastructure at risk; other values at risk; and local preparedness capability. Rate the level of risk for each factor and incorporate this information into the base map as appropriate.

Step Six: Establish Community Priorities and Recommendations. Use the base map and community risk assessment to facilitate a collaborative community discussion that leads to the identification of local priorities for treating fuels, reducing structural ignitability and other issues of interest, such as improving fire response capability. Clearly indicate whether priority projects are directly related to the protection of communities and essential infrastructure or to reducing wildfire risks to other community values.

Step Seven: Develop an Action Plan and Assessment Strategy. Consider developing a detailed implementation strategy to accompany the CWPP as well as a monitoring plan that will ensure its long-term success.

Step Eight: Finalize Community Wildfire Protection Plan. Finalize the CWPP and communicate the results to community and key partners.

FIRE MANAGEMENT POLICY

The primary responsibility for WUI fire prevention and protection lies with property owners and state and local governments. Property owners must comply with existing state statutes and local regulations. These primary responsibilities should be carried out in partnership with the federal government and private sector areas. Current federal fire policy states that protection priorities are 1) life, 2) property, and 3) natural resources. These priorities often limit flexibility in the decision-making process, especially when a wildland fire occurs within the WUI.

LAWS, ORDINANCES, STANDARDS, AND CODES FOR WILDFIRE PREVENTION

There are currently no ordinances, laws, codes or standards in Union County for wildfire prevention, with the exception of the State Fire Protection District Law (17-1560.pdf (illinois.gov)), which requires that landowners apply for a burn permit prior to the burning. The permit process is administered by the Illinois Department of Natural Resources (IDNR). A number of existing models are used in other communities in Illinois and in other states, which Union County could use to develop a WUI code if desired. Two national organizations, the International Code Council and the National Fire Protection Association (NFPA), have developed model WUI wildfire protection codes as standards for states and local governments to adopt. A core concept in these model codes and the resulting wildfire mitigation ordinances is that of structure protection through the creation of defensible space (Haines et al. 2005).

FEDERAL DIRECTION

In response to a landmark fire season in 2000, the National Fire Plan (NFP) was established to develop a collaborative approach among various governmental agencies to actively respond to severe wildland fires and ensure sufficient firefighting capacity for the future. The NFP was followed by a report in 2001 entitled *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-year Comprehensive Strategy*, which was updated in 2002 to include an implementation plan. This plan was updated once more in 2006, with a similar focus on using a collaborative framework for restoring fire-adapted ecosystems, reducing hazardous fuels, mitigating risks to communities, providing economic benefits, and improving fire prevention and suppression strategies. The 2006 implementation plan also emphasizes information sharing and monitoring of accomplishments and forest conditions, a long-term commitment to maintaining the essential resources for implementation, a landscape-level vision for restoration of fire-adapted ecosystems, the importance of using fire as a management tool, and continued improvements to collaboration efforts (Forests and Rangelands 2006). Progress reports and lessons learned reports for community fire prevention are provided annually.

In 2003, the U.S. Congress recognized widespread declining forest health by passing the Healthy Forests Restoration Act (HFRA), and President Bush signed the act into law (Public Law 108–148, 2003). The HFRA was revised in 2009 to address changes to funding and provide a renewed focus on wildfire mitigation (H.R. 4233 - Healthy Forest Restoration Amendments Act of 2009). The HFRA expedites the development and implementation of hazardous fuels reduction projects on federal land and emphasizes the need for federal agencies to work collaboratively with communities. A key component of the HFRA is the development of CWPPs, which facilitates the collaboration between federal agencies and communities in order to develop hazardous fuels reduction projects and place priority on treatment areas identified by communities in a CWPP. A CWPP also allows communities to establish their own definition of the WUI, which is used to delineate priority areas for treatment. In addition, priority is placed on municipal watersheds, critical wildlife habitat, and areas impacted by wind throw, insects, and disease. Communities with an established CWPP are given priority for funding of hazardous fuels reduction projects carried out in accordance with the HFRA.

In 2014, the final stage of the development of a national cohesive strategy for wildfire was developed: *The National Strategy: The Final Phase in the Development of the National Cohesive Wildland Fire Management Strategy* (Forests and Rangelands 2014). The national strategy takes a holistic approach to the future of wildfire management:

To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire.

In order to achieve this vision, the national strategy goals are:

- **Restore and maintain landscapes**: Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.

- **Fire-adapted communities**: Human populations and infrastructure can withstand a wildfire without loss of life and property.

- **Wildfire response**: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions (Forests and Rangelands 2014:3)

STATE DIRECTION

The Illinois Forest Action Plan (IFAP) identifies the decline of oak as a threat to forest biological diversity. The plan calls for forest management practices that mimic natural disturbance on the landscape, such as the use of fire and selective tree removal. Forested land in Union County is identified in the IFAP as high priority. The area is experiencing a loss of oak dominance, and as such, the IFAP calls for actions to improve the forest composition by favoring oaks in the understory of forested stands. Reintroducing fire to the landscape through prescribed burning is important in maintaining healthy oak dominance. Additionally, prescribed fire would improve the Fire Regime Condition Class and ecological condition, restoring fire-adapted land and reducing risk of wildfire impacts. For more information on the IFAP, please visit: ifdc.nres.illinois.edu/wp-content/uploads/ifap-2019.pdf.

Like the 2014 national strategy, the NFP, IFAP, 10-year comprehensive strategy, and Federal Emergency Management Agency (FEMA) Disaster Mitigation Act of 2000 all mandate community-based planning efforts with full stakeholder participation, coordination, project identification, prioritization, funding review, and multiagency cooperation. In compliance with Title 1 of the HFRA, a CWPP must be mutually agreed upon by the local government, local fire departments, and the state agency responsible for forest management (IDNR). As outlined in the HFRA, this CWPP is developed in consultation with interested parties and the federal agencies managing land surrounding the at-risk communities.

FIRE PLANNING

There are limited existing documents relating to fire management in Union County, the main fire management document being the Shawnee National Forest Fire Management Plan (USFS 2015), which provides more detailed information regarding operational procedures relating to wildfire on National Forest lands. The current version of the Fire Management Plan is now housed within the Wildland Fire Decision Support System (WFDSS), which is a system to assist fire managers and analysts in making strategic and tactical decisions for fire incidents.

In addition, the Trail of Tears Habitat Management Plan and accompanying management strategies are currently under development. When finalized, the plan will act as a guiding document for long-term forest management (Fidler and Allen 2020).

This CWPP is meant to supplement and not replace any other existing plans. See Chapter 2 for information on agency fire management planning and the growing use of spatial fire planning and decision support tools.

EMERGENCY MANAGEMENT PLANNING

Union County updated their County Hazard Mitigation Plan in 2020. This CWPP incorporates wildfire hazard mitigations identified in that plan. In the future, the County should consider revising both plans in unison.

ALIGNMENT WITH PAST PLANS AND AGREEMENTS

Local

Union County Multi-Hazard Mitigation Plan

In 2020, the 2010 Countywide Multi-Hazard Mitigation Plan was updated. The original plan was adopted in 2010 to comply with a federal funding requirement under the Federal Disaster Mitigation Act of 2000, which establishes federal disaster assistance and hazard mitigation funding programs for local governments (Union County 2020). The Union County Multi-Hazard Mitigation Plan update addresses

probability and impacts of certain hazards as well as changes in land-use, population, and demographics. The plan covers topics such as the county level risk assessment, vulnerability assessment, risk analysis, and mitigation strategies. Overall, the plan follows three main goals: 1) reduce impacts of hazards to infrastructure, 2) create or revise plans and maps for the County, and 3) develop a long-term education strategy for county residents. Wildfire is listed in this plan as a likely hazard with limited magnitude/ severity due to the large amount of cropland. However, with over 280,000 acres of National Forest lands alone and a history of fires taking place near populated areas such as roads and campgrounds, wildfire could cause significant damage to valuable resources (Union County 2020).

Oak Systems Recovery Plan

In 2021, Shawnee Resource, Conservation, and Development, Inc., developed the Oak System Recovery Plan, A Vision for Sustaining Oaks in Southern Illinois (Darling 2021). The plan acknowledges a significant decline in oak cover within southern Illinois. A wide array of factors, such as increased invasive species, the suppression of fire, habitat fragmentation, climate change, and unsustainable timber harvesting practices, have resulted in a significant decrease in oak, a keystone species. Oak trees are reliant on frequent fire disturbance to clear the understory of fire-intolerant species, allowing for sunlight to reach oak trees. The plan recommends re-incorporating manageable fire into the ecosystem via prescribed fire, implementing fuel treatments to reduce understory and canopy density, and managing invasive species to restore the ecosystem and create resilient landscapes (Darling 2021).

State

Trail of Tears Demonstration Project

In 2014, the Trail of Tears Demonstration Project Plan was developed. The plan provides an overview of the Trail of Tears State Forest's research findings, role of disturbance, forest management principals, demonstration project goals, and field management plan. The need for manageable fire within the Trail of Tears landscape is noted within the plan, and prescribed fire is recommended to aid in forest restoration. Goals of the demonstration project include (IDNR 2014):

- Identifying the best sequence and combination of management actions needed to restore and maintain diverse, healthy and resilient forest communities, with a special focus on oak regeneration. Current research, LiDAR mapping of ecological land type, original public land surveys, and observed conditions on the ground will inform management actions.

- Examining whether plan concepts are met, with special focus on maintaining or improving habitat for wildlife, including species in greatest need of conservation, as identified in the Illinois Wildlife Action Plan.

- Using information collected through this process in an adaptive management framework.

Illinois Fire Needs Assessment

The last Illinois Fire Needs Assessment was developed in 2016 by the Illinois Prescribed Fire Council (IPFC). The assessment systematically documents the current number of acres undergoing prescribed burns annually, as well as the number of additional acres that need to undergo prescribed burning to maintain ecosystem health. The plan recommends 213,000+ acres be burned annually to manage and restore target areas. Overall, the assessment demonstrates (IPFC 2016):

- Dramatically more acres need to be burned annually across Illinois

- Natural areas need to be managed with prescribed fire with a much higher frequency

- Far too many ecologically degraded acres across the state are in need of fire

- Considerably more resources need to be allocated to prescribed fire programs

Illinois Natural Hazard Mitigation Plan

In 2018, the Illinois Emergency Management Agency (IEMA) published the latest Illinois Natural Hazard Mitigation Plan. After 22 federal disaster declarations between 2000 and 2017, this plan was developed to provide a framework for hazard mitigation and recovery actions to prevent future loss (IEMA 2018). Within this plan you can find the hazard mitigation planning process, hazard analysis and risk assessment, mitigation strategies, coordination or local mitigation planning, and plan maintenance such as monitoring and updating. This plan points out the Shawnee National Forest and surrounding counties as the primary concern for wildfire within Illinois (IEMA 2018).

Illinois Forest Action Plan

In 2019, the Illinois Forestry Development Council (IFDC) developed the 2020–2030 IFAP (IFDC 2019). The plan was developed to present trends, opportunities, threats, priorities, and forest management strategies specific to Illinois forests. Outlined within the plan are Illinois forestry partners, threats to forest lands and resources, current conditions and trends, priority forest areas, and Illinois resource strategies and actions. Mitigating forest health threats, restoring fire adapted lands, and reducing the risk of wildfire are all listed as priorities within the plan (IFDC 2019).

Illinois Emergency Operations Plan

The Illinois Emergency Operations Plan (IEOP) was most recently updated in December of 2019 as part of the plan's review process and occurs on odd numbered years (IEMA 2019). The IEOP creates the structure by which the State coordinates and manages response and recovery to emergencies and disasters. The plan provides strategic and operational guidance for coordination and communication, mass care operations, services such as search and rescue and fire services, and various management procedures. The IEOP makes evident the need for local government and organizations to take the lead on fire-related efforts and allows for the augmentation of these services with state resources (IEMA 2019).

Draft Trail of Tears Habitat Management Plan

In 2020, the Draft Trail of Tears Habitat Management Plan was still being developed. The plan is being developed for the purpose of providing guidance for long-term forest management. However, management practices have not yet been determined as the forest is currently in a transitionary period. In response, the IDNR is currently implementing a 925-acre demonstration project, located at the heart of the forest, that monitors management practices to determine the best management approach (Fidler and Allen 2020). The demonstration project and accompanying research is discussed in the Trail of Tears State Forest Demonstration Project Plan (IDNR 2014).

Federal

National Cohesive Wildland Fire Management Strategy

The National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) was initiated in 2010 through a collaboration of federal, state, local, and tribal governments. The Cohesive Strategy recognizes and accepts fire as a natural process necessary for the maintenance of many ecosystems and strives to reduce conflicts between fire-prone landscapes and people (Forest and Rangelands 2014:3) The primary, national goals identified as necessary to achieving the vision are: Restore and maintain landscapes: Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives. Fire-adapted communities: Human populations and infrastructure can withstand a wildfire without loss of life and property. Wildfire response: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions. For more information on the Cohesive Strategy, please visit: https://www.forestsandrangelands.gov/strategy/index.shtml.

The Northeast Regional Action Plan

The Northeast Regional Action Plan was updated in 2015 by the NRSC (NRSC 2015). The plan was developed to identify who will do what, where, and by when in regard to wildland fire management and response. The goals of the plan align with the three goals of the Cohesive Strategy with regional considerations, updates, and revisions. This plan covers the implementation actions for these goals which are to 1) restore and maintain resilient landscapes, 2) create fire adapted communities, and 3) improve wildfire response. For more information on the Northeast Regional Action Plan, please visit: https://northeasternwildfire.net/wp-content/uploads/2019/09/2015_regional_action_plan.pdf.

In 2015, USFS developed the Shawnee National Forest Fire Management Plan. The plan was written with the intent of providing a guide for fire management within the National Forest, as well as guidance in regard to land management and policy (USFS 2015). In addition, the plan outlines the Forest's fire program, officially documents strategies, objectives, and resource considerations in regard to the fire program, including desired habitat conditions, and provides guidance to fire managers in regard to fire suppression and prescribed fire. The document recommends utilizing prescribed fire, hazardous fuels reduction, maintenance of fire-dependent communities, and timber-stand improvements to manage both planned and unplanned fire events (USFS 2015).

Northeast Wildfire Preparedness Resource Guide

In March of 2019, the NRSC prepared the Northeast Wildfire Preparedness Resource Guide, which is intended to assist homeowners, neighborhood groups, community leaders, and fire services within the 20 states that make up the Northeast and Midwest United States (NRSC 2019). The Northeast Region not only has the highest concentration of people in the United States, but also has the largest number of wildfires each year (NRSC 2019). The guide offers firewise resources aimed at reducing risk in and around homes by group for residents, homeowner's associations, neighborhoods, civic and community leaders, and fire services. Other resources in this guide include financial assistance, national information, state and regional information, a directory for national and state management agencies, and fire science resources (NRSC 2019).

Shawnee National Forest Land and Resource Management Plan

The Shawnee National Forest Land and Resource Management Plan was published in 2006 and is a revision of the 1992 Forest Plan (USFS 2006). The goal of this document is to guide all natural resource management activities by describing management practices, levels of resource production, and the availability and suitability of lands for resource management. Through five chapters, the plan discusses the benefits of the forest, major issues and management opportunities, management goals and objectives, standards and guidelines, and management implementation (USFS 2006). In addition, in 2016, a sixth chapter was added through amendment (Amendment No. 1) to include monitoring and evaluation criteria meant for long-term adaptation. This plan recognizes that fire is a crucial natural process and provides for the use of prescribed fire as a mitigation and regeneration practice, however, also acknowledges wildfire as a risk to communities that should be suppressed appropriately based on circumstances (USFS 2006).

Shawnee National Forest Aviation Management and Safety Plan

The 2011/2012 Shawnee National Forest Aviation Management and Safety Plan was developed to identify National Forest aviation management objectives and activities as well as to provide strategic and operational user guidance as appropriate (Peterson 2011). The plan covers organizations and responsibilities, aviation operations, fuels and fire behavior, and safety topics such as risk management. Although this plan leans on the Shawnee National Forest Fire Management Plan for fire-specific guidance, the plan does discuss the fire season for the National Forest and the types of fuels that may be present (Peterson 2011).

The USFS maintains a shared stewardship agreement with the IDNR to restore fire adapted communities and reduce the risk of wildfire (IDNR 2021c). The agreement was signed in January 2021 and identifies the need for proactive measures to address joint challenges, with a focus on:

- Restoring fire-adapted ecosystems and reducing the risk of wildfire.

- Identifying, managing, restoring, and reducing threats to forest and prairie ecosystems' health.

- Maintaining a sustainable use model to ensure forests meet the present and future demands for natural resources and public recreation.

- Fostering economic development strategies that keep working.

LAND MANAGEMENT STRATEGIES

Union County contains large areas of forest that are identified in the IFAP as high-priority forested land. The IFAP identifies the decline of oak as a threat to forest biological diversity and as such it calls for forest management practices that mimic natural disturbance on the landscape, such as the use of fire and selective tree removal. A number of campaigns are also underway as part of the Illinois Wildlife Action Plan to improve habitat in forested and grass/shrub areas. On a national scale, the National Cohesive Wildland Fire Management Strategy calls for the restoration and maintenance of landscapes and creation of fire adapted communities. On a regional scale, the Northeast Regional Cohesive Strategy calls for the restoration and maintenance of fire-adapted landscape in southern Illinois, including the expansion of prescribed fire on private land and fuel reduction and restoration efforts in the WUI. Forest managers in the region are addressing all these objectives through the use of prescribed fire to promote more resilient forest lands. Private, state, and federal lands are interspersed creating a matrix of landownership, which is often a hurdle to implementation of landscape level treatments. By working with private landowners, forest managers are enhancing landscape-scale efforts to create more resilient forest communities.

A variety of land management strategies are used in Union County to reduce hazardous fuels and carry out forest restoration with the goal of promoting long-term sustainability of oak-hickory forests. The following list summarizes actions recorded in the Illinois Wildlife Action Plan to promote the health of Illinois Forested lands (IDNR 2005):

- Natural disturbances, such as prescribed fire, should be applied to maintain and enhance the state of Illinois forested lands

- Broader transition zones between habitat types should be created

- Removal of invasive species and the introduction of native species should be implemented

- Interagency collaboration should be prioritized

- Private landowner forest management assistance programs should be widely advertised and implemented

- Forest stress points should be identified and conservation actions should be developed

Prescribed Fire

Although the focus of wildfire risk mitigation is often on the reduction and removal of vegetation, and the prevention and suppression of wildfire, fire under the right circumstances can be not only a useful tool to reduce hazardous amounts of fuel, but also an important factor in wildland ecosystems. Many fire and resource management agencies at the local, state, and federal levels include the use of fire in their programs. According to land managers, frequent burning is necessary for the maintenance of eastern oak dominated forests (Haines et al. 2001; Nowacki and Abrams 2008; Parker and Ruffner 2004; Ruffner and Groninger 2006). Prescribed fire can achieve many management goals, including controlling forest diseases or insects, maintaining early successional habitats, and reducing excessive build-up of biomass in wildland areas. Prescribed fire is often coupled with harvest or mechanical treatments in order to achieve an appropriate level of disturbance needed to initiate oak regeneration (Brose et al. 2014). The use of fire as a land management tool in southern Illinois is a long-standing practice; however, applying fire to the mosaic of landownership in the region requires exhaustive collaboration between landowners and extensive training of crews. The use of prescribed fire has several requirements to be successful, including the following:

- Planning documents include approval authority, burn objectives, preparation requirements, weather and fuels conditions under which the burn will be performed, operational responsibilities, contingency planning in the event of an escape, and post-burn monitoring to document the attainment of burn objectives and other potential fire effects, such as the occurrence of invasive species.

- Specific attention must be given to smoke management and weather forecasts concerning smoke direction and atmospheric mixing patterns. Consultation between the agencies involved with the burn and the U.S. Environmental Protection Agency needs to occur early in the planning cycle, especially with regard to identification of suitable weather periods for the burn to be conducted. Conditions suitable for the fire agency may not be suitable from the perspective of the U.S. Environmental Protection Agency. Air permits are held for 1 year; however, the State of Illinois does not control or enforce heavily. If there are known smoke sensitivities in the community, the agencies' outreach to those people and will be considered in the burn plan.

- Public education and outreach is vital given the frequent concern by the public over smoke, risk of escape, and post-fire appearance of the burn unit. It is unlikely that all of the public will support the prescribed fire program, but outreach conducted through social media and on-site visits to the post-burn areas as they recover can develop a broad base of support, especially if the fire has stimulated the occurrence of desirable species considered to be rare.

The development of prescribed burning associations (once more common in rangeland areas in the United States) is now being used to help facilitate the application of fire to these fire-dependent ecosystems in the southern Illinois region (Riechman et al. 2014). The Southern Illinois Prescribed Burn Association (SIPBA) has been increasing the use of prescribed fire throughout the region for over 10 years. SIPBA helps to empower private landowners to apply fire to their properties to address concerns for deteriorating forest health, insects, and disease. SIPBA works closely with and state and federal partners to collaboratively treat areas throughout Union County. The Shawnee National Forest prepares areas to conduct prescribed burns in various locations. This burning is implemented between October and May of most years. Prescribed burn objectives may include one or more of the following:

- To stimulate growth of native vegetation that are well-adapted to fire, and impede vegetation that is not

- To improve wildlife habitat

- To improve the visual quality of the area

- To reduce the likelihood and severity of a wildfire, thereby increasing safety for the public and firefighters in case of a wildfire.

For maps of planned and completed prescribed burns on the Shawnee National Forests, please visit: https://www.fs.usda.gov/main/shawnee/fire.

In addition, the Illinois Prescribed Burn Council and IDNR currently implements prescribed fire on state land and works cooperatively with private landowners to implement some prescribed fire of barrens and woodlands, grasslands, fields, and hardwood forests.

Landscape Treatments

It has become well accepted that the most effective way to develop fuel reduction projects to reduce impacts to communities and values at risk is to adopt a landscape-level approach to management. Federal, State, and local land managers are moving towards an "All Lands Approach" to forest management in the County that promotes opportunities to use landscape-scale burns to implement restoration of hardwood forests and reduce hazardous fuels. For example, the USFS has been promoting the following project elements to forest management:

- coordination and outreach to landowners adjacent and nearby to projects on National Forest lands; and

- prescribed burning of private lands in proximity to National Forest lands to reduce hazardous fuel loads and restore ecosystems at the landscape level.

Due to a fragmented ownership pattern in Union County, this approach of landscape treatments and collaboration between landowners is thought to be the most effective means to treat fuels across a mosaic of landownership. Numerous partners including IDNR, the USFS, the Natural Resources Conservation Service (NRCS), SIPBA, and the River to River Cooperative Weed Management Area (CWMA), are working to build collaboration through applying for funds to expand communication between landowners and ultimately develop more management agreements in Union County for landscape-level treatments.

Desired Condition

The goal of land managers in the region is to restore native fire-dependent ecosystems and move towards a desired condition of the oak-hickory forest type (Figures A.1 and A.2) and convert nonnative pine plantations to native hardwoods. This aligns with the strategic goals of the IDNR and the USFS (through the Forest Plan). The maintenance of the oak-hickory forest is important for plant diversity and wildlife habitat, but its maintenance will require additional disturbance of the forest canopy in order to encourage the regeneration of oak species and native herbaceous species. Federal and State Partners share a common goal for implementation of landscape-scale prescribed burns; timber harvesting, including shelterwood and clearcutting; timber stand improvement; and other vegetation management activities to interrupt rapid succession to the maple and beech forest type and maintain the oak-hickory forest type within the historic range of variability (USFS 2006). Specific strategies and guidelines are used in restoration planning to improve habitat for wildlife, including maintaining a variety of age classes of oak-hickory forest through active vegetation management. Increasing the presence of early age classes (seedlings, saplings, and small diameter stems) promote habitat for some special status species, including American woodcock (*Scolopax minor*), northern bobwhite (*Colinus virginianus*), and yellow-breasted chat (*Icteria virens*) (USFS 2006:296–297). Vegetation disturbance to promote oak-hickory forest (USFS 2006:13) also helps ensure the long-term sustainability of habitat components such as the availability of acorns that are of critical importance to wildlife (McShea and Healy 2002; USFS 2012).

Figure A.1. Oak-hickory pre-treatment.

Source: David Allen

Figure A.2. Oak-hickory post-prescribed fire treatment.

Source: David Allen.

Holzmueller et al. (2014) describe an experimental study of oak-hickory regeneration in southern Illinois using plots that received a prescribed fire only treatment, a prescribed fire and thinning treatment, a thinning alone treatment, and a no treatment (control). Ten years after treatment the study indicated that oak and hickory seedlings had a greater height and diameter in the thinning and burning treatment (see Figure A.2) compared with control (see Figure A.1) and that this treatment may help facilitate desirable regeneration in mature oak-hickory forests.

PROJECT AREA OVERVIEW

LOCATION AND GEOGRAPHY

Union County is 413 square miles and is bordered by five Illinois counties: Jackson to the north, Williamson at the northeast corner, Johnson to the east, Pulaski at the southeast corner, and Alexander to the southwest corner and two Missouri counties: Cape Girardeau to the west and Perry to the northwest. Union County is bordered to the west by the Mississippi River which divides Illinois and Missouri. Along the western edge of the County lies a floodplain for the Mississippi River. The floodplain is bordered to the east by a mountainous region of rolling hills that stretches from the northern end of the County to the southern end. Moving east from this area, the terrain begins to level out and is marked by patches of farmland interspersed between drainages and low rolling hills (Figure A.3).

Union County is primarily composed of private and USFS land, with a small percentage owned by the USFWS (see Table 1.1 of the UCCWPP).

Figure A.3. Typical landscape in Union County.

TOPOGRAPHY

Topography is important in determining fire behavior. Steepness of slope, aspect (direction the slope faces), elevation, and landscape features can all affect fuels, local weather (by channeling winds and affecting local temperatures), and rate of spread of wildfire. Slopes in Union County are generally even to gently rolling, with exception to hilly areas within the Shawnee National Forest.

ROADS AND TRANSPORTATION

There are five main transport routes throughout the County that connect communities within the WUI. Interstate 57, which connects Chicago to the southern portion of the state, passes through the County to the east connecting Lick Creek to Dongola. U.S. Route 51 splits off from Interstate 57 just north of Dongola and runs north to south through the County, passing the City of Anna to the east. Illinois Route 127, which passes through Jonesboro, runs north to south and connects communities within the central portion of the County. On the western edge of the County near the Mississippi River is Illinois Route 3 that runs north to south and connects the community of Aldridge to the north with the community of Reynoldsville to the south. Illinois Route 146 connects with Illinois Route 3 in Ware and runs east to west across the County connecting all previously mentioned routes as well as the City of Anna.

In addition to the surfaced highways, numerous smaller roads, and forest roads traverse the County, with variable road conditions. Some gravel road surfaces and narrow roads may impede travel in the event of a wildfire evacuation or emergency response (Figure A.4).

Figure A.4. Unsurfaced road in Union County.

POPULATION

The following information is drawn primarily from U.S. census data (U.S. Census Bureau 2021). The 2020 population of Union County was 17,244 persons, a decrease of 3.2% from the 2010 census numbers of 17,808. Census estimates for 2019 state there were 8,010 housing units in the County and a population density of 43.1 people per square mile. Majority of the population lives within the city limits of Anna, which had a population of 4,143 residents in 2018.

RECREATION

Outdoor recreation is extremely popular in the County. The Shawnee National Forest, state parks, local recreation areas, and cultural attractions throughout the County, attract thousands of visitors. Hunting, camping, and swimming are popular on public land (Figure A.5).

During peak seasons and large events, a significant number of people can congregate in a relatively small space, which constitutes a large population to evacuate.

Figure A.5. Residents enjoying Ponds Hollow Recreation Area in the Shawnee National Forest.

Source: USFS (2021b).

PUBLIC LAND MANAGEMENT

SHAWNEE NATIONAL FOREST

The Shawnee National Forest comprises 285,000 acres of southern Illinois. The Shawnee National Forest is the single largest publicly owned body of land in Illinois. The forest was designated in 1939 and originally comprised largely of exhausted farmland that was planted with non-native pine trees to combat heavy erosion and stabilize the soils during the 1930s and 1940s. The Shawnee National Forest is now made up of a diverse combination of hardwood forest vegetation, wildlife, and recreation opportunities. In addition, there are seven designated wilderness areas withing the forest; Bald Knob, Bay Creek, Burden Falls, Clear Springs, Garden of the Gods (Figure A.6), Lust Creek, and Panther Den Wilderness (USFS 2021a).

