

Missouri River Northeast Region Community Wildfire Protection Plan

FOR THE NEBRASKA COUNTIES OF
CEDAR, DAKOTA, DIXON, AND KNOX



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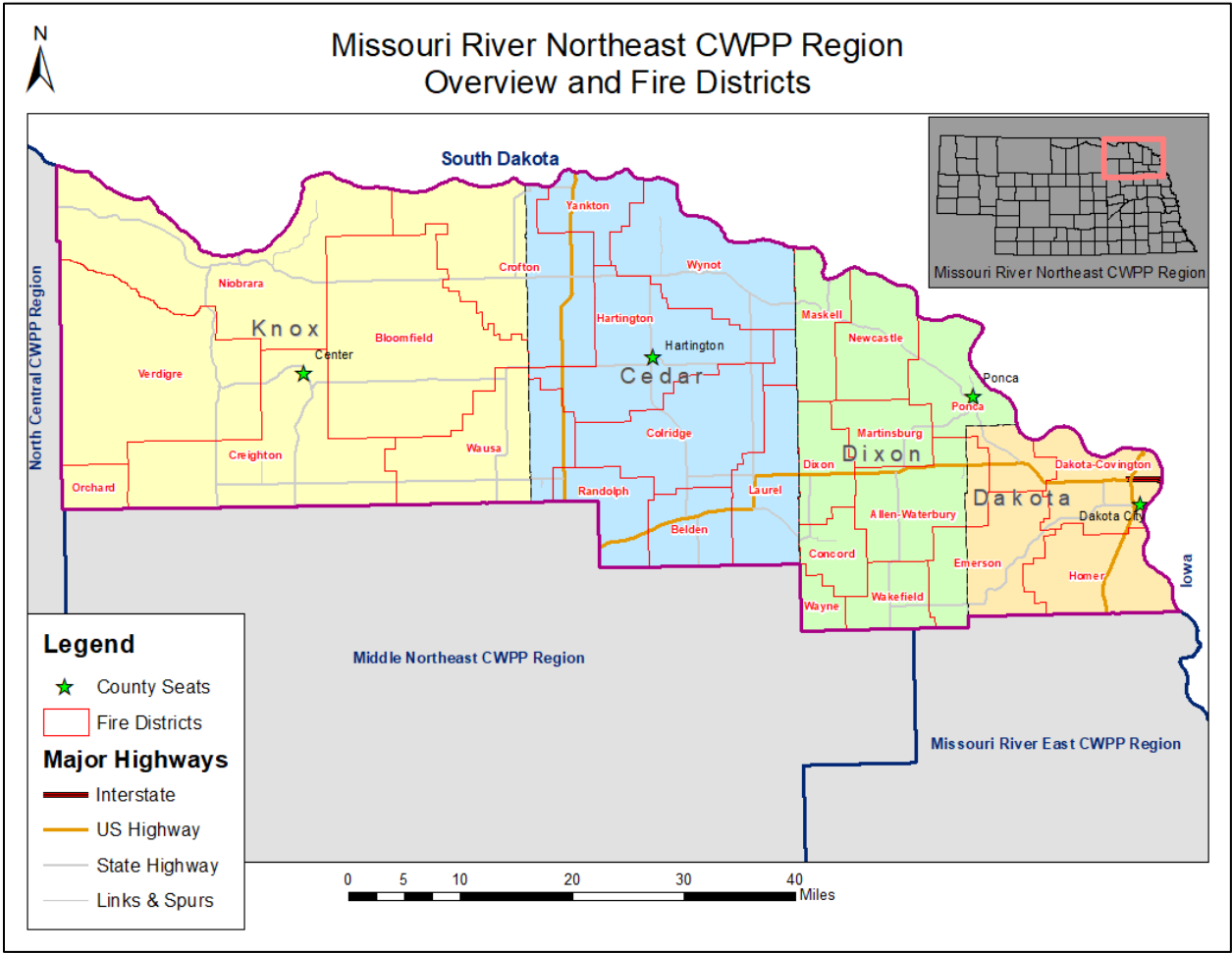
June 2022 Update



UNIVERSITY OF
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Lincoln



Missouri River Northeast Community Wildfire Protection Plan



Map 1: Overview of the Missouri River Northeast CWPP Region and the fire districts located all or partly within it.

Missouri River Northeast Community Wildfire Protection Plan

FACILITATED BY THE

Nebraska Forest Service

IN COLLABORATION AND COOPERATION WITH

CEDAR, DAKOTA, DIXON, AND KNOX COUNTY BOARDS

COUNTY EMERGENCY MANAGEMENT

LOCAL VOLUNTEER FIRE DISTRICTS

LOCAL MUNICIPAL OFFICIALS

LOCAL, STATE, AND FEDERAL NATURAL RESOURCES AGENCIES

AREA LANDOWNERS

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Missouri River Northeast Community Wildfire Protection Plan

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Community Wildfire Protection Plan Acronyms

Acronym	Meaning
ATV	All-Terrain Vehicle
BAER, BAR	Burned Area Emergency Response, Burned Area Rehabilitation (federal programs)
BIA	Bureau of Indian Affairs
BUL	Biologically Unique Landscape
CRP	Conservation Reserve Program (federal)
CWPP	Community Wildfire Protection Plan
ERC	Eastern Redcedar
FAP	Forest Action Plan
FD	Fire District, Fire Department
FEMA	Federal Emergency Management Agency
FEPP, FFP	Federal Excess Property Program, Firefighter Property (program)
GIS	Geographic Information System
GPS	Global Positioning System
GR, GS	Grassland fuel models, Grass-Shrub fuel models
HMP	Hazard Mitigation Plan
IC	Incident Commander
LEOP	Local Emergency Operations Plan
MA, MAA	Mutual Aid, Mutual Aid Association
MNRR	Missouri National Recreational River
NEMA	Nebraska Emergency Management Agency
NFPORS	National Fire Plan Operations and Reporting System
NFS	Nebraska Forest Service
NGPC	Nebraska Game and Parks Commission
NNLP	Nebraska Natural Legacy Project
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRD	Natural Resources District
NVPFA	Niobrara Valley Prescribed Fire Association
PBA	Prescribed Burn Association
PL	Priority Landscape
POA	Property Owners Association
PPD	Public Power District
PPE	Personal Protective Equipment
RH	Relative Humidity
SEAT	Single Engine Air Tanker
SH	Shrub fuel models
SP, SRA	State Park, State Recreation Area
TL, TU	Timber-Litter fuel models, Timber Understory fuel models
USACE	US Army Corps of Engineers
USFS	US Forest Service
UTV	Utility Task Vehicle
VFD	Volunteer Fire Department
VHF, VTAC	Fire radio channels
WIRAT	Wildfire Incident Response Assistance Team
WMA	Wildlife Management Area
WUI	Wildland-Urban Interface

Missouri River Northeast Community Wildfire Protection Plan

Introduction

The purpose of the Missouri River Northeast Community Wildfire Protection Plan (CWPP) is to provide a tool for effectively managing fire and hazardous vegetative fuels and to bolster collaboration and communication among the various agencies and organizations who manage fire in Nebraska's Cedar, Dakota, Dixon, and Knox Counties. Having a CWPP in place allows the Nebraska Forest Service (NFS) to apply for US Forest Service (USFS) grant dollars to cost-share forest fuels reduction treatments in at-risk areas within the boundaries of the CWPP. It also may increase opportunities for counties, municipalities, and rural fire districts to seek grant funding for activities related to fire protection.

The Missouri River Northeast Region has experienced many large wildfires. Between 2000 and 2020, volunteer fire departments (VFDs) reported 1,147 fires that burned more than 49,000 acres in the area's four counties. A CWPP can help communities be proactive in their approach to wildfire.

Extreme wildfires in Nebraska have demonstrated that intense fire behavior can start in rural areas, move aggressively over large expanses, and threaten population centers. For this reason, the CWPP planning team designated the entire region as Wildland Urban Interface (WUI) and, for planning purposes, treats each county as a 'community.' Within each community, local officials and planners have identified specific areas of particular concern for wildfire risk. These areas can be prioritized for risk mitigation. Forest and grassland management, as well as woody fuels treatment within forested areas, reduces the risk of wildfire throughout the WUI.

This revision of the CWPP updates information contained in the 2015 plan, adds new data that has become available since then, and eliminates material that is no longer pertinent. The document format has been changed to match other Nebraska CWPPs.

Legislative Background

To be eligible for federal conservation cost-share funding assistance, the federal government requires states to prepare action plans that lay out a strategy for forest and wildlife conservation. The Nebraska Game and Parks Commission (NGPC) published the Nebraska Natural Legacy Project (NNLP) in 2005 as the state's first Wildlife Action Plan (updated in 2011). It identified 40 Biologically Unique Landscapes (BULs) to help prioritize where conservation work can best be directed. The Missouri River Northeast CWPP region lies primarily within the Tallgrass Prairie and Mixedgrass Prairie Ecoregions identified in the NNLP. All or parts of five BULs are found within this CWPP boundary: Lower Niobrara River, Missouri River, Ponca Bluffs, Thurston-Dakota Bluffs, and Verdigre-Bazile Watershed (see map in Appendix A).

In accordance with the 2008 Farm Bill's requirement for states to conduct a comprehensive analysis of their forests, in 2011 the NFS published the Statewide Forest Resource Assessment and Strategy, known as the Forest Action Plan (FAP). This plan was updated in 2015 and 2020. Priority forest areas were identified throughout the state using the National Land Cover Dataset. This dataset represents 15 land cover and land use types including open water, development, crops, shrubs, grasslands, wetlands, and forests. Most of the land in the CWPP region lies within the Missouri River Priority Landscape (PL) (Map 2).

The Healthy Forest Restoration Act (US Congress, 2003) requires CWPPs to be developed collaboratively; identify and prioritize areas for fuels reduction and methods to reduce fuels on those areas; and recommend strategies to reduce structural ignitability. This CWPP addresses these requirements and other needs identified by stakeholders.

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Missouri River Northeast Community Wildfire Planning History

In 2015, the NFS partnered with fire districts, emergency managers, natural resources agencies, and local governments to develop the region's first CWPP, the *Missouri River Northeast Community Wildfire Protection Plan* (see link in Appendix C) for Cedar, Dakota, Dixon, and Knox Counties. The document discussed vegetation, fuels, land cover, weather, historic fire activity, communications, and infrastructure; summarized district capacity; described each fire district; and outlined an action plan that discussed risk reduction. It also examined the economic impacts of excessive fuel loading.

In 2018 the NFS began creating a network of CWPPs, preparing nine new plans and updating five existing ones to cover the entire state. The *Missouri River Northeast CWPP 2022 Update* is intended to keep the document up-to-date. In order to keep CWPPs current, the NFS recommends they be reviewed annually and fully updated every five years.

Plan Integration

The planning process strives to coordinate this CWPP with existing federal, state, and local plans and provides specific detail on wildfire hazards, areas at risk from wildfire, emergency operations and capacity, and critical infrastructure. To help accomplish such coordination, this document includes an action plan addressing wildfire-specific issues including a risk assessment procedure, risk reduction measures, preparedness recommendations, training and education, fuels mitigation strategies, and a monitoring and evaluation plan.

The components of the State Emergency Operations Plan are patterned after the National Response Plan. The Nebraska Emergency Management Agency (NEMA) prepared a basic plan that details Nebraska's operational functions approach to the response and recovery phases of emergency management. It defines the roles and responsibilities of the responding and supporting agencies and organizations and defines broad policies, plans, and procedures.¹

Each county has its own Local Emergency Operations Plan (LEOP). The content of these plans is defined by statute, which stipulates that each county's LEOP consist of specific components, including operations, organization and responsibilities; functional annexes supporting activities critical to emergency response and recovery; technical information on response procedures; protective measures unique to a hazard; and methods for use in emergency operations. It is the responsibility of local emergency management staff to maintain the LEOP according to the guidance from the State.¹

Each LEOP contains an 'Annex F' that covers fire services and resources. It includes a listing of county fire departments (FDs) and mutual aid (MA) partners, as well as equipment lists. Fire department information is listed in Appendix G of this CWPP. Mutual aid associations (MAAs) are listed in Appendix F. One of the gaps common to many county-level LEOPs is a lack of wildfire-specific information. In many, fire is lumped in with hazardous materials. The information contained in this CWPP is intended to augment existing material and support these LEOPs.

Nebraska has a state Hazard Mitigation Plan (HMP), which establishes the policies, plans, guidelines, and procedures for the Hazard Mitigation Program in Nebraska. NEMA coordinated with regional emergency management areas, Natural Resources Districts (NRDs), and counties to prepare, update, and maintain multi-jurisdictional hazard mitigation plans throughout the state.² Dakota County is included in the Papio-Missouri NRD HMP. Cedar and Dixon Counties share an HMP. Knox County is included in the Tri-County HMP with Antelope and Holt Counties. Appendix C contains links to these plans. As entities across Nebraska update their HMPs, they are increasing efforts to share information and coordinate with other plans.

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Some agencies currently have land and resource management plans in place. The National Park Service (NPS) has a fire management plan³ for the Missouri National Recreational River (MNRR), a separate Goat Island Management Plan, and a comprehensive fuels management plan (in progress) for the island. Park staff prepares detailed burn plans for all prescribed fires they conduct on NPS lands, with objectives that include mitigating risk for the public and firefighters and reducing fuel loading to reduce wildland fire threats to human life and cultural resources.

The US Army Corps of Engineers (USACE) does not have specific fire management plans, but they do have overall management plans for their properties. These include a number of options for addressing fuel management and wildfire response. The Bureau of Indian Affairs (BIA) has developed CWPPs for the Santee Sioux Nation⁴ and Winnebago Tribe of Nebraska⁵ under an umbrella 'Supplemental Fire Management Plan: East River Fire Management Zone' update⁶ for its agency, which operates on tribal lands in the CWPP region.

Fire management activities endorsed in this CWPP comply with the policies identified in federal and state regulations on wilderness, threatened and endangered species, cultural/historic preservation, and air and water quality. Wildfire events consistently provide both positive and negative environmental impacts to the affected areas. Potential impacts will be considered, and negative impacts will be mitigated, as much as is practical, during implementation of this plan.

Goals and Objectives

State Forest Action Plan Goals and Objectives

The 2020 FAP goals and objectives appear below:

1. Enhance and promote the role of Nebraska's forests and trees for mitigation and adaptation to the global change in climate
2. Manage trees and forest landscapes to include rural and community forest settings
3. Manage the function of forest and tree systems in Nebraska for maximum and sustained benefits
4. Improve, protect, and enhance fish and wildlife habitat in Nebraska
5. Restore fire-adapted landscapes to reduce risk of wildfire impacts on Nebraska's trees, forests, and communities
6. Manage for the health and productivity of Nebraska's trees and forests
7. Manage and build the capacity of Nebraska's trees and forests, in conjunction with the forest products industry, agriculture, and communities, which are all vital to Nebraska's economy
8. Maintain the natural environments of Nebraska including trees and forests, waterways, and rangelands
9. Manage Nebraska's forest and trees to enhance the water resources of Nebraska
10. Improve air quality and energy conservation through tree planting
11. Connect people to the state's trees and forest resources
12. Engage Nebraskans in the stewardship of trees and forests

This CWPP and the results of its implementation relate directly or indirectly to all of these. Sustainable forest management maintains natural environments and reduces negative wildfire impacts in the region's forests and adjacent communities, and it reduces threats to ecosystem health. Healthy forests and grasslands, in turn, protect air and water resources and fish and wildlife habitat, helping these ecosystems better cope with a changing climate. Communities that plan for and reduce wildfire risks and engage in environmental stewardship activities may also reap both direct and indirect economic benefits of healthy forests in fire-adapted landscapes.

Implementation of this CWPP relates directly to the NNLP goals of conserving natural communities, keeping common species common, and protecting at-risk species. Sustainably managed, fire-adapted forests include diverse habitats for both at-risk and common species. Restoring unnaturally dense forests to a more natural mosaic vegetative pattern benefits both wildlife and human communities.

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CWPP Goals and Objectives

The steering committee identified the following goals and objectives that are consistent with the state FAP and specific to community wildfire protection planning in the region. It is important to note that these are goals, not mandates. This begins the process of documenting needs and proposed solutions, which may provide new opportunities to address a variety of issues. Goals such as these can help tie grant applications directly to specifically-identified needs—a strategy that has been proven to increase the likelihood of funding. Any movement toward these goals can be considered progress. Proposed strategies and tactics to achieve these goals are included in the Action Plan section of this document and in Appendix B.