The Shawnee National Forest Fire Management Plan (Forest Plan) (USFS 2015) is the guiding policy document for forest and fire management on the forest. The plan was developed to act as a decision support tool for fire management and response personnel as the plan defines the implementation of the Fire Management Program. The Shawnee National Forest is broken up into two Fire Management Units (FMUs); FMU 1 is responsible for the general forest, where FMU 2 is responsible for the Mississippi and Big Muddy River Bottomlands. FMU 1 is the leading FMU within Union County as most lands fall under FMU 1 jurisdiction. A small portion of land is designated to FMU 2 (USFS 2015).

Figure A.6. Garden of the Gods Recreation Area in the Shawnee National Forest.

Source: Reed (2007).

TRAIL OF TEARS STATE FOREST

The Trail of Tears State Forest's story begins in 1803 when European settlers entered the region. Not long after the U.S. Army forced Native Americans out of their reservations and into the Oklahoma Territory. The Native Americans were forced out of their homes during the winter months. Trapped by snowfall, ice, and freezing temperatures, thousands of Native Americans lost their lives. The area has since been named the Trail of Tears to memorialize the tragic event (IDNR 2021a).

As of today, the Trail of Tears State Forest is comprised of 5,114 acres managed by the IDNR. The land falls within the Ozark Hills and is composed of chert hills, shallow soils, narrow rocky ridge tops, and clear streams. In addition to recreation, the forest is home to one of Illinois two propagation centers. Roughly 10 acres of the State Forest are dedicated to growing nursery stock. Those 10 acres are divided into 27 different management areas where forest materials, various harvest techniques, and their impacts on the ecosystem are studied (IDNR 2021a).

The current leading document for the Trail of Tears State Forest is the Draft Trail of Tears Habitat Management Plan, which provides guidance for long-term forest management. Management practices have not yet been determined as the forest is currently in a transitionary period. In response, the IDNR is currently implementing a 925-acre demonstration project, located at the heart of the forest, that monitors management practices to determine the best management approach (Fidler and Allen 2020). The demonstration project and accompanying research is discussed in the Trail of Tears State Forest Demonstration Project Plan (IDNR 2014).

NATURAL AREAS

A number of rare natural communities occur within both the Shawnee National Forest and Trail of Tears State Forest. Within Shawnee National Forest, the natural area management prescription "provides for the preservation, protection and/or enhancement of the unique scientific, educational or natural values found on about 15,000 acres of research natural areas, national natural landmarks, ecological areas, geological areas, zoological areas and botanical areas" (USFS 2006:76). In addition, the Trail of Tears

Sate Forest encompasses over 5,000 acres of critical forested land, and includes the 222 acre Ozark Hills Nature Preserve. Furthermore, the forest acts as critical habitat to various wildlife, including 25 species deemed in greatest need of conservation by the Illinois Wildlife Action Plan (Fidler and Allen 2020).

CLIMATE AND WEATHER PATTERNS

The year begins cold and wet with gradual warming into February and March, coinciding with the start of the spring fire season (Table A.1). January and February (along with August and September) are the driest and windiest months of the year. A wetter period begins in late April and early May with some heavy thunderstorms. Hot and humid conditions in May through August prevent ignition and spread of fire. A decline in rain showers occur in August and September, along with occasional short-term drought, resulting in the one of the driest and windiest times of the year. Colder weather triggers various grasses and other plants to enter dormancy, and leaf and needle litter becomes available for combustion. By mid-October, fine fuels are fully cured, and leaf fall contributes to the fine fuel load; this marks the start of the fall fire season (USFS 2015). In years with a lingering "Indian Summer," fire danger is enhanced; however, occasional frontal storms mitigate the fire danger in many years. The end of December is associated with the end of fall fire season as days become short and temperatures drop.

Table A.1. Mean Annual Temperature and Precipitation in Union County

| Location | Elevation (feet) | Period of Record | Temperature (°F) | | | Precipitation (inches) | |
			Mean Annual Max	Mean Annual Min	Overall Annual Mean	Overall Annual Mean	Mean Snowfall
Anna	627	1981-2010	68	45	56.4	50.38	12

Source: U.S. Climate Data (2021) and National Oceanic and Atmospheric Administration (2021).

Average temperatures in Union County range from a low of 23 degrees Fahrenheit (°F) in January to a high of 89°F in July and August. Average precipitation ranges from 3.23 inches in August to 6.01 inches in May (Figure A.7.).
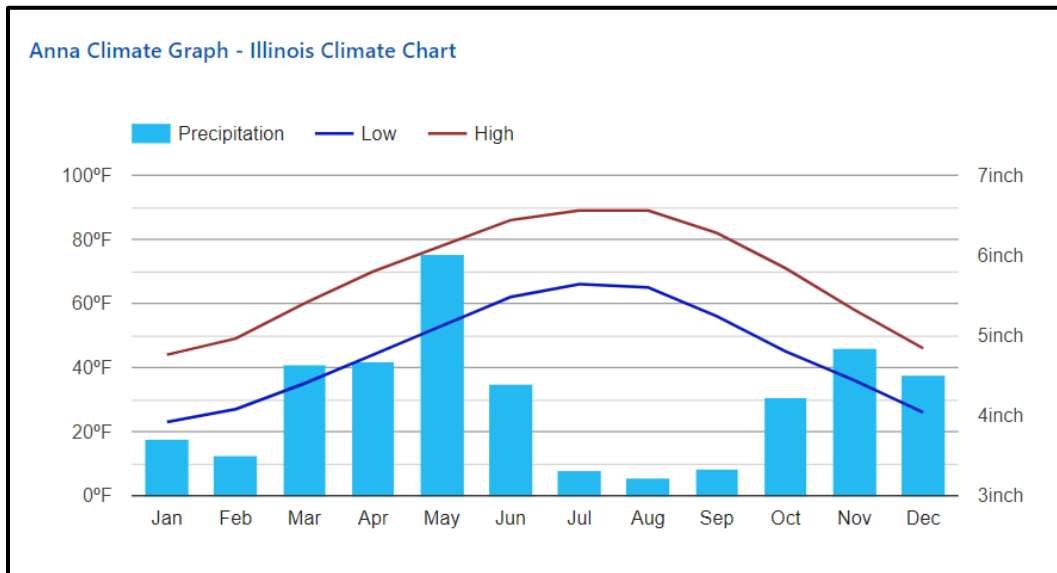
Figure A.7. Average precipitation and temperature minimums and maximums for Union County for the period of record (1981–2010).
Source: U.S. Climate Data (2021).

VEGETATION AND LAND COVER

Dominant vegetation types within the County are listed below in Table A.2 and shown on Figure A.8.

The westernmost portion of the County is predominantly composed of cultivated crops and wetland communities, transitioning into deciduous forest-dominated fuels as you move east. Continuing east from the forested community near the Mississippi River, the topography begins to change, and the vegetation becomes a matrix of deciduous forest, pasture, and cultivated crops.

Plant communities in the region are influenced by terrain, with dry ridgetops and south facing slopes comprising black oaks, white oaks and hickories and extremely dry sites containing prairie like openings. American beech, tulip tree, sugar maple and red oak stands are found on the north facing slopes. Moisture sites support a rich composition of shrubs, including pawpaw, buckeyes and bladdernut. Riparian areas comprise American elm, sweetgum, tuliptree and sycamore (IDNR 2021a).

Table A.2. Major Vegetation Types within Union County

Existing Vegetation Type	Acres	Percent
Deciduous Forest	129,894.09	47.87%
Hay/Pasture	55,706.84	20.53%
Cultivated Crops	40,232.76	14.83%
Woody Wetlands	12,480.29	4.60%
Developed, Open Space	10,252.27	3.78%
Open Water	6,917.50	2.55%
Developed, Low Intensity	4,504.92	1.66%
Mixed Forest	4,265.93	1.57%
Emergent Herbaceous Wetlands	2,642.38	0.97%
Herbaceous	1,234.01	0.45%
Barren Land	762.79	0.28%
Developed, Medium Intensity	545.65	0.20%
Evergreen Forest	467.80	0.17%
Shrub/Scrub	215.75	0.08%
Developed, High Intensity	87.42	0.03%

Source: Multi-Resolution Land Characteristics Consortium (2016).

FORESTED COMMUNITIES

Deciduous forest is the most dominant vegetation community across the planning area (see Table A.2). Closed canopy mid- to late seral forest currently predominates across the Shawnee region (USFS 2016). As oak-hickory forests are transitioning to mesophytic beech and maple-dominated stands, species richness and herbaceous communities (Fralish 1997) has been declining. The Forest Plan for the Shawnee National Forest recognizes the need to maintain and restore the oak-hickory ecosystem, by reducing shade-tolerant understory competition; creating light conditions favorable to the establishment of oak-hickory regeneration; improving forest structure through the creation of early successional habitat; reducing stressors caused by overstocked conditions; and improving and enhancing the health, vigor and growth of existing tress and native vegetation communities (USFS 2006).

Figure A.8. Union County existing vegetation cover.

Hardwood forests are composed of a diverse array of tree species (IDNR 2010). The most voluminous species in the state are white oak (*Quercus alba*), black oak (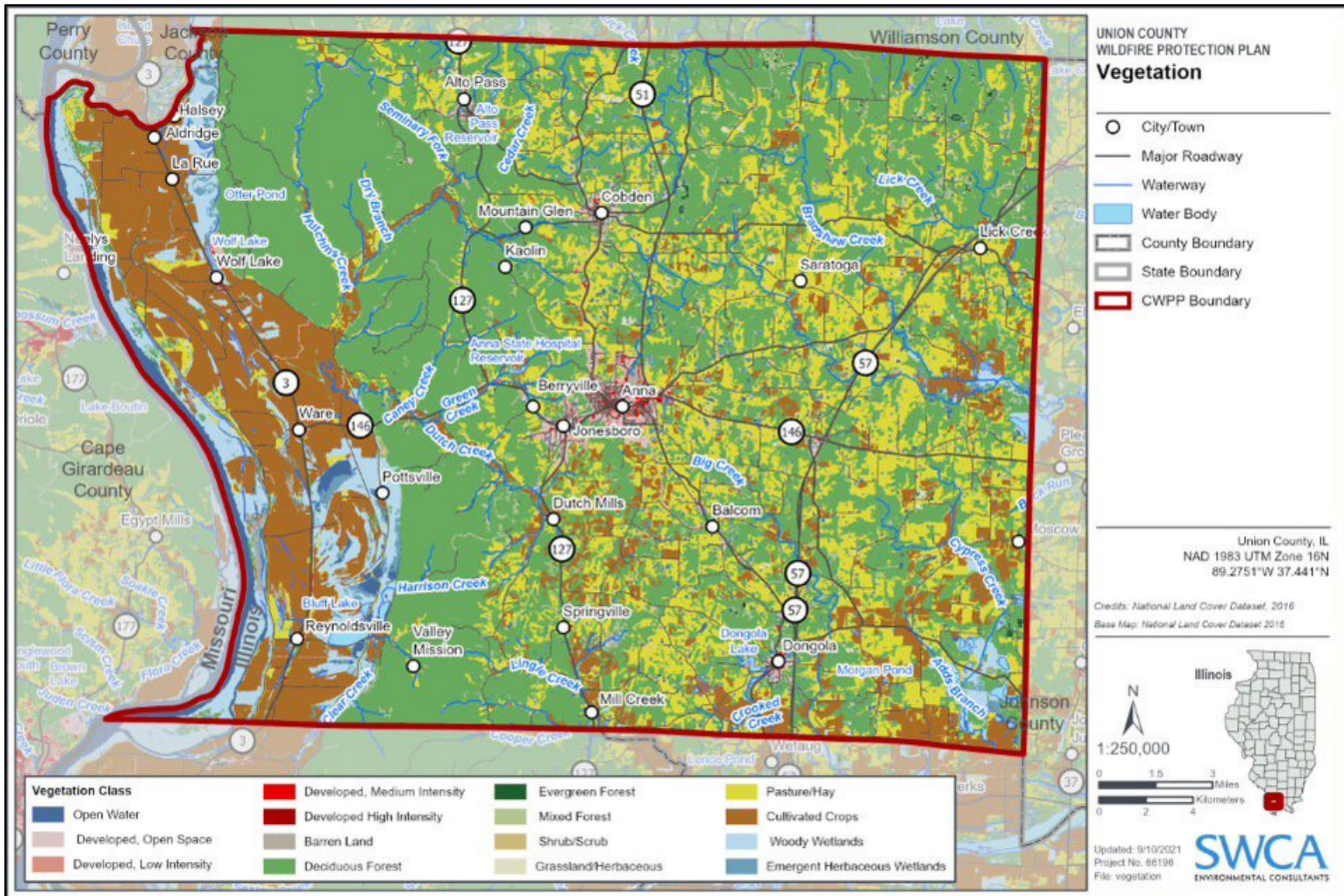*Q. velutina*), northern red oak (*Q. rubra*), and silver maple (*Acer saccharinum*); however, the most abundant species in terms of total number are American elm (*Ulmus americana*) and sugar maple, along with a host of understory species. These deciduous forests make up almost 50% of the county land area. Union County forest land falls primarily within the Eastern Broadleaf ecological province, which is dominated by a mixture of broadleaf deciduous species (IDNR 2010). Low precipitation in the area favors the drought resistance of the oak-hickory forest type group (Bailey 1995). The dominant species of this ecological province are white oak, red oak, black oak, shagbark hickory (*Carya ovata*), and bitternut hickory (*C. cordiformis*). Other associated species include yellow poplar (*Liriodendron tulipifera*), ash (*Fraxinus* sp.), black cherry (*Prunus serotina*), cottonwood (*Populus* sp.), and black walnut (*Juglans nigra*). The broad range of species and structural diversity associated with the oak-hickory forest type contributes to the huge biological biodiversity and wildlife habitat quality. Beech-maple forest has increased in the Shawnee National Forest by 19% in the 1.0- to 2.9-inch size class and 79% in the 3.0- to 4.9-inch class since the early 1980s (USFS 2016).

GRASSLAND COMMUNITIES

Approximately 21% of Union County is composed of grassland habitat, though a large proportion of this is held in pasture. Native prairie is rare in the region, but grassland planted for pasture and hayfields are an important habitat component for wildlife and highly valued throughout the county for providing species diversity and juxtaposition with forested areas (IDNR 2005). Some cool season grasses planted for pasture and hay production, grow actively during the spring and fall months. Grasslands can exhibit intense fire behavior due to the fast spread rates in this fuel type.

FOREST HEALTH CONSIDERATIONS

The regeneration of oak forests is poor, with oak seedlings making up only a minor component of the understory. Disturbance associated with ice storms and fire promotes oak regeneration, and where that disturbance is absent as a result of aggressive fire suppression and reduced disturbance, more shade tolerant species like maple (*Acer* sp.) and beech (*Fagus* sp.) out-compete oak (Parker and Ruffner 2004; Tikusis 2009; Zaczek et al. 2002). With understories dominated by non-oak species (such as sugar maple) with relatively few oak saplings, it is likely that there will be a successional change in species dominance (Tikusis 2009). Mesophytic species like beech and maple exhibit rapid leaf decomposition rates when compared with lignin-rich oak leaves, which alters fire behavior and renders oak hickory forests less likely to burn with desired effects (Abrams 2005; Nowacki and Abrams 2008; Rebertus and Burns 1997; Tikusis 2009). The long-term prospects for oak dominance are poor (Tikusis 2009), and wide-scale intervention is needed to prevent the replacement of oaks by non-oak species (IFDC 2019).

Illinois has seen a significant decline in state forestry professionals. The state lacks a sufficient number of qualified personnel to meet the forest management needs of its citizens. A large portion of Union County is also served by the Shawnee National Forest, but staffing resources, particularly for forest restoration and fire management, are limited.

There has been a decline in forest industry and insufficient market for small-diameter timber. Although there are processing facilities in Illinois, much of the value-added economy is lost as large volumes of timber are sent to other states for processing. The number of sawmills within Illinois has decreased by 72% since 1961 (IFDC 2019).

Storm damage from ice storms in 2008 and 2009 has contributed to dead and down fuel loads throughout the Shawnee National Forest, particularly in the most southerly areas. Some areas have fuel loads that may exceed 40 tons/acre, compared with a mean desired fuel load of 10 to 12 tons/acre (USFS 2016). Although reduced canopy cover from ice storm damage increases opportunity for oak regeneration, in many cases it may benefit shade-tolerant species already present in the understory. Canopy disturbance also provides a site for invasion by Japanese stiltgrass, which is prolific across disturbed areas of the county. Research has shown that reduced canopy cover in combination with prescribed fire may work to increase oak regeneration in these storm-damaged areas and, if properly timed, prescribed burning can

also be used to control stiltgrass. Research has also suggested that invasion by stiltgrass can intensify fire behavior (Crooked River Cooperative Weed Management Area 2016).

Pine plantations on the Shawnee National Forest comprise non-native loblolly pine and shortleaf pine and now occupy 45,000 acres of the forest. As these stands are aging, they will eventually be replaced by more shade-tolerant broadleaf species, but in some areas they are expanding into interior forest habitat and impacting natural biodiversity. The goal of the forest (under the Forest Plan) is to convert non-native pine plantations to native hardwood forests to increase biodiversity (USFS 2006). This goal emphasizes the maintenance and restoration of the oak-hickory forest type that includes production of some timber products as a by-product of vegetation management activities. This supports the need for wood products and uses a renewable forest resource.

Insects

Native insect epidemics within plant communities are usually part of a natural disturbance cycle similar to wildfire. They are often cyclic in nature and are usually followed by the natural succession of vegetation over time. Of primary interest are those that attack tree species because of the implications for fire management.

Present-day insect epidemics in U.S. forests are on the rise. Between 2018 and 2019 the number of acres with tree mortality in the United States increased from 6 million acres in 2018 to 7.1 million acres in 2019 (USDA 2019). This may be a result of drought-related stress and/or faster completion of insect life cycles due to warmer climate regimes. Stands of trees that have been killed by insects have varying degrees of associated fire danger depending on the time lapse following an insect attack and structure of the dead fuels that remain. However, forests with a large degree of mortality following an insect attack may have the potential to experience extremely high fire danger, especially if a large degree of needle cover remains in the canopy.

The Illinois Wildlife Conservation Plan and Strategy notes parasites and diseases as a major stressor of Illinois forests (IDNR 2005). Harmful exotic insects threaten Illinois forests, including gypsy moth (*Lymantira dispar*), Asian long-horned beetle (*Anoplophora glabripennis*), and emerald ash borer (*Agrilus planipennis*). The gypsy moth is isolated to northern areas, and the Asian long-horned beetle is believed to have been eradicated. The emerald ash borer remains a significant concern for forest land in Union County and the entirety of Illinois' ash resource (IFDC 2019).

Diseases

Diseases of trees, such as parasitic plants, fungi, and bacteria, can also affect forests in the UCCWPP planning area (Figure A.9). These diseases impact forest systems by degrading the productivity and health of the forest. Trees that are killed by disease have the similar potential to increase fire hazards.

Forest land is prone to continued mortality due to the maturity and senescence of Illinois forests. American elm, black oak, and red maple have the highest rates of mortality. Dutch elm disease is responsible for the high level of mortality of American elm trees. Oak wilt, caused by the fungus *Ceratocystis fagacearum*, is a source of mortality for oak throughout the state. Sudden Oak Death is also a potential threat to oak species. Oak is a major overstory component, but its decline is likely to result in replacement by maples in the overstory (IFDC 2019).
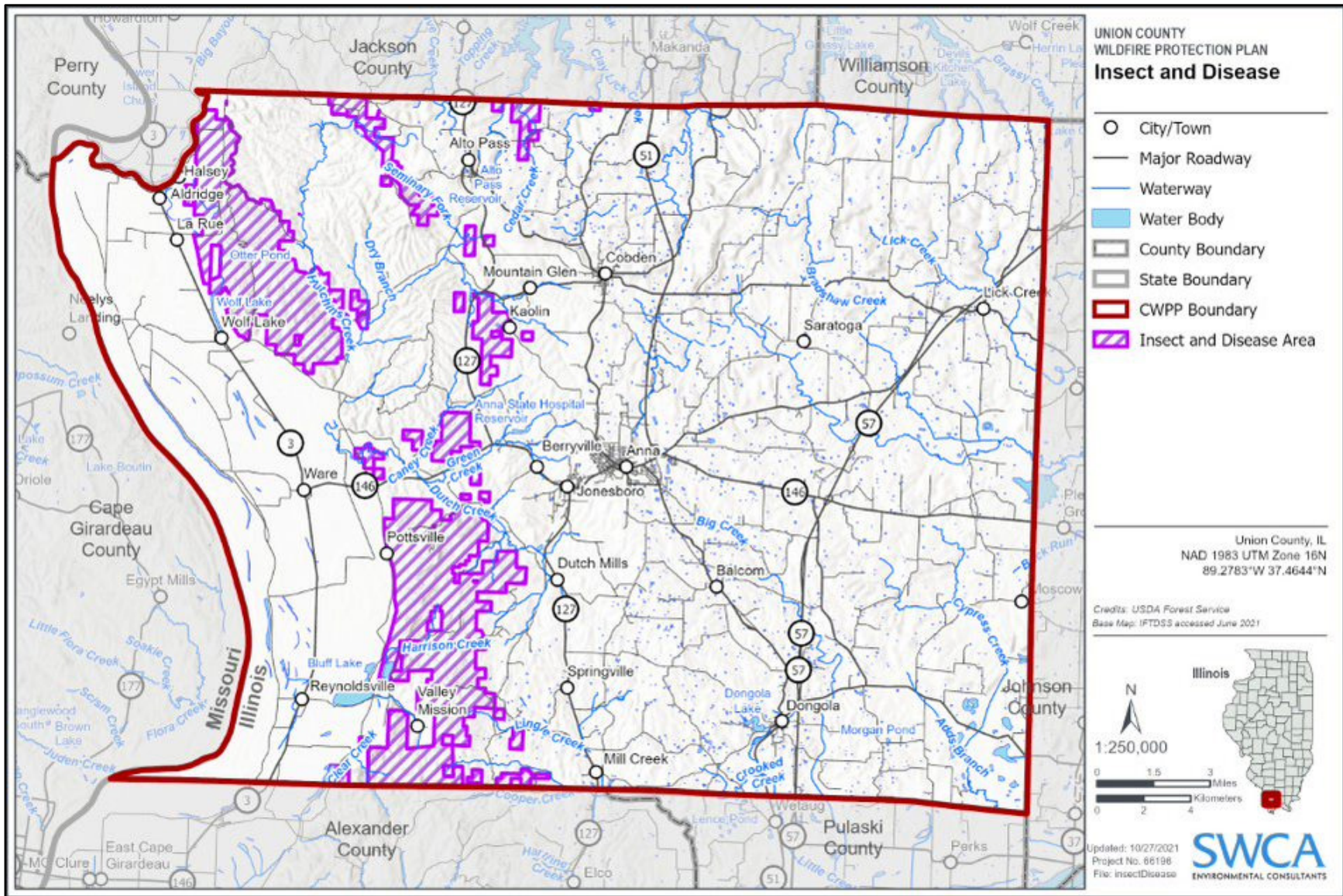
Figure A.9. Known insect and disease areas within Union County.

WILDLIFE

Vegetation management treatments are commonly applied throughout the County to benefit habitat for general wildlife species or game habitat. Most native wildlife species found in the region evolved with a frequent fire regime and are therefore adapted to early seral and mid-seral habitats, that are currently declining (USFS 2016):

> Oak is critical to maintaining the ecological structure and functions of Southern Illinois forests, and without them, biological diversity will be greatly reduced (Fralish, 2002; Ozier, Groninger & Ruffner, 2006), affecting amphibians, insects, invertebrates, reptiles, small mammals, songbirds and waterfowl (Dey et al. 2009).

Threatened and Endangered Species

Several federally and state-listed threatened and endangered species are known to occur in Union County, including Indiana bat (*Myotis sodalis*), least tern (*Sternula antillarum*), and pallid sturgeon (*Potamilus capax*) (USFWS 2017). Indiana bats and other bats use the area for summertime foraging. To avoid having adverse effects on Indiana bats, standards and guidelines in the Shawnee National Forest, Forest Plan have burning constraints listed for prescribed fire operations (USFS 2006).

In addition, the Trail of Tears Sate Forest acts as critical habitat to several species. The State Forest is home to 25 species deemed in greatest need of conservation by the Illinois Wildlife Action Plan, holds forest-nesting capabilities for neotropical migrant birds, serves as potential habitat to the federally endangered Indiana and northern bats, and federally threatened long eared bats, and is home to the state endangered bigeye shiner and state threatened timber rattlesnake (Fidler and Allen 2020).

The Illinois Natural Heritage database records 62 species considered critically imperiled (33 classified as endangered, and 29 as threatened) in Union County (Illinois Natural Heritage 2021). Of these rare and declining species, many are dependent upon periodic fire for maintenance of their biological integrity.

Treatments on federal land would be subject to the National Environmental Policy Act and associated analysis of impacts to these species. Treatments in areas that may impact threatened and endangered species would require application of certain mitigation measures to prevent degradation to habitat.

Invasive Species

Forest health is also declining as a result of exotic species invasions, insects, and disease. Common invasive species in the understory include Japanese stiltgrass (*Microstegium vimineum*), autumn olive (*Elaeagnus umbellata*), multiflora rose (*Rosa multiflora*), Amur honeysuckle (*Lonicera maackii*), Japanese honeysuckle (*Lonicera japonica*), tree-of-heaven (*Ailanthus altissima*), mimosa (*Albizia julibrissin*), Japanese barberry (*Berberis thunbergia*), Callery pear (*Pyrus calleryana*), princesstree (*Paulownia tomentosa*), black locust (*Robinia pseudoacacia*), and winged burning bush (*Euonymus alatus*) (Illinois Invasive Species 2016); these invasive species replace native plants across a range of sites. Exotic vegetation poses threats to native ecosystems and natural fire regimes (Brooks et al. 2004) by altering decomposition rates (Ashton et al. 2005), fuel loading (Dibble and Rees 2005), fuel continuity, and fire seasonality (Tikusis 2009).

RISK ASSESSMENT COMPONENTS

FIRE BEHAVIOR MODELS

For this plan, an assessment of fire behavior has been carried out using well-established fire behavior models: FARSITE, FlamMap, BehavePlus, and FireFamily Plus housed within the Interagency Fuel Treatment Decision Support System (IFTDSS), as well as ArcGIS Desktop Spatial Analyst tools. Data used in the Composite Risk-Hazard Assessment is largely obtained from LANDFIRE.

LANDFIRE

LANDFIRE is a national remote sensing project that provides land managers a data source for all inputs needed for FARSITE, FlamMap, and other fire behavior models. The database is managed by the USFS and the USDI and is widely used throughout the United States for land management planning. More information can be obtained from http://www.landfire.gov.

FARSITE

FARSITE is a computer model based on Rothermel's spread equations (Rothermel 1983); the model also incorporates crown fire models. FARSITE uses spatial data on fuels, canopy cover, crown bulk density, canopy base height, canopy height, aspect, slope, elevation, wind, and weather to model fire behavior across a landscape. In essence, FARSITE is a spatial and temporal fire behavior model. FARSITE is used to generate fuel moisture and landscape files as inputs for FlamMap. Information on fire behavior models can be obtained from http://www.fire.org.

FlamMap

Like FARSITE, FlamMap uses a spatial component for its inputs but only provides fire behavior predictions for a single set of weather inputs. In essence, FlamMap gives fire behavior predictions across a landscape for a snapshot of time; however, FlamMap does not predict fire spread across the landscape. FlamMap has been used for the HCCWPP to predict fire behavior across the landscape under extreme (worst case) weather scenarios.

BehavePlus

Also using Rothermel's (1983) equations, BehavePlus is a multifaceted fire behavior model and has been used to determine fuel moisture in this process.

FIRE BEHAVIOR MODEL INPUTS

Fuels

The fuels in the planning area are classified using Scott and Burgan's (2005) Standard Fire Behavior Fuel Model classification system. This classification system is based on the Rothermel surface fire spread equations, and each vegetation and litter type is broken down into 40 fuel models.

The general classification of fuels is by fire-carrying fuel type (Scott and Burgan 2005):

(NB) Non-burnable	(TU) Timber-Understory
(GR) Grass	(TL) Timber Litter
(GS) Grass-Shrub	(SB) Slash-Blowdown
(SH) Shrub	

Table A.3 provides a description of each fuel type.