Goal 1: Reduce wildfire risk

Objectives

- Identify wildfire risks, areas of concern that contain these risks, and a range of mitigation measures to address them
- Assess risks in the areas of concern
- Mitigate risks: Implement measures to create defensible space and reduce structural ignitability

Goal 2: Support emergency response

Objectives

- Assess local response capacity
- Enhance local response capacity
- Improve firefighter readiness and safety
- Enhance communication among fire management agencies

Goal 3: Promote an informed and active citizenry for wildfire preparedness

Objectives

- Increase local knowledge of wildfire risk and prevention
- Engage stakeholders in preparedness activities that promote the use of defensible space to protect communities and resources

Goal 4: Restore fire-adapted ecosystems

Objectives

- Encourage land managers to reduce heavy understory fuels in woodlands
- Encourage land managers to control non-native invasive plant species and to actively manage prolific and aggressive native species
- Encourage land managers to use native plant species when restoring ecosystems
- Safely incorporate prescribed fire, using trained personnel and standard operating procedures

Goal 5: Enhance post-fire recovery

Objective

- Enable rapid assessments of burned lands and the implementation of stabilization techniques

Goal 6: Establish/implement a CWPP monitoring and evaluation process

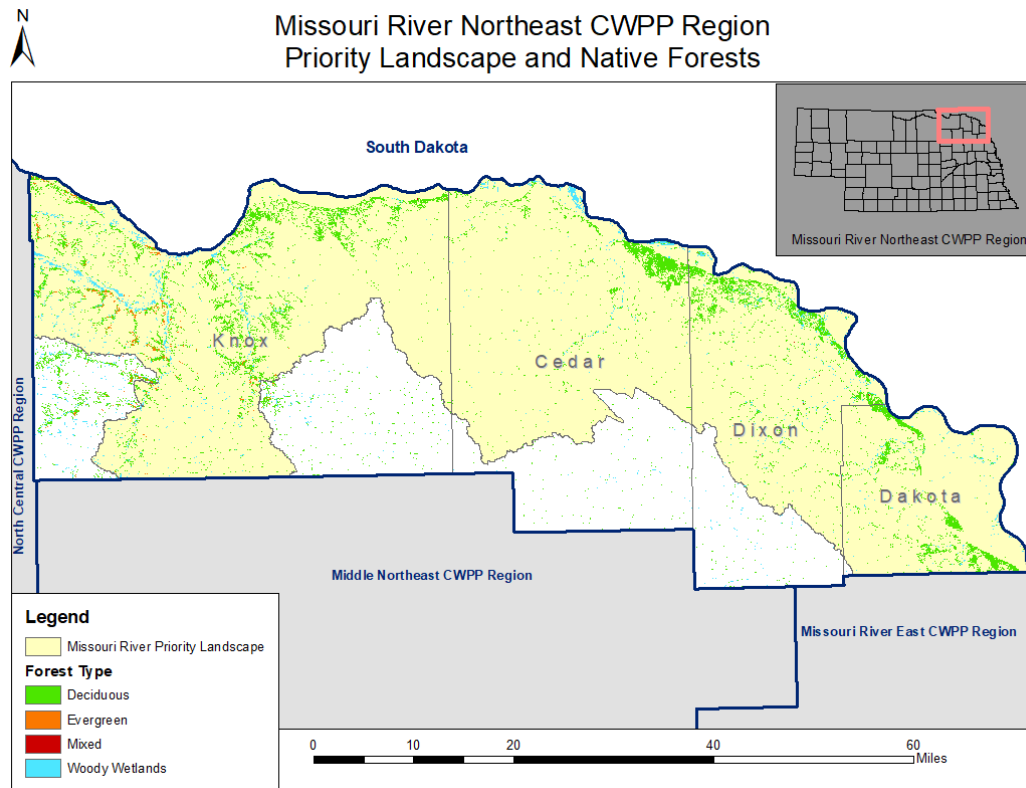
Objectives

- Annually evaluate progress in implementing the CWPP and recommend changes as needed
- Monitor selected projects and activities to assess progress and effectiveness
- Improve grant eligibility by keeping planning documents up-to-date to reflect current activities and needs

Priority Landscapes

At the state level, the FAP identified PLs to help focus effort and funding on landscape-scale projects. Most of the CWPP region lies within the Missouri River PL (Map 2). A full description of this PL is in the Nebraska FAP: <https://nfs.unl.edu/statewide-forest-action-plan>.⁷ This landscape includes many locally-identified 'Areas of Concern' where vegetative fuels reduction activities can be targeted (see *Areas of Concern* map in Appendix A).

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Map 2: Woody vegetation within the Missouri River Priority Landscape includes woody wetlands, evergreen forests (ERC), riparian deciduous forests, and mixed forests (evergreen/deciduous).⁷

Unnaturally dense and unhealthy woodlands and encroachment of eastern redcedar (ERC) into grasslands create extreme wildfire risk. Drought cycles are predicted to occur with increasing frequency. Communities can protect structures by reducing their ignitability, reducing the surrounding woody fuels, and improving access for emergency equipment. Priority Landscapes help focus management activities on areas most at risk.

Vegetation Types and Areas of Concern within Priority Landscapes

The Missouri River PL contains a range of topography and vegetation types, including riparian deciduous, upland deciduous, evergreen (ERC is the only native evergreen in this region), and mixed evergreen-deciduous forests, as well as several types of prairie (Map 4). Within each county, local stakeholders have identified ‘Areas of Concern’—specific sites that are at greatest risk for wildfire within the larger landscapes (see map in Appendix A). Most of these areas lie within the Missouri River PL.

In recent decades ERC, a native conifer, has increased extensively in the Missouri River PL. In 2006, the CWPP counties in this PL contained an estimated 87,487 acres of forestland. By 2018 that number grew to 107,722 acres.⁸ ERC accounted for the vast majority of that increase, as it encroached aggressively into grasslands and deciduous forests.

According to the FAP, one desired outcome for the region is enhancing forest health and reducing wildfire risks by removing aggressive native species such as ERC. Local priorities for the region include controlling ERC encroachment and decreasing fire risk through fuels reduction programs that offer technical or financial assistance.

ERC has a thin bark and flammable foliage that easily ignites, making it highly susceptible to fire. It contains cedrol, a volatile terpene, and other oils that ignite and burn easily. The conical growth form brings the

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flammable foliage close to the ground. In forests and woodlands, ERC can act as a ladder fuel to allow fire to climb into the crowns of taller trees. When it burns, ERC can shower thousands of embers (firebrands) downwind, increasing the chance of spot fires and the overall rate of fire spread.⁹

Managing the grass component of the forested areas is also extremely important. Deciduous woodlands can develop a heavy grass and shrub understory which, if not managed appropriately, can create a significant fuels risk. The best management is done on a landscape basis—fuels mitigation treatments are only as effective as their weakest link. Unmanaged ‘islands’ among managed areas pose a significant risk to the managed lands.

Process

The first step in the CWPP update process was to establish a steering committee, which included many of the same entities that guided the original plan: fire districts, emergency managers, natural resources professionals, and local governments. A complete list of steering committee members appears in Appendix I. The planning team (a subset of the steering committee) gathered data, seeking input from county officials, VFDs, and others to review and update CWPP goals and objectives, local wildfire risk factors, areas of concern, and other information. This input provided a locally-focused framework for the project.

The NFS sent a questionnaire to all 26 VFDs in the CWPP region (see Map 1 on page ii) asking for current contact information, lists of equipment, and pertinent issues, concerns, and priorities. Responses from the 19 VFDs that returned the survey appear in Appendix G, along with information obtained from Annex F of each county’s LEOP for all departments located entirely or partially within the CWPP boundary. The survey and distribution list appear in Appendix H.

News releases sent to local newspapers and radio stations described the update process, encouraged input, and provided contact information for comments. CWPP update information was posted on the NFS website and social media page. The stakeholder list, outreach letters, and media releases appear in Appendix I. Feedback from counties, municipalities, emergency response agencies, VFDs, and others was incorporated into the draft.

After a 30-day public review of the draft CWPP, the planning team incorporated additional input and comments into the final document before sending it to county boards for adoption. NFS mailed copies of the finalized document to each county and each emergency manager. The plan is available online at <https://nfs.unl.edu/documents/CWPP/MRNECWPP.pdf>.

Overview

This section contains background information common to all four counties within the 2,636 sq. mi. region. The 2020 US census data lists a total population of 44,431 for this area. Information that is specific to only certain parts of the region is included in the county (community) sections.

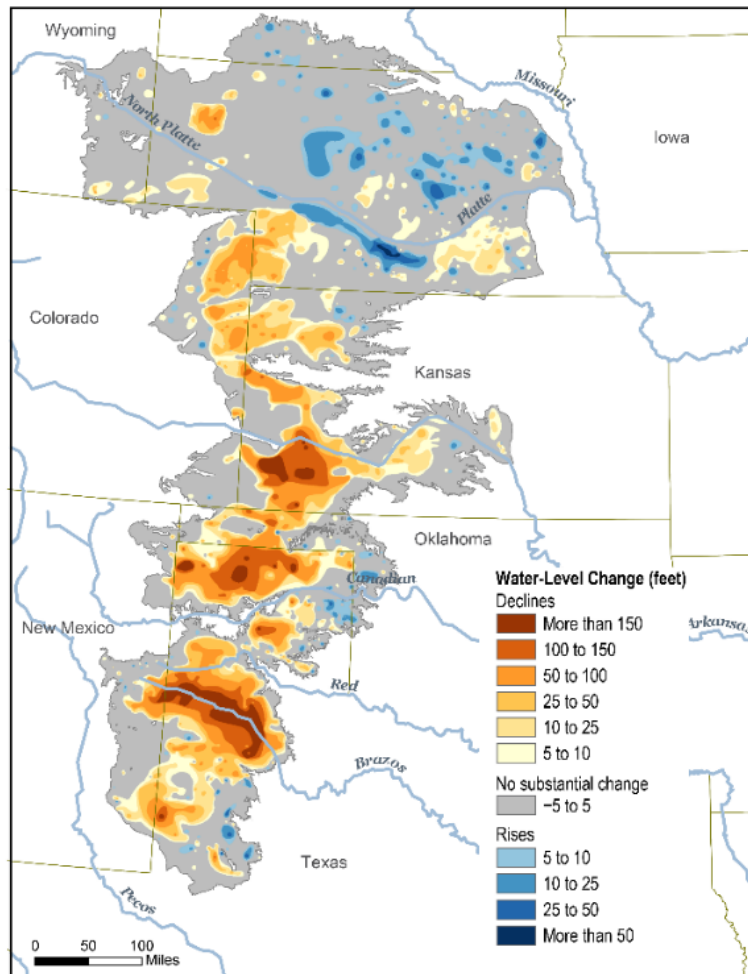
Landforms, Climate and Weather

The CWPP counties lie within the NNLP Tallgrass and Mixedgrass Prairie Ecoregions. Part of the area sits atop the Ogallala Aquifer, which underlies about 175,000 square miles in eight states from Texas to South Dakota (see Map 3).

Nebraska has a continental climate with cold winters and hot summers. The CWPP region averages about 27 inches of precipitation annually. July is the warmest month, with maximum temperatures averaging 85-86°F. Since the beginning of the 20th century, temperatures in Nebraska have risen approximately 1°F. Temperatures in the 2000s have been warmer than the long-term average and comparable to the previous record warmest period of the early 1930s Dust Bowl era, when drought and poor land management likely exacerbated the hot

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summer temperatures. The recent warming has been concentrated in the winter and spring, while summers have not warmed substantially in the state. This is reflected in a below-average occurrence of extremely hot days and no overall trend in the number of warm nights since the 1960s. The winter warming trend is reflected in a below-average number of very cold nights since 1990.¹⁰ In recent decades droughts have become more severe. Extreme drought and wildfire years occurred in 1988, 1994, 2000, 2006 and 2012.



Map 3: The Ogallala Aquifer underlies much of the Great Plains. This graphic¹¹ shows the water level change between the early 1900s and 2015.

Weather data was obtained from the University of Nebraska High Plains Regional Climate Center¹² and Iowa State University.¹³ Weather factors including temperature, precipitation, relative humidity (RH), and wind define fire season, as well as the direction and speed of fire spread.

There are two fire seasons in this area. The early fire season occurs from snowmelt and the last spring frost (when the previous year's cured vegetation dries) until early May, then eases as vegetation greens up. The late season begins in mid to late summer as fine fuels, such as grasses and forbs, begin to dry. In most years the late season extends to mid-November, coinciding with agriculture crop harvests, leaf drop, and curing of prairie grasses. Wet springs can delay the onset of the early season, but they produce more fine fuels in ditches and across rangelands that, in late summer and fall, become tinder for sparks that can start wildfires. In drier years fine fuels can start curing by early to mid-July, but there is less growth, and consequently fewer fine fuels to catch sparks from trains, farm equipment, or motorists.

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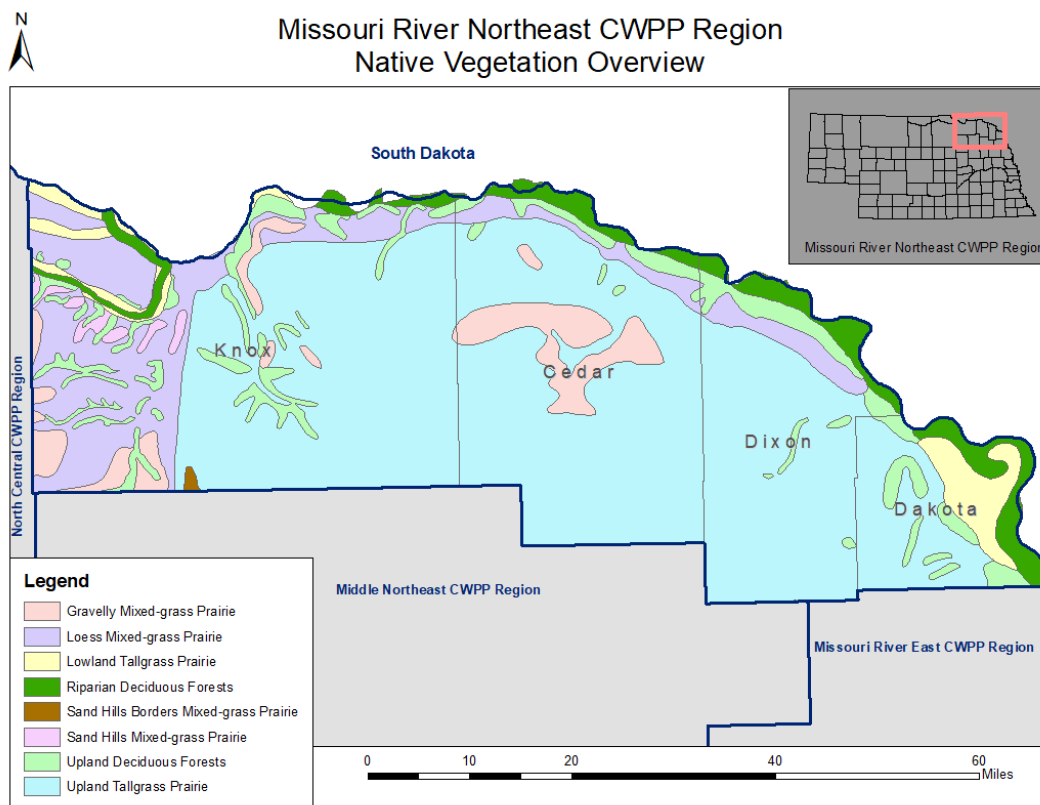
Table 1: Average maximum temperatures (degrees F), precipitation (inches), and median minimum RH (percent) 1982-2020 for April, July, and October for the CWPP region's counties. RH data is interpolated from selected area weather stations.¹⁴

County	April			July			October		
	Max. Temp.	Precip.	Min. RH	Max. Temp.	Precip.	Min. RH	Max. Temp.	Precip.	Min. RH
Cedar	60.31	3.08	36	85.48	3.19	53.5	62.63	2.33	39
Dakota	60.82	3.30	37	85.39	3.53	63.5	62.97	2.32	46.5
Dixon	60.37	3.27	35	85.03	3.26	61	62.66	2.35	45
Knox	60.08	3.02	40	86.00	3.05	61	62.60	2.21	47

Wind is a primary factor in fire spread, even where fuels are light or discontinuous. Some areas are more than half agriculture and grass fuels. Wind rosettes for April, July, and October from three stations near the plan area—Sioux City, Iowa; Wayne, Nebraska; and Yankton, South Dakota—are in Appendix D.

Vegetation and Natural Communities

Native vegetation in the CWPP region is mostly tallgrass and mixed-grass prairie. Wooded areas include upland and riparian deciduous forests (Map 4). As an aggressive native species, ERC occurs in dense, monoculture stands and has encroached into deciduous forests and prairies.



Map 4: The Missouri River Northeast Region CWPP counties are dominated by upland tallgrass prairie, with Loess mixed-grass prairie in western Knox County and in a strip south of the Missouri River in Knox, Cedar, and Dixon Counties. Patches of gravelly, sandhills, and sandhills borders Mixedgrass prairie occur in the western counties. Ribbons of riparian deciduous forests and lowland tallgrass prairie follow the Missouri and Niobrara Rivers. Patches of upland deciduous forest are scattered throughout the region.¹⁵

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The principal deciduous tree species are bur oak, hackberry, red mulberry, green ash, silver maple, elm, and cottonwood. Most of the green ash is expected to die when the emerald ash borer, an invasive pest, moves into the region. Other woody species that are locally abundant include chokecherry, American plum, and gooseberry. Riparian deciduous woodlands follow the major drainages. Most of the deciduous trees and shrubs are found in stringers and patches along the drainages with cooler, more humid environments. In areas where eastern redcedar has encroached, fuel continuity in the wooded areas is moderate to high.

Grasslands in Cedar, Dakota, Dixon, and the eastern two-thirds of Knox Counties are primarily upland tallgrass prairie, with strips of lowland tallgrass prairie and loess mixed-grass prairie following the Missouri River. A large portion of central Cedar County supports gravelly mixed-grass prairie. The western third of Knox County is primarily loess mixed-grass prairie with patches of gravelly mixed-grass prairie and Sandhills mixed-grass prairie in the uplands and strips of lowland tallgrass prairie along the Niobrara and Missouri Rivers.

Riparian deciduous forests follow the Missouri and Niobrara Rivers, and upland deciduous forests are scattered across all four counties. Evergreen forests are composed of ERC and are primarily found in Knox County. ERC has encroached into deciduous forests throughout the region. Other land cover includes agricultural fields, which cover a significant portion of the region. A land cover map appears in Appendix A.

Land Use

There are about 1,687,040 acres (2,636 sq. mi.) in the CWPP region. Public and conservation lands include about 18,770 acres in federal ownership. The USACE owns 17,674 acres in the CWPP counties in conjunction with Gavins Point Dam and Lewis and Clark Lake. The MNRR encompasses 69,000 acres¹⁶ in Cedar, Dixon, and Knox Counties but owns just 1,096 acres in fee. Tribal lands within these counties include the Santee Reservation (116,516 acres) and a portion of the Winnebago Reservation (3,000 acres). According to the Lower Elkhorn NRD's Special Districts Appendix, the Ponca Tribe of Nebraska, although it has no geographic reservation, has a service area for tribal members that includes Knox County.

State lands include 13,026 acres in NGPC wildlife management areas, state recreation areas, and state parks. There are 19,261 acres in state school lands.¹⁷ The Lewis & Clark NRD manages 931 acres in four sites. There are also county and municipal properties in the CWPP region. The remainder of the land is privately owned.

Agriculture (livestock and crops) is the predominant use on rural private and school lands. Residential, commercial, manufacturing, and industrial land uses dominate the region's 37 incorporated municipalities and their immediate surroundings. Land use is primarily agricultural in the region's four unincorporated communities. Rural residential land use exists in conjunction with agricultural operations.

Cedar and Knox Counties have county zoning plans in place; Dakota and Dixon Counties do not. There are currently no regulations in any of these counties specifically pertaining to wildfire preparedness and risk or for building construction in fire-prone areas such as canyon rims.

Popular outdoor recreational activities include hunting, fishing, hiking, boating, biking, and camping. NPS reported 140,814 visitors to the MNRR in 2021. The USACE reported that during 2021 there were 1,081,246 visitors to federally-owned recreation sites managed by the USACE and the NGPC.

State sites open to the public include the Danish Alps and Lewis and Clark Lake State Recreation Areas (SRAs), Niobrara and Ponca State Parks (SPs), and 11 wildlife management areas (WMAs). The NGPC does not track WMA visitation.

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Wildland Urban Interface

The WUI is defined as areas where homes and other structures are built on or near lands prone to wildfire. According to the “Ready, Set, Go!” program, managed by the International Association of Fire Chiefs, the WUI is not necessarily a place, but a set of conditions that can exist in nearly every community. It can be a major subdivision, or it can be four homes on an open range.

National Fire Protection Association literature states that WUI elements include, but are not limited to, the amount, type, and distribution of vegetation; the flammability of the structures in the area and their proximity to fire-prone vegetation and to other combustible structures; weather patterns and general climate conditions; topography; hydrology; average lot size; and road construction. The WUI exists in every state in the country, and in every county/community within the CWPP boundary.

Site-specific WUI issues are listed in each county/community section of this CWPP.

Property Owners Associations

Some rural and WUI subdivisions have property owners associations (POAs) that provide services and could potentially provide wildfire risk and preparedness information to members. There are several POAs in rural subdivisions along the Missouri River in Knox County. Hideaway Acres is located north of Crofton and has over 100 members. There are two POAs serving the Devils Nest community northwest of Crofton, with a combined total of about 37 members. Other POAs in along this part of the Missouri River include Kohls Acres/SID#1, The Timbers, and Mischke Hillcrest. There may be other such associations in the region.

Infrastructure

Webster defines infrastructure as: “...the system of public works of a country, state, or region; also: the resources (such as personnel, buildings, or equipment) required for an activity.” In the CWPP region, infrastructure includes county, state, and federal roads and bridges, communications systems, the power grid, water systems, hospitals, schools, parks and fairgrounds, public administration buildings, fire halls, public officials, law enforcement officers, and fire personnel. These systems, structures, and people are critical to regional functionality.

For the purpose of this plan infrastructure does not include privately owned properties or residences, although these structures also benefit from the same wildfire risk reduction projects. One of the goals of community planning is to protect the basic physical and organizational structure of communities. This infrastructure, in turn, protects citizens.

Regional infrastructure expedites access to a fire by emergency responders, allows them to communicate with one another and the public, facilitates evacuations and support functions, and assists recovery efforts after the event. It is important for both local and out-of-area responders to know what facilities and resources are available and where they are located.

Emergency evacuations depend on infrastructure. Immediate evacuation destinations are likely to be in areas away from the fire that have water, power, and room for gathering. Fairgrounds or parks often make good short-term destinations, as they have large parking areas, restrooms, and electricity. In a wildfire evacuation scenario, local officials will designate immediate evacuation destinations. During prolonged evacuation periods or when homes or access routes have been destroyed, longer range planning is needed.

The Participant Profiles sections of regional HMPs identify specific sheltering locations, which include the mass care facilities identified in the county LEOPs. The Department of Homeland Security’s website <https://www.ready.gov/evacuating-yourself-and-your-family> also offers some ideas.

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The CWPP region is crossed by several high-tension power lines. Rural electric service in the counties is provided by Cedar-Knox Public Power District (PPD), Niobrara Valley Elec. Membership Corp., North Central PPD, and Northeast Power.

Both cellular and landline telephone services are available region wide. Cellular reception is spotty in some locations, particularly in canyons.

Hazardous Fuels Reduction

Hazardous fuels reduction is key to decreasing risks to human life and damage to property. In terms of wildfire, hazardous fuels include any kind of living or dead vegetation that is flammable. Implementation of hazardous fuels reduction projects reduces fuels that feed wildfires, resulting in less extreme fire behavior and intensity. Fire behavior reductions include reduced rates of spread and shorter flame lengths. Fuels treatment in the CWPP region is being accomplished via several approaches, including forest thinning, fuelbreak and firebreak establishment, prescribed fire, prescribed grazing, and implementing Firewise® practices around structures. Table 2 shows acres of vegetation treatments implemented over the past five years in the CWPP region by several agencies and organizations.

Table 2: Estimated acres of vegetation treatment (prescribed fire, mechanical, chemical) in the CWPP Region counties during the past five years. Other treatments may have occurred, but only entities that reported treated acres are included in this table.

Acres of Vegetation Treated During the Last Five Years in the Missouri River Northeast CWPP Region																	
	NFS	NGPC-Parks Div.			NPS			NRCS			PBAs	Tribal			USACE		
County	M	RxB	M	C	RxB	M	C	RxB	M	C	RxB	RxB	M	C	RxB	M	C
Cedar	88	0	0	0	0	175	10	115	380	0	2,785				856	1,544	40
Dakota	0	430	28	225				0	100	0							
Dixon	35	2,050	300	900	31	0	5	0	687	0	469	0	0	0			
Knox	930	1,045	450	1,380	0	0	0	2,493	3,149	55	12,686	10,023*	0	0			
Total	1,053	3,525	778	2,505	31	175	15	2,608	3,529	55	15,940	10,023	0	0	856	1,544	40

Key: M=Mechanical RxB=Prescribed Fire C=Chemical; PBA=Prescribed Burn Association *Tribal data is for FY 2015-2021

Mechanical Treatment

Mechanical fuels reduction of ERC can be expensive, depending on access, terrain, and tree size and density. It is often accomplished by using equipment ranging from chainsaws and hand-held weed trimmers with saw blades to ATV-mounted cutters and hydraulic shears mounted on skid-steers or tractors. As tree size, tree density, and slope increase, so do the costs. The NFS, NGPC, and Natural Resources Conservation Service (NRCS) offer cost-share programs to help private landowners mechanically treat woody vegetation on their properties.

The NFS administers several federal and state grants that provide cost-share to defray the expense of woody fuels reduction. Property owners in counties that have a CWPP in place are eligible for these programs. More information is available at <https://nfs.unl.edu/fuels-assistance>.

Fuels reduction can also be achieved as a result of vegetative manipulation for other purposes, including wildlife habitat enhancement, range management, noxious weed control, and public safety. Even haying activities can provide fire risk reduction benefits. The USACE employs practices such as hay sales, grazing leases, or mowing, depending on what is suitable for each site. They also mow trails that serve as firebreaks at each of their sites.

The MNRR staff is working with their Regional NPS office to develop a fuels management plan for the 563 non-sandbar acres of the 800-acre Goat Island, with a short-term goal of mechanically reducing ERC by 25% and a long-term goal of reintroducing fire to the area. They plan to contract and also use NPS crews for cutting/chipping/piling work on the island.

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The Winnebago Agency Fuels Program conducts mechanical fuels reduction annually on both the Santee Sioux Nation and the Winnebago Tribe of Nebraska's lands. Techniques used in their program include tree cutting, mastication, mowing, haying, and disking, as well as chemical control. Acreage statistics were not provided.

Chemical Treatment

Some entities use chemical treatments to manage vegetation for habitat improvement, noxious weed control, agricultural production, or other purposes. These treatments can affect the quantity and condition of vegetative fuels available during wildfires.

Prescribed Fire and Prescribed Burn Associations

In recent years, the use of prescribed fire has increased as a method of keeping woody encroachment in check, particularly in grasslands, where it can be extremely efficient for managing ERC. In forested settings, prescribed fire is more effective and safer when used to maintain woodlands after they have been mechanically thinned. When tree densities are reduced prior to burning, it is easier to keep the fire on the ground, where it cleans up downed woody fuels. Crown fires are difficult to control, and they kill healthy trees.

Fuels reduction can also be achieved as a result of using prescribed fire for other purposes, such as wildlife habitat enhancement and promoting grassland health. Prescribed fire practitioners include individual landowners, prescribed fire associations, non-profit conservation organizations, and public agencies.

The Winnebago Agency Fire Program conducts prescribed fire annually on both the Santee Sioux Nation and the Winnebago Tribe of Nebraska lands. The USACE's overall management plans include the use of prescribed burning for grassland maintenance, and they have other options for fuel management available, such as hay sales, grazing leases, or mowing, depending on what is suitable for each site. Additionally, they mow trails that also serve as firebreaks at each site.

Prescribed fire associations in the CWPP region include the Northeast Nebraska Prescribed Burn Association (PBA) including Cedar, Dixon, and part of Knox Counties, and the Niobrara Valley Prescribed Fire Association (NVPFA) covering the rest of Knox County. During the past five years, the Northeast Nebraska PBA conducted 97 burns totaling 6,520 acres. The downriver unit of the NVPFA burned 9,420 acres in Knox County during the last five years.¹⁸ Fuels reduction is discussed in detail in the Action Plan section of this document.

Fire Districts and Emergency Management

There are 26 VFDs all or partially within the CWPP boundary (see Map 1). Each county in the region has its own full-time emergency manager. The planning team sent each VFD a survey that asked for contact information, equipment lists, and a summary of their wildfire issues and concerns. Their responses appear in Appendix G.

Wildfire Hazard: History and Impacts

Historic Role of Fire

Prior to European settlement, large fires (started by lightning or intentionally as management activities by indigenous people) were common, and these fires kept the prairies free of most woody vegetation. Table 3 shows a mean replacement fire interval of 45 years for wooded ravines, while the mean replacement fire interval for floodplain forests was 500 years (*note: the flooding-caused replacement interval for these forests may be more frequent*).

The prairies in the region may have experienced a replacement fire interval of 6.5 to 15 years prior to Euro-American influence. However, since settlement, people have become increasingly adept at suppressing wildfire. Without fire, over time, forests became densely overcrowded and woody vegetation encroaches on prairies.

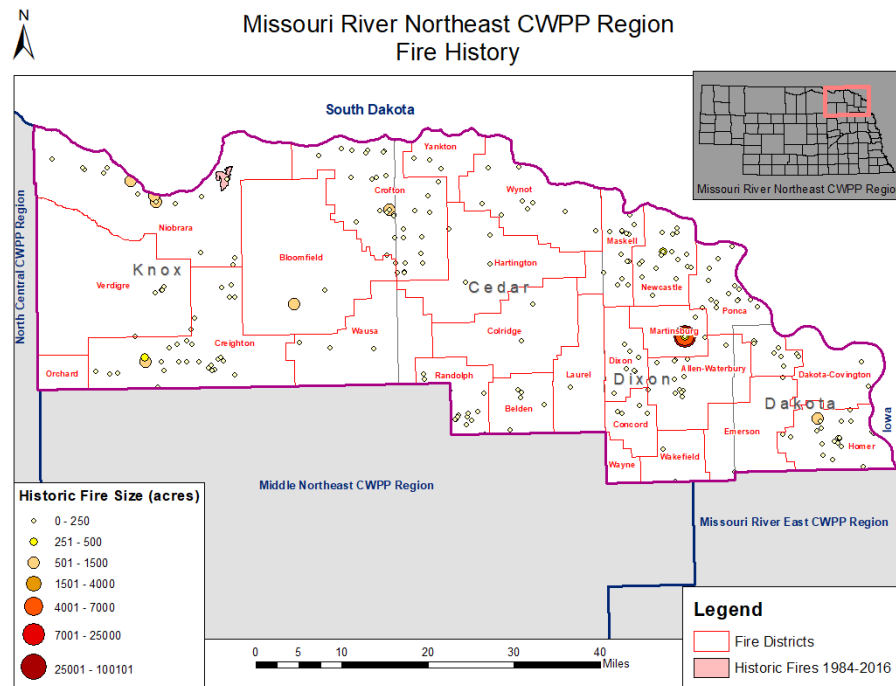
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Table 3: Fire intervals for the wooded draws/ravines, Great Plains floodplain, northern mixed-grass prairie, and northern tallgrass prairie vegetation types are shown above.¹⁹

Vegetation Community	Fire Severity	Fire Regime Characteristics			
		% of Fires	Mean Interval (years)	Min. Interval (years)	Maximum Interval (years)
Northern Great Plains Wooded Draws & Ravines	Replacement	38	45	30	100
	Mixed	18	94		
	Surface or Low	43	40	10	
Great Plains Floodplain	Replacement	100	500		
Northern Mixed-Grass Prairie	Replacement	67	15	8	25
	Mixed	33	30	15	35
Central Tallgrass Prairie	Replacement	75	5	3	5
	Mixed	11	34	1	100
	Surface or Low	13	28	1	50

Local Fire History

Nebraska is no stranger to extremely large wildfires. In 1865 the US Army and ranchers intentionally set a 300-mile-wide prairie fire during a dispute with Native Americans. The fire blackened the entire section of Nebraska south of the Platte River and west of Fort Kearny. It was visible from Colorado and Kansas, and eventually burned all the way to Texas.



Map 5: Some of the larger fires reported in the CWPP area since 1984 are shown in the map above. Between 2000 and 2020, CWPP area VFDs reported 2,083 fires that burned over 86,000 acres.

Some fire districts voluntarily report their annual fire response data to the NFS. Wildfires exceeding 400 acres in size have occurred in all of the CWPP counties. The largest fire reported to the NFS was a 1,200-acre equipment fire in the Crofton Fire District in October 2011. Although not reported in the NFS fire reports database, the historic fires map layer shows that the 1,650-acre 'Six Pack' fire occurred in the Niobrara Fire District in Knox County in 2012. Map 5 shows the locations of some of the larger fires reported in the CWPP area since 2000. In 2012, fire departments from across the state, including some in the CWPP region, provided support for major

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wildfires that burned nearly half a million acres in the Niobrara Valley and the Pine Ridge areas of Nebraska. As observed that year, and evidenced in historical research, rivers are not always a barrier to fire spread.²⁰

According to NFS records, local VFDs have reported 18 fires over 500 acres in size since 2000. Of these, the Orchard VFD reported 11 fires larger than 500 acres for this time period, but since they were not listed by county, these fires may have occurred in Antelope, Holt, or Knox County. The largest was a 10,000-acre lightning fire. Other large fires reported included a 1,200-acre swather fire in the Crofton FD in October 2011, an 800-acre mower fire in the Niobrara FD in July 2002, and a 560-acre debris burning fire in the Homer FD in April 2008.

From 2000 through 2020, CWPP area VFDs reported 1,147 wildfires that burned a total of 49,223 acres and caused \$631,127 in property and crop losses. Although reporting has improved in recent years, not all departments report every year, so the actual numbers are likely much higher. Table 4 shows the fire data reported by VFDs during this time frame.²¹ Because the fire districts vary in their level of reporting, there is no accurate, comprehensive fire history available for the CWPP area.

Table 4: Fires reported by the CWPP Region VFDs between 2000 and 2020. Departments reported a total of 36,151 volunteer hours for this period. Only departments that reported are listed. Some departments did not report every year. Actual numbers are higher. Fire districts report the total number of fires and acres for their district. These figures were not adjusted for districts that include land outside of the CWPP region.

Fires Reported 2000-2020							
Department	# Fires Human	# Acres Human	# Fires Lightning	# Acres Lightning	Total # Fires	Total # Acres	# Mutual Aid Responses
Allen-Waterbury	15	226	0	0	15	226	5
Belden	13	21	1	80	14	101	0
Bloomfield/Lindy	9	62	1	1	10	63	0
Coleridge	3	24	0	0	3	24	0
Concord	14	469	0	0	14	469	5
Creighton	44	2,659	0	0	44	2,659	5
Crofton	90	1,702	6	3	96	1,705	9
Dakota-Covington	1	2	0	0	1	2	0
Dixon	16	129	0	0	16	129	1
Emerson	12	365	0	0	12	365	1
Hartington	7	57	0	0	7	57	1
Homer	78	1,416	0	0	78	1,416	27
Laurel	0	0	1	1	1	1	0
Martinsburg	38	458	11	117	49	575	4
Newcastle-Maskell	52	1,036	1	60	53	1,096	4
Niobrara	21	2,363	3	162	24	2,525	4
Orchard	425	16,301	48	18,747	473	35,048	17
Ponca	65	715	1	10	66	725	19
Randolph	62	343	0	0	62	343	9
Verdigre	56	1,347	5	6	61	1,353	31
Wakefield	3	92	0	0	3	92	1
Wausa	8	15	0	0	8	15	0
Wayne	9	37	0	0	9	37	1
Wynot	23	192	5	5	28	198	2
Total	1,064	30,032	83	19,191	1,147	49,223	146

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Fire Hazard

In the years since European settlement, exclusion of low-intensity ground fires and prolific regeneration of eastern redcedar have increased the fire hazard in both prairies and woodlands. This, combined with severe drought, created conditions conducive to the catastrophic wildfires of 2006 and 2012 in western and central Nebraska. Flash flooding often occurs in areas where vegetative cover has burned, increasing runoff and leaving soils more susceptible to erosion.

Although over 92% of reported fires between 2000 and 2020 were human-caused, those fires accounted for just 61% of the total acres burned. Lightning caused 39% of all acres burned (see Table 4). During most years the majority of wildfires are small and do not burn with high intensity because of rain or quick suppression. However, in some years medium-sized and large fires occur and burn with high intensity and extreme fire behavior, posing a threat to rural homes and potentially causing damage to major watersheds. Often the fires are wind-driven from the southwest or northwest and can burn across drainages at a rapid rate. This situation challenges fire suppression personnel and agency managers to remain vigilant while monitoring the fire danger ratings and indices, particularly the heavy fuel moisture (1,000-hour time lag) fuels, during the fire season. Fuel continuity is high in the forested areas and in some of the grasslands in this region. Fires in these areas can have a high rate of spread and a high resistance to control during very high and extreme fire danger.

The planning team asked VFD personnel, emergency managers, and other stakeholders to identify specific areas of concern for wildfire response. These are described in each community-specific section of the CWPP and shown on a map in Appendix A. The locations include rural subdivisions, wooded areas along drainages with homes and other structures, as well as recreational sites that experience heavy seasonal visitor use, have limited access, and are high-risk ignition sources due to dense undergrowth. Many agricultural lands often experience dry weather conditions conducive to fire ignition from lightning and hot farm machinery.