Table A.3. Fuel Model Classification for UCCWPP Planning Area

1.	Nearly pure grass and/or forb type (Grass)
i.	**GR1:** Grass is short, patchy, and possibly heavily grazed. Spread rate is moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (0.40 ton/acre).
ii.	**GR2:** Moderately coarse continuous grass, average depth about 1 foot. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (1.10 tons/acre).
iii.	**GR3:** Very coarse grass, average depth 2 feet. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet).

iv. **GR4:** Moderately coarse continuous grass, average depth 2 feet. Spread rate very high (50–150 chains/hour); flame length high (8–12 feet).

v. **GR5:** Dense coarse continuous grass, average depth 1-2 feet. Spread rate very high (50–150 chains/hour); flame length high (8–12 feet).

vi. **GR6:** Dryland grass about 1 to 2 feet tall. Spread rate very high (50–150 chains/hour); flame length very high (12-25 feet).

vii. **GR9:** Very heavy, coarse, continuous grass 5 to 8 feet tall. Spread rate extreme (>150 chains/hour); flame length extreme (>25 chains/hour).

| 2. | Mixture of grass and shrub, up to about 50% shrub cover (Grass-Shrub) |

i. **GS1:** Shrubs are about 1-foot high, low grass load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (1.35 tons/acre).

ii. **GS2:** Shrubs are 1–3 feet high, moderate grass load. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (2.1 tons/acre).

iii. **GS3:** Moderate grass and shrub load, average depth less than 2 feet. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet).

| 3. | Shrubs cover at least 50% of the site; grass sparse to non-existent (Shrub) |

i. **SH1:** Low fuel load, depth about 1 foot, some grass fuels present. Spread rate very low (0–2 chains/hour); flame length very low (0–1 feet).

ii. **SH2:** Moderate fuel load (higher than SH1), depth about 1 foot, no grass fuels present. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (5.2 tons/acre).

iii. **SH3:** Moderate shrub load. Fuel bed depth 2–3 feet. Spread rate low (2–5 chains/hour), flame length low (1–4 feet).

iv. **SH4:** Low to moderate shrub and litter load, possibly with pine overstory. Fuel bed depth about 3 feet. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet).

v. **SH6:** Dense shrubs, little to no herb fuels. Fuel bed depth about 2 feet. Spread rate high (20–50 chains/hour); flame length high (8-12 feet).

vi. **SH7:** Very heavy shrub load, possibly with pine overstory. Fuel bed depth 4–6 feet. Spread rate high (20–50 chains/hour); flame length very high (12–25 feet).

vii. **SH8:** Dense shrubs, little to no herb. Fuel bed depth about 3 feet. Spread rate high (20–50 chains/hour); flame length high (8–12 feet).

viii. **SH9:** Dense shrubs, significant fine fuel. Fuel bed depth 4-6 feet. Spread rate high (20–50 chains/hour); flame length very high (12–25 feet).

| 4. | Grass or shrubs mixed with litter from forest canopy (Timber-Understory) |

i. **TU1:** Fuel bed is low load of grass and/or shrub with litter. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (1.3 tons/acre).

| 5. | Dead and downed woody fuel (litter) beneath a forest canopy (Timber Litter) |

i. **TL1:** Low to moderate load, fuels 1–2 inches deep. Spread rate very low (0–2 chains/hour); flame length very low (0–1 foot).

ii. **TL3:** Moderate load. Spread rate very low (0–2 chains/hour); flame length low (1–4 foot); fine fuel load (0.5 ton/acre).

iii. **TL4:** Moderate load. Spread rate very low (0–2 chains/hour); flame length low (1–4 foot).

iv. **TL5:** High load conifer litter. Spread rate low (2–5 chains/hour); flame length low (1–4 foot).

v. **TL8:** Long needle litter; long needle fuel. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet).

vi. **TL9:** Very high load fluffy dead and downed fuel littler. Spread rate moderate (5–20 chains/hour); flame length moderate (4–8 feet).

6.	Insufficient wildland fuel to carry wildland fire under any condition (Non-burnable)
i.	**NB1:** Urban or suburban development; insufficient wildland fuel to carry wildland fire.
ii.	**NB2:** Snow/ice.
iii.	**NB3:** Agricultural field, maintained in non-burnable condition.
iv.	**NB8:** Open water.
v.	**NB9:** Bare ground.

Notes: Based on Scott and Burgan's (2005) 40 Fuel Model System.

Map 1 in Appendix B illustrates the fuels classification throughout the planning area.

Hardwood Forests

When developing the fire behavior analysis, some fuels were calibrated to better represent the fire behavior that is observed in the project area. The original fuel data set showed a predominance of TL2 and TL6 fuels, however that fuel model was underpredicting flame lengths under extreme conditions (97th percentile). In order to better represent the fire behavior, the TL2 fuel model was calibrated to TL8 (to represent the oak-hickory) and TL6 was calibrated to TL9 (to represent the beech-maple). TL8 fuels comprise 23% of the County, while TL9 fuels comprise 26%.

Pine

Pine plantations comprise shortleaf pine and white pine (*Pinus strobus*), which are both modelled as a TL3 (<1%), and loblolly, which is modelled as a TL8. For the first year or two after a burn, all stands are considered TL1, depending on the consumption and coverage. Loblolly re-accumulates fuel the fastest, followed by shortleaf pine, then white pine.

Blow Down and Ice Storm Damaged Stands

Isolated pockets of heavier fuel accumulation may be found associated with storm damage and blow down. These areas are modeled as a logging slash/blow down model, which accounts for heavy accumulation of downed timber either as a result of logging or natural disturbance. This fuel model type is not picked up in the fuel model classification used in this project, which is possibly due to remote sensing shortfalls or the resolution of the data (30-meter resolution); however, the occurrence of these pockets of mortality is an important component of land management because fire behavior in these fuels is typically elevated relative to standing fuels. Fire behavior in these heavy fuel load areas exhibits low rate of spread and low flame lengths.

Grassland Fuels

Short Grass Fuels – GR1 and GR2

Grassland fuels GR1 and GR2 comprise 18% and 6% of the land cover in the county, respectively. Spread rates in these fuel types are generally slow with low flame lengths; these would be most typical of grazed areas with low fuel bed depth.

Other fuels make up less than 1% of the project area and are therefore not described here. Non-burnable fuels however do contribute to the fuel complex within a community and are integrated into the risk assessment by their contribution as structures in the WUI and therefore values at risk.

Topography

Topography is important in determining fire behavior. Steepness of slope, aspect (direction the slope faces), elevation, and landscape features can all affect fuels, local weather (by channeling winds and affecting local temperatures), and rate of spread of wildfire. While much of the County is flat or rolling,

there are steep slopes and cliffs throughout the Union County that would influence fire behavior and spread.

Weather

Of the three fire behavior components, weather is the most likely to fluctuate. Accurately predicting fire weather remains a challenge for forecasters, particularly during the fall and spring when the area is in transition between summer and winter patterns and there are frequent frontal boundaries crossing the area. As winds and rising temperatures dry fuels in late January–early February, conditions can deteriorate rapidly, creating an environment that is susceptible to wildland fire. Fine fuels (grass and leaf litter) can cure rapidly, making them highly flammable in as little as 1 hour following light precipitation. Low live fuel moistures of shrubs and trees can significantly contribute to fire behavior in the form of crowning and torching. With a high wind, grass fires can spread rapidly, engulfing communities, often with limited warning for evacuation. The creation of defensible space is of vital importance in protecting communities from this type of fire. For instance, a carefully constructed fuel break placed in an appropriate location could protect homes or possibly an entire community from fire. This type of defensible space can also provide safer conditions for firefighters, improving their ability to suppress fire and protect life and property.

The fire behavior modeling was completed under 97% percentile historic weather conditions, collected from the project area. These weather inputs also include live and dead fuel moisture scenarios, with dead fuel moistures for 1-hr fuels of 3%, 10-hr fuels of 4%, and 100-hr fuels of 5%; and live herbaceous fuel moistures of 30% and live woody fuel moistures of 60%. These conditions represent extreme conditions for fire behavior, in order to represent risk to communities during a worst case scenario fire situation in the County.

FIRE BEHAVIOR MODEL OUTPUTS

The following is a discussion of the fire behavior outputs from FlamMap.

Flame Length

Map 2 in Appendix B illustrates the flame length classifications for the planning area. Flame lengths are determined by fuels, weather, and topography. Flame length is a particularly important component of the risk assessment because it relates to potential crown fire (particularly important in timber areas) and suppression tactics. Direct attack by hand lines is usually limited to flame lengths less than 4 feet. In excess of 4 feet, indirect suppression is the dominant tactic. Suppression using engines and heavy equipment will move from direct to indirect with flame lengths in excess of 8 feet. Flame lengths across the planning area primarily fall into the less than 4-foot flame length category, however, timber fuels in the National Forest and surrounding areas, exhibit potential flame lengths of 11-25 ft under the extreme weather scenarios modeled for the project.

Fireline Intensity

Map 3 in Appendix B illustrates the predicted fireline intensity throughout the planning area. Fireline intensity describes the rate of energy released by the flaming front and is measured in British thermal units per foot per second. This is a good measure of intensity and is used to plan suppression activities. The expected fireline intensity throughout the planning area is similar in pattern to predicted flame length, as fireline intensity is a function of flame length. The pattern for fireline intensity is similar to flame length in that intensities are primarily low or extreme and the extreme areas tend to be associated with areas dominated by timber fuel loads.

Rate of Spread

Map 4 in Appendix B illustrates the rate of spread classifications for the planning area. The rates of spread are a little more diverse than flame length and fireline intensity with rates in the low, moderate, and high category, and some small patches in the extreme category. Low rates of spread are associated with the beech-maple and oak-hickory dominated areas. Low spread rates are also associated with short

grass areas and moderate load shrub areas. The highest rates of spread are associated with tall grass areas. Agricultural areas are clearly delineated in this model by their low rate of spread; however, these fuel types can also pose a severe hazard during certain times of the year (prior to harvest or following harvest when residual materials remain) and are often areas of ignition through human activity such as agricultural burning practices (Figure A.10).

Figure A.10. Agricultural burning, a common practice across Union County.
Source: SWCA.

Crown Fire Potential

Map 5 in Appendix B illustrates the range of crown fire activity from surface fire (in grass-dominated areas) to passive and active crown fire (in timber dominated fuels).

Fire Occurrence/Density of Starts

Map 6 in Appendix B illustrates the fire occurrence density for the planning area. Fire occurrence density has been determined by performing a density analysis on fire start locations with ArcGIS Desktop Spatial Analyst. These locations have been provided by the USFS and the IDNR and when combined the points show the location of fire starts within the planning area from 1986-2021. The density analysis has been performed as a kernel density, using a 2,500-meter search radius. The density of previous fire starts is used to determine the risk of ignition of a fire. Map 6 reveals a definite pattern of fires close to populated areas, at intersections, along highways and around the National Forest. High fire density is observed in a number of locations for example around Halsey, Wolf Lake and Valley Mission.

The fire occurrence maps are used to provide information on areas where human-ignited fires are prevalent and hence could be more prone to fire in the future.

Composite Risk-Hazard Assessment Model

All data used in the risk assessment have been processed using Esri ArcGIS Desktop and the Esri Spatial Analyst Extension. Information on these programs can be found at http://www.esri.com. Data have been gathered from all relevant agencies, and the most current data have been used.

The Composite Risk-Hazard Assessment comprises multiple inputs that can be categorized into three types- hazard, threats and values (Figure A.11). The result is a raster data layer that weighs and sums those inputs to determine risk. Data sets in the hazard category include historical weather data, topography, and vegetation and fuel regimes. Data sets in the threat category include fire history points and perimeters. The values category includes the WUI, distance from fire station, and natural, cultural, and socioeconomic assets data sets.

As shown in Figure A.11 with the elements in the black shaded box, we began by using the IFTDSS application to prepare a landscape file for the project area. This landscape file compiles multiple LANDFIRE data sets, including fuels, slope, elevation, and aspect, into one layer that can then be used to develop fire behavior outputs. We then edited the fuels model to match the more precise local data sets and used the edited fuels and landscape file to create custom fire behavior outputs.
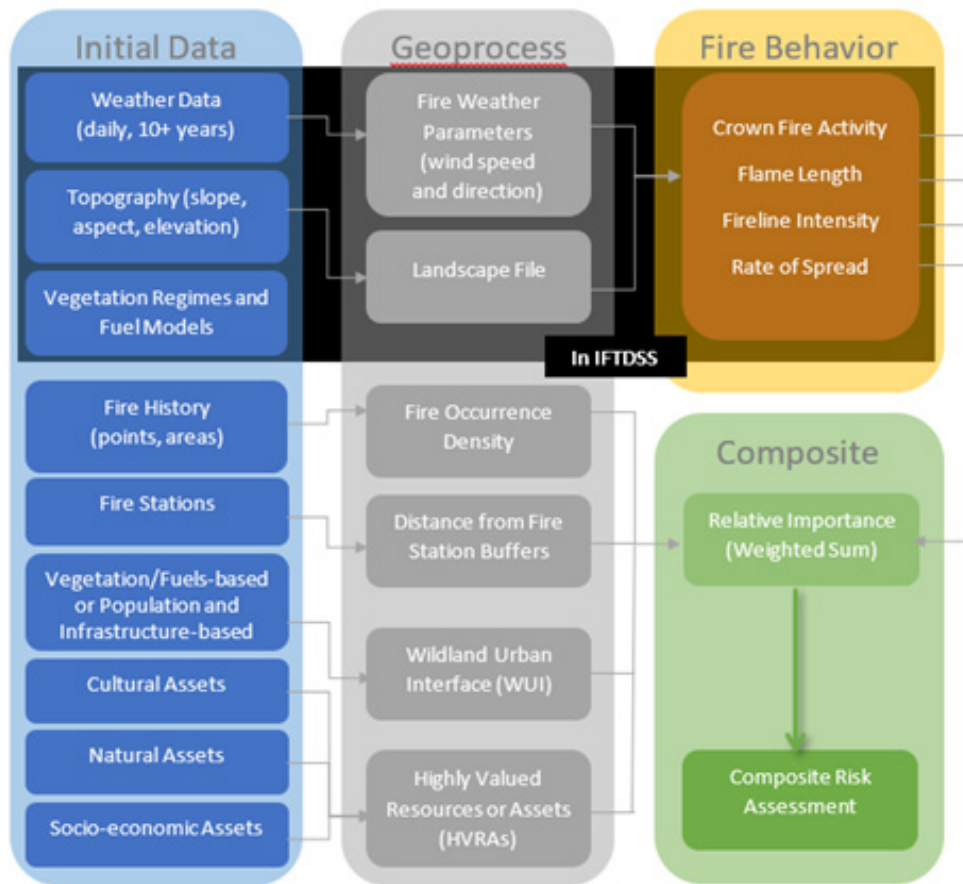

Figure A.11. Composite Risk-Hazard Assessment Breakdown

Next, in Esri ArcGIS Pro, we processed the fire history, fire station, WUI, and HVRA data sets to merge and create buffers where appropriate and converted the layers to rasters with the same spatial extent and resolution as the IFTDSS fire behavior outputs (30-meter cell size).

Last, we used ArcGIS Pro to run a weighted sum raster process to add all the inputs together. We assigned weights for input layers, based on feedback from the Core Team on the importance that each layer should contribute to the Composite Risk-Hazard Assessment (see Figure 3.3). While weighted sum composite rasters can be better for describing more detailed variations in risk, they can be overwhelming and difficult to understand, so we also created a reclassified raster from the weighted sum composite, using the natural breaks (Jenks) method, with four categories of low, medium, high, and extreme risk.

PUBLIC EDUCATION AND OUTREACH PROGRAMS

Public education and outreach programs are a common factor in virtually every agency and organization involved with the wildfire issue.

LOCAL AND STATE PROGRAMS

Shawnee National Forest Learning Center

The Shawnee National Forest works to educate the local population and visitors on natural resources and management. In addition to other educational topics, the Shawnee National Forest also provides education resources and programs for wildfire prevention through the Smokey Bear program and other avenues. For more information visit: http://www.fs.usda.gov/main/shawnee/learning

Illinois Department of Natural Resources

The IDNR provides fire education information such as fire resource websites and fact sheets. You can view the Fire Information Webpage here: https://www2.illinois.gov/dnr/conservation/Forestry/Pages/FireInformationWebsites.aspx.

Examples of available fact sheets include:

- The Science of Fire
- Prairie Fire
- Native American Use of Fire
- Managed Wildfires

Southern Illinois Prescribed Burn Association

SIPBA was incorporated in southern Illinois as a not-for-profit organization in 2006. SIPBA is an example of a partnership that empowers landowners, conservation groups, and agencies to apply prescribed burning as a management tool across the southern Illinois region. SIPBA maintains a partnership with the River to River Cooperative Weed Management Area, Shawnee Resource Conservation and Development, National Wild Turkey Federation, IDNR, and the U.S. Forest Service (SIPBA 2021).

SIPBA members enjoy many valuable and long-lasting benefits from their involvement:

- professional guidance and assistance with burn preparation
- quality training in every aspect of prescribed fire management
- access to specialized prescribed burn equipment; and
- assistance on burns from experienced and well-trained crews.

For more information, please visit the SIPBA website: www.sipba.org.

Illinois Prescribed Fire Council

The Illinois Prescribed Fire Council is a compilation of individuals, organizations, land managers and agencies who collectively operate with the mission of promoting the safe and continued use of prescribed fire on the Illinois landscape. The Council provides a wide array of information including a map of completed prescribed fires in Illinois, the Illinois Fire Needs Assessment and summary data, equipment reviews, fire insurance resources, employment and training resources, prescribed burn reports, lessons learned and best management practices, forest ecology literature, and more.

For more information, please visit the Illinois Prescribed Fire Council website: https://www.illinoisprescribedfirecouncil.org/.

Shawnee Resource Conservation and Development Inc.

Shawnee Resource Conservation and Development, Inc. (RC&D) was founded in 1967 and serves the southern 16 counties of Illinois. The mission of the RC&D is to provide local leadership with the framework required to develop and carry out a plan of action for the conservation, development, and wise use of the resources within the RC&D area. The focus of the group's work has been conservation, education, landowner support, and community development related to the natural resource base. A key program administered by the RD&C is the Let the Sun Shine In (LSSI) campaign. This campaign seeks to develop a landscape-scale approach to forest management.

For more information, please visit the RC&D Website: https://shawneercd.org/

Let the Sun Shine In

Established in 2016 in southern Illinois, LSSI is a conservation program committed to maintaining and restoring oak ecosystems. LSSI partners with local, state, federal, nongovernmental agencies, and private landowners with the purpose of tackling threats to forest and woodland environments, supporting biodiversity, and decreasing habitat fragmentation. Specifically, LSSI aims to enhance the age class distribution of forest trees, increase native biodiversity, and implement forest management to the largest extent feasible to restore and sustain healthy forests. Forest management procedures include prescribed fire, invasive species control, overstory harvest, and forest stand improvement (LSSI 2021).

For more information on the LSSI Campaign, please visit the website: https://www.letthesunshinein.life/

NATIONAL PROGRAMS

Ready, Set, Go!

The Ready, Set, Go! Program, which is managed by the International Association of Fire Chiefs, was launched in 2011 at the WUI Conference. The program seeks to develop and improve the dialogue between fire departments and residents, providing teaching tools for residents who live in high-risk wildfire areas—and the WUI—on how to best prepare themselves and their properties against fire threats (Ready, Set, Go! 2021).

The tenets of Ready, Set, Go! as included on the website (http://www.wildlandfirersg.org) are:

Ready – Take personal responsibility and prepare long before the threat of a wildland fire so your home is ready in case of a fire. Create defensible space by clearing brush away from your home. Use fire-resistant landscaping and harden your home with fire-safe construction measures. Assemble emergency supplies and belongings in a safe place. Plan escape routes and make sure all those residing within the home know the plan of action.

Set – Pack your emergency items. Stay aware of the latest news and information on the fire from local media, your local fire department, and public safety.

Go – Follow your personal wildland fire action plan. Doing so will not only support your safety but will allow firefighters to best maneuver resources to combat the fire.

National Fire Protection Association

The NFPA is a global non-profit organization devoted to eliminating death, injury, property, and economic loss due to fire, electrical, and related hazards. Its 300 codes and standards are designed to minimize the risk and effects of fire by establishing criteria for building, processing, design, service, and installation around the world.

The NFPA develops easy-to-use educational programs, tools, and resources for all ages and audiences, including Fire Prevention Week, an annual campaign that addresses a specific fire safety theme. The NFPA's Firewise Communities program (www.firewise.org) encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.

The NFPA is a premier resource for fire data analysis, research, and analysis. The Fire Analysis and Research division conducts investigations of fire incidents and produces a wide range of annual reports and special studies on all aspects of the nation's fire problem.

U.S. Fire Administration's WUI Toolkit

The U.S. Fire Administration (USFA) is an entity of FEMA that aids in the preparation for and response to fire. Their WUI toolkit consists of a list of websites and other information regarding risk assessment, public outreach, and community training. Find the toolkit here: https://www.usfa.fema.gov/wui_toolkit/wui_training.html.

Insurance Institute for Business and Home Safety

The Insurance Institute for Business and Home Safety (IBHS) is an independent, non-profit, scientific research and communications organization supported solely by property insurers and reinsurers. The IBHS's building safety research leads to real-world solutions for home and business owners, helping to create more resilient communities. Its mission is to conduct objective, scientific research to identify and promote the most effective ways to strengthen homes, businesses, and communities against natural disasters and other causes of loss.

The IBHS conducts laboratory and field experiments in structural ignitability and has helped develop new guidelines for defensible space zones to emphasize ember resistance and a "home ignition zone" (Figure A.12). IBHS's wildfire research page can be found here: https://ibhs.org/risk-research/wildfire/.

Figure A.12. Defensible space standards from the IBHS.

APPENDIX B:

Additional Mapping
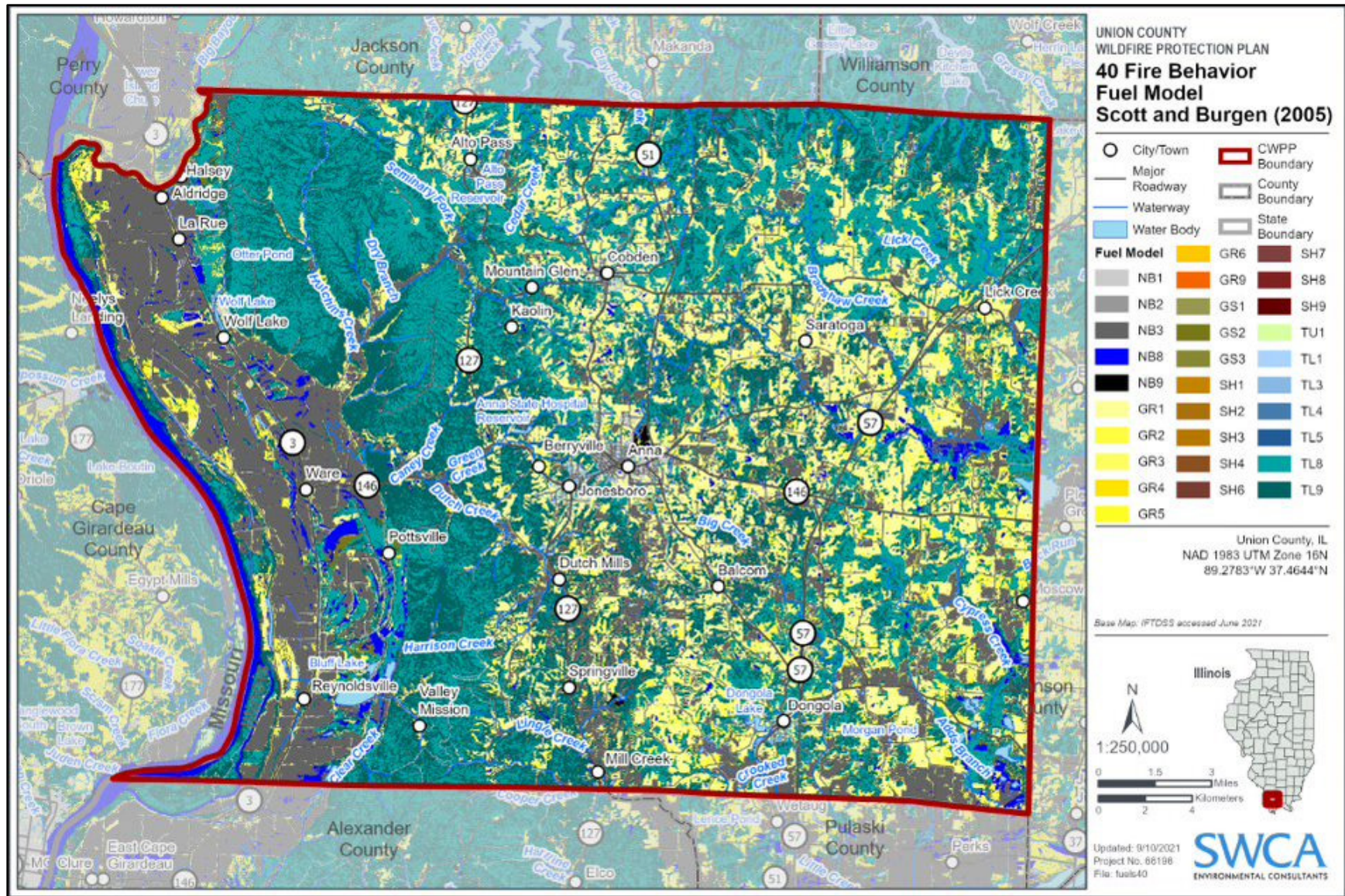
Map 1. Scott and Burgan 40 Fire Behavior Fuel Models.
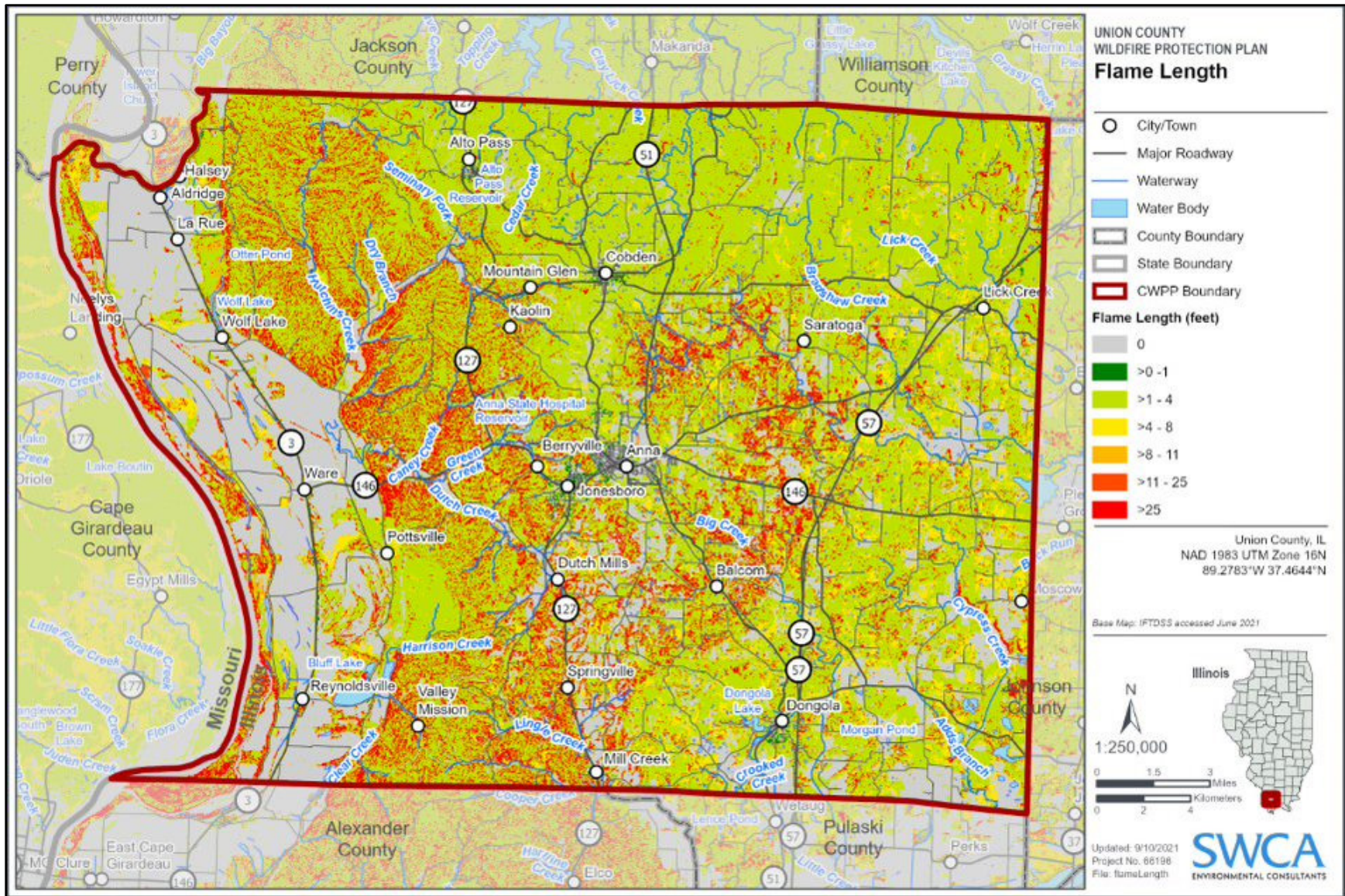
Map 2. Risk assessment inputs: flame length.
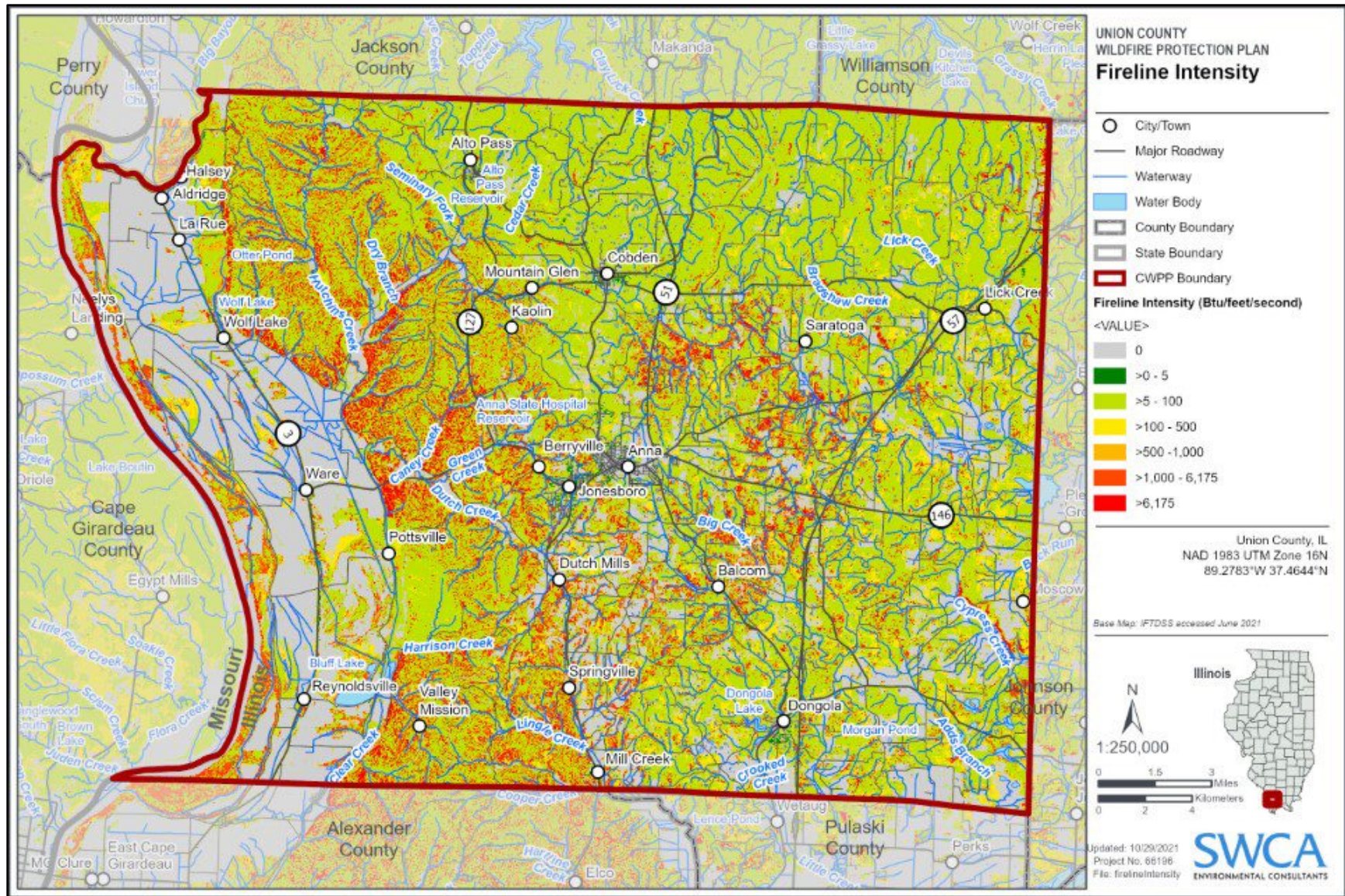
Map 3. Risk assessment inputs: fireline intensity.
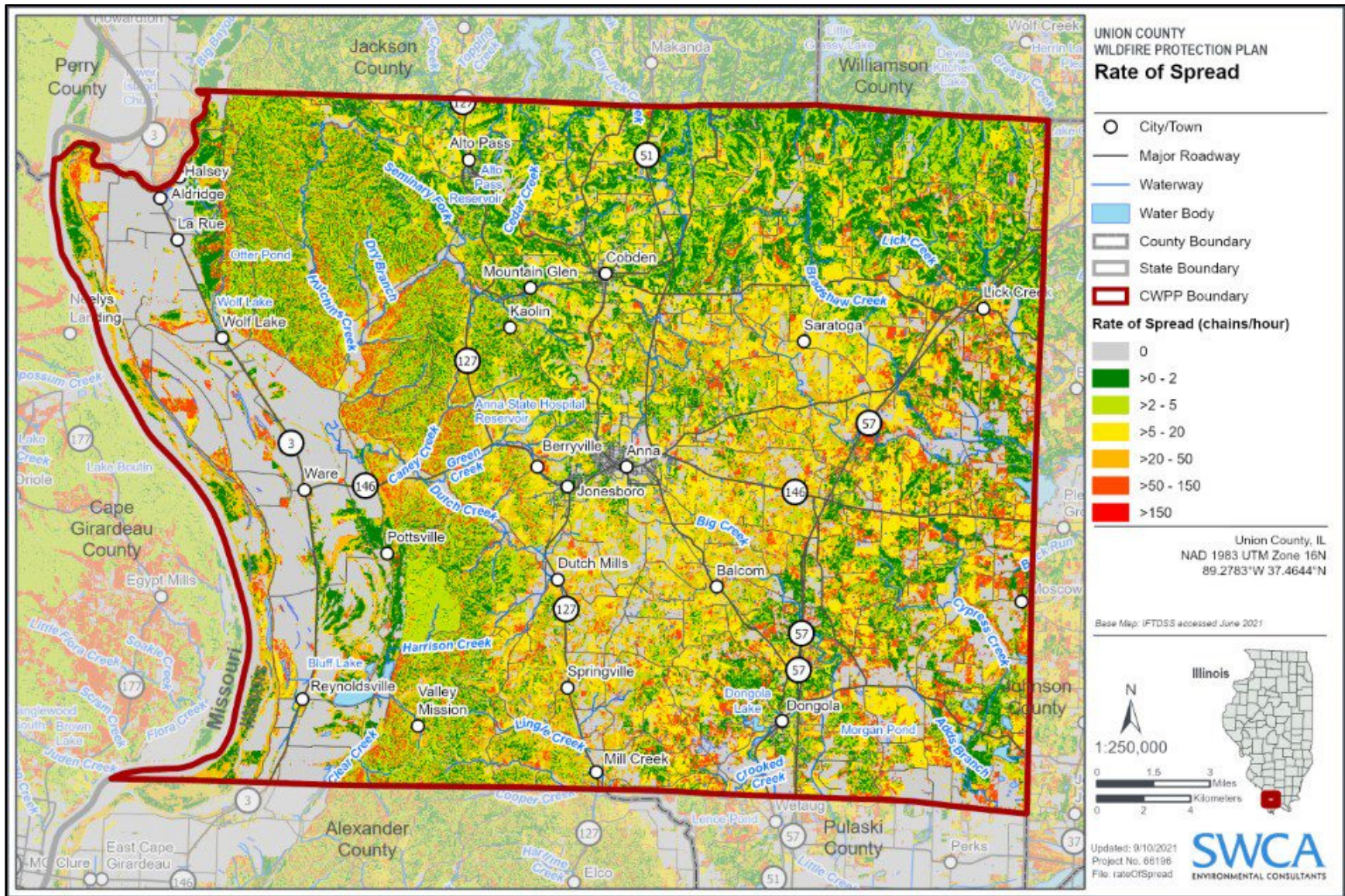
Map 4. Risk assessment inputs: rate of spread.
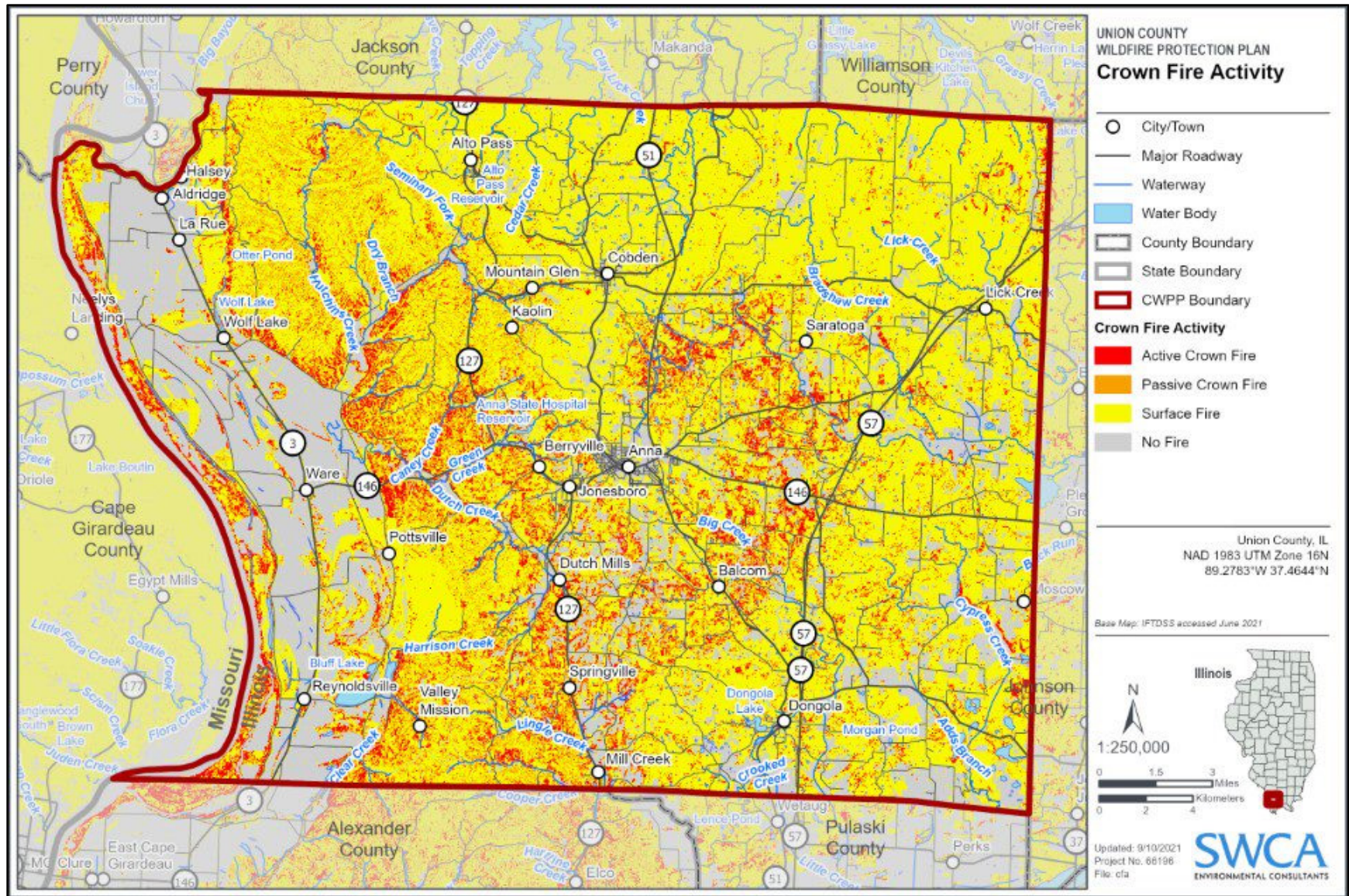
Map 5. Risk assessment inputs: crown fire activity.
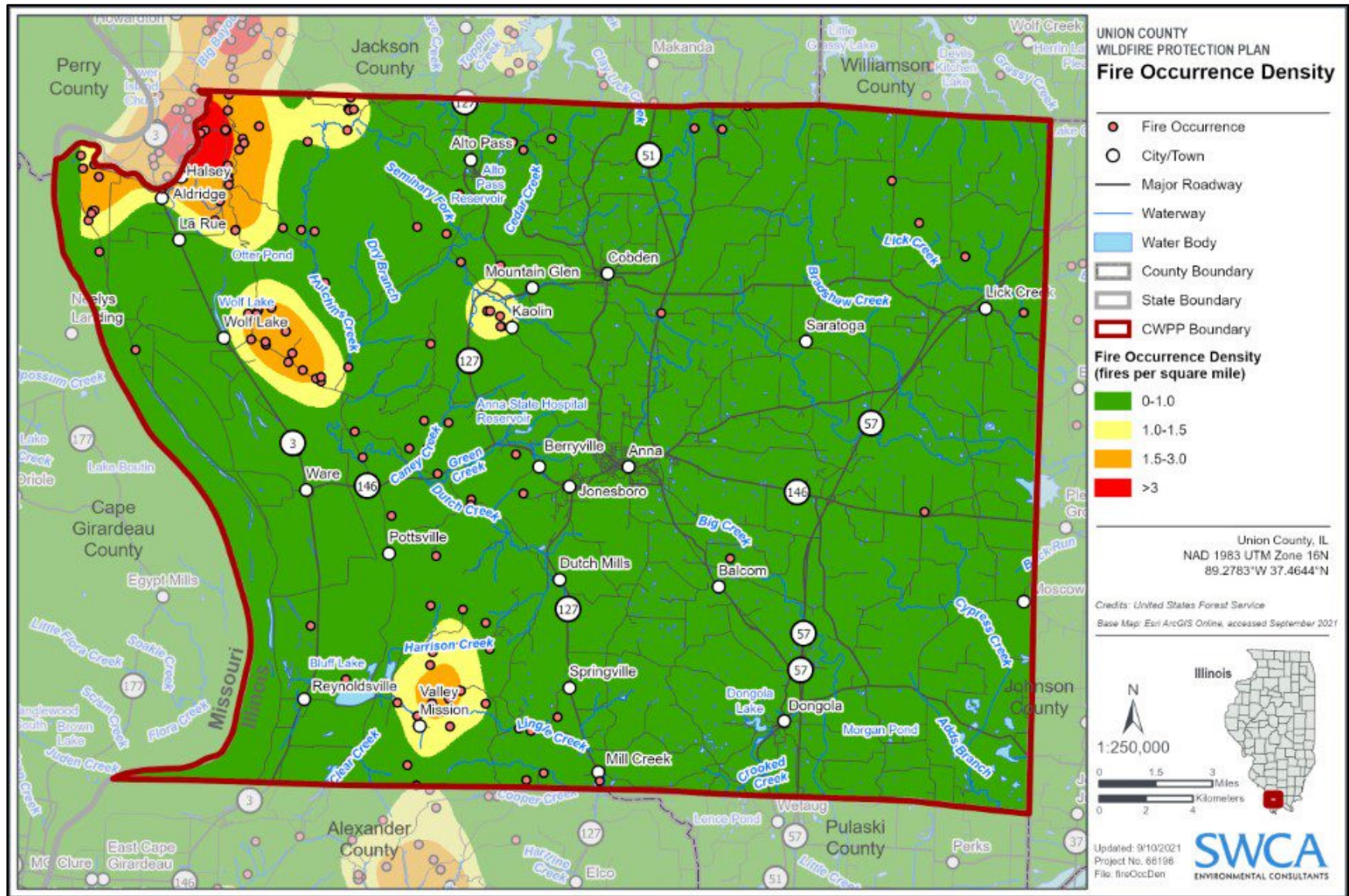
Map 6. Risk assessment inputs: fire occurrence density.
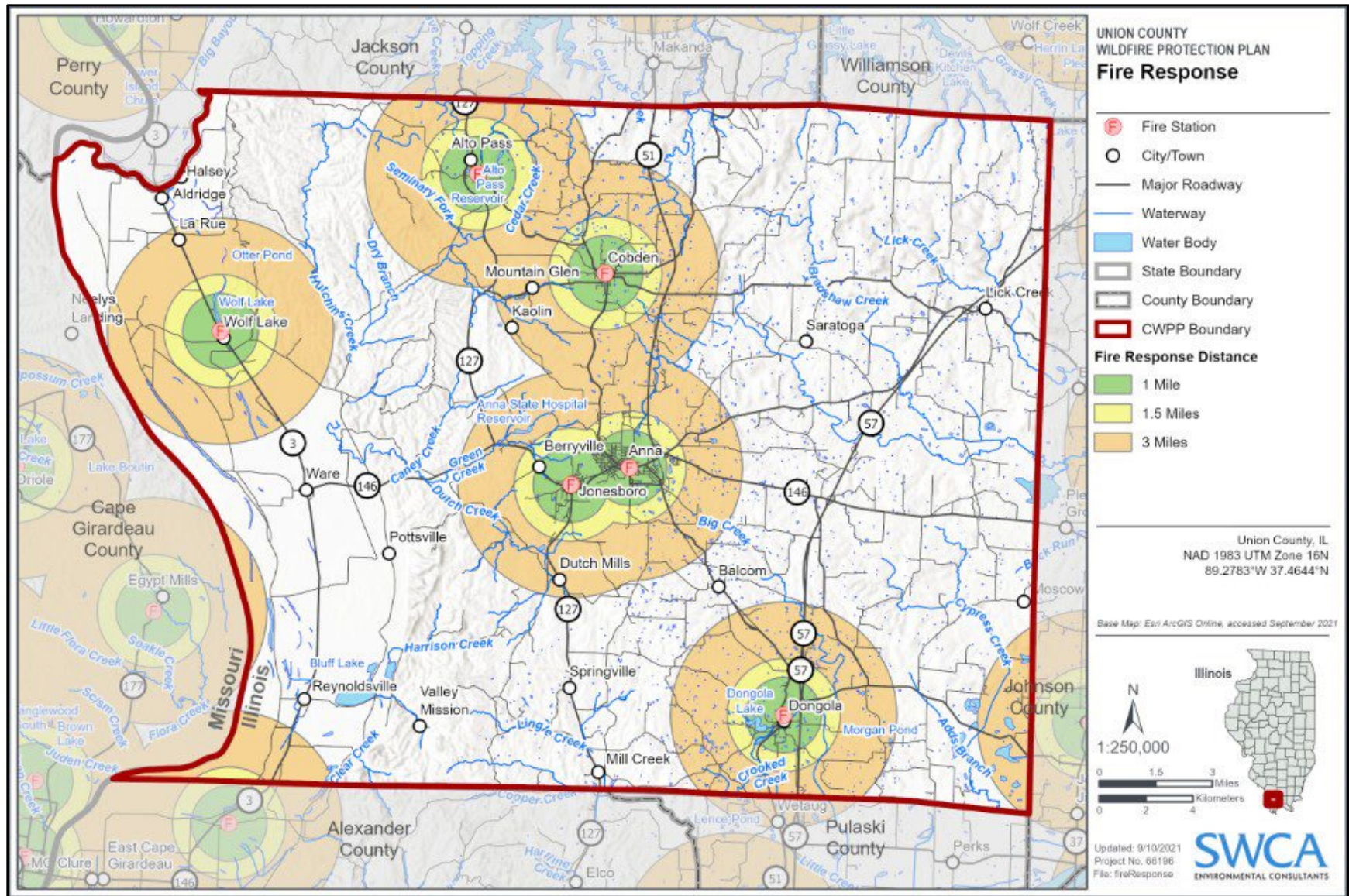
Map 7. Fire district boundaries.
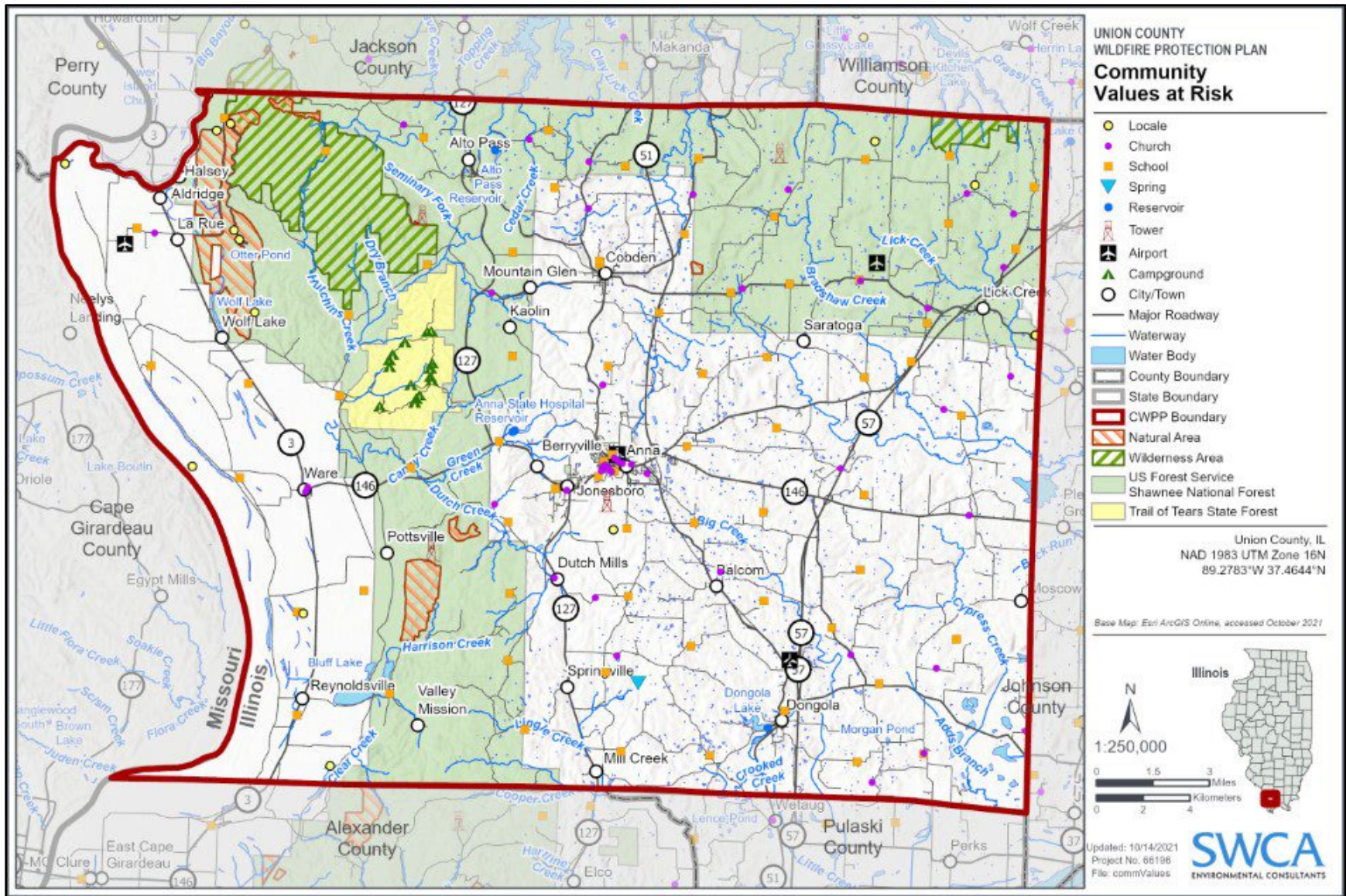
Map 8. Community values at risk.
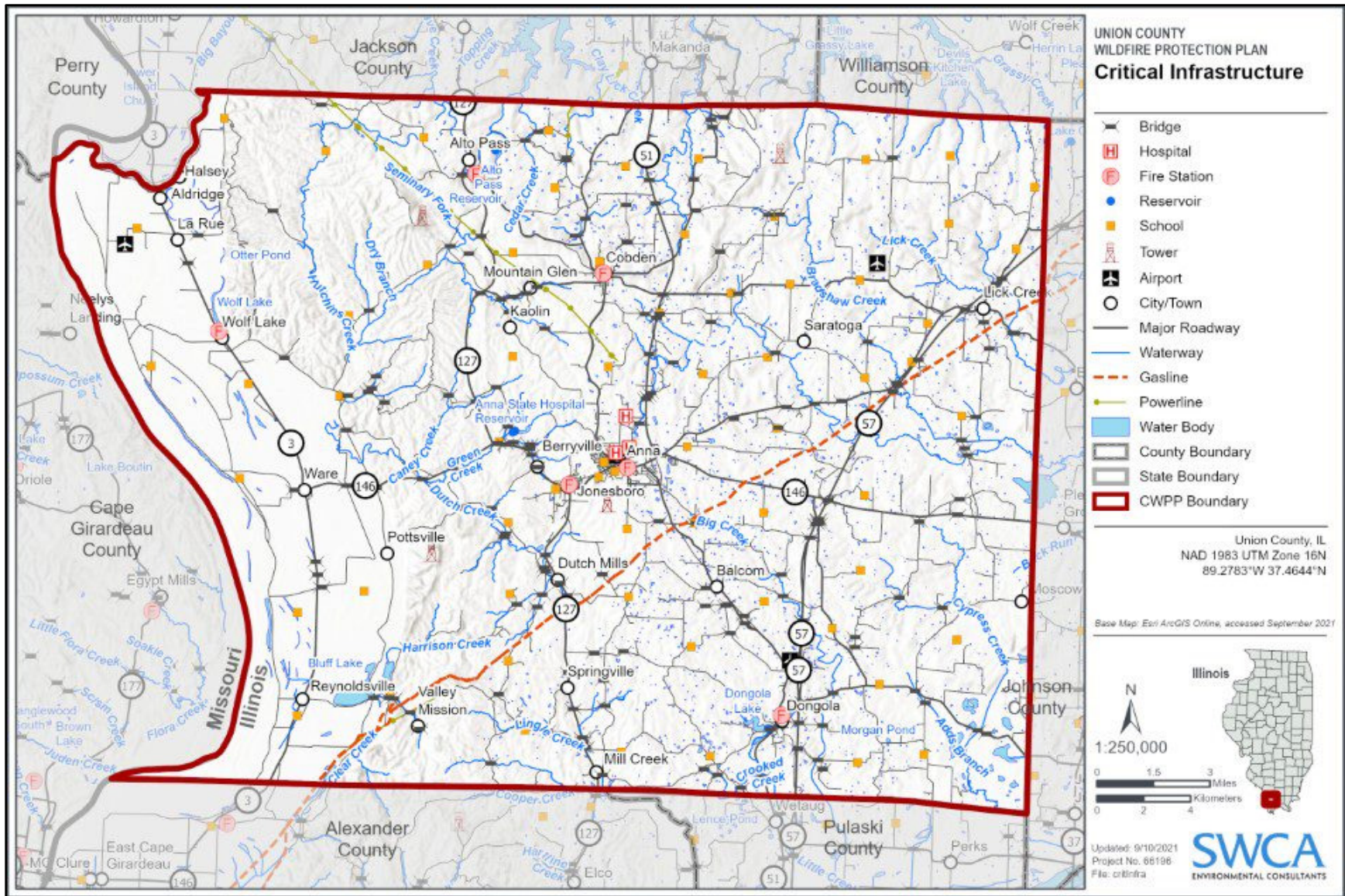
Map 9. Critical infrastructure.