Knox County is included in the Tri-County local mitigation planning area, which also includes the Knox County service area for the Ponca Tribe of Nebraska. The tribe has identified Grass/Wildfires as a priority hazard. Dakota County is part of the Papio-Missouri River NRD local mitigation planning area, and the other two counties are in the Cedar/Dixon local mitigation planning area (see map in Appendix A). Each of these planning areas has its own Multi-Jurisdictional HMP that includes a discussion of wildfire hazard (see link in Appendix C). This CWPP builds on the HMPs to address specific wildfire concerns.

Two factors that heavily influence fire hazard are fuel moisture and the vegetation fuel models present.

Fuel Moisture

Dead fuels are classified according to how fast they gain and lose moisture. They are categorized into 1, 10, 100, and 1,000-hour fuel size classes.²² The larger the fuel, the longer it takes for the weather to affect it. Large branches (100-hour fuels) will take much longer to dry out than dead fine fuels such as grass (1-hour fuels). Once 100- and 1,000-hour fuels become dry, it also takes a long time for them to regain moisture from wetter weather.

Fuel Models

Predicting the potential behavior and effects of wildland fire is an essential task in fire management. Mathematical surface fire behavior and fire effects models and prediction systems are driven in part by fuelbed inputs such as load, bulk density, fuel particle size, heat content, and moisture of extinction. To facilitate use in models and systems, fuelbed inputs have been formulated into fuel models. A fuel model is a set of fuelbed inputs needed by a particular fire behavior or fire effects model.²³

According to the [Nebraska Wildfire Risk Explorer](#),²⁴ the following fuel models²³ are the most prevalent within the CWPP region (full descriptions of these fuel models appear in Appendix E):

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Grassland Models (GR): In the prairie portions of the CWPP region, the primary carrier of fire is grass. Grass fuels can vary from heavily grazed grass stubble or sparse natural grass to dense grass more than 6 feet tall. Fire behavior varies from moderate spread rate and low flame length in the sparse grass to extreme spread rate and flame length in the tall grass models. All GR fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong. The following fuel models best represent the grasslands throughout the region.

- GR1 Short Sparse Dry Climate Grass: The primary carrier of fire in GR1 is sparse grass, though small amounts of fine dead fuel may be present. The grass in GR1 is generally short, either naturally or by grazing, and may be sparse or discontinuous.
- GR2 Low Load Dry Climate Grass: The primary carrier of fire in GR2 is grass, though small amounts of fine dead fuel may be present. Load is greater than GR1, and fuelbed may be more continuous. Shrubs, if present, do not affect fire behavior.
- GR4 Moderate Load Dry Climate Grass: The primary carrier of fire in GR4 is continuous, dry-climate grass. Load and depth are greater than GR2; fuelbed depth is about 2 feet.
- GR6 Moderate Load, Humid Climate Grass: The primary carrier of fire in GR6 is continuous humid-climate grass about 1 to 2 feet tall. Spread rate very high, flame length very high.
- GR8 High Load, Very Coarse, Humid Climate Grass (Knox Co. only): The primary carrier of fire in GR8 is continuous, very coarse, humid climate grass. Load and depth are greater than GR6. Spread rate and flame length can be extreme if grass is fully cured.

Grass-Shrub Models (GS): The primary carrier of fire in the GS fuel models is grass and shrubs combined. Both components are important in determining fire behavior. GS fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong and depends on the relative amount of grass and shrub load in the fuel model.

- GS1 Low Load, Dry Climate Grass-Shrub: Shrubs are about 1 foot high, grass load is low. Spread rate is moderate; flame length low. Moisture of extinction is low. GS1 is found in Cedar and Knox Counties.

Shrub Models (SH): The primary carrier of fire in the SH fuel models is live and dead shrub twigs and foliage in combination with dead and down shrub litter.

- SH7 Very High Load, Dry Climate Shrub: The primary carrier of fire in SH7 is woody shrubs and shrub litter. Very heavy shrub load, depth 4 to 6 feet. Spread rate is high; flame length very high. SH7 is found in Cedar and Knox Counties.

Timber Understory Models (TU): The primary carrier of fire in the TU fuel models is forest litter in combination with herbaceous or shrub fuels. TU1 contains live herbaceous load and is dynamic, meaning that the live herbaceous fuel load is allocated between live and dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong and depends on the relative amount of grass and shrub load in the fuel model. TU1 is found along the rivers, particularly in Knox County.

- TU1 Low Load Dry Climate Timber-Grass-Shrub: The primary carrier of fire in TU1 is low load of grass and/or shrub with litter. Spread rate is low; flame length low.
- TU2 Moderate Load, Humid Climate Timber-Shrub: The primary carrier of fire in TU2 is moderate litter load with shrub component. Spread rate is moderate; flame length low. Found in Dixon County.

Timber Litter Models (TL): The primary carrier of fire in the TL fuel models is dead and down woody fuel. Live fuel, if present, has little effect on fire behavior.

- TL2 Low Load Broadleaf Litter: The primary carrier of fire in TL2 is broadleaf (hardwood) litter. Low load, compact broadleaf litter. Spread rate is very low; flame length very low. TL2 is found primarily in Cedar, Dakota, and Dixon Counties.

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- TL3 Moderate Load Conifer Litter: The primary carrier of fire in TL3 is moderate load conifer litter, light load of coarse fuels. Spread rate is very low; flame length low. TL3 is found in Knox and Cedar Counties.
- TL6 Moderate Load Broadleaf Litter: Less compact than TL2. Spread rate moderate; flame length low. TL6 is found in Dixon County.

Economic Impacts

Excessive fuel loading can affect local economies in many ways. It reduces available forage, and therefore the grazing carrying capacity, for livestock and wildlife. If woody fuels are removed by uncontrolled, high intensity wildfire, other resources are affected. Intense fires may induce hydrophobic soils, which significantly increase runoff and erosion in steep terrain. Loss of grazing capacity and decreased water quality can be long-lasting problems for landowners whose livelihoods depend on livestock and hunting income.

A proactive approach to reducing hazardous fuels can provide jobs and generate valuable wood products such as lumber, posts, and biomass. Mechanically thinning forests reduces the hazard and risk of intense wildfire, can improve grazing capacity and wildlife habitat, and can increase the amount of precipitation that reaches streams, lakes, and the water table. Adherence to the *Forestry Best Management Practices for Nebraska* (<https://nfs.unl.edu/documents/ruralforestry/NebraskaBMP.pdf>) by those conducting mechanical thinning operations can reduce the potential for soil erosion from equipment use.

Emergency Operations

Responsibilities and Mutual Aid Agreements

Local VFDs are the first line of defense against wildfires on private and state lands in this planning area and statewide. During large wildfires, they rely on MA agreements with neighboring jurisdictions. Each of the 26 departments in the CWPP counties belong to one or more of the three Nebraska MA districts that overlap the region: 40-12 MA, Big Nine MA, and Northeast Nebraska MA. Crofton also has an informal MA agreement with the Yankton (SD) fire department. See Appendix F for a complete list of MAAs and member departments.

The NGPC responds to wildfires within the state if they receive a mutual aid request but does not have specific mutual aid agreements with individual fire districts. The NPS staff at the MNRR plans to establish mutual aid agreements with local entities in 2022.

Emergency managers work closely with VFDs and law enforcement when responding to wildfires and other incidents. In addition to notification by sheriff's department personnel and/or dispatch, some jurisdictions have notification from 'Code Red' that allows them to develop groups that can be called in an emergency situation for notification of evacuations, hazardous material incidents, and any other emergency, including wildfire. This allows notification of a large geographical area or a group of people. This and similar applications are 'opt-in' programs which can be used to notify residents in the area of wildfire events but would likely not reach everyone.

The state introduced the Salamander identification card check-in system for emergency response personnel and equipment prior to the 2012 wildfires. This identification and credentialing system allows first responders (agencies, personnel, and equipment) to respond to incidents more efficiently. It streamlines the incident check-in process and tracks time spent on an incident for both personnel and equipment. The cards use bar codes that identify equipment, people and their qualifications, and can track volunteers. The Salamander Command program and the Salamander Track Application are used to track incidents.

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Staging Areas and Safety Zones

The forested drainages in the CWPP region are separated by expanses of grassland and farm ground. There are abundant staging area locations in the uplands away from the drainages. Grazed pastures, green alfalfa fields, and fallow farmland can provide staging areas away from forested areas. Fairgrounds and municipal parks are generally good staging areas, depending on the particular location of a wildfire. Safety zone sites are designated by fire officials and depend upon the wildfire location and characteristics.

Roads/Bridges

In addition to the federal and state highways, the region is served by a network of county-maintained roads. Farm and ranch trails provide additional access for emergency vehicles. Restricted bridges and roads which could restrict truck/lowboy passage have not been mapped. Developing such a map has been identified as a need that should be addressed (see *Action Plan* section of this document). Road and bridge information reported for each county appears in the county detail pages.

Communications

VHF radio is required to communicate with the Single Engine Air Tanker (SEAT), which is described in the *Aerial Resources* section. Air-to-Ground frequencies, specifically A/G 25, is the assigned and preferred method of communication with the SEAT; however, if the capability doesn't exist for a certain department, any of the Mutual Aid frequencies such as VTAC 11 OR VTAC 14 can be substituted.

Location-specific data about communications is listed in each county section of this CWPP for those entities that provided such information. Gaps in cellular service exist across some parts of the CWPP region, particularly in steeper drainages. Cell service in the area varies, depending on the service provider.

Capabilities and Capacity

Resources to support emergency responder safety and help VFDs prepare for and respond to fire, natural disasters and non-fire emergencies can include vehicles, equipment, air support, and personnel. This section describes resources maintained by or available to VFDs in the CWPP region, as well as resources maintained by other organizations.

Vehicles and Equipment

A listing of apparatus and staffing for each fire district is included in Appendix G. Some districts may have agreements with outside agencies or county departments (such as Roads) for assistance with heavy equipment.

Through the Federal Excess Property Program (FEPP) and Fire Fighter Property (FFP) program, a cooperative effort with the USFS, the NFS acquires and reconditions excess equipment which is no longer needed by the federal government. This equipment is then loaned to rural fire districts, which are responsible for maintenance. When no longer needed, the equipment is returned to the NFS and either re-assigned or sold, with the proceeds being returned to the US Treasury or state program. In 2021 there were 984 pieces of FEPP equipment in use by 306 rural fire districts and other emergency response jurisdictions across Nebraska, valued at \$105,018,000. In the CWPP Region there were 36 pieces of FEPP equipment, valued at \$3,095,400 and housed at 12 fire districts.

These programs allow fire districts to obtain essential fire-fighting equipment at an affordable price. The NFS Fire Shop also offers cooperating fire districts resources to reduce vehicle maintenance costs. This includes securing parts for vehicles and providing complimentary maintenance checks. Mechanics can also provide routine vehicle maintenance at the NFS Fire Shop in Mead or fire districts may use a trusted local mechanic. Two NFS mobile repair units are available to respond to the maintenance needs of cooperating fire districts. These units can provide routine repairs, as well as on-site support for cooperating districts in the event of catastrophic fires.

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Some public agencies also maintain fire equipment. The NGPC Parks Division has fire resources located in Dakota County at Danish Alps SRA (UTV w/slide-in pumper, truck), in Dixon County at Ponca State Park (2 UTV w/slide in pumper, 2 slide-in pumpers & trucks, 2 ATVs with H₂O sprayer), and in Knox County at Niobrara State Park and Lewis and Clark SRA (4 UTV w/slide-in pumper, 1 ATV w/ H₂O sprayer, 2 trucks/slide-in pumpers). All areas have PPEs, drip torches, hand-tools, etc. are available in Northeast Parks horticulture/burn trailer. Other equipment and staff from parks within the Northeast Parks Region are also utilized if and when needed on these areas. At their MNRR headquarters in Yankton, SD, the NPS has hand tools, a UTV with slide-in pumper, and a second portable pump, which they plan on being able to utilize from a patrol vessel. The USACE at Gavins Point used to do their own prescribed burning in northeast Nebraska. They now complete their prescribed burns in this area through contracts. Although they no longer maintain any fire equipment, but they still have an assortment of Nomex overalls, metal backpack water sprayers, and tools.

Aerial Resources

The Wildfire Control Act of 2013 enabled the establishment of Single Engine Air Tanker (SEAT) bases in Nebraska. The SEAT provides critical observation and access for remote areas. Air tanker support is vital for locations away from towns and for wildfires located in difficult terrain or spreading quickly. Having a SEAT dedicated strictly to wildfire suppression provides nearby resources for quick initial attack on small fires, keeping them from growing into large, catastrophic wildfires.

Permanent SEAT (Type 1) bases enhance fire aviation and initial attack capabilities. SEAT bases are staffed by NFS personnel during the fire season, working with a SEAT on contract to Nebraska through its partners at NEMA. During peak wildfire season (generally July 15-September 15) the state of Nebraska hires a SEAT for at least a 60-day contract period. NEMA pays for the aircraft's daily rate, and flight time is paid out of the Governor's Emergency fund. NFS provides the SEAT Manager who directs the entire operation. It is an interagency effort managed by NFS and paid for by NEMA. Of the five permanent (Type 1) SEAT bases in Nebraska, Valentine is the primary one that serves this CWPP Region. The other bases are located in McCook, Scottsbluff, Chadron, and Alliance. In addition, NFS has a mobile SEAT base to support operations at airports without a permanent base. Each base houses LC 95 retardant.

Prior to the onset of fire season, the Wildfire Advisory Group assesses wildfire risk throughout the state. This committee consists of representatives from the NFS, State Fire Marshal's Office, NEMA, USFS, and Great Plains Dispatch. They have two in-person meetings per year plus weekly conference calls to discuss wildfire operations, fuel conditions, and resources. The group recommends to NEMA which SEAT base is the best location to station the SEAT plane, and when and for how long the SEAT will be contracted.

The state has a long history of utilizing agricultural aerial applicators for fire suppression. These are an important resource because they are available year around, not just during the peak fire season. Aerial applicators sign up yearly to be part of this program but are not 'on call' for wildfire response. Any fire chief who decides one is needed can simply call directly to see if the applicator is available. These aircraft can only carry loads of water or foam, not the preferred and more effective retardant product. Their availability may be limited due to the pilot not being present or out spraying fields. These pilots and the aircraft are not 'carded' to fly missions on federal land, so they cannot be utilized on fires on federal properties.

The NFS *Yellow Book* (link in Appendix K) contains detailed information about aerial resources, including:

- Contact information for state, federal and private agencies that have emergency suppression resources or can provide technical expertise in the suppression of wildfires
- Aerial Applicator and Foam Retardant Directory
- Deployment procedures and forms needed to order a SEAT
- Map of cooperating aerial applicators and SEAT base locations

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Overhead Teams

In major wildfire situations, overhead teams can be called in to help VFDs. State assistance starts with the Wildfire Incident Response Assistance Team (WIRAT). This team is comprised of State Fire Marshals and the NFS. When an Incident Commander (IC) orders the team, the four closest members will respond and assist. This could include scouting the fire, ordering additional resources, establishing a communication plan, operations, communicating with aircraft, or reloading aircraft.

The WIRAT does not take over responsibility for the fire. Once a state disaster is declared by NEMA and the governor, a state-level All Hazard Type 3 Team can respond. At this point the fire is beyond the capabilities of the local IC. The team either takes control of the fire or shares the responsibility with the local IC. If the fire grows beyond their capabilities, then the Federal Emergency Management Agency (FEMA) and a Type 1 or 2 team become involved.

Training

The NFS, Nebraska State Fire Marshal's Office, and NEMA provide wildland fire training through classes in communities across the state as well as mutual aid schools and State Fire School attended by thousands of people each year.

In addition, the NFS sponsors the Nebraska Wildland Fire Academy, held annually in April at Fort Robinson State Park. Launched as an interagency effort by the NFS and the USFS, the Academy provides opportunities for Nebraska volunteer firefighters to attend nationally recognized wildland fire and incident management training at little or no cost, on a schedule that does not require them to be away from home more than what is already required by their volunteer efforts. It utilizes the expertise of local, state, and federal firefighters to ensure the fire training needs of Nebraska and the surrounding region are met. It also enables local volunteers to enter the national red card system and develop certifications that are recognized across the nation. In 2018, NFS expanded this effort and created the Eastern Nebraska Wildland Fire Academy. This weekend event is hosted at Ponca State Park and provides valuable wildland fire classes each November.

Classes cover a variety of topics ranging from beginning to advanced firefighting techniques, Firewise® landscaping and construction, leadership, and fire prevention education. The classes offer flexibility and can be fine-tuned to meet the needs of local VFDs. NFS delivered and sponsored 11,072 course hours in 2021, and 4,039 hours during the first quarter of 2022. Wildland fire instructors are based in Ainsworth, Chadron, and Lincoln.

The tribal fire management plan⁶ for the Santee and Winnebago reservations requires all firefighting personnel performing interagency wildfire suppression assignments to meet federal training and physical fitness requirements.

The MNRR has four NPS staffers holding Firefighter 2 qualifications as of April 2022. The NPS utilizes the Incident Qualifications and Certification System for maintaining the fire qualifications of personnel. These records are updated annually before fire season.

Missouri River Northeast Community Wildfire Protection Plan

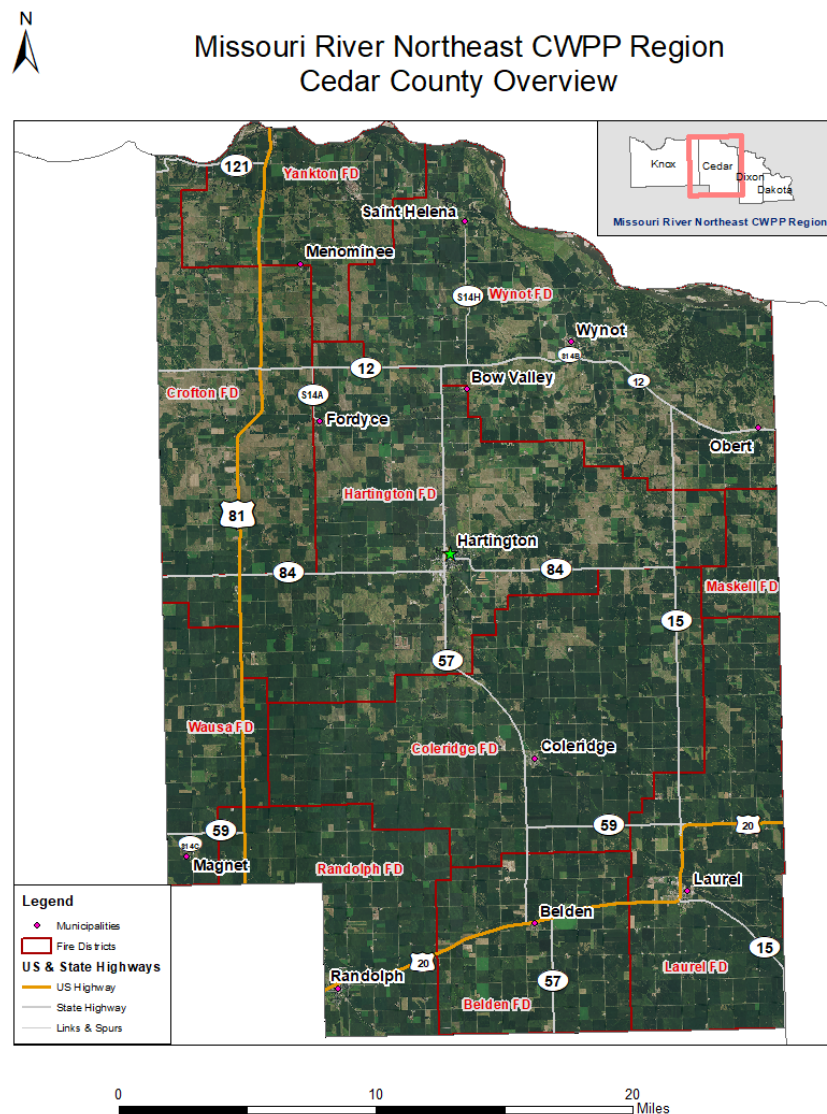
Community-Specific Considerations

Topics pertinent to the entire CWPP region appear in the previous pages. For planning purposes, each county is considered a 'community.' This part of the document contains elements specific to each county/community. Each of these sections consists of a 'Community Profile' (description, fire history, and fire hazard/risk) and 'Infrastructure and Protection Capabilities' (fire districts, emergency operations, greatest concerns listed by VFDs, and infrastructure such as water sources, roads and bridges). The HMPs contain complete critical infrastructure lists; therefore, these community sections include only a reference to the HMPs (links in Appendix C). Critical facilities are determined based on the discretion of the jurisdiction.

Cedar County

746 sq. miles

2020 population: 8,852



Community Profile

Cedar County is in the central portion of the CWPP region. It is bounded on the west by Knox County, on the east by Dixon County, on the south by Wayne and Pierce Counties, and on the north by the Missouri River and South

Missouri River Northeast Community Wildfire Protection Plan

Dakota. Incorporated municipalities include the county seat of Hartington (pop. 1,517), Belden (pop. 113), Coleridge (pop. 537), Fordyce (pop. 154), Laurel (pop. 972), Magnet (pop. 43), Obert (pop. 22), Randolph (pop. 879), Saint Helena (pop. 89), and Wynot (pop. 216). Aten (pop. 28), Bow Valley (pop. 116), and Menominee (no pop. data) are listed as unincorporated communities.

Federal lands in Cedar County include 3,067 acres managed by the USACE and 1,065 acres in three MNRR recreation areas managed by the NPS. State lands include the NGPC's 380-acre Wiseman WMA and 2,190 acres in school lands. The Lewis and Clark NRD and the NGPC jointly manage 154 acres in two WMAs. Other than municipal property, the balance of the land within the county is privately owned. Agriculture and livestock operations constitute the primary land use. The county fronts 29 miles of the MNRR. The quarter-mile boundary encompasses approximately 4,640 acres, but nearly all of this is privately owned and managed.

Vegetation zones include strips of riparian deciduous forests along the Missouri River and some of its tributaries, with upland deciduous forest above and scattered in pockets across the northern part of the county. Mixed-grass prairie occupies most of the rest of the landscape. ERC has encroached into deciduous woodlands and prairies in some areas, particularly near the Missouri River. Both irrigated and dryland cropland is present throughout the county.

Fire History

Although large prairie fires were common prehistorically, since the time this area was settled by Europeans wildfire activity has been mostly limited to small fires which residents rapidly and effectively controlled. This allowed woody vegetation to become denser and more widespread, particularly in rugged terrain.

Cedar County VFDs reported 272 fires between 2000 and 2020, which burned a total of 3,539 acres. The largest of these was an equipment fire reported by the Crofton VFD in October 2011, which burned about 1,200 acres in Cedar and Knox Counties.

Fire Hazard and Risk

The areas most at-risk from wildfire are in the WUI surrounding municipalities and in the canyons and bluffs along the Missouri River, where there are heavy fuels, rough terrain, and limited access. Homes and other structures in these locations are at increased risk due to these factors.

Locations of special concern identified by local VFDs and steering committee members include residential and recreational developments along the Missouri River. The Crofton fire chief named the Devils Nest and the Lewis and Clark Lake area as of particular concern due to multiple structures, difficult access, rough terrain, one way in/out, heavy fuels (ERC), and lack of water within effective distance. The 2015 CWPP noted that the Crofton FD's forested area is concentrated along the Missouri River, with 91% of the forested acres and 45% of the shrub acres north of Beaver Creek. The topography and continuing increase in the number of homes, both vacation and full-time residential, among the ERC-encroached riparian forest is a high concern. Egress and road width issues in these areas impact firefighter access and safety, as well as evacuation and wildland fire suppression.

The 2015 CWPP stated that in the Wynot FD, the forestland is located primarily north of State Highway 12 and east of Wynot. It includes 7,300 acres along the bluffs and Goat Island in the Missouri River, with 1,641 acres in smaller blocks of woodland near St. Helena, and 180 acres south of Wynot west of Bow Creek. These areas contain subdivisions with one-way in and out access.

A portion of the 7,300 forested acres northeast of Wynot is within the NPS MNRR and the NGPC's Wiseman WMA. An NPS Fire Management Plan and Environmental Assessment addresses suppression and prevention on NPS lands and cooperation between the agencies, neighboring landowners, and VFDs. The MNRR chief ranger identified the non-sandbar portion (563 acres) of the approximately 800-acre Goat Island as a concern due to heavy ERC encroachment and access by boat only. The island contains riparian cottonwood forest, becoming

Missouri River Northeast Community Wildfire Protection Plan

increasingly dominated by mature ERC. He is working with their Regional NPS office to develop a fuels management plan specifically for the island.

USACE staff identified Audubon Bend, located north of Wynot and East of St. Helena, as an area of concern due to heavy fuels, one way in/out, and lack of water within an effective distance. Staff considers this a particularly vulnerable area due to both public use factors such as cigarettes discarded into dry vegetation, people parking vehicles in dry grass, and natural causes such as lightning strikes. They believe the Wynot VFD and other locals also consider it a concern.

The Yankton VFD listed both sides of the South Dakota/Nebraska border along Lewis & Clark Lake and Missouri River as having difficult access, rough terrain, one way in/out, and heavy fuels. High home density, infrastructure, populated areas along and above Lewis & Clark Lake makes this an area of concern. The 2015 CWPP stated that the Yankton Fire District contains large feed yards that present hazards including fuel, chemicals, and stockpiled feed.

The Belden fire chief identified a Bible camp northwest of Belden that houses many children in the summer as a concern due to multiple structures, rough terrain, one way in/out, lack of water within effective distance, and a propane tank. He also noted that feedlots and farmland in the district often have difficult access, lack of water within effective distance, and bridges that may not support equipment weight; and abandoned farms frequently have just one way in/out. The Laurel fire chief did not name specific locations but said areas with lack of water within effective distance are problematic in their district.

Areas of Concern are mapped in Appendix A. Agricultural lands in those portions of the county which lie outside mapped Areas of Concern do have their own fire risk variables; however, irrigated croplands are not as fire-prone as forests and grasslands. All of Cedar County lies within the boundaries of the WUI as defined by the NFS in the introduction to this CWPP.

Infrastructure and Protection Capabilities

The Cedar and Dixon Counties HMP includes a full geo-located critical infrastructure list (see link in Appendix C).

Fire Districts, Mutual Aid, and Emergency Operations

Cedar County has a full time Emergency Manager. Ten fire districts are located within or partly within the county: Belden, Coleridge, Crofton, Hartington, Laurel, Newcastle-Maskell, Randolph, Wausa, Wynot, and Yankton. See Appendix G for their contact information, equipment lists, and responses to the VFD questionnaire. The VFDs are responsible for fire protection and assist with other emergencies in their districts. The Cedar County Sheriff's department provides assistance as needed.

All of the VFDs belong to one or more of the three MAAs that overlap the county. The Belden, Coleridge, Hartington, Laurel, Newcastle-Maskell, Randolph, Wausa, and Wynot VFDs all belong to the Big Nine MAA. The Laurel and Newcastle VFDs belong to the Northeast Nebraska MAA. The 40-12 MAA includes the Crofton, Randolph, and Wausa VFDs. Crofton has an informal agreement with the Yankton (SD) VFD. The Yankton VFD said they also have informal agreements with the Fordyce (Hartington) and Wynot VFDs, and that they are in the process of establishing formal mutual aid agreements. See Appendix F for a statewide list of MAAs.

Water Sources

The only developed non-agricultural water systems (other than private wells) are in the municipalities. The Missouri River and some of the larger creeks are generally reliable water sources. Ponds and stock tanks are located throughout the county. During drought conditions many ponds are not dependable. Many smaller streams have only intermittent flows and are not reliable. Windmills are abundant in the county and can provide

Missouri River Northeast Community Wildfire Protection Plan

water when they are operational. The Belden, Coleridge, Crofton, Laurel and Randolph VFDs identified water sources and availability as a concern.

Utilities/Phone Service/Radio Communications

Cedar County is crossed by several high tension power lines. Rural electric service is provided by the Cedar-Knox PPD. There is both cellular and landline telephone service available in the county. There are gaps in cell coverage in some areas.

The Yankton VFD noted that radio communications have improved. Nebraska channels have been added for departments along the border.

Roads and Bridges

US Highway 20 enters the south part of the county west of Randolph and exits into Dixon County east of Laurel. US Highway 81 enters the west part of the county from Pierce County and runs north to South Dakota. State Highways 121, 12, 84, 59, and 15 provide east-west access, and State Highways 57 and 15 run north-south. These routes are augmented by a network of county-maintained roads.

The Belden VFD reported that some bridges in town and on county roads are old and do not have a high enough weight limit. The Crofton fire chief identified 895 Road, west of Hwy 121 as a having bridge that will not support equipment weight. Randolph's fire chief stated that the 558 Road bridge just west of Randolph will be replaced with the current floodplain project. The Laurel VFD noted that a few bridges in their district aren't heavy enough for their trucks. The Wausa fire chief said there is a possibility that some bridges on certain gravel or minimum maintenance roads are insufficient to support equipment. The Yankton VFD noted that the Meridian Bridge over the Missouri River has been mainly turned into a walking bridge.

Greatest Concerns

The VFDs were asked to list their greatest concerns for their districts, shown in the table below:

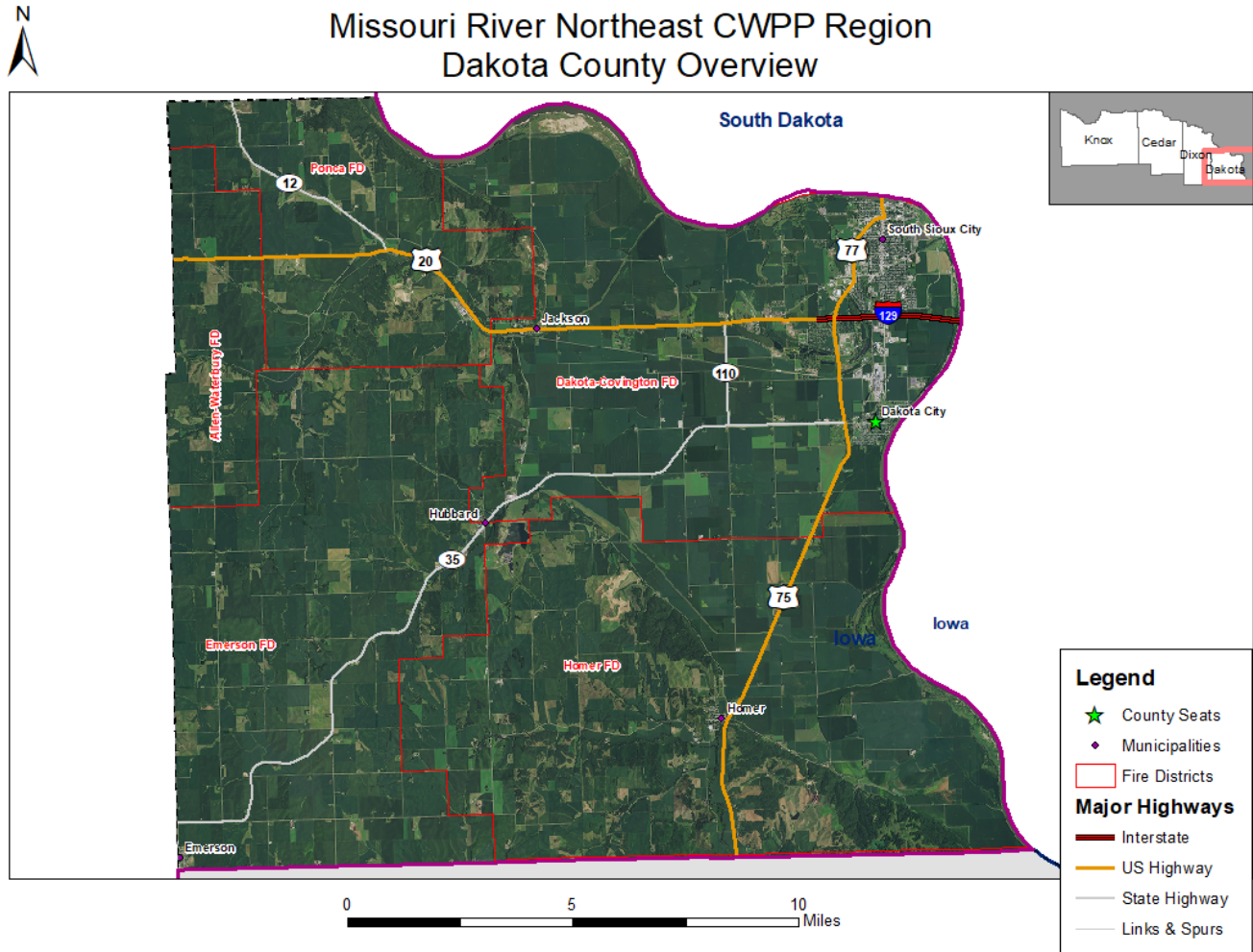
Department	Greatest Concerns
Belden	Property damage, personal injury, water access
Coleridge	Lack of adequate water supply, lack of personnel
Crofton	Devils Nest & lake area, lots of red cedars
Hartington	(Survey not returned)
Laurel	Don't have any
Newcastle/Maskell	(Survey not returned)
Randolph	Water supply
Wausa	Having enough manpower and equipment
Wynot	(Survey not returned)
Yankton	Structure protection and access

Missouri River Northeast Community Wildfire Protection Plan

Dakota County

267 sq. miles

2020 population: 21,582



Community Profile

Dakota County forms the east end of the CWPP region and the northeast corner of the state. It is bounded on the west by Dixon County, on the south by Thurston County, on the east by Iowa, and on the north by South Dakota. The Missouri River forms the east and most of the north boundaries of the county. Incorporated municipalities include the county seat of Hartington (pop. 1,517), Belden (pop. 113), Coleridge (pop. 537), Fordyce (pop. 154), Laurel (pop. 972), Magnet (pop. 43), Obert (pop. 22), Randolph (pop. 879), Saint Helena (pop. 89), and Wynot (pop. 216). There are no unincorporated communities in the county.

There are no federal lands in Dakota County. Besides municipal lands, public lands include 1,172 acres owned by the NGPC in one SRA, two WMAs, and an easement managed by South Sioux City Parks; and 653 acres in state school lands. The balance of the land within the county is privately owned. The primary land use is agriculture and livestock operations.

Vegetation zones are primarily upland tallgrass prairie, with lowland tallgrass prairie and riparian deciduous forests along the Missouri River; patches of upland deciduous forest are scattered across the county. ERC has encroached into some of the wooded areas. Cropland occupies much of the county.

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Fire History

Although large prairie fires were common prehistorically, since the time this area was settled by Europeans wildfire activity has been mostly limited to small fires which residents rapidly and effectively controlled. This allowed woody vegetation to become denser and more widespread, particularly in rugged terrain.

Dakota County VFDs reported 172 fires between 2000 and 2020, which burned a total of over 2,700 acres. The largest of these was a debris burning fire reported by the Homer VFD in April 2008, which burned about 560 acres. The district also reported fires larger than 100 acres in the spring of 2014.

Fire Hazard and Risk

The areas most at-risk from wildfire are in the WUI surrounding municipalities and in the canyons and bluffs along the Missouri River, where there are heavy fuels, rough terrain, and limited access. Homes and other structures in these locations are at increased risk due to these factors.

The 2015 CWPP identified portions of two fire districts in the county that are at elevated risk of wildfire. Over 12% of the Homer Fire District is in large blocks of forestland which runs northwest to southeast through Homer and to the west. An additional 21% of land in that district contain small blocks of shrubland, but eight of these areas contain 50 acres or more that could provide a higher risk of uncontrolled wildfire on the bluffs. In the Ponca Fire District, the nearly 15% forest acres are on the bluffs running northwest to southeast with the Missouri River and floodplain below. The 21% shrub acres in this district are mainly in small blocks, but eight areas contain 50 acres or more that could provide a higher risk or uncontrolled wildfire on the bluffs.

Locations of special concern identified by local FDs include difficult access and rough terrain along the river bluffs and land bordering the river (Ponca VFD) and areas with multiple structures, difficult access, rough terrain, one way in/out, and/or lack of water within effective distance (Emerson and Allen-Waterbury VFDs). The Allen-Waterbury VFD has specific concerns about feedlots and areas that store bales.