APPENDIX C:

Core Team List

Name	Organization
Tiffany George	Southern Five Regional Planning District and Development
Max Miller	Union County Board Chairman
Dana Pearson	Union County ESDA
Mike Dammerman	Fire Chief – Anna
Larry Quertermous	Fire Chief – Cobden
Mark Kaufman	Fire Chief – Dongola
Timothy Bowen	Fire Chief – Jonesbro
Larry Derossett	Fire Chief – Ware Wolf Lake
Scott Christ	USFS
Jason Rose	USFS
Whit Jiter	USFS
Ben Snyder	IDNR
David Allen	Shawnee RC&D
Chris Walker	Shawnee RC&D
Nick Seaton	River to River Cooperative Weed Management Area
Victoria Amato	SWCA Environmental Consultants
Arianna Porter	SWCA Environmental Consultants
Anne Russell	SWCA Environmental Consultants
Breanna Plucinski	SWCA Environmental Consultants

APPENDIX D:

Community Descriptions and Hazard Ratings

UNION COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES
COMMUNITY ASSESSMENT SUMMARIES
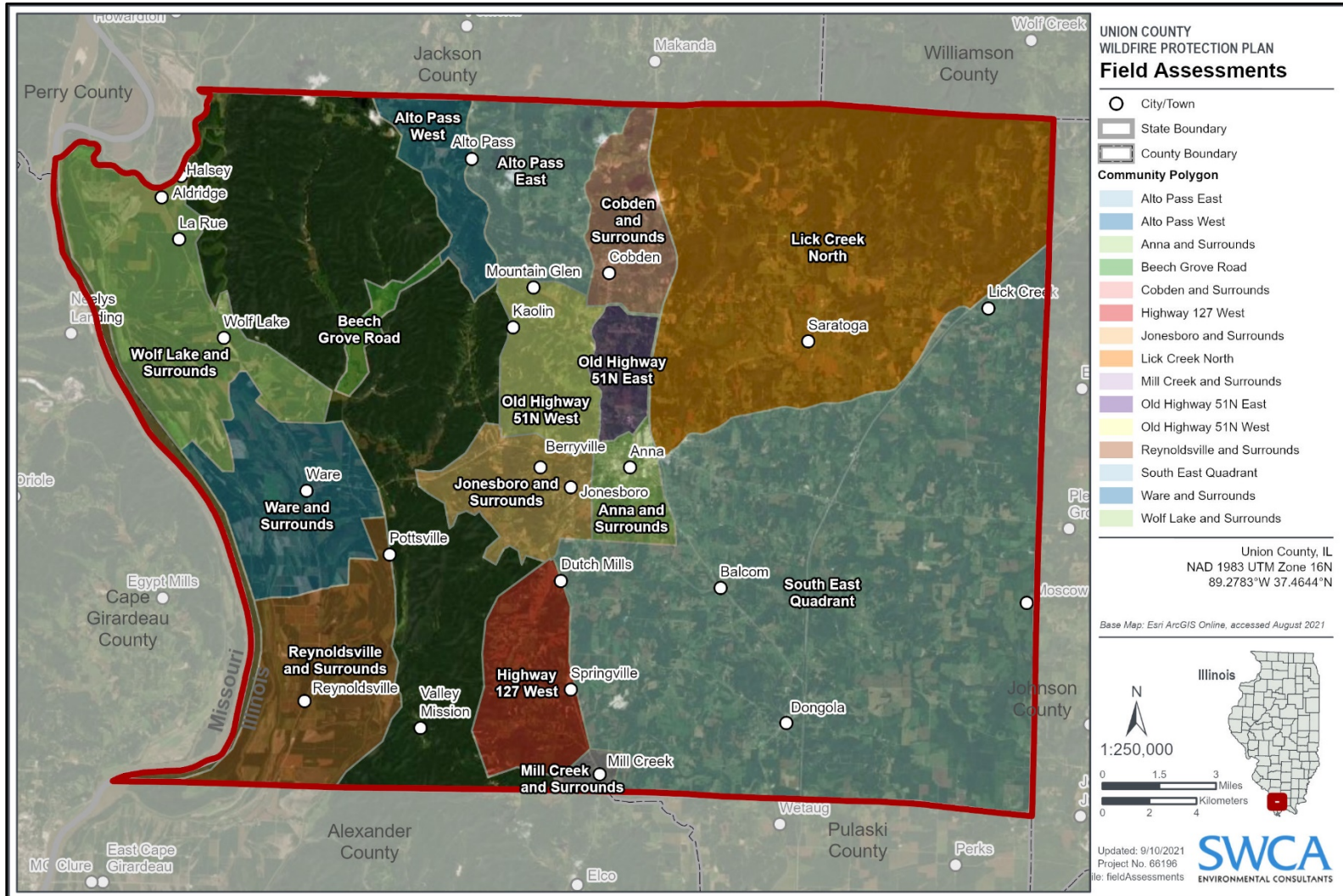
Figure D.1. Union County community polygon delineations.

SOUTH-EAST QUADRANT SUMMARY STATISTICS

Town:	South East Quadrant	**Population Density (people/*mi²*):**	N/A
Land Area (*mi²*)	126.84	**Home Density (housing units/ *mi²*):**	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI)Types

WUI	Acres	Percent
High_Dens_Intermix	1.032	0.00%
High_Dens_NoVeg	22.39	0.03%
Low_Dens_Interface	1338.62	1.65%
Low_Dens_Intermix	1560.70	1.92%
Low_Dens_NoVeg	12279.1	15.13%
Med_Dens_Intermix	178.00	0.22%
Med_Dens_NoVeg	527.07	0.65%
Uninhabited_NoVeg	5220.94	6.43%
Uninhabited_Veg	2248.81	2.77%
Very_Low_Dens_NoVeg	51747.88	63.75%
Very_Low_Dens_Veg	5937.15	7.31%
Water	117.05	0.14%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
47.68%	43.89%	8.00%	0.44%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 90.18%	0–5 (ch./hr.): 52.02%	No Data: 23.01%	0–0.5 (mi): 2.60%
4–8 (ft): 0.51%	5–20 (ch./hr.): 47.83%	Surface Fire: 67.13%	0.5–1.0 (mi): 3.70%
8–12 (ft): 0.60%	20–50 (ch./hr.): 0.14%	Passive Crown Fire: 1.33%	1.0–1.5 (mi): 25.74%
>12 (ft): 8.70%	>50 (ch./hr.): 0.00%	Active Crown Fire: 8.54%	>1.5 (mi): 67.96%

Fire Department Statistics*

Fire stations: –   Fulltime Firefighters: –   Call Firefighters: –   Volunteer Firefighters -

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	–			
Type 2:	–	Type 3: –	–	–
Type 3:	–	Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1:	–	Type 6: –	–	–
Type 2:	0	Type 7: –	–	–
Port-A-Tanks: –	Portable Pumps: –			

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress and Egress – more than one road in and out, good access to highway
- Street Signs – visible and reflective
- Vegetation type – hardwood and agricultural
- Slope – mostly flat
- Organized Response – fire department close to communities
- History of fire occurrence – low fire occurrence
- Severe fire weather potential – minimal
- Separation of adjacent structures – good, large plots

Negative Attributes (High Scores)

- Building construction – combustible
- Water source – limited access in rural areas
- Utility placement – both aboveground
- Deck and fencing – combustible

Values at Risk

- Residential properties
- Agricultural values
- Tourism values – wineries, guest houses, etc.

NFPA 1144 Final Rating

Community Polygon Name	Total Score
South East Quadrant	53
Town Average:	53 (Moderate)
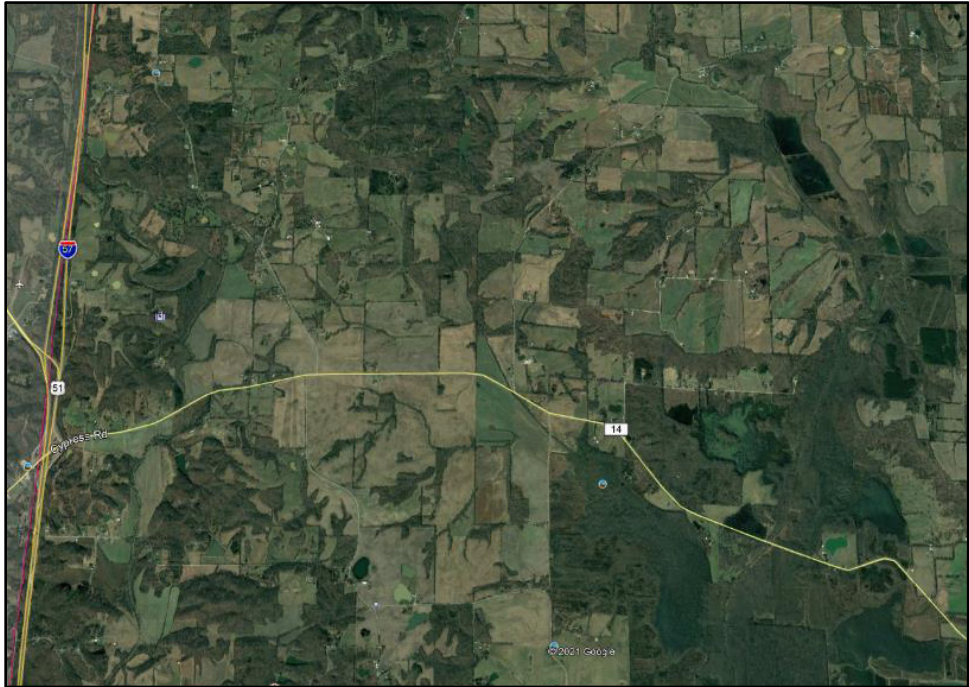
Figure D.2. Agricultural land is dominant throughout the polygon, with large tracts of forested land at a greater distance from structures.

Source: Google.

Figure D.3. Agricultural land and scattered properties are common throughout this polygon.

OLD HIGHWAY 51N WEST SUMMARY STATISTICS

Town:	Old Highway 51N West	**Population Density (people/mi^2):**	N/A
Land Area (mi^2)	10.59	**Home Density (housing units/ mi^2):**	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
High_Dens_NoVeg	3.73	0.06%
Low_Dens_Interface	615.18	9.08%
Low_Dens_Intermix	809.97	11.95%
Low_Dens_NoVeg	24.79	0.37%
Med_Dens_Interface	85.32	1.26%
Med_Dens_NoVeg	80.68	1.19%
Uninhabited_NoVeg	397.23	5.86%
Uninhabited_Veg	410.14	6.05%
Very_Low_Dens_NoVeg	492.33	7.26%
Very_Low_Dens_Veg	3829.38	56.50%
Water	29.32	0.43%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
65.07%	23.39%	10.90%	0.64%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 86.35%	0–5 (ch./hr.): 62.22%	No Data: 11.49%	0–0.5 (mi): 1.78%
4–8 (ft): 1.28%	5–20 (ch./hr.): 37.69%	Surface Fire: 74.82%	0.5–1.0 (mi): 13.54%
8–12 (ft): 1.37%	20–50 (ch./hr.): 0.09%	Passive Crown Fire: 5.66%	1.0–1.5 (mi): 74.75%
>12 (ft): 11.00%	>50 (ch./hr.): 0.00%	Active Crown Fire: 8.02%	>1.5 (mi): 9.93%

Fire Department Statistics*

Fire stations: – Fulltime Firefighters: – Call Firefighters: – Volunteer Firefighters -

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	–			
Type 2:	–	Type 3: –	–	–
Type 3:	–	Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1:	–	Type 6: –	–	–
Type 2:	0	Type 7: –	–	–
Port-A-Tanks:	–	Portable Pumps: –		

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans
• 2020–2030 Illinois Forest Action Plan • 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

<u>Positive Attributes (Low Scores)</u>

- Street Signs – visible and reflective
- Separation of adjacent structures – good
- Severe fire weather potential – limited
- History of high fire occurrence – low frequency of previous fires

<u>Negative Attributes (High Scores)</u>

- Ingress/Egress – limited access roads, unsurfaced roads, steeper grade
- Road conditions – unsurfaced, slow response
- Fire access – limited turnaround
- Vegetation type – timber fuels prevalent and surrounding some homes; some extensive forested tracks interface homes
- Defensible space – limited
- Building construction – combustible
- Deck and fencing – combustible
- Water source – no water source in rural areas
- Organized response – > 5 miles from station
- Utility placement – both aboveground

Values at Risk

- Residential properties
- Agricultural values
- Tourism values – wineries, guest houses, etc.

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Old Highway 51N West	101
Town Average:	101 (high)

Figure D.4. Some homes are surrounded by forested lands with limited ingress and egress. Many homes have limited defensible space between structures and wildland fuels.

Source: Google.

Figure D.5. Adjacent forest lands have undergone treatment in some areas, utilizing prescribed fire.

OLD HIGHWAY 51N EAST SUMMARY STATISTICS

Town:	Old Highway 51N East	**Population Density (people/*mi²*):**	N/A
Land Area (*mi²*)	4.78	**Home Density (housing units/ *mi²*):**	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
Low_Dens_Interface	617.69	20.18%
Low_Dens_Intermix	68.87	2.25%
Low_Dens_NoVeg	804.39	26.27%
Med_Dens_Interface	28.41	0.93%
Med_Dens_NoVeg	92.65	3.03%
Uninhabited_NoVeg	357.75	11.69%
Uninhabited_Veg	19.61	0.64%
Very_Low_Dens_NoVeg	662.12	21.63%
Very_Low_Dens_Veg	408.10	13.33%
Water	1.93	0.06%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
66.83%	24.88%	8.29%	0.00%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 90.87%	0–5 (ch./hr.): 52.76%	No Data: 20.33%	0–0.5 (mi): 3.26%
4–8 (ft): 0.46%	5–20 (ch./hr.): 47.22%	Surface Fire: 70.42%	0.5–1.0 (mi): 22.62%
8–12 (ft): 0.50%	20–50 (ch./hr.): 0.02%	Passive Crown Fire: 1.24%	1.0–1.5 (mi): 74.12%
>12 (ft): 8.17%	>50 (ch./hr.): 0.00%	Active Crown Fire: 8.01%	>1.5 (mi): 0.00%

Fire Department Statistics*

Fire stations: – Fulltime Firefighters: – Call Firefighters: – Volunteer Firefighters –

Water Tender		Wildland Engines		
Type 1: –			Standard	Brush Breaker
Type 2: –		Type 3: –	–	–
Type 3: –		Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1: –		Type 6: –	–	–
Type 2: –		Type 7: –	–	–
Port-A-Tanks: –	Portable Pumps: –			

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – two or more roads in and out
- Street signs – visible and reflective
- Slope – minimal slope
- History of high fire occurrence – minimal recent fires
- Severe fire weather potential – limited
- Separation of adjacent structures – good, larger lots
- Organized Response – within 5 miles of a station

Negative Attributes (High Scores)

- Vegetation type – timber and understory
- Defensible space – less than 70 feet of clearance
- Building construction – combustible
- Utility placement – both aboveground

Values at Risk

- Residential properties
- Agricultural values

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Old Highway 51N East	78
Town Average:	78 (High)

Figure D.6. Scattered homes in an intermix of forested lands and agricultural fields. Sparsely populated.

Source: Google.

REYNOLDSVILLE AND SURROUNDS SUMMARY STATISTICS

Town:	Reynoldsville and Surrounds	**Population Density (people/mi^2):**	N/A
Land Area (mi^2)	20.59	**Home Density (housing units/ mi^2):**	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
Low_Dens_Interface	10.64	0.08%
Low_Dens_Intermix	10.36	0.08%
Low_Dens_NoVeg	77.76	0.59%
Uninhabited_NoVeg	2167.25	16.44%
Uninhabited_Veg	4451.14	33.77%
Very_Low_Dens_NoVeg	5347.46	40.57%
Very_Low_Dens_Veg	638.05	4.84%
Water	476.97	3.62%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
69.36%	18.95%	10.99%	0.70%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 87.42%	0–5 (ch./hr.): 74.65%	No Data: 54.99%	0–0.5 (mi): 0.00%
4–8 (ft): 0.52%	5–20 (ch./hr.): 24.29%	Surface Fire: 32.54%	0.5–1.0 (mi): 2.52%
8–12 (ft): 0.56%	20–50 (ch./hr.): 1.06%	Passive Crown Fire: 1.05%	1.0–1.5 (mi): 18.58%
>12 (ft): 11.51%	>50 (ch./hr.): 0.00%	Active Crown Fire: 11.42%	>1.5 (mi): 78.89%

Fire Department Statistics

Fire stations: 1   Fulltime Firefighters: 0   Call Firefighters: 0   Volunteer Firefighters   15

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1: 1–3				
Type 2: 0		Type 3:	1–3	0
Type 3: 0		Type 4:	1–3	0
Structure Engines		Type 5:	1–3	0
Type 1:	1–3	Type 6:	1–3	0
Type 2:	1–3	Type 7:	0	0

Port-A-Tanks: 2   Portable Pumps: 1

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – two or more roads in and out; Levee Road provides access to adjacent forest areas
- Vegetation type – grass dominant
- Slope – limited
- Separation of adjacent structures – good, larger plots
- History of high fire occurrence – limited
- Street signs – visible and reflective
- Water source – good/hydrants

Negative Attributes (High Scores)

- Severe fire weather potential – previous weather anomalies create strong destructive winds
- Building construction – combustible
- Deck and fencing – combustible
- Organized response – greater than 5 miles from station
- Utility placement – both aboveground

Values at Risk

- Residential properties
- Agricultural values
- Union County State Fish and Wildlife Area
- Railroad

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Reynoldsville and Surrounds	56
Town Average:	56 (Moderate)

Figure D.7. Very sparsely populated area with most homes surrounded by agricultural lands. Levee Road separates homes from adjacent forest land.

Source: Google.

Figure D.8. Fuels in the area are comprised of grass mix with deciduous tree patches.

WARE AND SURROUNDS SUMMARY STATISTICS

Town:	Ware and Surrounds	Population Density (people/*mi²*):	3,422
Land Area (*mi²*)	17.51	Home Density (housing units/ *mi²*):	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
Low_Dens_Interface	1038.24	9.26%
Low_Dens_Intermix	1.78	0.02%
Low_Dens_NoVeg	574.62	5.13%
Med_Dens_NoVeg	7.46	0.07%
Uninhabited_NoVeg	749.87	6.69%
Uninhabited_Veg	2250.71	20.08%
Very_Low_Dens_NoVeg	6054.65	54.02%
Very_Low_Dens_Veg	307.87	2.75%
Water	223.38	1.99%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
77.7%	14.92%	7.23%	0.15%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 92.23%	0–5 (ch./hr.): 81.72%	No Data: 70.23%	0–0.5 (mi): 0.00%
4–8 (ft): 0.36%	5–20 (ch./hr.): 17.35%	Surface Fire: 22.00%	0.5–1.0 (mi): 0.77%
8–12 (ft): 0.43%	20–50 (ch./hr.): 0.93%	Passive Crown Fire: 0.78%	1.0–1.5 (mi): 12.13%
>12 (ft): 6.98%	>50 (ch./hr.): 0.00%	Active Crown Fire: 6.98%	>1.5 (mi): 87.10%

Fire Department Statistics

Fire stations: 1   Fulltime Firefighters: 0   Call Firefighters: 0   Volunteer Firefighters 15

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1: 1–3				
Type 2: 0		Type 3:	1–3	0
Type 3: 0		Type 4:	1–3	0
Structure Engines		Type 5:	1–3	0
Type 1:	1–3	Type 6:	1–3	0
Type 2:	1–3	Type 7:	0	0
Port-A-Tanks: 2 Portable Pumps: 1				

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – two or more roads in and out
- Street signs – visible and reflective
- Vegetation – agricultural with timber on far interface
- Slope – relatively flat
- Separation of adjacent structures – good, larger plots
- Water source – hydrants
- Fire response – fire station within 5 miles
- Helipad in nearby Wolf Lake

Negative Attributes (High Scores)

- Severe fire weather potential – exposed, potential for strong winds, unique weather phenomenon has occurred in the past causing forest damage
- Deck and fencing – combustible
- History of large number of fire calls
- High fire frequency (relative to other areas)
- Utility placement – both aboveground

Values at Risk

- Residential properties
- Agricultural values
- Commercial and industrial values
- Railroad

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Ware and Surrounds	70
Town Average:	70 (Moderate)
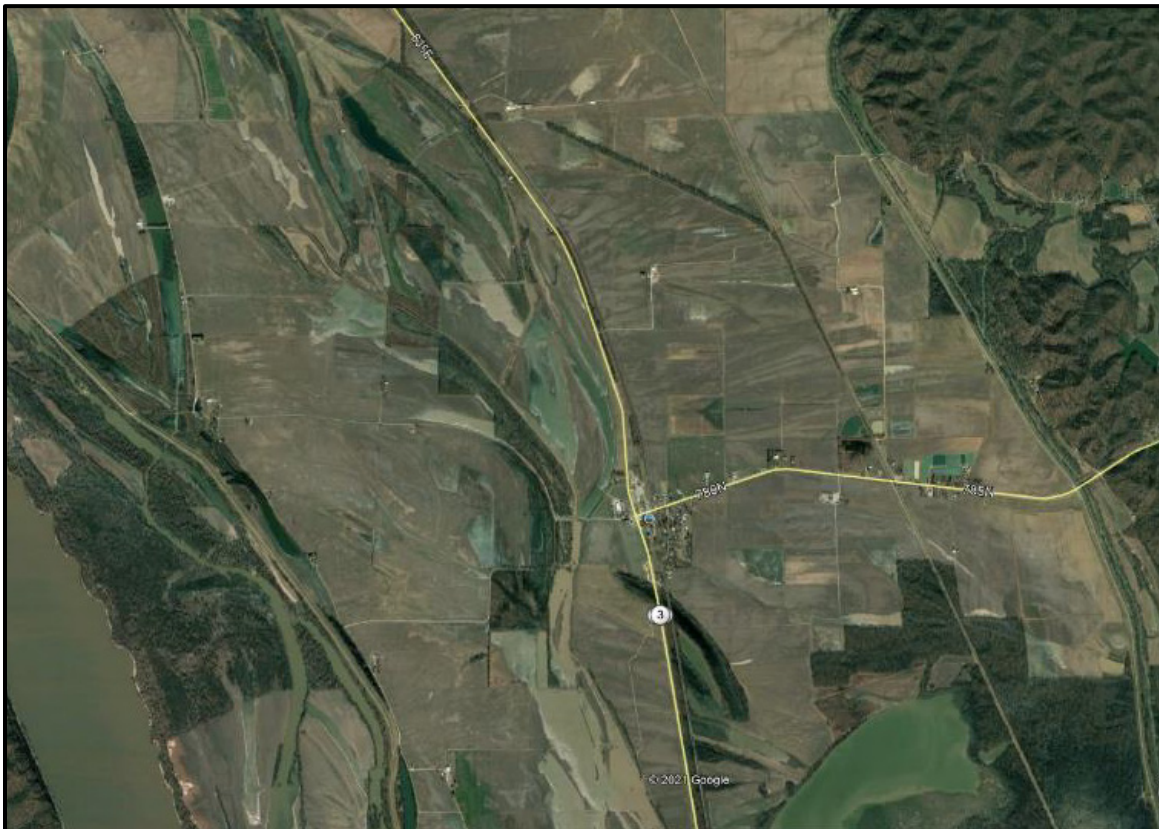
Figure D.9. Most homes are located in an agricultural setting, with good separation from the home to adjacent forested lands.

Source: Google.

Figure D.10. Agricultural burning is a common practice on lands within this polygon.

WOLF LAKE AND SURROUNDS SUMMARY STATISTICS

Town:	Wolf Lake and Surrounds	Population Density (people/mi^2):	316
Land Area (mi^2)	25.61	Home Density (housing units/ mi^2):	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
High_Dens_Interface	2.82	0.02%
Low_Dens_Interface	1064.96	6.50%
Low_Dens_NoVeg	114.78	0.70%
Med_Dens_Interface	43.96	0.27%
Uninhabited_NoVeg	3950.10	24.10%
Uninhabited_Veg	144.52	0.88%
Very_Low_Dens_NoVeg	10696.58	65.26%
Very_Low_Dens_Veg	56.10	0.35%
Water	316.81	1.93%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
75.10%	18.48%	6.16%	0.26%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 92.81%	0–5 (ch./hr.): 80.65%	No Data: 70.63%	0–0.5 (mi): 9.76%
4–8 (ft): 1.03%	5–20 (ch./hr.): 18.43%	Surface Fire: 22.22%	0.5–1.0 (mi): 9.41%
8–12 (ft): 0.32%	20–50 (ch./hr.): 0.92%	Passive Crown Fire: 1.28%	1.0–1.5 (mi): 44.61%
>12 (ft): 5.84%	>50 (ch./hr.): 0.00%	Active Crown Fire: 5.87%	>1.5 (mi): 36.22%

Fire Department Statistics

Fire stations: 1   Fulltime Firefighters: 0   Call Firefighters: 0   Volunteer Firefighters 15

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1: 1–3				
Type 2: 0		Type 3:	1–3	0
Type 3: 0		Type 4:	1–3	0
Structure Engines		Type 5:	1–3	0
Type 1:	1–3	Type 6:	1–3	0
Type 2:	1–3	Type 7:	0	0

Port-A-Tanks: 2   Portable Pumps: 1

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – two or more roads in and out
- Street signs – visible and reflective
- Separation of adjacent structures – good, large plots
- Slope – minimal, floodplain
- Water source – hydrants
- Organized response – fire station within 5 miles
- Helipad and dip spots

Negative Attributes (High Scores)

- Vegetation type – timber and understory
- Utility placement – both aboveground
- Deck and fencing – combustible
- Severe fire weather potential – exposed, potential strong winds; unique weather phenomenon has occurred in the past causing forest damage
- Building construction – combustible
- Values at risk – commercial industry in community
- High fire frequency (relative to other areas)

Values at Risk

- Residential properties
- Agricultural values
- Commercial and industrial values – Dyno Nobel Ammunitions plant (potential hazard); Shaefer Enterprises
- Adjacent Pine Hills Natural Area
- Recreational areas

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Wolf Lake and Surrounds	73
Town Average:	73 (High

Figure D.11. Most of the polygon comprises flat river floodplain and agricultural lands. There are some homes and commercial/industrial operations located immediately adjacent to forested lands.

Source: Google.

Figure D.12. The polygon interfaces with USFS lands, heavier fuels and steep topography.

BEECH GROVE ROAD SUMMARY STATISTICS

Town:	Beech Grove Road	Population Density (people/mi^2):	N/A
Land Area (mi^2)	2.29	Home Density (housing units/ mi^2):	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
Uninhabited_NoVeg	315.90	21.51%
Uninhabited_Veg	284.82	19.39%
Very_Low_Dens_NoVeg	275.10	18.79%
Very_Low_Dens_Veg	592.12	40.31%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
45.50%	41.52%	12.02%	0.96%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 85.97%	0–5 (ch./hr.): 57.46%	No Data: 42.46%	0–0.5 (mi): 0.00%
4–8 (ft): 0.89%	5–20 (ch./hr.): 40.61%	Surface Fire: 42.94%	0.5–1.0 (mi): 0.00%
8–12 (ft): 0.43%	20–50 (ch./hr.): 1.92%	Passive Crown Fire: 2.44%	1.0–1.5 (mi): 5.90%
>12 (ft): 12.70%	>50 (ch./hr.): 0.00%	Active Crown Fire: 12.15%	>1.5 (mi): 94.10%

Fire Department Statistics*

Fire stations: –   Fulltime Firefighters: –   Call Firefighters: –   Volunteer Firefighters   –

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	–			
Type 2:	–	Type 3: –	–	–
Type 3:	–	Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1:	–	Type 6: –	–	–
Type 2:	–	Type 7: –	–	–
Port-A-Tanks: –	Portable Pumps: –			

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Street signs – visible and reflective
- Slope – flat
- Separation of adjacent structures – good, large plots

Negative Attributes (High Scores)

- Ingress/Egress – one road in and out; surrounded by forest on both sides
- Vegetation type – timber and litter, large expanse of forested land in interface
- Topographic features – variable slope in vicinity, channeling of winds
- Utility placement – both aboveground
- Organized response – closest station is Wolf Lake, greater than 5 miles away
- Building construction – combustible
- Deck and fencing – combustible
- Water source – None

Values at Risk

- Residential properties
- Agricultural values
- Trail of Tears State Forest

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Beech Grove Road	95
Town Average:	95 (High)
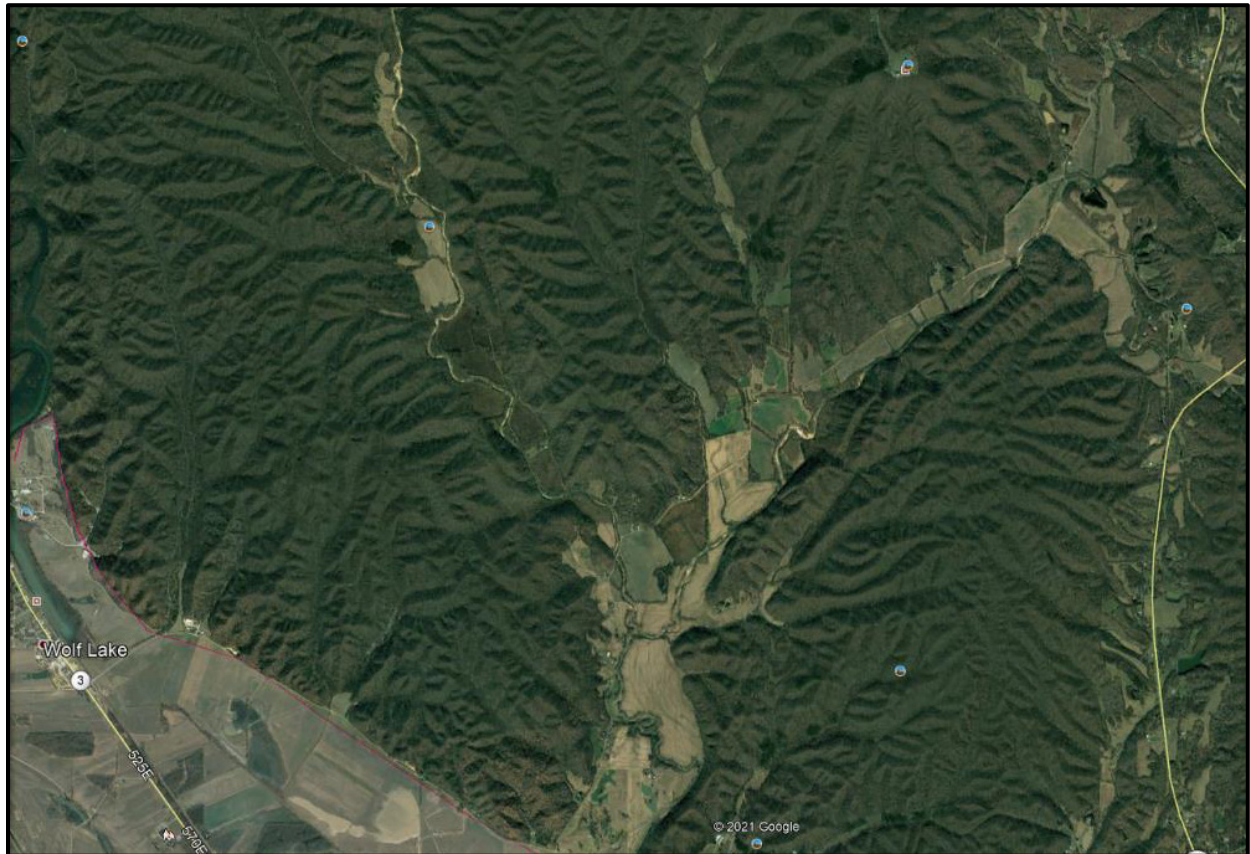
Figure D.13. Beech Grove is surrounded by forest on both sides. Possible egress/ingress concerns. Most homes are located at the foot of the slope.

Source: Google.

ALTO PASS WEST SUMMARY STATISTICS

Town:	Alto Pass West	Population Density (people/mi^2):	N/A
Land Area (mi^2)	7.62	Home Density (housing units/ mi^2):	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
Low_Dens_Interface	530.79	10.88%
Low_Dens_Intermix	99.18	2.03%
Med_Dens_Interface	0.90	0.02%
Uninhabited_NoVeg	257.14	5.27%
Uninhabited_Veg	121.98	2.50%
Very_Low_Dens_NoVeg	85.28	1.75%
Very_Low_Dens_Veg	3782.15	77.54%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
81.63%	13.02%	5.22%	0.13%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 93.56%	0–5 (ch./hr.): 65.20%	No Data: 10.46%	0–0.5 (mi): 16.53%
4–8 (ft): 0.55%	5–20 (ch./hr.): 34.72%	Surface Fire: 83.15%	0.5–1.0 (mi): 23.80%
8–12 (ft): 0.43%	20–50 (ch./hr.): 0.08%	Passive Crown Fire: 2.60%	1.0–1.5 (mi): 55.70%
>12 (ft): 5.46%	>50 (ch./hr.): 0.00%	Active Crown Fire: 3.79%	>1.5 (mi): 3.97%

Fire Department Statistics*

Fire stations: –   Fulltime Firefighters: –   Call Firefighters: –   Volunteer Firefighters   –

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	–			
Type 2:	–	Type 3: –	–	–
Type 3:	–	Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1:	–	Type 6: –	–	–
Type 2:	–	Type 7: –	–	–
Port-A-Tanks:	–	Portable Pumps: –		

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – more than one road in and out
- Street signs – visible and reflective
- Slope – flat
- Separation of adjacent structures – good, large lots
- Organized response – within 5 miles of station, Alto Pass Fire
- Topographic features – flat
- History of high fire occurrence – limited
- Severe fire weather potential – limited

Negative Attributes (High Scores)

- Vegetation type – timber and litter, large expanse of forested land in interface
- Building construction – combustible
- Deck and fence – combustible
- Water source – none
- Utility placement – both aboveground
- Values at risk – recreation and tourism

Values at Risk

- Residential properties
- Agricultural values
- Communications infrastructure
- Religious Site – Bald Knob Cross of Peace on adjacent USFS lands

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Alto Pass West	79
Town Average:	79 (High)
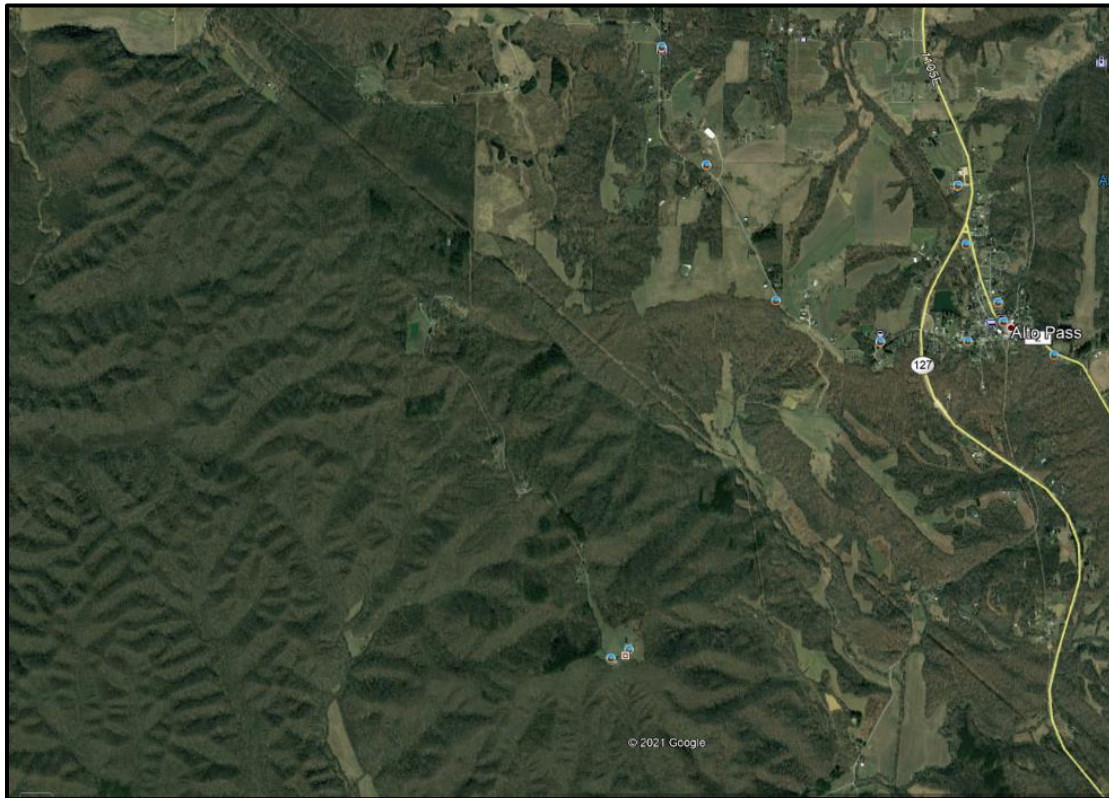
Figure D.14. Large expanses of Shawnee National Forest land adjacent to the community of Alto Pass. Most homes are located at some distance from the immediate interface with forested lands.

Source: Google.

Figure D.15. Bald Knob Cross of Peace is a tourist attraction and valued symbol on the landscape.

ALTO PASS EAST SUMMARY STATISTICS

Town:	Alto Pass East	**Population Density (people/*mi²*):**	NA
Land Area (*mi²*)	14.98	**Home Density (housing units/ *mi²*):**	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
High_Dens_Interface	0.87	0.01%
Low_Dens_Interface	2368.72	24.71%
Low_Dens_Intermix	3644.31	38.01%
Low_Dens_NoVeg	18.35	0.19%
Med_Dens_Interface	182.16	1.90%
Med_Dens_Intermix	11.97	0.12%
Med_Dens_NoVeg	80.73	0.84%
Uninhabited_NoVeg	107.50	1.12%
Uninhabited_Veg	316.72	3.30%
Very_Low_Dens_NoVeg	660.07	6.88%
Very_Low_Dens_Veg	2179.97	22.74%
Water	15.77	0.16%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
61.21%	36.29%	2.30%	0.20%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 96.82%	0–5 (ch./hr.): 67.58%	No Data: 8.91%	0–0.5 (mi): 16.86%
4–8 (ft): 0.16%	5–20 (ch./hr.): 32.41%	Surface Fire: 87.92%	0.5–1.0 (mi): 19.06%
8–12 (ft): 0.17%	20–50 (ch./hr.): 0.01%	Passive Crown Fire: 0.73%	1.0–1.5 (mi): 55.48%
>12 (ft): 2.85%	>50 (ch./hr.): 0.00%	Active Crown Fire: 2.44%	>1.5 (mi): 8.59%

Fire Department Statistics*

Fire stations: – Fulltime Firefighters: – Call Firefighters: – Volunteer Firefighters -

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	–	Type 3: –	–	–
Type 2:	–	Type 4: –	–	–
Type 3:	–	Type 5: –	–	–
Structure Engines		Type 6: –	–	–
Type 1:	–	Type 7: –	–	–
Type 2:	–			
Port-A-Tanks:	–	Portable Pumps: –		

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans
• 2020–2030 Illinois Forest Action Plan • 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – two or more roads in and out
- Street signs – visible and reflective
- Slope – flat but some homes on Ridge/Skyline Drive
- Severe fire weather potential – limited
- Separation of adjacent structures – good, large lots
- Topographic features – flat
- History of high fire occurrence – minimal

Negative Attributes (High Scores)

- Vegetation type – timber and understory
- Building construction – combustible
- Deck and fencing – combustible
- Water source – none
- Organized response – greater than 5 miles from station
- Utility placement – both aboveground

Values at Risk

- Residential properties
- Tourism – wineries, guest houses etc.
- Agricultural values
- Commercial values

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Alto Pass East	75
Town Average:	75 (High)

Figure D.16. Some larger forest patches with adjacent homes, intermixed with agricultural lands.

Source: Google.

Figure D.17. The community of Alto Pass has a cluster of values at risk, including tourist resources like restaurants and gift shops.

COBDEN AND SURROUNDS SUMMARY STATISTICS

Town:	Cobden and Surrounds	Population Density (people/mi^2):	840
Land Area (mi^2)	9.36	Home Density (housing units/ mi^2):	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
High_Dens_NoVeg	16.99	0.28%
Low_Dens_Interface	410.33	6.85%
Low_Dens_Intermix	1824.13	30.44%
Low_Dens_NoVeg	526.32	8.78%
Med_Dens_Interface	0.0086	0.00%
Med_Dens_Intermix	73.30	1.22%
Med_Dens_NoVeg	559.00	9.33%
Uninhabited_NoVeg	54.56	0.91%
Uninhabited_Veg	24.80	0.41%
Very_Low_Dens_NoVeg	2386.92	39.83%
Very_Low_Dens_Veg	115.72	1.93%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
74.92%	23.98%	1.08%	0.02%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 98.77%	0–5 (ch./hr.): 63.45%	No Data: 13.16%	0–0.5 (mi): 24.84%
4–8 (ft): 0.03%	5–20 (ch./hr.): 36.52%	Surface Fire: 85.58%	0.5–1.0 (mi): 19.83%
8–12 (ft): 0.01%	20–50 (ch./hr.): 0.03%	Passive Crown Fire: 0.13%	1.0–1.5 (mi): 39.26%
>12 (ft): 1.18%	>50 (ch./hr.): 0.00%	Active Crown Fire: 1.13%	>1.5 (mi): 16.07%

Fire Department Statistics*

Fire stations: –   Fulltime Firefighters: –   Call Firefighters: –   Volunteer Firefighters –

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	–			
Type 2:	–	Type 3: –	–	–
Type 3:	–	Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1:	–	Type 6: –	–	–
Type 2:	–	Type 7: –	–	–
Port-A-Tanks:	–	Portable Pumps: –		

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans
• 2020–2030 Illinois Forest Action Plan • 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – two or more roads, surfaced, low grade
- Street signs – visible and reflective
- Vegetation type – grass
- Slope – minimal
- History of high fire occurrence – minimal
- Severe fire weather potential – minimal
- Separation of adjacent structures – good, large lots
- Organized response – within 5 miles of a fire department; Cobden has a fire station

Negative Attributes (High Scores)

- Building construction – combustible
- Deck and fence – combustible
- Water source – none
- Utility placement – both aboveground

Values at Risk

- Residential properties
- Tourism – wineries, guest houses etc.
- Agricultural values

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Cobden and Surrounds	60
Town Average:	60 (Moderate)
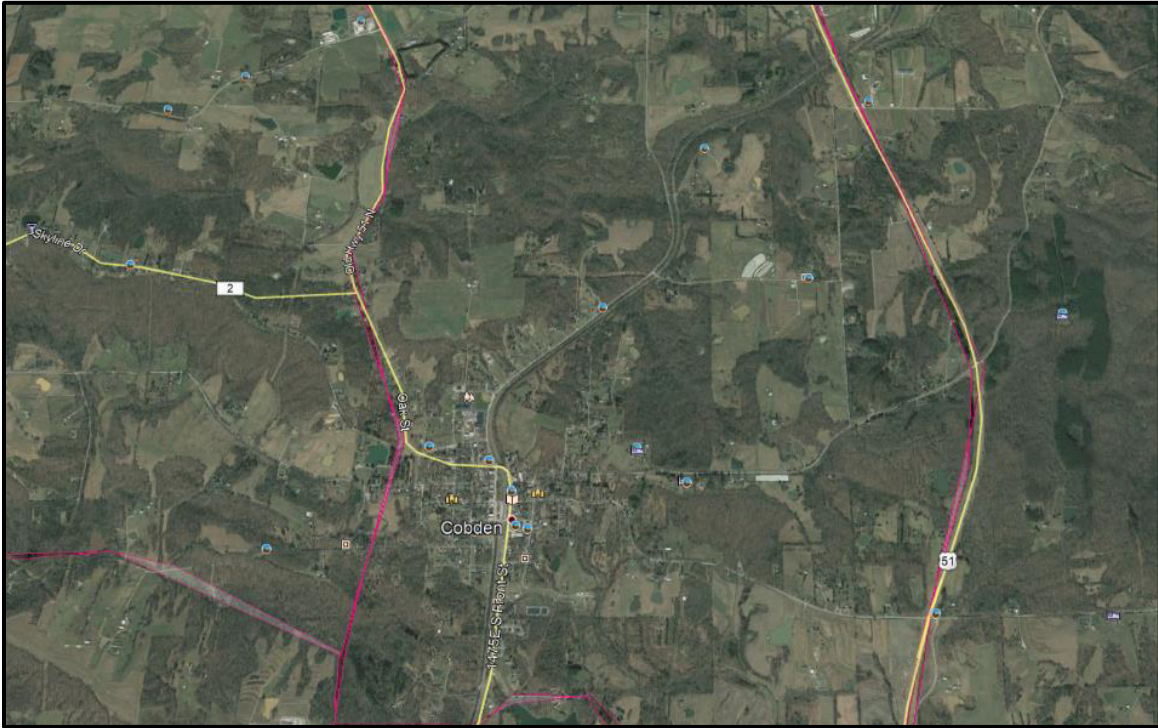
Figure D.18. Most population is consolidated in the town of Cobden. Spare population in rural areas. Heavy tourism values at risk, including guest houses, farms, etc.

Source: Google.

Figure D.19. Agricultural patches interfacing with forested land is a common vegetation matrix in the County.

ANNA AND SURROUNDS SUMMARY STATISTICS

Town:	Anna and Surrounds	**Population Density (people/mi^2):**	1,148
Land Area (mi^2)	5.41	**Home Density (housing units/ mi^2):**	562
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
High_Dens_NoVeg	253.40	7.31%
Low_Dens_Interface	2.22	0.06%
Low_Dens_Intermix	230.87	6.66%
Low_Dens_NoVeg	842.13	24.29%
Med_Dens_Intermix	3.06	0.09%
Med_Dens_NoVeg	1130.78	32.62%
Uninhabited_NoVeg	388.89	11.22%
Uninhabited_Veg	101.61	2.93%
Very_Low_Dens_NoVeg	501.64	14.47%
Water	12.06	0.35%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
0.84%	0.1%	0.53%	0.003%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 0.91%	0–5 (ch./hr.): 0.65%	No Data: 0.44%	0–0.5 (mi): 0.57%
4–8 (ft): 0.009 %	5–20 (ch./hr.): 0.34%	Surface Fire: 0.47%	0.5–1.0 (mi): 0.23%
8–12 (ft): 0.006%	20–50 (ch./hr.): 0.003%	Passive Crown Fire: 0.024%	1.0–1.5 (mi): 0.2%
>12 (ft): 0.07%	>50 (ch./hr.): 0.0005%	Active Crown Fire: 0.06%	>1.5 (mi): 2.65 E-08%

Fire Department Statistics*

Fire stations: –   Fulltime Firefighters: –   Call Firefighters: –   Volunteer Firefighters   –

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	–			
Type 2:	–	Type 3: –	–	–
Type 3:	–	Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1:	–	Type 6: –	–	–
Type 2:	–	Type 7: –	–	–
Port-A-Tanks:	–	Portable Pumps: –		

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – more than two roads in/out
- Road width – greater than 24 feet
- Road conditions – surfaced
- Fire access – turnarounds good
- Street signs – visible and reflective
- Vegetation type – urban and low fuel loading vegetation
- Slope – flat
- History of high fire occurrence – low
- Severe fire weather potential – minimal
- Water source – hydrants
  Organized response – within 5 miles of community; fire station in town

Negative Attributes (High Scores)

- Building construction – combustible
- Deck and fencing – combustible
- Utility placement – both aboveground
- Building construction – combustible
- Deck and fencing – combustible

Values at Risk

- Residential properties
- Churches
- Library
- Commercial structures
- Agriculture
- Historic structures

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Anna and Surrounds	39
Town Average:	39 (Low)

Figure D.20. More open agricultural land use in the WUI. Some forested strips but primarily agricultural and grassland fuels.

Source: Google.

Figure D.21. Firewood pile stacked neatly and away from residential property.

JONESBORO AND SURROUNDS SUMMARY STATISTICS

Town:	Jonesboro and Surrounds	Population Density (people/mi^2):	628
Land Area (mi^2)	10.44	Home Density (housing units/ mi^2):	309
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
High_Dens_Intermix	1.02	0.02%
High_Dens_NoVeg	23.23	0.35%
Low_Dens_Interface	683.96	10.24%
Low_Dens_Intermix	2732.93	40.90%
Low_Dens_NoVeg	168.64	2.52%
Med_Dens_Interface	182.16	2.73%
Med_Dens_Intermix	22.81	0.34%
Med_Dens_NoVeg	578.08	8.65%
Uninhabited_NoVeg	376.31	5.63%
Uninhabited_Veg	84.39	1.26%
Very_Low_Dens_NoVeg	613.56	9.18%
Very_Low_Dens_Veg	1215.40	18.19%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
49.94%	31.05%	17.79%	1.22%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 77.95%	0–5 (ch./hr.): 51.10%	No Data: 20.13%	0–0.5 (mi): 23.86%
4–8 (ft): 1.19%	5–20 (ch./hr.): 57.66%	Surface Fire: 57.66%	0.5–1.0 (mi): 18.29%
8–12 (ft): 1.26%	20–50 (ch./hr.): 4.63%	Passive Crown Fire: 4.63%	1.0–1.5 (mi): 47.80%
>12 (ft): 19.60%	>50 (ch./hr.): 17.58%	Active Crown Fire: 17.58%	>1.5 (mi): 10.05%

Fire Department Statistics

Fire stations: 1   Fulltime Firefighters: 0   Call Firefighters: 0   Volunteer Firefighters 15

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	1–3			
Type 2:	1–3	Type 3:	0	0
Type 3:	0	Type 4:	0	0
Structure Engines		Type 5:	0	0
Type 1:	1–3	Type 6:	0	0
Type 2:	1–3	Type 7:	1–3	0

Port-A-Tanks: 0   Portable Pumps: 15

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Street signs – visible and reflective
- Organized response – within 5 miles of a station; Jonesboro fire station in town
- Slope – homes situated in relatively flat land at base of slope
- Severe fire weather potential – minimal
- Separation of adjacent structures – good, large lots
- History of high fire occurrence – low

Negative Attributes (High Scores)

- Ingress/Egress – one road in and out of some areas
- Fire Access – narrow and limited turnarounds
- Vegetation type – timber and understory
- Defensible Space – limited
- Roofing – some wood shingle or combustible roofing materials
- Building construction – combustible
- Deck and fencing – combustible
- Water source – none
- Utility placement – both aboveground
- Poor yard maintenance

Values at Risk

- Residential properties
- Berryville Shale Glade Nature Preserve
- Commercial structures in the town
- Tourism – guest houses
- School
- County Court House
- Historic properties

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Jonesboro and Surrounds	110
Town Average:	110 (High)
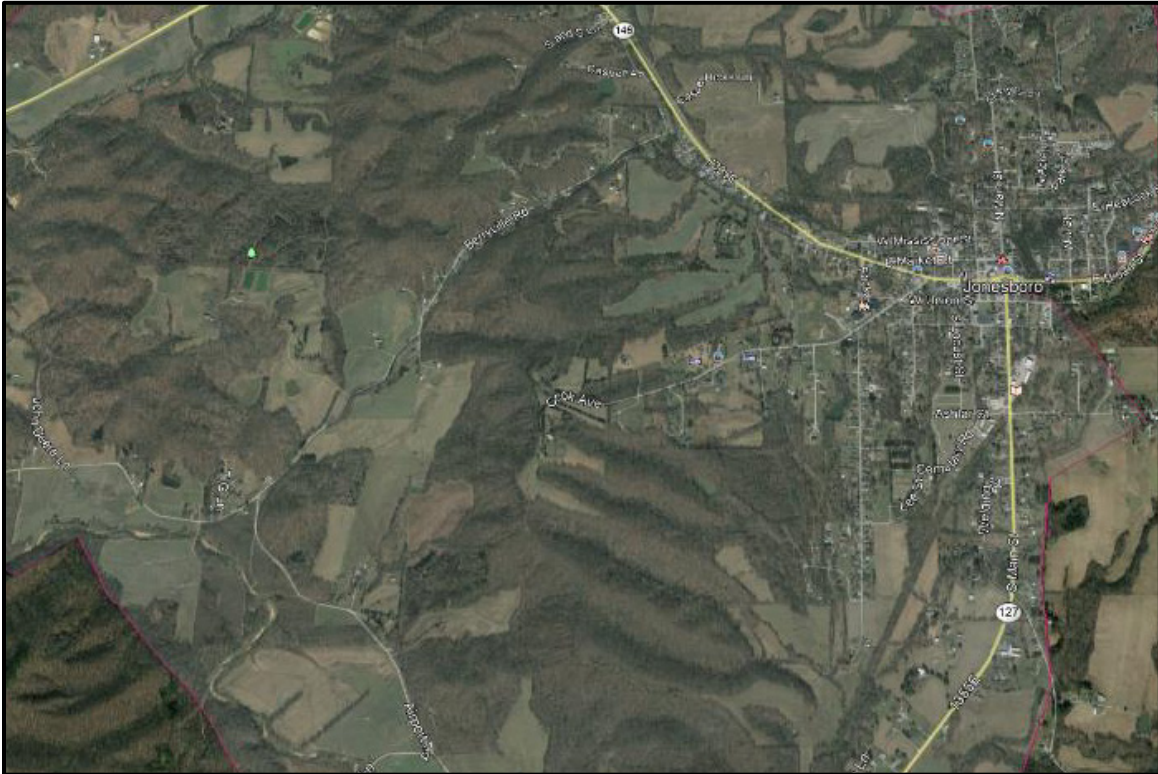
Figure D.22. Most population is centered around Jonesboro and made up of urban fuels. Sparse population in the rural areas. Some limited defensible space but agricultural patches scattered throughout.

Source: Google.

Figure D.23. Property lacking defensible space and hardening.

MILL CREEK AND SURROUNDS SUMMARY STATISTICS

Town:	Mill Creek and Surrounds	**Population Density (people/*mi²*):**	168
Land Area (*mi²*)	1.39	**Home Density (housing units/ *mi²*):**	65
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
Low_Dens_Interface	92.64	10.32%
Low_Dens_Intermix	69.65	7.76%
Med_Dens_Interface	23.38	2.60%
Uninhabited_NoVeg	122.34	13.63%
Uninhabited_Veg	10.64	1.19%
Very_Low_Dens_NoVeg	201.35	22.42%
Very_Low_Dens_Veg	363.49	40.48%
Water	8.39	0.93%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
33.32%	44.33%	19.04%	2.64%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 76.53%	0–5 (ch./hr.): 58.86%	No Data: 30.50%	0–0.5 (mi): 0.00%
4–8 (ft): 1.00%	5–20 (ch./hr.): 40.47%	Surface Fire: 45.69%	0.5–1.0 (mi): 0.00%
8–12 (ft): 1.60%	20–50 (ch./hr.): 0.00%	Passive Crown Fire: 7.13%	1.0–1.5 (mi): 1.00%
>12 (ft): 20.21%	>50 (ch./hr.): 0.00%	Active Crown Fire: 16.01%	>1.5 (mi): 100%

Fire Department Statistics*

Fire stations: – Fulltime Firefighters: – Call Firefighters: – Volunteer Firefighters –

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	–			
Type 2:	–	Type 3: –	–	–
Type 3:	–	Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1:	–	Type 6: –	–	–
Type 2:	–	Type 7: –	–	–
Port-A-Tanks:	–	Portable Pumps: –		

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – two or more roads in and out and good access to highway
- Street signs – visible and reflective
- History of high fire occurrence – low (higher fire occurrence to the south-west of the community on USFS lands)
- Severe fire weather potential – limited
- Water source – hydrants

Negative Attributes (High Scores)

- Fire access – some limited turnarounds in community and narrow roads
- Defensible space – limited
- Slope – homes located mid-slope
- Separation of adjacent structures – limited, smaller lots
- Roofing – combustible
- Building construction – combustible
- Deck and fence – combustible
- Utility placement – both aboveground
- Organized response – station over 5 miles away; closest station is in Dongola

Values at Risk

- Residential properties
- Communications tower

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Mill Creek and Surrounds	91
Town Average:	91 (High)

Figure D.24. Homes adjacent to forested lands with limited defensible space. Values at risk include communications tower, which has good defensible space.

Source: Google.