The Dakota City fire chief noted that there are homes along the bluffs with high density wooded areas and only one driveway. The 2015 CWPP stated that just under half of that district's forested acres are on the bluffs north and south of Jackson. Additionally, there are eight areas of shrubland that contain 50 acres or more that could provide a higher risk or uncontrolled wildfire on the bluffs. The flooding that occurred in 2012 and 2019 along the Missouri River left the riparian forest in poor shape. Many trees died and are continuing to fall. These fallen logs represent an increase in fuel loading and makes access and transport through the areas difficult. The logs are 1,000-hour fuels that will extend the longevity of a fire event or, at a minimum, will require increased personnel to contain the fire and monitor as the large fuels burn out.

Areas of Concern are mapped in Appendix A. Agricultural lands in those portions of the county which lie outside mapped Areas of Concern do have their own fire risk variables; however, irrigated croplands are not as fire prone as forests and grasslands. All of Dakota County lies within the boundaries of the WUI as defined by the NFS in the introduction to this CWPP.

Protection Capabilities and Infrastructure

The 2021 Papio-Missouri NRD HMP includes a full geo-located critical infrastructure list (see link in Appendix C).

Fire Districts, Mutual Aid, and Emergency Operations

Dakota County has a full time Emergency Manager. Five volunteer fire districts are located within or partly within the county: Allen-Waterbury, Dakota City (Dakota-Covington), Emerson, Homer, and Ponca. South Sioux City has a municipal fire department. See Appendix G for their contact information, equipment lists, and responses to the VFD questionnaire. The fire departments are responsible for fire protection and assist with other emergencies in their districts. The Dakota County Sheriff's department provides assistance as needed.

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All of the fire departments belong to the Northeast Nebraska MAA. The Dakota City VFD also has an agreement with Sioux City Fire and Rescue for Hazmat response. See Appendix F for a statewide list of MAAs.

Water Sources

The only developed non-agricultural water systems (other than private wells) are in the municipalities. The Missouri River and some of the larger creeks are generally reliable water sources. Ponds and stock tanks are located throughout the county. During drought conditions many ponds are not dependable. Many smaller streams have only intermittent flows and are not reliable. Windmills are abundant in the county and can provide water when they are operational. The Emerson, Homer, and Ponca VFDs identified water sources and availability as a concern.

Utilities/Phone Service

Dakota County is crossed by several high tension power lines. Rural electric service is provided by Northeast Power. There is both cellular and landline telephone service available in the county. There are gaps in cell coverage in some areas.

Roads and Bridges

Interstate 129 runs from South Sioux City east into Iowa, where it joins Interstate 29. US Highway 77 crosses the east side of the county from north to south. US Highway 20 crosses the northern part of the county from west to east. State Highway 12 enters the northwest corner of the county and joins US 20 northwest of Jackson. State Highway 35 enters the southwest corner of the county north of Emerson and runs through Hubbard before joining US 75 west of Dakota City. State Highway 110 connects State Highway 35 with US 20. The federal and state highways are augmented by a network of county-maintained roads.

The Dakota City fire chief named the bridge by Jackson, Nebraska as one that will not support equipment weight. The Emerson fire chief reported that they have a bridge in their district that has been closed for three years.

Greatest Concerns

The fire departments were asked to list their greatest concerns for their district, responses appear in the table below:

Department	Greatest Concerns
Allen-Waterbury	Feedyards; manpower
Dakota City (Dakota-Covington)	Equipment
Emerson	What is in the path of the fire
Homer	To stop the fire before it reaches any structures
Ponca	(None indicated)
South Sioux City Municipal	(Survey not returned)

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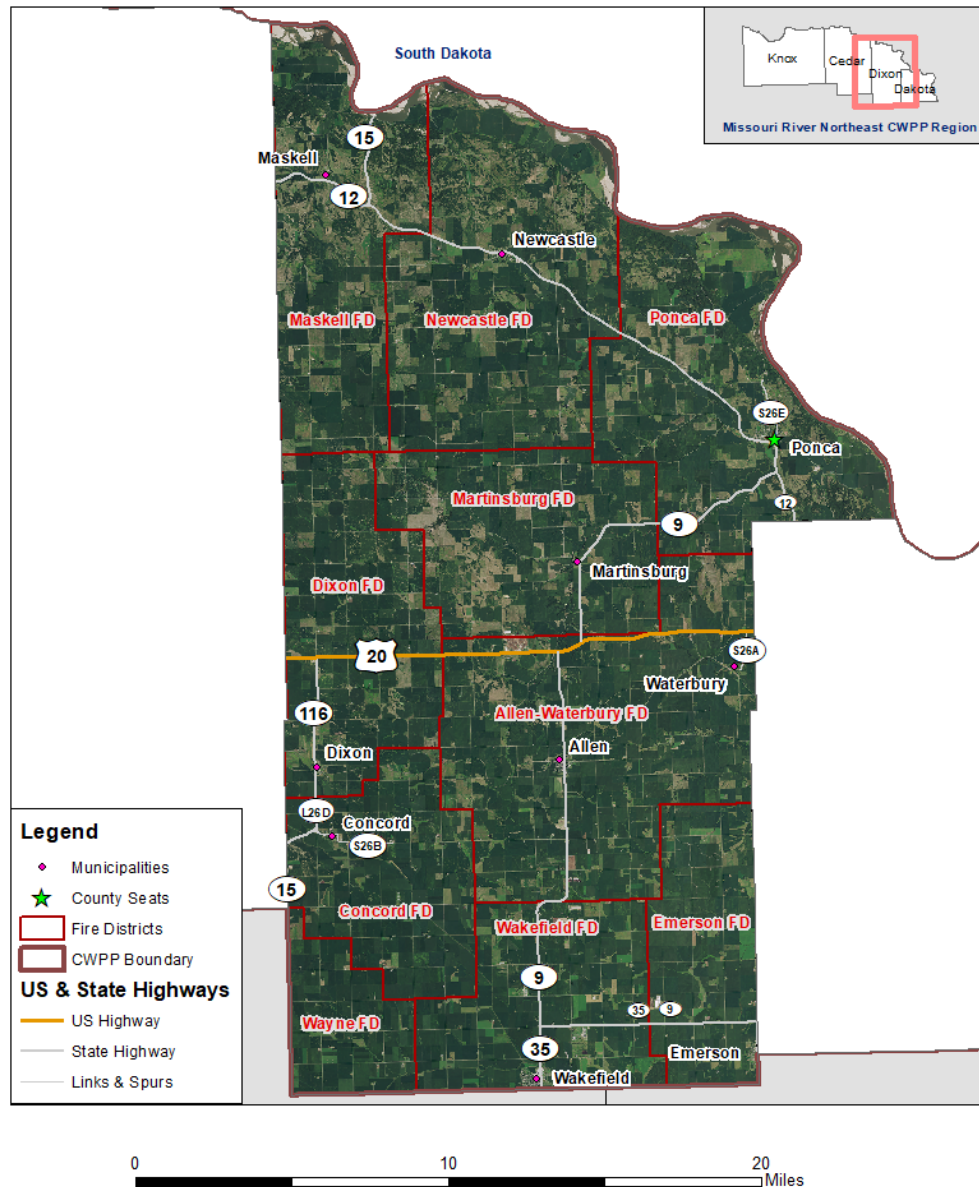
Dixon County

483 sq. miles

2020 population: 5,606



Missouri River Northeast CWPP Region Dixon County Overview



Community Profile

Dixon County is located in the central-east part of the CWPP region. It is bounded on the west by Cedar County, on the south by Wayne and Thurston Counties, on the east by Dakota County, and on the north by the Missouri River and South Dakota. Incorporated municipalities include the county seat of Ponca (pop. 907), Allen (pop. 355), Concord (pop. 126), Dixon (pop. 77), Emerson (pop. 840), Martinsburg (pop. 78), Maskell (pop. 58), Newcastle (pop. 272), Wakefield (pop. 1,522), and Waterbury (pop. 72). There are no unincorporated communities in the county.

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In addition to municipal lands, public lands include the 31-acre Mulberry Bend Overlook managed by NPS; 2,756 NGPC-managed acres in two WMAs and one state park; 807 acres in two WMAs owned by the Lewis & Clark NRD and managed by NGPC; and 1,630 acres in school lands. Approximately 3,000 acres in the southeast corner of the county are located on the Winnebago Reservation. The balance of the land within the county is privately owned. The primary land use is agriculture and livestock operations. The county fronts 28 miles of the MNRR. The quarter-mile boundary encompasses approximately 4,480 acres, but nearly all of this is privately owned and managed.

The vegetation is primarily upland tallgrass prairie with a strip of Loess mixed-grass prairie south of the Missouri River. Strips of riparian deciduous forests and upland deciduous woodlands follow the river, with patches of upland deciduous woodlands scattered across the central and southern parts of the county. ERC has encroached into some of the wooded areas, particularly in the rough terrain south of the river. Cropland occupies much of the county.

Fire History

Although large prairie fires were common prehistorically, since the time this area was settled by Europeans wildfire activity has been mostly limited to small fires which residents rapidly and effectively controlled. This allowed woody vegetation to become denser and more widespread, particularly in rugged terrain.

Dixon County VFDs reported 237 fires between 2000 and 2020, which burned a total of 3,714 acres. The largest of these was a 400-acre debris-burning fire reported by the Newcastle-Maskell VFD in March 2005.

Fire Hazard and Risk

The areas most at-risk from wildfire are in the WUI surrounding municipalities and in the canyons and bluffs along the Missouri River, where there are heavy fuels, rough terrain, and limited access. Homes and other structures in these locations are at increased risk due to these factors.

The 2015 CWPP identified portions of several fire districts in the county that are at elevated risk of wildfire. The area north of Newcastle and State Highway 12 has 17.5% forest and 41% shrubs growing across hills and valleys with some areas of contiguous forest up to 246 acres, and larger blocks of mixed forest and shrubs, with few roads or cropland areas to break up the potential for a long fire run. Isolated homes and farms are at risk in this region. In the Ponca Fire District, the nearly 15% forest acres are on the bluffs running northwest to southeast with the Missouri River and floodplain below. The 21% shrub acres in this district are mainly in small blocks, but eight areas contain 50 acres or more that could provide a higher risk of uncontrolled wildfire on the bluffs.

Locations of special concern identified by local VFDs include difficult access and rough terrain along the river bluffs and land bordering the river (Ponca VFD) and areas with multiple structures, difficult access, rough terrain, one way in/out, and/or lack of water within effective distance (Emerson, Allen-Waterbury, and Wayne VFDs). The Allen-Waterbury VFD has specific concerns about feedlots and areas that store bales.

The Winnebago Tribe of Nebraska CWPP⁵ identified 24,600 acres of their reservation as at-risk WUI areas. Included in this area is 5,500 acres that incorporates the community of Emerson and the surrounding landscape along the Dixon-Thurston county line. This area contains rural housing intermixed in the WUI and is a designated focus for the BIA fire management program.

Areas of Concern are mapped in Appendix A. Agricultural lands in those portions of the county which lie outside mapped Areas of Concern do have their own fire risk variables; however, irrigated croplands are not as fire-prone as forests and grasslands. All of Dixon County lies within the boundaries of the WUI as defined by the NFS in the introduction to this CWPP.

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Protection Capabilities and Infrastructure

The Cedar and Dixon Counties HMP includes a full geo-located critical infrastructure list (see link in Appendix C).

Fire Districts, Mutual Aid, and Emergency Operations

Dixon County has a full time Emergency Manager. Nine volunteer fire districts are located within or partly within the county: Allen-Waterbury, Concord, Dixon, Emerson, Martinsburg, Newcastle-Maskell, Ponca, Wakefield, and Wayne. See Appendix G for their contact information, equipment lists, and responses to the VFD questionnaire. The VFDs are responsible for fire protection and assist with other emergencies in their districts. The Dixon County Sheriff's department provides assistance as needed.

All of the VFDs belong to the Northeast Nebraska MAA. The Concord and Dixon VFDs also belong to the Big Nine MAA. The BIA has agreements with the Winnebago, Thurston, Homer, and Emerson VFDs to suppress wildfire on the Winnebago Reservation. See Appendix F for a statewide list of MAAs.

Water Sources

The only developed non-agricultural water systems (other than private wells) are in the municipalities. The Missouri River and some of the larger creeks are generally reliable water sources. Ponds and stock tanks are located throughout the county. During drought conditions many ponds are not dependable. Many smaller streams have only intermittent flows and are not reliable. Windmills are abundant in the county and can provide water when they are operational. The Dixon, Emerson, Ponca, and Wayne fire VFDs identified water sources and availability as a concern.

Utilities/Phone service

Dixon County is crossed by several high tension power lines. Rural electric service is provided by Northeast Power. There is both cellular and landline telephone service available in the county. There are gaps in cell coverage in some areas.

Roads and Bridges

US Highway 20 crosses the central part of the county from west to east. State Highway 12 enters the northwest corner of the county from Knox County and exits into Dakota County south of Ponca. State Highways 9 and 15 traverse the county from north to south. The federal and state highways are augmented by a network of county-maintained roads.

The Dixon and Wayne fire chiefs said that some rural bridges in their jurisdiction won't support the weight of their trucks. The Emerson fire chief reported that they have a bridge in their district that has been closed for three years.

Greatest Concerns

The VFDs were asked to list their greatest concerns for their district; responses appear in the table below:

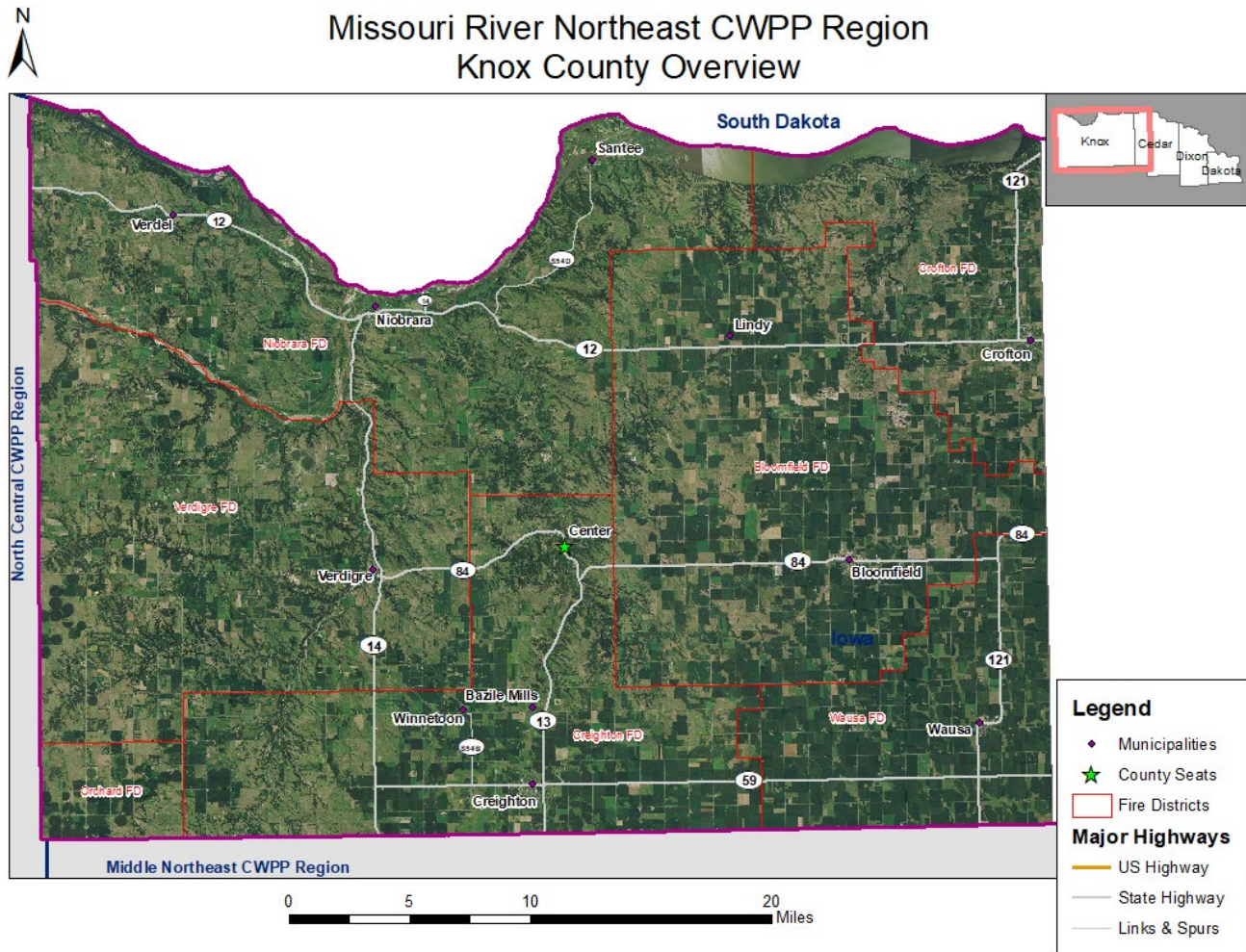
Department	Greatest Concerns
Allen-Waterbury	Feedyards; manpower
Concord	(None listed)
Dixon	Manpower, water supply, road conditions
Emerson	What is in the path of the fire
Martinsburg	(Survey not returned)
Newcastle-Maskell	(Survey not returned)
Ponca	(None indicated)
Wakefield	(Survey not returned)
Wayne	(None indicated)

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Knox County

1,140 sq. miles

2020 population: 8,391



Community Profile

Knox County occupies the west end of the CWPP region. It is bounded on the east by Cedar County, on the south by Antelope and Pierce Counties, on the west by Holt and Boyd Counties, and on the north by the Missouri River and South Dakota. Incorporated municipalities include the county seat of Center (pop. 79), Bazile Mills (pop. 26), Bloomfield (pop. 986), Creighton (pop. 1,147), Crofton (pop. 756), Niobrara (pop. 365), Santee (pop. 424), Verdel (pop. 38), Verdigre (pop. 554), Wausa (pop. 592), and Winnetoon (pop. 54). Lindy (pop. 13) is an unincorporated community.

Besides municipal lands, public lands in Knox County include 14,607 acres along Lewis and Clark Lake managed by the USACE, 14,788 acres in school lands, 7 NGPC properties (8,718 acres total in 5 WMAs, one SRA, and a state park), and one small tract owned by the Lewis and Clark NRD. The balance of the land within the county is privately owned. The primary land use in the county is agriculture and livestock operations. Within Knox County, the MNRR includes frontage on 20 miles of the Missouri River and 29 miles of the Niobrara River and Verdigre Creek. The quarter-mile boundary encompasses approximately 12,480 acres, but nearly all of this is privately owned and managed.