HIGHWAY 127 WEST SUMMARY STATISTICS

Town:	Highway 127 West	Population Density (people/mi^2):	N/A
Land Area (mi^2)	12.44	Home Density (housing units/ mi^2):	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
Low_Dens_Interface	50.38	0.63%
Low_Dens_NoVeg	26.00	0.33%
Med_Dens_Interface	20.71	0.26%
Med_Dens_Intermix	34.95	0.44%
Uninhabited_NoVeg	376.31	4.72%
Uninhabited_Veg	705.48	8.86%
Very_Low_Dens_NoVeg	2984.16	37.46%
Very_Low_Dens_Veg	3767.57	47.30%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
21.8%	51.67%	24.66%	1.87%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 71.75%	0–5 (ch./hr.): 47.12%	No Data: 12.89%	0–0.5 (mi): 0.00%
4–8 (ft): 1.98%	5–20 (ch./hr.): 52.78%	Surface Fire: 58.75%	0.5–1.0 (mi): 0.00%
8–12 (ft): 2.52%	20–50 (ch./hr.): 0.10%	Passive Crown Fire: 7.92%	1.0–1.5 (mi): 6.31%
>12 (ft): 23.75%	>50 (ch./hr.): 0.00%	Active Crown Fire: 20.44%	>1.5 (mi): 93.69%

Fire Department Statistics*

Fire stations: –   Fulltime Firefighters: –   Call Firefighters: –   Volunteer Firefighters –

Water Tender		Wildland Engines		
Type 1:	–		Standard	Brush Breaker
Type 2:	–	Type 3: –	–	–
Type 3:	–	Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1:	–	Type 6: –	–	–
Type 2:	–	Type 7: –	–	–
Port-A-Tanks:	–	Portable Pumps: –		

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Street signs – visible and reflective
- Severe fire weather potential – limited
- Separation of adjacent structures – good, large lots

Negative Attributes (High Scores)

- Ingress/Egress – one road in and out of some areas
- Road conditions – unsurfaced
- Slope – variable
- Vegetation type – timber understory
- Building construction – combustible
- Deck and fence – combustible
- Water source – none
- Utility placement – both aboveground
- History of high fire occurrence – high (relative to other polygons due to adjacent forest service)

Values at Risk

- Residential properties
- Agricultural values
- Churches

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Highway 127 West	94
Town Average:	**94 (High)**

Figure D.25. Mixture of forested lands and agricultural clearings. Forest stringers are connected in some areas and could transmit fire spread. Low density WUI intermix. Some dead-end spur roads to access homes.

Source: Google.

Figure D.26. Values at risk including churches are common scattered in the interface. Most have good defensible space.

LICK CREEK NORTH SUMMARY STATISTICS

Town:	Lick Creek North	**Population Density (people/*mi²*):**	N/A
Land Area (*mi²*)	72.11	**Home Density (housing units/ *mi²*):**	N/A
		Town Housing Units Vacant for Seasonal/Recreational Use (%):	N/A
		Seasonal/Vacationers (%):	N/A

Percent of Town Classified by Wildland Urban Interface (WUI) Types

WUI	Acres	Percent
High_Dens_NoVeg	1.89	0.00%
Low_Dens_Interface	97.33	0.21%
Low_Dens_Intermix	1105.97	2.40%
Low_Dens_NoVeg	3364.51	7.29%
Med_Dens_Interface	8.88	0.02%
Med_Dens_Intermix	22.20	0.05%
Med_Dens_NoVeg	118.28	0.26%
Uninhabited_NoVeg	549.43	1.19%
Uninhabited_Veg	2499.14	5.42%
Very_Low_Dens_NoVeg	11733.76	25.42%
Very_Low_Dens_Veg	26605.26	57.65%
Water	27.09	0.06%

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
40.06%	53.81%	5.91%	0.22%

Percent of Town by Modeled/Calculated Wildfire Risk Inputs

Flame Length	Rate of Spread	Fire Type	Dist. From Fire Station
0–4 (ft): 93.08%	0–5 (ch./hr.): 64.16%	No Data: 9.01%	0–0.5 (mi): 0.11%
4–8 (ft): 0.29%	5–20 (ch./hr.): 35.80%	Surface Fire: 84.00%	0.5–1.0 (mi): 0.64%
8–12 (ft): 0.28%	20–50 (ch./hr.): 0.04%	Passive Crown Fire: 0.81%	1.0–1.5 (mi): 11.60%
>12 (ft): 6.35%	>50 (ch./hr.): 0.00%	Active Crown Fire: 6.17%	>1.5 (mi): 87.64%

Fire Department Statistics*

Fire stations: –   Fulltime Firefighters: –   Call Firefighters: –   Volunteer Firefighters   –

Water Tender		Wildland Engines		
			Standard	Brush Breaker
Type 1:	–			
Type 2:	–	Type 3: –	–	–
Type 3:	–	Type 4: –	–	–
Structure Engines		Type 5: –	–	–
Type 1:	–	Type 6: –	–	–
Type 2:	–	Type 7: –	–	–
Port-A-Tanks: – Portable Pumps: –				

* No Fire Department data was received.

Current Fire and Fuel Management Programs and Plans

- 2020–2030 Illinois Forest Action Plan
- 2020 Union County Multi-Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/Egress – more than two roads in and out
- Street signs – visible and reflective
- Slope – variable but homes located on flat lands primarily
- History of high fire occurrence – low
- Severe fire weather potential – minimal
- Separation of adjacent structures – good, large agricultural lots

Negative Attributes (High Scores)

- Vegetation type – mixture of timber and agricultural
- Building construction – combustible
- Deck and fence – combustible
- Water source – none in rural areas
- Organized response – Cobden is closest fire station; some areas more than 5 miles away
- Utility placement – both aboveground

Values at Risk

- Residential properties
- Agricultural values
- Tourism – guest houses, wineries etc.
- Airport

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Lick Creek North	76
Town Average:	76 (High)

Figure D.27. Mixture of forest and residential structures. Low density WUI intermix. Homes adjacent to forested lands with limited defensible space. Some dead-end spur roads.

Source: Google.

APPENDIX E:

NFPA 1144 Form

SWCA Wildfire Risk Assessment		
Community		Notes:
Surveyor		
Survey Date/Time		

Means of Access	
Ingress and Egress	
2 or more roads in and out score | 0	
1 road in and out | 7	
Road Width	
> 24 ft | 0	
> 20 ft < 24 ft | 2	
< 20 ft | 4	
Road Conditions	
Surfaced road, grade < 5% | 0	
Surfaced road, grade > 5% | 2	
Non-surfaced road, grade < 5% | 2	
Non-surfaced road, grade > 5% | 5	
Other than all season | 7	
Fire Access	
< 300 ft with turnaround | 0	
> 300 ft with turnaround | 2	
< 300 ft with no turnaround | 4	
> 300 ft with no turnaround | 5	
Street Signs	
Present – reflective | 0	
Present – non-reflective | 2	
Not present | 5	
Notes:	

Vegetation (Fuel Models)	
Predominant Vegetation	
Primary Predominant Vegetation	
Non-Burnable (NB) Score | 2	
Grass (GR) Score | 5	
Grass-Shrub (GS) Score | 10	
Shrub (SH) Score | 15	
Timber-Understory (TU) Score | 20	
Timber-Litter (TL) Score | 25	
Slash-Blow (TU) Score | 30	
Notes:	

Defensible Space	
Defensible Space	
> 100 ft around structure | 1	
> 70 ft < 100 ft around structure | 3	
> 30 ft < 70 ft around structure | 10	
< 30 ft around structure | 25	
Topography Within 300 ft of Structures	
Slope	
< 9% | 1	
10% to 20% | 4	
21% to 30% | 7	
31% to 40% | 8	
>41% | 10	
Additional Rating Factors (rate all that apply)	
Topographic features | 1-5	
History of high fire occurrence | 1-5	
Severe fire weather potential | 1-5	
Separation of adjacent structures | 1-5	
Notes:	

Roofing Assembly	
Roofing	
Class A - metal roof, clay/concrete tiles, slate, asphalt shingles | 0	
Class B - pressure treated composite shakes and shingles | 3	
Class C - untreated wood shingle, plywood, particle board | 15	
Unrated - Extremely poor roofing conditions | 25	
Notes:	

Building Construction	
Siding Materials (predominant)	
Non-combustible (brick/concrete) | 5	
Fire Resistive (stucco/adobe) | 10	
Combustible (wood or vinyl) | 12	
Deck and fencing (predominant)	
No deck or fence/non-combustible | 0	
Combustible deck and fence | 5	
Building Set-Back	
> 30 ft to slope | 1	
< 30 ft to slope | 5	
Notes:	

Available Fire Protection	
Water Sources	
Water Source? | yes/no	
Water Source Type | hydrant, water tank, other	
Other Water Source	
Water Source Score | Hydrant = 1 Water Tank = 3 No Source = 10	
Organized Response	
Station < 5 mi from community | 1	
Station > 5 mi from community | 3	

Notes:	
Placement of Gas and Electric Utilities	
Both underground | 0	
One above, one below | 3	
Both aboveground | 5	
Values at Risk Observations	
Forest Health Observations	
Land Use Observations	
Misc. Observations	

Total: **Risk Scores: Low = 0-40; Moderate = 41-70; High = 71-112; Extreme = 113 +**	

APPENDIX F:

Funding Sources

FEDERAL FUNDING INFORMATION

Source: **Pre-disaster Mitigation (PDM) Grant Program**

Agency: Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA)

Website: http://www.fema.gov/government/grant/pdm/index.shtm

Description: The DHS includes FEMA and the U.S. Fire Administration. FEMA's Federal Mitigation and Insurance Administration is responsible for promoting pre-disaster activities that can reduce the likelihood or magnitude of loss of life and property from multiple hazards, including wildfire.
The Disaster Mitigation Act of 2000 created a requirement for states and communities to develop pre-disaster mitigation plans and established funding to support the development of the plans and to implement actions identified in the plans. This competitive grant program, known as PDM, has funds available to state entities, tribes, and local governments to help develop multi-hazard mitigation plans and to implement projects identified in those plans. The Pre-Disaster Mitigation program is currently in process of transitioning to the Building Resilient Infrastructure and Communities (BRIC) program. BRIC will support states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. You can find more information on the BRIC program here:
https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

Source: **Hazard Mitigation Grant Program (HMGP)**

Agency: FEMA

Website: https://www.fema.gov/grants/mitigation/hazard-mitigation

Description: The HMGP provides funding to state, local, tribal, or territorial governments (and individuals or businesses if the community applies on their behalf) to rebuild with the intentions to mitigate future losses due to potential disasters. This grant program is available after a presidentially declared disaster.

Source: **HMGP – Post Fire**

Agency: FEMA

Website: https://www.fema.gov/grants/mitigation/post-fire

Description: The HMGP Post Fire grant program provides assistance to communities for the purpose of implementing hazard mitigation measures following a wildfire. Mitigation measures may include:

- Soil stabilization
- Flood diversion
- Reforestation

Source: **Flood Mitigation Assistance (FMA) Grant**

Agency: FEMA

Website: https://www.fema.gov/grants/mitigation/floods

Description: The Flood Mitigation Assistance Program is a competitive grant program that provides funding to states, local communities, federally recognized tribes, and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA chooses recipients based on the applicant's ranking of the project and the eligibility and cost-effectiveness of the project.

Source: **Emergency Management Performance Grant (EMPG)**

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/emergency-management-performance

Description: The EMPG program provides funding to state, local, tribal, and territorial emergency management agencies with the overall goal of creating a safe and resilient nation. The two main objectives of the program are 1) closing capability gaps that are identified in the state or territory's most recent Stakeholder Preparedness Review (SPR); and 2) building or sustaining those capabilities that are identified as high priority through the Threat and Hazard Identification and Risk Assessment (THIRA)/SPR process and other relevant information sources. The grant recipient and Regional Administrator must come to an agreement on program priorities, which are crafted based on National, State, and regional priorities.

Source: **Fire Management Assistance Grant (FMAG)**

Agency: FEMA

Website: https://www.fema.gov/assistance/public/fire-management-assistance

Description: Fire Management Assistance is available to state, local, and tribal governments for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster. The Fire Management Assistance declaration process is initiated when a state submits a request for assistance to the FEMA Regional Director at the time a "threat of major disaster" exists. The entire process is accomplished on an expedited basis and a FEMA decision is rendered in a matter of hours. Before a grant can be awarded, a state must demonstrate that total eligible costs for the declared fire meet or exceed either the individual fire cost threshold, which applies to single fires, or the cumulative fire cost threshold, which recognizes numerous smaller fires burning throughout a state.

Source: **Regional Catastrophic Preparedness Grants**

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/regional-catastrophic

Description: The Regional Catastrophic Preparedness Grant program provides funding to increase collaboration and capacity in regard to catastrophic incident response and preparation.

Source: **Emergency Forest Restoration Program (EFRP)**

Agency: USDA Farm Service Agency (FSA)

Website: https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/emergency-forest-restoration/index

Description: The EFRP helps the owners of non-industrial private forests restore forest health damaged by natural disasters. The EFRP does this by authorizing payments to owners of private forests to restore disaster damaged forests. The local FSA County Committee implements EFRP for all disasters with the exceptions of drought and insect infestations. Eligible practices may include debris removal, such as down or damaged trees; site preparation, planting materials, and labor to replant forest stand; restoration of forestland roads, fire lanes, fuel breaks, or erosion-control structures; fencing, tree shelters; wildlife enhancement.

To be eligible for EFRP, the land must have existing tree cover; and be owned by any nonindustrial private individual, group, association, corporation, or other private legal entity.

Source: **Emergency Conservation Program (ECP)**

Agency: USDA FSA

Website: https://www.fsa.usda.gov/programs-and-services/conservation-programs/emergency-conservation/index

Description: The ECP helps farmers and ranchers to repair damage to farmlands caused by natural disasters and to help put in place methods for water conservation during severe drought. The ECP does this by giving ranchers and farmers funding and assistance to repair the damaged farmland or to install methods for water conservation. The grant could be used for restoring conservation structures (waterways, diversion ditches, buried irrigation mainlines, and permanently installed ditching system).

Source: **Environmental Quality Incentives Program (EQIP)**

Agency: National Resource Conservation Service (NRCS)

Website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/co/programs/financial/eqip/

Description: The EQIP is a voluntary program authorized under the Agricultural Act of 2014 (2014 Farm Bill) that helps producers install measures to protect soil, water, plant, wildlife, and other natural resources while ensuring sustainable production on their farms, ranches, and working forest lands.

Source: **Emergency Watershed Protection (EWP) Program**

Agency: National Resource Conservation Service (NRCS)

Website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/

Description: The program offers technical and financial assistance to help local communities relieve imminent threats to life and property caused by floods, fires, windstorms, and other natural disasters that impair a watershed.

Eligible sponsors include cities, counties, towns, conservation districts, or any federally recognized Native American tribe or tribal organization. Interested public and private landowners can apply for EWP Program recovery assistance through one of those sponsors.

EWP Program covers the following activities.

- Debris removal from stream channels, road culverts, and bridges
- Reshape and protect eroded streambanks
- Correct damaged drainage facilities
- Establish vegetative cover on critically eroded lands
- Repair levees and structures
- Repair conservation practices

Source: **Funding for Fire Departments and First Responders**

Agency: DHS, U.S. Fire Administration

Website: https://www.usfa.fema.gov/grants/

Description: Includes grants and general information on financial assistance for fire departments and first responders. Programs include the Assistance to Firefighters Grant Program, Reimbursement for Firefighting on Federal Property, State Fire Training Systems Grants, and National Fire Academy Training Assistance.

Source: **Specific U.S. Environmental Protection Agency (EPA) Grant Programs**

Agency: EPA

Website: https://www.epa.gov/grants/specific-epa-grant-programs

Description: Various grant programs are listed under this site. Listed below are examples of grants offered:

- Multipurpose Grants to States and Tribes: https://www.epa.gov/grants/multipurpose-grants-states-and-tribes

- Environmental Education Grants: https://www.epa.gov/education/grants

- Environmental Justice Grants: https://www.epa.gov/environmentaljustice/environmental-justice-grants-funding-and-technical-assistance

Source: **Conservation Innovation Grants (CIG)**

Agency: National Resource Conservation Service

Website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/

Description: CIG State Component. CIG is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. Under CIG, EQIP funds are used to award competitive grants to non-federal governmental or nongovernmental organizations, tribes, or individuals. CIG enables the Natural Resources Conservation Service (NRCS) to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with federal, state, and local regulations. The NRCS administers the CIG program. The CIG requires a 50/50 match between the agency and the applicant. The CIG has two funding components: national and state. Funding sources are available for water resources, soil resources, atmospheric resources, and grazing land and forest health.

Source: **Volunteer Fire Assistance Program**

Agency: U.S. Forest Service (USFS)

Website: https://www2.illinois.gov/dnr/conservation/Forestry/Pages/VolunteerFireAssistanceProgram.aspx

Description: USFS funding will provide assistance, through the states, to volunteer fire departments to improve communication capabilities, increase wildland fire management training, and purchase protective fire clothing and firefighting equipment. For more information, contact your state representative; contact information can be found on the National Association of State Foresters website.

Source: **Urban and Community Forestry Program, 2021 National Urban and Community Forestry Challenge Cost Share Grant Program**

Agency: USFS

Website: https://www.fs.usda.gov/managing-land/urban-forests/ucf

Description: USFS funding will provide for Urban and Community Forestry Programs that work with local communities to establish climate-resilient tree species to promote long-term forest health. The other initiative behind this program is to promote and carry out disaster risk mitigation activities, with priority given to environmental justice communities. For more information, contact a USFS Regional Program Manager.

Source: **Catalog of Federal Funding Sources; Land Resources**

Agency: Multiple

Website: https://ordspub.epa.gov/ords/wfc/f?p=165:512:6325285542034:::512::

Description: The Land Finance Clearing House is a catalogue of Federal funding sources for all things land related.

Examples of the types of grants found at this site are:

- Forest and Woodlands Resource Management Grant: https://sam.gov/fal/a798ad78cac749639b48270db3e86fdc/view?index=cfda&page=2&organization_id=100011100
- Environmental Education Grant: https://www.epa.gov/education/grants
- Public Assistance Grant Program: https://www.fema.gov/assistance/public
- Hazard Mitigation Grant: https://www.fema.gov/grants/mitigation/hazard-mitigation

Source: **Catalog of Federal Funding Sources; Water Resources**

Agency: Multiple

Website: https://ordspub.epa.gov/ords/wfc/f?p=165:12:10439242675971:::12::

Description: The Water Finance Clearing House is a catalogue of federal funding sources for all things water related.

Examples of the types of grants found at this site are:

- Water Conservation Field Services Program: https://www.usbr.gov/waterconservation/
- Forestry on Indian Lands Grant: https://www.bia.gov/

Source: **Firewise Communities**

Agency: Multiple

Website: http://www.firewise.org

Description: Many different Firewise Communities activities are available to help homes and whole neighborhoods become safer from wildfire without significant expense. Community cleanup days, awareness events, and other cooperative activities can often be successfully accomplished through partnerships among neighbors, local businesses, and local fire departments at little or no cost.

The kind of help you need will depend on who you are, where you are, and what you want to do. Among the different activities that individuals and neighborhoods can undertake, the following often benefit from seed funding or additional assistance from an outside source:

- Thinning/pruning/tree removal/clearing on private property—particularly on very large, densely wooded properties
- Retrofit of home roofing or siding to non-combustible materials
- Managing private forest
- Community slash pickup or chipping
- Creation or improvement of access/egress roads
- Improvement of water supply for firefighting
- Public education activities throughout the community or region

Source: **The National Fire Plan (NFP)**

Agency: DOI & USDA

Website: https://www.federalgrantswire.com/national-fire-plan--rural-fire-assistance.html#.YUJ_Fp1KhPY and https://www.federalgrantswire.com/national-fire-plan-wildland-urban-interface-community-fire-assistance.html#.YUT1uCuSlPZ

Description: Many states are using funds from the NFP to provide funds through a cost-share with residents to help them reduce the wildfire risk to their private property. These actions are usually in the form of thinning or pruning trees, shrubs, and other vegetation and/or clearing the slash and debris from this kind of work. Opportunities are available for rural, state, and volunteer fire assistance.

Source: **Staffing for Adequate Fire and Emergency Response (SAFER)**

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/firefighters/safer

Description: The purpose of SAFER grants is to help fire departments increase the number of frontline firefighters. The goal is for fire departments to increase their staffing and deployment capabilities and ultimately attain 24-hour staffing, thus ensuring that their communities have adequate protection from fire and fire-related hazards. The SAFER grants support two specific activities: (1) hiring of firefighters and (2) recruitment and retention of volunteer firefighters. The hiring of firefighters activity provides grants to pay for part of the salaries of newly hired firefighters over the five-year program.

Source: **The Fire Prevention and Safety Grants (FP&S)**

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/firefighters/safety-awards#:~:text=Awards%20%20%20%20Organization%20%20%20,%20%20%241%2C499%2C957%20%2016%20more%20rows%20

Description: FP&S offers support to projects that enhance the safety of the public and firefighters who may be exposed to fire and related hazards. The primary goal is to target high risk populations and mitigate high incidences of death and injury. Examples of the types of projects supported by FP&S include fire-prevention and public-safety education campaigns, juvenile fire-setter interventions, media campaigns, and arson prevention and awareness programs. In fiscal year 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include firefighter safety research and development.

Source: **GSA-Federal Excess Personal Property**

Agency: USFS

Website: https://gsaxcess.gov/

Description: The Federal Excess Personal Property (FEPP) program refers to USFS-owned property that is on loan to State Foresters for the purpose of wildland and rural firefighting. Most of the property originally belonged to the Department of Defense. Once acquired by the USFS, it is loaned to State Cooperators for firefighting purposes. The property is then loaned to the State Forester, who may then place it with local departments to improve local fire programs. State Foresters and the USFS have mutually participated in the FEPP program since 1956.

Source: **Assistance to Firefighters Grants (AFG)**

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/firefighters.

Description: The AFG program provides resources to assist fire departments in attaining critical resources such as training and equipment.

STATE AND PRIVATE FUNDING INFORMATION

Source: **Acres for Wildlife**

Agency: IDNR

Website: https://www2.illinois.gov/dnr/conservation/wildlife/Pages/AcresWildlife.aspx

Description: The Acres for Wildlife is a landowner assistance program offered by the IDNR. Through this program landowners and provided assistance in protecting, improving, or developing long-term wildlife habitat on their property. The program is 100% voluntary, there is no cost to the landowner, and landowners retain complete control of their property. However, landowners must pledge their willingness to protect the habitat on their property as they are able and participate for a minimum of one year.

Source: **Small Equipment Grant Program**

Agency: **Office of the State Fire Marshal (OSFM)**

Website: https://www2.illinois.gov/sites/sfm/Iam/FireDepartment/Grants-and-Loans/Pages/default.aspx

Description: This program provides grants of up to $26,000 for the purchase of small equipment by a fire department, fire protection district, township fire department, or not-for-profit ambulance service. Applicants are required to have participated in the National Fire Incident Reporting System (NFIRS) for a minimum of two years prior to applying.

Source: **Urban and Community Forestry**

Agency: IDNR

Website: https://www2.illinois.gov/dnr/conservation/Forestry/UrbanForestry/Pages/default.aspx#:~:text=The%20Illinois%20Department%20of%20Natural%20Resources%20Urban%20and,developing%2C%20managing%20and%20sustaining%20local%20community%20forestry%20programs.

Description: Urban and Community Forestry: Provides technical and financial assistance to the State's 2,000 cities and towns. This program builds a local community's capacity to manage their natural resources. Program goals are accomplished by engaging local citizens in tree planting, care and protection activities, and the development of comprehensive natural resource management plans. The Urban and Community Forestry Program helps achieve community sustainability and enhances the quality of life by improving and maintaining the health of trees and other related natural resources. The Urban and Community Forestry Program: 1. increases awareness of natural resources 2. improves environmental quality 3. creates partnerships to manage community natural resources 4. implements long-term natural resource management in the State's cities and towns.

Source: **Forest Products Industry Assistance**

Agency: IDNR

Website: https://www2.illinois.gov/dnr/conservation/Forestry/Documents/IFAssistanceProgram.pdf

Description: Forest Products Industry Assistance: Provides assistance to forest industries by providing: Forestry Development Act (FDA): Provides the funding source for a forest landowner cost-share program. This program is funded through the collection of a four (4) percent harvest fee on all timber sales. These funds are only available for the cost-share program and the operations of the Illinois Legislature's Council on forestry Development. *The Council gathers and disseminates information on the State's forest resources and industries and makes recommendations on appropriate forest management practices. 1. timber, lumber, and forest-based herbal product marketing information, 2. forest resource information for potential new forest industries, and

3. recommendations regarding improved operating techniques. Additional grants administered by the IDNR are listed at the following address: https://www2.illinois.gov/dnr/grants/Pages/default.aspx

Source: **Illinois Natural Areas Stewardship Grant**

Agency: IDNR

Website: https://www2.illinois.gov/dnr/grants/Pages/StewardshipGrants.aspx

Description: These grants are provided to eligible conservation land trusts to increase stewardship on Illinois preserves and reserves and to increase stewardship capacity within the land trust. Grants are awarded in amounts up to $100,000 and matched up to 7% or $1,000 (whichever is less). Funds may be used for stewardship activities, contractual services, purchase or rental of equipment, staff time, and indirect expenses. Although this grant is not specifically for wildfire, I does allow for the promotion of stewardship activities on conserved lands within the State.

Source: **Special Wildlife Funds Grant**

Agency: IDNR

Website: https://www2.illinois.gov/dnr/grants/Pages/Special-Wildlife-Funds-Grant-Program.aspx

Description: This grant opportunity is funded through the purchase of Habitat Stamps and Migratory Waterfowl Stamps by Illinois sportsmen. The program is broken is comprised of four funding opportunities: habitat funding (game and non-game habitat), pheasant habitat, duck habitat, and furbearer habitat. These grants are for various organizations and provide for the protection and management of habitat with some of the grants allowing for education and research as well. These grant opportunities, although not specifically for wildfire, could be used for forest management activities related to the improvement of wildlife habitat.

Source: **Hazard Mitigation Grant Program - IL**

Agency: Illinois Emergency Management Agency (IEMA)

Website: https://www2.illinois.gov/iema/Mitigation/Pages/MitigationPrograms.aspx

Description: Grants are guided by FEMA and available through this program for state and local governments as well as non-profit organizations for the purposes of long-term mitigation following a major disaster declaration. The goal of these grants is to break the cycle of disaster damage – reconstruction – disaster damage. Approved projects are funded with 75% federal funding while the other 25% is the responsibility of the applicant to fund.

Source: **State Farm Good Neighbor Citizen Grants**

Agency: State Farm

Website: https://www.statefarm.com/about-us/corporate-responsibility/community-grants/good-neighbor-citizenship-grants

Description: State Farm funding is directed at:

- Auto and roadway safety
- Teen Driver Education
- Home safety and fire prevention
- Disaster preparedness
- Disaster recovery

Source: **State and Private Forestry Programs**

Agency: National Association of State Foresters

Website: https://www.stateforesters.org/appropriations/

Description: The National Association of State Foresters recommends that funds become available through a competitive grant process on Wildland Urban Interface hazard mitigation projects. State fire managers see opportunities to use both the State Fire Assistance Program and the Volunteer Fire Assistance Program to improve the safety and effectiveness of firefighters in the interface, as well as in other wildland fire situations. To ensure firefighter safety, minimize property and resource loss, and reduce suppression costs, land management agencies, property owners, local leaders, and fire protection agencies must work cooperatively to mitigate interface fire risks, as well as to ensure that wildland firefighters receive the training, information, and equipment necessary to safely carry out their responsibilities.

Source: **The Urban Land Institute (ULI)**

Website: http://www.uli.org

Description: ULI is a 501(c)(3) nonprofit research and education organization supported by its members. The institute has more than 22,000 members worldwide, representing the entire spectrum of land use and real estate development disciplines, working in private enterprise and public service. The mission of the ULI is to provide responsible leadership in the use of land to enhance the total environment. ULI and the ULI Foundation have instituted Community Action Grants (http://www.uli.org/Content/NavigationMenu/MyCommunity/CommunityActionGrants/Community_Action_Gr.htm) that could be used for Firewise Communities activities. Applicants must be ULI members or part of a ULI District Council. Contact actiongrants@uli.org or review the web page to find your District Council and the application information.

Source: **Environmental Systems Research Institute (ESRI)**

Website: http://www.esri.com/grants

Description: ESRI is a privately held firm and the world's largest research and development organization dedicated to geographic information systems. ESRI provides free software, hardware, and training bundles under ESRI-sponsored Grants that include such activities as conservation, education, and sustainable development, and posts related non-ESRI grant opportunities under such categories as agriculture, education, environment, fire, public safety, and more. You can register on the website to receive updates on grant opportunities.

Source: **StEPP Foundation**

Website: https://steppfoundation.org/

Description: StEPP is a 501(c)(3) organization dedicated to helping organizations realize their vision of a clean and safe environment by matching projects with funders nationwide. The StEPP Foundation provides project oversight to enhance the success of projects, increasing the number of energy efficiency, clean energy, and pollution prevention projects implemented at the local, state, and national levels for the benefit of the public. The website includes an online project submittal system and a Request for Proposals page.

Source: **Matching Awards Program (MAP)**

Agency: National Forest Foundation (NFF)

Website: https://www.nationalforests.org/grant-programs/map

Description: The NFF is soliciting proposals for its MAP to provide funds for direct on-the-ground projects benefitting America's National Forests and Grasslands. By pairing federal funds provided through a cooperative agreement with the USFS with non-federal dollars raised by award recipients,

MAP measurably multiplies the resources available to implement stewardship projects that benefit the National Forest System.