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Major waterways include the Missouri River, which forms the north county boundary; the Niobrara River, which enters the northwest part of the county southwest of Verdel and flows into the Missouri River at the Village of Niobrara; and the North Fork and the West Branch of the North Fork of the Elkhorn River, which rise southeast and south of Bloomfield and flow south into Pierce County.

Vegetation zones include strips of riparian deciduous forest and lowland tallgrass prairie along the Missouri and Niobrara Rivers and some of their tributaries, and upland deciduous forests scattered in pockets across the county. Upland tallgrass prairie occupies much of the eastern two thirds of the county, and several types of mixed-grass prairie are found in much of the rest of the upland areas. ERC has encroached into deciduous woodlands and prairies in some locations, particularly along the Missouri River and in the western half of the county, where the terrain is rugged. Cropland dominates the eastern half of the county.

Fire History

Although large prairie fires were common prehistorically, from the time this area was settled by Europeans until the 1970s, wildfire activity was mostly limited to small fires which residents rapidly and effectively controlled. This allowed woody vegetation to become denser and more widespread, particularly in rugged terrain. The increased fuel loading has contributed to larger wildfires in recent years.

Knox County VFDs reported 716 fires between 2000 and 2020, which burned a total of 43,367 acres. Several of the largest fires reported were lightning fires reported by the Orchard VFD between 2000 and 2002 and ranged in size from 500-10,000 acres. Because the Orchard Fire District also includes portions of Antelope and Holt Counties, it is unknown how many of these fires occurred in Knox County. A few of the other large fires that occurred in Knox County are listed below:

- 2012: The 6,500-acre 'Six Pack' fire burned in the Niobrara VFD
- July 2002: 800-acre equipment fire in the Niobrara VFD
- March 2015: The Creighton VFD responded to two 700-acre debris burning fires
- April 2018: The Niobrara VFD responded to a 640-acre fire of unknown cause and a 600-acre debris burning fire

Fire Hazard and Risk

The areas most at-risk from wildfire are in the WUI surrounding municipalities and in the canyons and bluffs along the Missouri and Niobrara Rivers, where there are heavy fuels, rough terrain, and limited access. Homes and other structures in these locations are at increased risk due to these factors.

Locations of special concern identified by local fire districts and steering committee members include residential and recreational developments along the Missouri and Niobrara Rivers. The Creighton fire chief identified the areas north and west of Highway 59 as an issue because of difficult access, rough terrain, heavy fuels (ERC), and lack of water within effective distance. The Verdigre VFD identified the west hillside of the village as a concern.

The Crofton fire chief named the Devils Nest subdivision and the Lewis and Clark Lake area as being of particular concern due to multiple structures, difficult access, rough terrain, one way in/out, heavy fuels (ERC), and lack of water within effective distance. The 2015 CWPP stated that in the Crofton district the forested area is concentrated along the Missouri River, with 91% of the wooded acres and 45% of the shrub acres north of Beaver Creek. The topography and the increasing presence of homes, both vacation and full-time residential, among the ERC-encroached riparian forest is a high concern. Egress and road width issues in these areas impact firefighter access and safety, as well as evacuation and wildland fire suppression.

Part of the Yankton VFD is located in neighboring Cedar County. Their deputy chief listed both sides of the South Dakota/Nebraska border along Lewis & Clark Lake (which extends from Cedar County well into Knox County) and the Missouri River as having difficult access, rough terrain, one way in/out, and heavy fuels. He said that high

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home density, infrastructure, populated areas along and above Lewis and Clark Lake makes this an area of concern.

The 2015 CWPP noted that portions of the Creighton district along Bazile Creek in the north, and Merriman Creek and branches of Verdigre/Cottonwood Creeks in the west, as well as parts of the Bloomfield district along Howe, Lost, Cook, Devils Nest, and Weigand Creeks, plus the west side of Little Bazile Creek would have the highest probability of large fire growth in the hilly mixed fuels. Limited water supply is a concern in the Verdel area.

The Santee Sioux Nation CWPP⁴ identified 27,000 acres of their reservation as at-risk WUI areas. These include the communities of Santee and Lindy, two tribal housing areas, the casino, and the surrounding areas. These areas contain rural housing intermixed in the WUI and are a designated focus for the BIA fire management program.

The Ponca Tribe of Nebraska, although it has no geographic reservation, has a service area for tribal members that includes Knox County. The tribe has identified Grass/Wildfires as a priority hazard. Due to high percentages of young and elderly people, they stated that fires could impact the public health of the Tribe by causing respiration issues in these vulnerable populations.

Areas of Concern are mapped in Appendix A. Agricultural lands in those portions of the county which lie outside mapped Areas of Concern do have their own fire risk variables; however, irrigated croplands are not as fire-prone as forests and grasslands. All of Knox County lies within the boundaries of the WUI as defined by the NFS in the introduction to this CWPP.

Protection Capabilities and Infrastructure

The Tri-County HMP includes a complete critical infrastructure list for Knox County (see Appendix C).

Fire Districts, Mutual Aid, and Emergency Operations

Knox County has a full time Emergency Manager. Seven fire districts are located within or partly within the county: Bloomfield-Lindy, Creighton, Crofton, Niobrara, Orchard, Verdigre, and Wausa. See Appendix G for their contact information, equipment lists, and responses to the VFD questionnaire. The VFDs are responsible for fire protection and assist with other emergencies in their districts. The Knox County Sheriff's department provides assistance as needed. In addition, the Santee Sioux Nation has a VFD with a roster of six volunteers and operates out of a fire station located in the Santee Community.⁴

All of the VFDs belong to one or both of the two MAAs that overlap the county. The Bloomfield, Creighton, Crofton, Niobrara, Orchard, Verdigre, and Wausa VFDs are part of the 40-12 MAA. Wausa also belongs to the Big Nine MAA. The BIA has agreements with the Santee, Niobrara, Lindy, and Bloomfield volunteer VFDs to suppress wildfire on the Santee Reservation. Crofton has an informal agreement with the Yankton (SD) VFD. Yankton VFD staff said that formal mutual aid agreements are in progress with their Nebraska counterparts. See Appendix F for a statewide list of MAAs.

Water Sources

The only developed non-agricultural water systems (other than private wells) are in the municipalities. The rivers and some of their larger tributaries are generally reliable water sources. Ponds and stock tanks are located throughout the county. During drought conditions many ponds are not dependable. Many smaller streams have only intermittent flows and are not reliable. Windmills are abundant in the county and can provide water when they are operational. The Bloomfield, Creighton, and Orchard fire VFDs identified water sources and availability as a concern.

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Utilities/Phone Service/Radio Communications

Knox County is crossed by several high-tension power lines. Rural electric service is provided by the Cedar-Knox PPD, the Niobrara Valley Elec. Membership Corp., and the North Central PPD. There is both cellular and landline telephone service available in the county. There are gaps in cell coverage in some areas.

The Yankton VFD said that radio communications have improved in recent years. Nebraska channels have been added for departments along the border.

Roads and Bridges

State Highways 12, 84, and 59 cross the county from west to east. State Highways 14, 13, and 121 provide north-south access. These routes are augmented by a network of county-maintained roads.

The Crofton fire chief identified 895 Road, west of Hwy 121 as a having a bridge that will not support equipment weight. The Wausa fire chief said there is a possibility that some bridges on certain gravel or minimum maintenance roads are insufficient to support equipment. The Bloomfield and Creighton VFDs noted that low weight limits on some bridges in their jurisdiction will not accommodate larger trucks. The Verdigre fire chief said that the bridge on 885 Rd. Hwy. 14 is scheduled to be replaced within the next two years.

Education and Outreach

According to the NFS 2015 CWPP, resident and public education began with a Firewise® workshop in June 2014, and the Winnebago Tribe sponsored a Firewise® billboard on State Highway 121.

Greatest Concerns

The VFDs were asked to list their greatest concerns for their district, shown in the table below:

Department	Greatest Concerns
Bloomfield-Lindy	(None indicated)
Creighton	Water sources, terrain
Crofton	Devils Nest & lake area, lots of red cedars
Niobrara	(Survey not returned)
Orchard	(None indicated in Knox County)
Santee	(Survey not returned)
Verdigre	Getting it stopped with the least amount of damage
Wausa	Having enough manpower and equipment

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Action Plan

This section of the CWPP addresses risk assessment, fire risk rating, treatment of structural ignitability, prioritization, and risk reduction, and it recommends a plan of action for increasing emergency preparedness. The action plan offers specific preparedness recommendations and describes wildfire risk reduction strategies, fuels mitigation practices, training, education, post-fire response, and maintenance. The final part of this section outlines a monitoring and evaluation process that can be used to track progress and periodically update the plan.

Establish and Implement a Risk Assessment Procedure

Risk assessment is a systematic process for identifying and assessing the range of elements that could lead to undesirable outcomes for a specific situation. Quantitative risk assessments provide a method by which we can calculate risk based on measurements or estimates of various risk components such as likelihood of fire occurrence, intensity of fire should it occur, and susceptibility to fire of the various values being evaluated. Qualitative risk assessment is the application of judgment based in knowledge and experience when assessing wildfire risk, the potential for ignitions and recommendations regarding possible ways to mitigate the risk.²⁵

It is important to understand the meaning of risk and hazard in relation to wildfire as it pertains to this CWPP. **Risk** is the chance or probability of occurrence of fire. **Hazard** is the exposure to risk; in a wildfire situation, those hazards can be related to either the natural or the human-made environment. Natural hazards include fuel type and amount, topography, and weather. Human-made hazards include the limited availability of water, limited access to structures, limited green space around structures, and the ignitability of structures. The capability of firefighting resources will be compromised by the severity of both natural and human-made hazards.²⁶ Conducting a risk assessment helps develop strategies to address areas of concern.

An assessment includes a review of the area's fire history, fuels/vegetation rating, topographic hazard analysis, weather hazard potential, access, water availability, defensible space, and structural ignitability. The Overview section of this plan contains information about the area's fire history, climate, weather, fuels/vegetation, and topography. Individual county sections provide details on water sources and access issues. Local fire department equipment lists appear in Appendix G. Defensible space and structural ignitability are addressed in this section of the plan.

Several risk assessment tools are available to help communities and individuals understand, explore, and reduce wildfire risk. The USFS's [Wildfire Risk to Communities](#)²⁷ website is designed to help community leaders, such as elected officials, community planners, and fire managers. This is the first time that wildfire risk to communities has been mapped nationwide. Headwaters Economics provides another national-scale tool that allows users to run a custom [Wildfire Risk Report](#).²⁸ On a more local level, the NFS [Nebraska Wildfire Risk Explorer](#) website²⁴ provides wildfire-related resources to Nebraskans. The site includes risk assessment tools, property owner resources, and weather data for homeowners, landowners, natural resources and fire professionals, and community planners.

Further information on risk assessment is available in a USFS Rocky Mountain Research Station technical report, which describes a specific risk assessment process premised on three modeling approaches to characterize wildfire likelihood and intensity, fire effects, and the relative importance of highly valued resources and assets that could be impacted by wildfire.²⁹

The existing CWPPs^{4,5} in place for the Santee Sioux Nation and the Winnebago Tribe of Nebraska articulate an assessment strategy and action plan in which the Winnebago Agency meets with the tribes, VFDs, and Great Plains Regional Fire staff to discuss implementation of the WUI area priorities. Fuels treatments is tracked in the National Fire Plan Operations and Reporting System (NFPORS). Funding for fuels reduction projects is requested

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through the National Fire Plan, and other available options. Continued protection of the communities will be necessary through maintenance of treatment areas. Some structural ignitability issues are addressed by implementing hazardous fuels treatments in WUI communities. Implementation of a home assessment program in reservation communities will address some of the home ignition zone concerns. Upon assessment completion, community outreach can focus on teaching Firewise® principles. Fire staff will be trained as Firewise® Advisors through regional home assessment courses.

Wildfire-Related Concerns Identified in HMPs by Local Participants

The first step in the assessment process is to identify risks that need to be examined. Looking at wildfire-related concerns identified by local HMP participants is a good place to begin.

The 2021 Cedar/Dixon HMP and the 2021 Papio-Missouri NRD HMP (which includes Dakota County) both identify their entire planning areas as being at 100% risk of wildfire; some fires can be expected to exceed 100 acres in size. The 2016 Tri-County HMP, which includes Knox County, does not address wildfire risk. It refers readers to the CWPPs that cover the HMP counties.

The Cedar/Dixon NRD HMP specifically identifies wildfire as a hazard, and it was prioritized by the Lewis & Clark NRD; the City of Hartington; Villages of Allen, Maskell, Newcastle, Obert, and St. Helena; Allen-Waterbury Fire District, Dixon Fire & Rescue, Hartington-Fordyce VFD, Newcastle Rural Fire District, and Ponca Fire & Rescue. The HMP includes a regional risk/general vulnerability assessment. It lists specific mitigation alternatives and selected mitigation actions. In addition to mitigation actions that address all hazards, several new or continuing wildfire-specific mitigation measures were named by participants. The Lewis & Clark NRD listed updating the CWPP, expanding water storage capacity/emergency water supplies, fire prevention program and training, and hazardous fuel reduction. The City of Hartington needs to acquire additional bunker gear. The Village of Dixon listed water system improvements; the Village of Maskell said a new municipal well is needed; and the village of Newcastle listed a new water tower. The Newcastle Rural FD is in need of a new fire station.

In the Papio-Missouri NRD HMP, wildfire is a specifically-identified hazard, and it was prioritized by the City of Bennington due to fire history and demand on local resources, and by the Winnebago Tribe because of danger to human health, diminished air quality, loss of property, and economic loss. It should be noted that in several participant sections, surveys of residents identified wildfire as a concern, but this was not reflected in the participants' priority list. The HMP includes a regional risk/general vulnerability assessment. It lists specific mitigation alternatives and selected mitigation actions. In addition to mitigation actions that address all hazards, several new or continuing fire-specific mitigation measures were named by participants. Dakota City listed fire hydrant rehabilitation, South Sioux City stated their need for fire trucks, and Winnebago Tribe listed the need for an emergency exercise.

The 2016 Tri-County HMP identified but did not evaluate wildfire risk, citing coverage of this issue in the regional CWPPs. It is hoped that wildfire will be addressed or cross-referenced with this CWPP in future HMP updates.

Wildfire-Related Concerns Identified in the 2015 CWPP

The original 2015 CWPP listed specific concerns with large livestock and poultry confinement facilities and recommended each of these operations prepare a facility fire response plan and share it with the local fire chief. The document also stated that infrastructure of any type, homes, and farmyards are not safe from wildfire just because they are not surrounded by woodlands. Grass fires, and some crop fires, can present challenges and can be dangerous when hot, drying winds push the fire, increasing the rate of spread, directing the fire's path, and spreading embers ahead of the fire. Because of their fast rate of spread and sometimes unpredictable direction, wind-driven fires present a shortened response time both for the people in its path and for first responders.

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Wildfire-Related Concerns and Values at Risk Identified in Partner Fuel/Fire Management Plans

In their Fire Management Plan for the Missouri National Recreational River,³ the NPS identified the following concerns and values at risk:

- At MNRR, the size of NPS-owned lands and proximity to private property requires suppression of all wildfires. Local fire departments have primary responsibility to respond to wildfires.
- Fire in MNRR can be fast moving on the surface in light fuels. Control problems can be expected when fires burn during peak fire season, or when fuels have accumulated over many years. Fires will spread rapidly and be intense when environmental conditions are warm, dry, and windy.
- Eastern redcedar has fine foliage which contains volatile oils that make it ignite and burn easily. It behaves as a ladder fuel in forests, where it can carry fire into the canopy. The resin-rich wood sends embers into the air that can cause spot fires and increase the rate of fire spread.
- Access into many parts of the park is complicated by steep bluffs. Many parts of the riparian floodplain are only accessible by water. Although roads access the bluff tops at frequent intervals, the terrain between access points can be rough. In addition, combined, overlapping, and uncertain jurisdiction over land areas may complicate response to wildland fire.
- Values at risk include habitat/[sensitive] species, cultural resources, and park infrastructure and developments.

The Santee and Winnebago CWPPs^{4,5} identify specific WUI areas at risk from wildfire. Primary concerns for the tribes are:

- ERC-encroached areas and tree and brush-lined locations along the Missouri River and tributaries, some with dead timber.
- Several hundred acres of CRP land containing a large fuel load.
- The primary ... crop is corn, with some fields covering hundreds of acres. In late summer, just prior to or during harvest, these fields are very volatile, and fires occur every year in corn fields. Given the right circumstances with heat and wind, many acres can quickly be consumed by fire.
- Rangeland covers thousands of acres with large blocks of several square miles accessed only by unimproved roads or trails. These areas are scattered throughout the reservations. The scattered home sites in the rural areas require special attention be given to the access road and to keep the fuel load along these routes reduced.
- The tribes have special concerns for protecting ancient cultural sites, traditional gathering areas, communications towers, power lines, and recreation areas.
- Housing areas, both in-town and scattered, are considered particularly at-risk.

Fire Risk Rating and Structural Ignitability

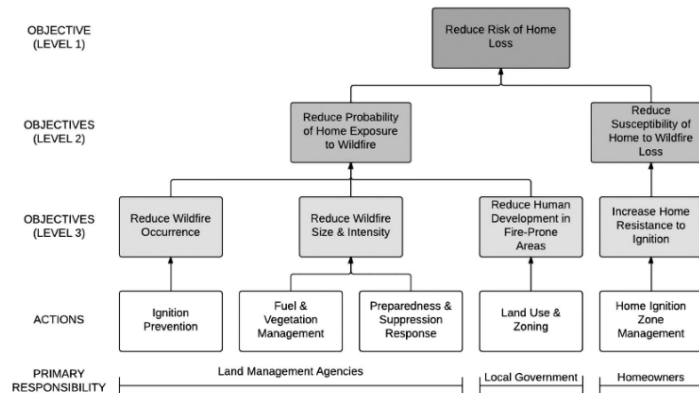
Homes in both forested and non-forested settings can be at risk from wildfires. Quantitative structure risk ratings can be handled under location-specific plans for incorporated communities. Major components of structural ignitability include roofing materials, walls, windows, and wooden attachments. Most of the CWPP region is rural/agricultural with widely-spaced home locations. There is an opportunity to perform structural risk and ignitability analysis and treatment activities at rural residential and recreational home sites at the same time fuels mitigation work is being conducted in these areas.