Source: **Patagonia Environmental Grants and Support**

Agency: Patagonia

Website: https://www.patagonia.com/how-we-fund/

Description: Patagonia supports innovative work that addresses the root causes of the environmental crisis and seeks to protect both the environment and affected communities. Patagonia focuses on places where they have built connections through outdoor recreation and through their network of retail stores, nationally and internationally.

Source: **Leonardo DiCaprio Foundation Grants**

Agency: Leonardo DiCaprio Foundation

Website: https://www.rewild.org/

Description: The foundation supports projects around the world that build climate resiliency, protect vulnerable wildlife, and restore balance to threatened ecosystems and communities.

Source: **U.S. Endowment for Forestry and Communities**

Agency: U.S. Environmental Protection Agency, Natural Resources Conservation Service (NRCS), USFS, U.S. Department of Defense, U.S. Economic Development Agency

Website: https://www.usendowment.org/

Description: As the nation's largest public charity dedicated to keeping our working forests working and ensuring their bounty for current and future generations, the Endowment deploys the creativity and power of markets to advance their mission: The Endowment works collaboratively with partners in the public and private sectors to advance systemic, transformative and sustainable change for the health and vitality of the nation's working forests and forest-reliant communities.

OTHER FUNDING INFORMATION

The following resources may also provide helpful information for funding opportunities:

- USDA Information Center: https://www.nal.usda.gov/main/information-centers
- USFS Fire Management website: http://www.fs.fed.us/fire/
- Insurance Services Office Mitigation Online (town fire ratings): http://www.isomitigation.com/
- National Fire Protection Association: https://www.nfpa.org/
- National Interagency Fire Center, Wildland Fire Prevention/Education: https://www.nifc.gov/fire-information/fire-prevention-education-mitigation
- Department of Homeland Security U.S. Fire Administration: https://www.usfa.fema.gov/index.html

APPENDIX G:

Homeowner's Guide

UNION COUNTY CWPP

HOMEOWNER'S GUIDE

This guide has been developed to provide a resource for homeowners to prepare for wildfire in the County. This document can be tailored to meet the needs of a community and distributed as part of an educational campaign. The guide 1) suggests specific measures that can be taken by homeowners to reduce structure ignitability and 2) enhances overall preparedness in the planning area by consolidating preparedness information from several local agencies and departments.

BEFORE THE FIRE—PROTECTION AND PREVENTION

REDUCING STRUCTURE IGNITABILITY

Structural Materials

Roofing—The more fire-resistant the roofing material, the better. The roof is the portion of the house that is most vulnerable to ignition by falling embers, known as firebrands. Metal roofs afford the best protection against ignition from falling embers. Slate or tile roofs are also non-combustible, and Class-A asphalt shingles are recommended as well. The most dangerous type of roofing material is wood shingles. Removing debris from roof gutters and downspouts at least twice a year will help to prevent fire, along with keeping them functioning properly.

Siding—Non-combustible materials are ideal for the home exterior. Preferred materials include stucco, cement, block, brick, and masonry.

Windows—Double-pane windows are most resistant to heat and flames. Smaller windows tend to hold up better within their frames than larger windows. Tempered glass is best, particularly for skylights, because it will not melt as plastic will.

Fencing and trellises—Any structure attached to the house should be considered part of the house. A wood fence or trellis can carry fire to your home siding or roof. Consider using nonflammable materials or use a protective barrier such as metal or masonry between the fence and the house.

If you are designing a new home or remodeling your existing one, do it with fire safety as a primary concern. Use nonflammable or fire-resistant materials and have the exterior wood treated with UL-approved fire-retardant chemicals. More information on fire-resistant construction can be found at http://www.firewise.org.

SCREEN OFF THE AREA BENEATH DECKS AND PORCHES

The area below an aboveground deck or porch can become a trap for burning embers or debris, increasing the chances of the fire transferring to your home. Screen off the area using screening with openings no larger than one-half inch. Keep the area behind the screen free of all leaves and debris.

FIREWOOD, KINDLING, AND OTHER FLAMMABLES

Although convenient, stacked firewood on or below a wooden deck adds fuel that can feed a fire close to your home. Be sure to move all wood away from the home during fire season. Stack all firewood uphill, at least 30 feet and preferably 100 feet from your home.

When storing flammable materials such as paint, solvents, or gasoline, always store them in approved safety containers away from any sources of ignition such as hot water tanks or furnaces. The fumes from highly volatile liquids can travel a great distance after they turn into a gas. If possible, store the containers in a safe, separate location away from the main house.

CHIMNEYS AND FIREPLACE FLUES

Inspect your chimney and damper at least twice a year and have the chimney cleaned every year before first use. Have the spark arrestor inspected and confirm that it meets the latest safety code. Your local fire department will have the latest edition of National Fire Prevention Code 211 covering spark arrestors. Make sure to clear away dead limbs from within 15 feet of chimneys and stovepipes

FIREPLACE AND WOODSTOVE ASHES

Never take ashes from the fireplace and put them into the garbage or dump them on the ground. Even in winter, one hot ember can quickly start a grass fire. Instead, place ashes in a metal container, and as an extra precaution, soak them with water. Cover the container with its metal cover and place it in a safe location for a couple of days. Then either dispose of the cold ash with other garbage or bury the ash residue in the earth and cover it with at least 6 inches of mineral soil.

PROPANE TANKS

Your propane tank has many hundreds of gallons of highly flammable liquid that could become an explosive incendiary source in the event of a fire. It should be located at least 30 feet from any structure. Keep all flammables at least 10 feet from your tank. Learn how to turn the tank off and on. In the event of a fire, you should turn the gas off at the tank before evacuating, if safety and time allow.

SMOKE ALARMS

A functioning smoke alarm can help warn you of a fire in or around your home. Install smoke alarms on every level of your residence. Test and clean smoke alarms once a month and replace batteries at least once per year. Replace smoke alarms once every 10 years.

FIRE-SAFE BEHAVIOR

- If you smoke, always use an ashtray in your car and at home.
- Store and use flammable liquids properly.
- Keep doors and windows clear as escape routes in each room.

DEFENSIBLE SPACE

The removal of dense, flammable foliage from the area immediately surrounding the house reduces the risk of structure ignition and allows firefighters access to protect the home. Pruning and limbing trees along with the selective removal of trees and shrubs is recommended to create a minimum defensible space area of 30 feet. Steep slopes require increased defensible space because fire can travel quickly uphill.

Within the minimum 30-foot safety zone, plants should be limited to fire-resistant trees and shrubs. Focus on fuel breaks such as concrete patios, walkways, rock gardens, and irrigated garden or grass areas within this zone. Use mulch sparingly within the safety zone, and focus use in areas that will be watered regularly. In areas such as turnarounds and driveways, nonflammable materials such as gravel are much better than wood chips or pine needles.

Vegetative debris such as dead grasses or leaves provide important erosion protection for soil but also may carry a surface fire. It is simply not feasible to remove all the vegetative debris from around your property. However, it is a good idea to remove any accumulations within the safety zone and extending out as far as possible. This is particularly important if leaves tend to build up alongside your house or outbuildings. Removing dead vegetation and leaves and exposing bare mineral soil are recommended in a 2-foot-wide perimeter along the foundation of the house. Also, be sure to regularly remove all dead vegetative matter including grasses, flowers, and leaf litter surrounding your home and any debris from gutters, especially during summer months. Mow the lawn regularly and promptly dispose of the cuttings properly. If possible, maintain a green lawn for 30 feet around your home.

All trees within the safety zone should have lower limbs removed to a height of 6 to 10 feet. Remove any branches within 15 feet of your chimney or overhanging any part of your roof. Ladder fuels are short shrubs or trees growing under the eaves of the house or under larger trees. Ladder fuels carry fire from the ground level onto the house or into the tree canopy. Be sure to remove all ladder fuels within the safety zone first. The removal of ladder fuels within about 100 feet of the house will help to limit the risk of crown fire around your home. More information about defensible space is provided at http://www.firewise.org.

FIRE RETARDANTS

For homeowners who would like home protection beyond defensible space and fire-resistant structural materials, fire-retardant gels and foams are available. These materials are sold with various types of equipment for applying the material to the home. They are like the substances applied by firefighters in advance of wildfire to prevent ignition of homes. Different products have different timelines for application and effectiveness. The amount of product needed is based on the size of the home, and prices may vary based on the application tools. Prices range from a few hundred to a few thousand dollars. An online search for "fire blocking gel" or "home firefighting" will provide a list of product vendors. Residents should research and consider environmental impacts of chemicals.

ADDRESS POSTING

Locating individual homes is one of the most difficult tasks facing emergency responders. Every home should have the address clearly posted with numbers at least three inches high. The colors of the address posting should be contrasting or reflective. The address should be posted so that it is visible to cars approaching from either direction.

ACCESS

Unfortunately, limited access may prevent firefighters from reaching many homes in the planning area. Many of the access problems occur at the property line and can be improved by homeowners. First, make sure that emergency responders can get in your gate. This may be important not only during a fire but also to allow access during any other type of emergency response. If you will be gone for long periods during fire season, make sure a neighbor has access, and ask them to leave your gate open in the event of a wildfire in the area.

Ideally, gates should swing inward. A chain or padlock can be easily cut with large bolt cutters, but large automatic gates can prevent entry. Special emergency access red boxes with keys are sold by many gate companies but are not recommended by emergency services. The keys are difficult to keep track of and may not be available to the specific personnel that arrive at your home. An alternative offered by some manufacturers is a device that opens the gate in response to sirens. This option is preferred by firefighters but may be difficult or expensive to obtain.

Beyond your gate, make sure your driveway is uncluttered and at least 12 feet wide. The slope should be less than 10%. Trim any overhanging branches to allow at least 13.5 feet of overhead clearance. Also make sure that any overhead lines are at least 14 feet above the ground. If any lines are hanging too low, contact the appropriate phone, cable, or power company to find out how to address the situation.

If possible, consider a turnaround within your property at least 45 feet wide. This is especially important if your driveway is more than 300 feet in length. Even small fire engines have a hard time turning around and cannot safely enter areas where the only means of escape is by backing out. Any bridges must be designed with the capacity to hold the weight of a fire engine.

NEIGHBORHOOD COMMUNICATION

It is important to talk to your neighbors about the possibility of wildfire in your community. Assume that you will not be able to return home when a fire breaks out and may have to rely on your neighbors for information and assistance. Unfortunately, it sometimes takes tragedy to get people talking to each other. Don't wait for disaster to strike. Strong communication can improve the response and safety of every member of the community.

PHONE TREES

Many neighborhoods use phone trees to keep each other informed of emergencies within and around the community. The primary criticism is that the failure to reach one person high on the tree can cause a breakdown of the system. However, if you have willing and able neighbors, particularly those that are at home during the day, the creation of a well-planned phone tree can often alert residents to the occurrence of a wildfire more quickly than media channels. Talk to your neighborhood association about the possibility of designing an effective phone tree.

NEIGHBORS IN NEED OF ASSISTANCE

Ask mobility-impaired neighbors if they have notified emergency responders of their specific needs. It is also a good idea for willing neighbors to commit to evacuating a mobility-impaired resident in the event of an emergency. Make sure that a line of communication is in place to verify the evacuation.

ABSENTEE OWNERS

Absentee owners are often not in communication with their neighbors. If a home near you is unoccupied for large portions of the year, try to get contact information for the owners from other neighbors or your neighborhood association. Your neighbors would probably appreciate notification in the event of an emergency. Also, you may want to contact them to suggest that they move their woodpile or make sure that the propane line to the house is turned off.

HOUSEHOLD EMERGENCY PLAN

A household emergency plan does not take much time to develop and will be invaluable in helping your family deal with an emergency safely and calmly. One of the fundamental issues in the event of any type of emergency is communication. Be sure to keep the phone numbers of neighbors with you rather than at home.

It is a good idea to have an out of state contact, such as a family member. When disaster strikes locally, it is often easier to make outgoing calls to a different area code than local calls. Make sure everyone in the family has the contact phone number and understands why they need to check in with that person in the event of an emergency. Also, designate a meeting place for your family. Having an established meeting site helps to ensure that family members know where to go, even if they can't communicate by phone.

CHILDREN

Local schools have policies for evacuation of students during school hours. Contact the school to get information on how the process would take place and where the children would likely go.

The time between when the children arrive home from school and when you return home from work is the most important time frame that you must address. Fire officials must clear residential areas of occupants to protect lives and to allow access for fire engines and water drops from airplanes or helicopters. If your area is evacuated, blockades may prevent you from returning home to collect your children. It is crucial to have a plan with a neighbor for them to pick up your children if evacuation is necessary.

PETS AND LIVESTOCK

Some basic questions about pets and livestock involve whether you can evacuate the animals yourself and where you would take them. Planning for the worst-case scenario may save your animals.
An estimated 90% of pets left behind in an emergency do not survive. Don't expect emergency service personnel to prioritize your pets in an emergency. Put plans in place to protect your furry family members.

PETS

Assemble a pet disaster supply kit and keep it handy. The kit should contain a three-day supply of food and water, bowls, a litter box for cats, and a manual can opener if necessary. It is also important to have extra medication and medical records for each pet. The kit should contain a leash for each dog and a carrier for each cat. Carriers of some kind should be ready for birds and exotic pets. In case your pet must be left at a kennel or with a friend, also include an information packet that describes medical conditions, feeding instructions, and behavioral problems. A photo of each pet will help to put the right instructions with the right pet.

In the event of a wildfire you may be prevented from returning home for your animals. Talk to your neighbors and develop a buddy system in case you or your neighbors are not home when fire threatens. Make sure your neighbor has a key and understands what to do with your pets should they need to be evacuated.

If you and your pets were evacuated, where would you go? Contact friends and family in advance to ask whether they would be willing to care for your pets. Contact hotels and motels in the area to find out which ones accept pets. Boarding kennels may also be an option. Make sure your pets' vaccinations are up to date if you plan to board them.

Once you have evacuated your pets, continue to provide for their safety by keeping them cool and hydrated. Try to get your pets to an indoor location rather than leaving them in the car. Do not leave your pets in your vehicle without providing shade and water. It is not necessary to give your pets water while you are driving but be sure to offer water as soon as you reach your destination.

LIVESTOCK

Getting livestock out of harm's way during a wildfire is not easy. You may not be able or allowed to return home to rescue your stock during a wildfire evacuation. Talk to your neighbors about how you intend to deal with an evacuation. If livestock are encountered by emergency responders, they will be released and allowed to escape the fire on their own. Make sure your livestock have some sort of identification. Ideally, your contact information should be included on a halter tag or ear tag so that you could be reached if your animal is encountered.

If you plan to evacuate your livestock, have a plan in place for a destination. Talk to other livestock owners in the area to find out whether they would be willing to board your stock in the event of an emergency. Often in large-scale emergencies, special accommodations can be made at fair and rodeo grounds, but personal arrangements may allow you to respond more quickly and efficiently.

If you do not own a trailer for your horses or other livestock, talk to a neighbor who does. Find out whether they would be willing to assist in the evacuation of your animals. If you do own a trailer, make sure it is in working condition with good, inflated tires and functioning signal lights. Keep in mind that even horses that are accustomed to a trailer may be difficult to load during an emergency. Practicing may be a good idea to make sure your animals are as comfortable as possible when being loaded into the trailer.

HOUSE AND PROPERTY

Insurance companies suggest that you make a video that scans each room of your house to help document and recall all items within your home. This video can make replacement of your property much easier in the unfortunate event of a large insurance claim. See more information on insurance claims in the "After the Fire" section below.

PERSONAL ITEMS

During fire season, items you would want to take with you during an evacuation should be kept in one readily accessible location. As an extra precaution, it may be a good idea to store irreplaceable mementos or heirlooms away from your home during fire season.

It is important to make copies of all of your important household paperwork, such as birth certificates, titles, and so forth. Store them away from your home, such as in a safe deposit box. Important documents can also be protected in a designated firesafe storage box within your home.

IN THE EVENT OF A FIRE

NOTIFICATION

In the event of a wildfire, announcements from the local Emergency Management office will be broadcast over local radio and television stations. Media notification may be in the form of news reports or the Emergency Alert System. On television, the emergency management message will scroll across the top of the screen on local channels. The notice is not broadcast on non-local satellite and cable channels.

One good way to stay informed about wildfire is to use a National Oceanic and Atmospheric Administration weather alert radio. The radios can be purchased at most stores that carry small appliances, such as Target, Walmart, or Amazon. The radio comes with instructions for the required programming to tune the radio to your local frequency. The programming also determines the types of events for which you want to be alerted. The weather alert radio can be used for any type of large incident (weather, wildfire, hazardous materials, etc.), depending on how it is programmed. Local fire personnel can assist with programming if needed.

WHEN FIRE THREATENS

Before an evacuation order is given for your community, there are several steps you can take to make your escape easier and to provide for protection of your home. When evaluating what to do as fire threatens, the most important guideline is: **DO NOT JEOPARDIZE YOUR LIFE**.

Back your car into the garage or park it in an open space facing the direction of escape. Shut the car doors and roll up the windows. Place all valuables that you want to take with you in the vehicle. Leave the keys in the ignition or in another easily accessible location. Open your gate.

Close all windows, doors, and vents, interior doors, and i your garage door. Disconnect automatic garage openers. Leave exterior doors unlocked. Move furniture away from windows and sliding glass doors.

If you have lightweight curtains, remove them. Heavy curtains, drapes, and blinds should be closed. Leave a light on in each room.

Turn off the propane tank or shut off gas at the meter. Turn off pilot lights on appliances and furnaces.

Move firewood and flammable patio furniture away from the house or into the garage.

Connect garden hoses to all available outdoor faucets and make sure they are in a conspicuous place. Turn the water on to "charge," or fill your hoses and then shut off the water.

Place a ladder up against the side of the home, opposite the direction of the approaching fire, to allow firefighters easy access to your roof.

EVACUATION

When evacuation is ordered, you need to go *immediately*. Evacuation not only protects lives; it also helps to protect property. Some roads are too narrow for two-way traffic, especially with fire engines. Fire trucks often can't get into an area until the residents are out. Also, arguably the most important tool in the WUI toolbox is aerial attack. Airplanes and helicopters can be used to drop water or retardant to help limit the spread of the fire, but these resources cannot be used until the area has been cleared of civilians.

Expect emergency managers to designate a check-out location for evacuees. This process helps to ensure that everyone is accounted for and informs emergency personnel as to who may be remaining in the community. Every resident should check out at the designated location before proceeding to any established family meeting spot.

A light-colored sheet closed in the front door serves as a signal to emergency responders that your family has safely left. This signal saves firefighters precious time, as it takes 12–15 minutes per house to knock on each door and inform residents of the evacuation.

AFTER THE FIRE

RETURNING HOME

First and foremost, follow the advice and recommendations of emergency management agencies, fire departments, utility companies, and local aid organizations regarding activities following the wildfire. Do not attempt to return to your home until fire personnel have deemed it safe to do so.

Even if the fire did not damage your house, do not expect to return to business as usual immediately. Expect that utility infrastructure may have been damaged and repairs may be necessary. When you return to your home, check for hazards, such as gas or water leaks and electrical shorts. Turn off damaged utilities if you did not do so previously. Have the fire department or utility companies turn the utilities back on once the area is secured.

INSURANCE CLAIMS

Your insurance agent is your best source of information as to the actions you must take in order to submit a claim. Here are some things to keep in mind. Your insurance claim process will be much easier if you photographed your home and valuable possessions before the fire and kept the photographs in a safe place away from your home. Most if not all of the expenses incurred during the time you are forced to live outside your home could be reimbursable. These could include, for instance, mileage driven, lodging, and meals. Keep all records and receipts. Don't start any repairs or rebuilding without the approval of your claims adjuster. Beware of predatory contractors looking to take advantage of anxious homeowners wanting to rebuild as quickly as possible. Consider all contracts very carefully, take your time to decide, and contact your insurance agent with any questions. If it appears to be a large loss, consider whether you should hire a public adjuster that is licensed by the state department of insurance who will represent

and advocate for you as the policyholder in appraising and negotiating the claimant's insurance claim to ensure you get the best outcome and recovery from your insurance company. Most public adjusters charge a small percentage of the settlement that is set by the state and primarily they appraise the damage, prepare an estimate and other claim documentation, read the policy of insurance to determine coverages, and negotiate with the insurance company's claims handler.

POST-FIRE REHABILITATION

Homes that may have been saved in the fire may still be at risk from flooding and debris flows. Burned Area Emergency Rehabilitation (BAER) teams are professionals who work to mitigate the effects of post-fire flooding and erosion. These teams often work with limited budgets and manpower. Homeowners can assist the process by implementing treatments on their own properties as well as volunteering on burned public lands to help reduce the threat to valuable resources. Volunteers can assist BAER team members by planting seeds or trees, hand mulching, or helping to construct straw-bale check dams in small drainages.

Volunteers can help protect roads and culverts by conducting storm patrols during storm events. These efforts dramatically reduce the costs of such work as installing trash racks, removing culverts, and re-routing roads.

Community volunteers can also help scientists to better understand the dynamics of the burned area by monitoring rain gauges and monitoring the efficacy of the installed BAER treatments.

APPENDIX H:

Community Outreach

PUBLIC OUTREACH

COMMUNITY SURVEY

An online survey was developed for this project to gather feedback from the community on wildfire concerns, assistance that the community needs to reduce wildfire risk, and barriers to action. The survey was distributed to the public in person, online, and to all Shawnee National Forest Employees.

The following is a summary of the results of the community survey. Sixteen residents responded to the survey, providing the following information. Most responses came from the city of Jonesboro (36%); other communities that also participated include the villages of Alto Pass (27%) and Cobden (20%). In terms of wildfire risk, 60% of respondents rated their homes as low risk, 33% as medium risk, and 7% as high risk. Regarding home susceptibility to wildfire, the most common concern for residents was surrounding fuels on their property. Other concerns that ranked high with respect to home vulnerability included surrounding fuels on neighboring properties, ignition sources from neighboring areas (e.g., cigarette butts), building materials, and limited water availability. The majority of residents surveyed perceived their community inadequately prepared for a large wildfire, with 73% ranking their community as moderately prepared and 27% as poorly prepared. Wildfire mitigation actions favored by residents included better firefighting equipment, vegetation maintenance, and improved water supply. However, most respondents identified time, financial constraints, and lack of information as the biggest challenges to making their home safe. Consequently, community funding for fire departments, green waste disposal, fuel treatments, and water supply development ranked as high priorities for concerned residents. Overall, community survey results suggest that residents of Union County perceive their communities as inadequately prepared in the event of a large fire.

The full survey questions can be found in Appendix I.

OTHER PUBLIC OUTREACH EFFORTS

Table H.1 presents examples of the public outreach completed as part of the CWPP development. Figures H.1 through H.4 show examples of public outreach efforts.

Table H.1. Public Outreach Resources

Resource Description	Location	URL	Figure Number	Date Published
Social media Post	Facebook	N/A	H.1	June 21, 2021
Newspaper Article	The Gazette Democrat	Link	H.2	Week of June 21, 2021
Flyer	In person handout	N/A	H.3	Week of June 21, 2021
Social Media Post	Facebook	N/A	H.4	August 14, 2021

Figure H.1. Facebook post regarding CWPP from the Union County Stinson Memorial Library.

Figure H.2. Gazette Democrat newspaper press release regarding CWPP.

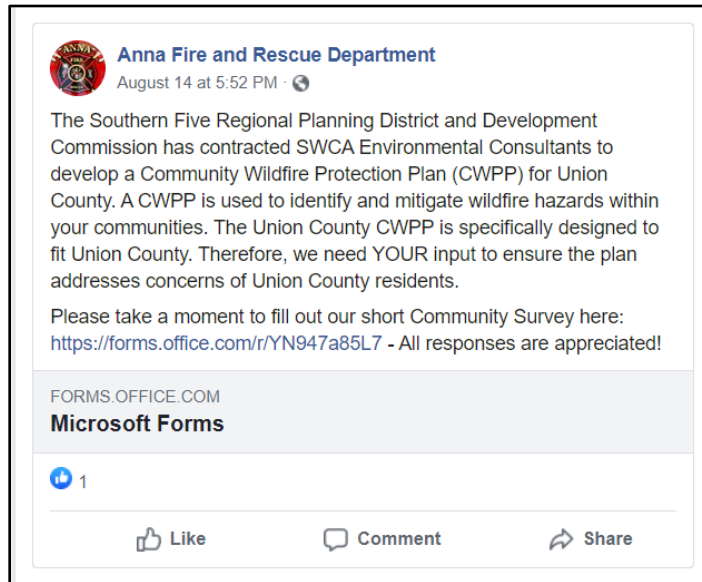**Figure H.3. SWCA informational flyer regarding the CWPP.**

Figure H.4. Facebook post from Anna Fire and Rescue Department regarding the CWPP.

APPENDIX I:

Community Survey Questions

COMMUNITY WILDFIRE PROTECTION PLAN (CWPP) COMMUNITY SURVEY

Fire, forestry, and emergency management agencies within Union County are currently working together to develop this Community Wildfire Protection Plan in order to identify communities within the County that are at risk from wildfire. We want to hear from you in order to understand how the County can better plan and prepare for potential wildfire in your community. This survey is also available online at https://forms.office.com/r/YN947a85L7 or via the QR code.

1. **Please enter as much or as little information about your home location as possible (If you wish to remain anonymous, please provide general location information)**

   Street Address_____

   Zip Code_____

   Or General Location_____

2. **How would you rate your house in terms of risk from wildfire? (*Consider the proximity of your house to tracts of undeveloped land, vegetated land, emergency response and access*)**

   _____ Low

   _____ Medium

   _____ High

3. **My home is vulnerable to wildfire because of…… (*Select top 2 reasons*).**

   _____ Surrounding fuels on your property - (i.e., live and dead trees, shrubs, grass, wood piles).

   _____ Surrounding fuels on neighboring property - (i.e., dense vegetation, wood piles, dead and downed trees.

   _____ Building materials - (i.e., wood shingles, clap board siding, wooden decks, wood fences).

   _____ Lack of water supply - (i.e., dependence on well water, far from hydrant).

   _____ Inaccessible area - (i.e., long narrow driveway, dead end road, can a fire truck easily access your property?)

   _____ Ignition sources from neighboring areas - (i.e., disposal of cigarette butts from trails or roads).

4. **How prepared is your community for a large wildfire? (*Select one*)**

   _____ Poorly prepared

   _____ Moderately prepared

   _____ Well prepared

5. **Rate the following actions in their importance to making the community better prepared for wildfire (Please *RANK 1-5; 1 is most important*).**

_____ Clean up live and dead vegetation and yard debris around homes by individual property owners.

_____ Better firefighting equipment.

_____ Improved water supply – (i.e., expansion of public water systems, increased number of hydrants, and installation of wells).

_____ Fuel treatments on public lands to reduce the amount of live and dead vegetation available to burn in a fire.

_____ Community education on wildfire prevention and awareness.

6. **My biggest challenge to making my home fire safe is…. (*Please RANK 1-4; 1 is most important*).**

_____ Time

_____ Financial burden of carrying out mitigation measures and maintaining clearance.

_____ Not knowing what to do.

_____ There is no challenge, I think my home is already safe.

7. **I would be most interested in funding to help me and my community with…. (*Please RANK from 1- 7; 1 is most important*)**

_____ Green waste disposal - (i.e., removal of leaves, branches, wood from cleared areas).

_____ Home wildfire hazard assessments.

_____ Wildfire prevention education.

_____ Timber/fuel treatments on private land.

_____ Timber/fuel treatments on public land.

_____ Water supply development - (i.e., extend public water systems, add additional hydrants, install fire wells, and acquire portable water supplies).

_____ Funding for fire departments - (i.e., to secure additional apparatus/equipment, fund training, fund additional staff).

8. **Are you currently using prescribed fire to treat your property?**

Yes _____

No _____

No, but I am interested in learning more _____

9. **Name any community resources you would most like to see prioritized for protection from wildfire (*e.g., natural areas, cultural sites, municipal infrastructure, and recreation sites*).**

_____

_____

_____

_____

10. Any other comments?

_____
_____
_____
_____
_____
_____
_____

The survey can be copied (scan or photo) and returned to the following email:

Victoria Amato (Contractor Project Manager) at vamato@swca.com

Thank you for contributing to this important project to reduce wildfire risk to your community. Your answers will be considered in the development of this community wildfire planning document.