Overcoming perceptions of WUI fire disasters as a wildfire control problem rather than a home ignition problem, determined by ignition conditions, will reduce home loss. The following graphic illustrates the dual-pronged objectives of reducing the risk of home loss by both reducing the probability of exposure to wildfire and reducing susceptibility to wildfire loss.³⁰

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Conceptual model highlighting the major fundamental objectives (level 1), means-based objectives (levels 2 and 3), and actions for reducing the risk of home loss as a result of wildfire.



David E. Calkin et al. PNAS 2014;111:2:746-751

PNAS

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The Santee Sioux Nation and the Winnebago Tribe of Nebraska conducted an assessment of structural ignitability, described in their CWPPs^{4,5} as follows:

Structural Ignitability Assessment

In the process of assessing community risk, special attention was paid to the factors affecting structural ignitability according to Firewise®. Overall, the level of Firewise® compliance throughout the Nebraska Agencies is very good, with 2/3 of the communities assessed as being generally Firewise® compliant.

The factors assessed were:

- Roofing and siding (type of material)
- Landscaping (type and location of material)
- Roof hygiene (quantity of debris)
- Landscape Hygiene (yard maintenance)
- Structural hygiene (building maintenance)
- Flammables (location)

A generalized evaluation was made for the entire community, assigned a numeric value, and summed. For both reservations, overall Firewise® compliance was rated 70% high, 18% moderate, and 12% low.

Prioritization

The community sections in this document describe the WUI focus areas within each county. These can be further prioritized based on data gathered during risk assessment for individual neighborhoods. The proliferation of ERC in parts of the region and its encroachment into riparian woodlands along rivers and streams creates high priority for hazardous woody fuels reduction in these areas, especially in locations with recreational and rural residential subdivisions. All of the WUI edges of population centers, unincorporated residential developments, and dispersed recreational developments in the CWPP region have high priority for fuels treatment and Firewise® preparation. Further assessments may identify additional priority areas.

Appendix A contains an 'Areas of Concern' map depicting the parts of each county considered to be at the highest risk from wildfire. The locations were identified by local fire officials, the steering committee, and the planning team. These include interface areas with neighborhoods directly adjacent to open spaces, intermix areas where homes are interspersed with natural fuels, and occluded interface areas where neighborhoods are

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isolated or surrounded by areas of natural fuels.³¹ These areas can be prioritized according to locally identified criteria such as hazardous vegetation, structure density, access, and water availability.

The Assessment Process

Many actions can be taken to reduce the fire potential in both existing housing developments and planned new subdivisions. People can assess the potential of a structure located in a wildland environment to withstand an approaching wildfire without the intervention of firefighting personnel and equipment. Assessments focus on proactive, pre-fire preventative actions rather than reactive fire suppression plans. Several excellent fire hazard assessment methodologies are widely available. Below are excerpts from the National Wildland/Urban Interface Fire Protection Program's methodology³² publication:

First, it is important to understand how three ignition sources (radiation, convection, and firebrands) can impact a structure located in a wildland environment and how they affect certain building components—roofs, eaves/overhangs, walls, windows, vents, and attachments. Fire potential can be reduced when building a structure or altering an existing structure by conducting mitigation measures on the structure itself and in the surrounding wildland area.

The following is an example of a five-step method for assessing the hazards of a WUI area:

Step 1: Select the area to be evaluated.

Step 2: Select the hazard components to be considered. These can include but are not limited to:

- Vegetative fuel hazards both in and beyond the immediate vicinity of the structure
- Structure density (lot size, structures per lot)
- Slope (steeper slopes are more hazardous)
- Weather patterns (temperature, humidity, winds, drought)
- Fire occurrence (increased fire probability where fires have occurred in the past)

Step 3: Rank the hazard components. Develop or use an existing system to define the significance of each component. The system, though subjective in nature, should be specific and consistent.

- Define a system to rank the hazard level of the components (e.g., low-medium-high or numeric)
- Evaluate and rank each individual component that is included in the assessment
- Develop an overall hazard rating system
- Calculate the overall hazard rating

Step 4: Compile the hazard rankings in a usable format that reveals the relationships between the individual hazards and categories of hazards. Three methods are often used to analyze the data collected:

- A geographic information system can define the hazards components and display each hazard on clear overlays, rather than on a single map, allowing analysis of various combinations of data
- A grid index system references specific points of interest on a map. The coordinates of the grid define the hazard rating of a specific property or area
- A matrix system describes the severity of each hazard for each area within the assessment

Step 5: Develop future actions—use the information developed to reduce fire loss potential in the WUI:

- Develop mitigation strategies to improve firefighter and public safety
- Develop fire response/evacuation plans
- Provide reference tools for planners, insurers, bankers, and local code adoption
- Develop region-wide cooperative fire protection agreements
- Perform cost/benefit analyses

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- Implement or evaluate existing programs
- Strategically focus fuels reduction projects
- Distribute this information along with public fire safety education materials to educate property owners, local and state governments, and fire-service agencies

Wildfire Risk Reduction

The goal of risk reduction is to reduce the potential loss to life and property. Understanding that wildfire is inevitable can help communities prepare for wildfires. Fire-adapted communities are knowledgeable, engaged communities where actions of residents and agencies in relation to infrastructure, buildings, landscaping, and the surrounding ecosystem lessen the need for extensive protection actions. This enables people to safely accept fire as part of the surrounding landscape. A successful fire-adapted community approach has the potential to save lives, homes and communities, and millions of dollars in suppression costs annually.

There is a range of actions property owners and managers can undertake to become more adapted to wildfire. In general, the more elements that a community has addressed, the more fire-adapted the community will become. Major elements of a fire-adapted community include vegetation management, ignition-resistant homes, increasing local responders' understanding of wildfire, cooperation between jurisdictional authorities, and fuels treatments on both private and public lands to reduce hazardous fuels and create fuels buffers.

The requirements and procedures to become recognized as a Firewise® Community require coordination among homeowners. When landowners implement fuels reduction treatments using NFS cost-share programs, or if a landowner asks for suggestions, the NFS adheres to established Firewise® standards. Many homeowners who do not reside within an officially designated Firewise® Community have utilized those standards independently. NFS staff is available to help homeowners in areas at-risk from wildfire to establish formal Firewise® Communities.

Homeowners may undertake mitigation measures that can decrease the potential destructive effects a wildfire might have on their property. Some measures are designed to modify the vegetative environment surrounding a structure to decrease potential ignition sources. Others focus on modifying a structure (or changing its location) to make the building more resistant to ignition. To reduce the risk for the long term, actions need to be maintained over time.³³

Common Practices

- Actively managing vegetation near the home by reducing density, conducting landscaping maintenance, and replacing flammable vegetation with ignition-resistant components. Greater efforts are needed within close proximity of the structure and gradually decreasing efforts beyond that.
- Maintaining structures free of needles, leaves, and other organic debris from decks, roofs, and near the base of exterior walls.
- Increasing ignition resistance of structures by actions such as using ignition-resistant roofing and covering exterior openings of structures, such as attic vents, eaves, soffits, and crawl spaces, with non-flammable wire mesh screening.
- Removing flammable materials from beneath structures and decks.
- Locating firewood, fuel tanks, and propane tanks at a safe distance from structures.

Refer to Appendix J for an expanded list of common practices and a listing of several programs, such as 'Firewise®' and 'Ready Set Go,' available to help homeowners and communities reduce wildfire risks.

Other Wildfire Mitigation Practices

Additional wildfire-related mitigation practices are listed below. Some entities have already implemented one or more of these. Planners may want to periodically review and implement or expand on them, as appropriate.

- Acquire training and equipment for local FDs

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- Implement woody fuels reduction and defensible space projects
- Establish or expand wildfire prevention and education programs
- Participate in the Firewise® program
- Adopt a wildfire hazard identification and mitigation system (see Appendix J)
- Conduct maintenance to reduce risk (tree care and public landscape maintenance programs)
- Reduce risk through land use planning (landscaping and building ordinances)
- Require or encourage fire-resistant construction (the use of non-combustible materials)
- Incorporate wildfire mitigation into comprehensive planning
- Develop a wildland-urban interface code
- Expand water storage capacity/emergency water supplies/dry hydrants
- Upgrade rural water systems; improve well and water systems

Although funding limitations affect any jurisdiction's ability to implement some of these practices, identifying them as critical needs helps prioritize them for funding assistance opportunities such as the NFS fire equipment program described earlier in this plan.

Wildfire-Related Mitigation Practices Identified in the 2015 CWPP

The original 2015 CWPP listed specific mitigation measures that should be included in planning:

- Large animal confinement operations should have a fire response plan that they share with the local fire chief
- Firefighter training should include mop-up and handling heavy fuels for wildland fires that burn into riparian forests, windbreaks and wood lots
- Firewise® principles should be implemented around critical infrastructure, farmyards, stock facilities, and municipalities

Wildfire-Related Mitigation Practices Identified in Partner Fuel/Fire Management Plans

The existing CWPPs^{4,5} for the Santee Sioux Nation and the Winnebago Tribe of Nebraska articulate the following structural ignitability mitigation measures:

To protect against structural ignitability, communities on the Santee and Winnebago Reservations (tribal members) will work with fire departments and BIA fire management to reduce hazardous fuels adjacent to structures, particularly homes. BIA will work closely with tribal housing, local fire departments, community leaders and homeowners to make them aware of wildfire risks and hazards. The agency will focus their efforts how to mitigate risks and hazards. Fire education outreach efforts such as Firewise® will be implemented.

The Winnebago Agency plans to work with the National Fire Protection Association, Regional Firewise® Coordinator, the Great Plains Fire Safe Council, and the BIA Inter-Regional WUI/Prevention Specialist to implement Firewise® principles, and develop actions that will reduce wildfire ignition risks and hazardous fuels in communities on the reservations.

In their Fire Management Plan for the Missouri National Recreational River,³ the NPS identified the following wildfire-related mitigation practices:

- Defensible space. The NPS has adopted the International Urban-Wildland Interface Code [which contains] descriptions of defensible space and maintenance requirements for urban wildland interface areas. Maintenance of the defensible space includes modifying or removing non-fire-resistant vegetation and keeping needles, leaves, and other dead vegetative material regularly removed from around structures and roofs.
- Structure protection. (Refer to NPS Wildland Fire Risk Assessment.)

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- Preparedness [planning]. Document addresses delegation of authority; cooperative and interagency agreements; operating, staffing, and response plans.
- Preparedness [activities]. Some of these are:
 - Prepare prescribed fire plans and briefing messages for public notification
 - Perform prescribed fire treatment
 - Implement fire prevention activities
 - Monitor fire potential
 - Analyze fire season including all fire management activities (i.e. wildland fire suppression, prescribed fires and mechanical fuel treatment, prevention, etc.)
 - Evaluate performance and recommend training

Recommendations for Increasing Emergency Preparedness

This section includes the recommendations made in the original 2015 CWPP and in partner plans, information about a range of mitigation and preparedness activities that can be adapted to this region, and new recommendations specifically developed for this region.

Recommendations from the 2015 CWPP

The original 2015 CWPP included a ‘Collaborator's Survey,’ a poll to rank six programs that could facilitate portions of the plan. The results, in order of respondents' rankings, appear below:

- Emergency Preparedness and Communications Program. This can include training, equipment and education at many levels, and preparedness plans for evacuation procedures for a fire district, mutual aid district, entire county, or individual homeowners. It incorporates trigger points for when/where to go and how to get there, including pets, people, and livestock.
- Hazardous Fuels Projects. This includes removal of excessive wildland fuels in targeted areas, including evacuation routes. Property ingress/egress lanes may also need treatments to achieve low tree and shrub density and maintain sufficient width for fire equipment.
- Wildfire Protection Program. This could include activities such as Smokey Bear school programs, home or farmstead inspections for Firewise® practices to reduce fire risk and ignitability, and improve defensibility.
- Community Homeowner Wildland Fire Education Program. This would likely be Firewise® educational programs on how to make homes and farmsteads safer from wildland fire threat.
- Wildfire Suppression Program. This includes additional firefighter training for wildland Red Card certification (approved National Wildfire Coordinating Group courses), additional firefighting equipment, and firefighter recruitment.

Recommendations Listed in Partner Fuel/Fire Management Plans

The existing CWPPs^{4,5} for the Santee Sioux Nation and the Winnebago Tribe of Nebraska recommend the following practices and wildfire mitigation measures:

- Public education; Firewise® program/defensible space
- Agricultural practices:
 - Firebreaks along fence lines, around hayfields and house/farmyards
 - Planned grazing to reduce fuel loading in pastureland
 - Mowing driveways
 - Conducting haying operations, particularly mowing, during periods of cooler weather such as mornings and evenings
 - Windbreak maintenance
- Mowing and spraying: Mow road rights of way; chemical control of vegetation in and around critical structures and public utilities
- Construction practices:
 - Fire-resistant construction materials and landscaping species
 - Setback from wildlands; establish green zones

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- Subdivisions, public facilities, and commercial enterprises should be subject to review by local fire authorities during the planning phase and recommendations considered before construction begins. Consider access for emergency vehicles, construction materials, setbacks, landscaping design, plantings, and hydrant systems
- Ordinances: Burn permits, burn bans
- 911 Addressing: both reservations currently have this

Communication

Having and using a comprehensive communications plan is integral to maintaining smooth operations. Many jurisdictions in Nebraska have identified communications as a major issue when working under a mutual aid scenario. Various responders have different communications hardware, and often these are incompatible with one another. This is more than just a nuisance. Communication is vital to responder safety and to coordinating an effective response to wildfire. It is recommended that all entities in the region establish or review, and regularly update, their local communications plans.

According to the 2015 CWPP, dispatch communications and communications between mutual aid responders can be issues in the CWPP area. In areas along the Missouri River, 911 calls can go to South Dakota. The Yankton, South Dakota Fire Department has a subscription fire response service in Nebraska. Many properties along Lewis and Clark Lake have this service, and Yankton is called to respond, not Nebraska units. If Nebraska dispatchers and fire departments don't know of a fire/response until after the fact, it can cause resentment or duplication of effort if a call comes into a Nebraska dispatch. It is also a dangerous situation if more resources or evacuation are needed, and Nebraska dispatchers are not in the loop.

The 2015 CWPP also noted that when working together on mutual aid, Nebraska resources and South Dakota resources are on different radio frequencies/systems. This is a major wildland fire Watch-Out Situation that should be fixed. At the very least, portable radios should be in each South Dakota unit responding to a Nebraska fire call so they can send/receive on Nebraska frequencies. According to the Yankton VFD, this issue has been addressed.

The NPS Fire Management Plan³ states that the Great Plains Interagency Dispatch Center provides incident coordination and dispatching for MNR. Fire-qualified individuals communicate with them directly for availability and dispatching. The Interagency Resource Ordering Capability enables fire managers to request fire personnel and equipment and track where they are located.

Coordination

Coordination among responders is crucial in any emergency response situation. Local emergency managers must be able to tie in their responses with neighboring and outside assisting jurisdictions. The following opportunities have been identified to address common issues and concerns:

- 1) To protect firefighters, property owners, and structures, consider developing county-level standards for buildings in WUI areas.
- 2) Encourage communities to utilize the national Firewise® Communities program to decrease risk.
- 3) Engage partners such as the NRCS, NGPC, and conservation organizations to implement or expand WUI fuels reduction and thinning on a landscape basis via the use of NFS and other cost-share programs.
- 4) Work with the NFS and other partners to implement a CWPP region-wide public education and awareness program to improve wildfire hazard conditions within the WUI.
- 5) Encourage VFDs in the CWPP region to continue to participate with the other agencies to facilitate interagency wildland fire training.
- 6) Cooperate with other agencies and property owners to develop long-term multi-unit, multi-year fuel hazard reduction projects, including prescribed burning.

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- 7) Facilitate VFD monitoring of the federal wildland fire weather system indices.
- 8) Create a statewide “Mutual Aid Guide” that can be carried in each engine, including the engines operated by the federal and state agencies. This document would show what equipment each department, county, or agency has. A fire chief could then consult the guide and could order it for their fire, if needed.
- 9) Ensure quick notification and involvement process for assessment and assistance on fires, when needed (i.e., WIRAT, Type 3, FEMA, and Type 1 or 2 teams).

Aerial Support

It is critical to maintain the SEAT program authorized through the Wildfire Control Act of 2013. Having a SEAT dedicated strictly to wildfire suppression during peak fire season provides quick initial attack on small fires, particularly those in difficult terrain, keeping them from growing into large catastrophic wildfires. The NFS Seat Managers have made the following recommendations:

- 1) Having additional SEAT Managers throughout the state would increase response times. Currently there are four qualified managers; more would increase program capabilities.
- 2) Increase the number of aerial applicators within the CWPP region who cooperate with NFS and NEMA to provide aerial fire suppression to requesting FDs. Having fewer applicators limits available options during wildfires.
- 3) Sustain or increase the current level of cooperation with adjacent states and their aviation resources. Maintain clear paths of communication to ensure that neighboring jurisdictions are aware of available resources, times of planned contracted aviation availability, and enable the sharing of resources across state borders, when needed. Facilitate sharing managers and help trainees become qualified. Cooperation in sharing information, personnel, and resources will benefit all in creating effective operations.

Maps and Data

The following information from the original 2015 CWPP about mapping is still valid: ‘Local fire fighters in each district know which loaded fire truck or tender they should not take over which bridges and how many homes are down a specific narrow road. Updated maps showing this information is imperative if a large fire requires mutual aid. Current technology allows smart phone, tablet, or laptop displays of dynamic maps, even without internet access.’

The document suggested that all fire districts/counties work towards having these map layers:

- Industrial areas should be mapped, and potential hazards identified. This includes agriculture and other chemical storage, propane storage, and stockpiled feed at feed yards that can turn a wildland fire into an industrial fire.
- Bridges, including height, width, and load restrictions. This information is available from the state.
- Roads, including width and surface type.
- Railroads, including hazardous crossings.
- Powerlines; radio and communication towers.
- Airstrips / airports that could be used by air resources during an incident.
- Parcels with building footprints.
- Water sources: hydrants; locations on ponds, streams, and rivers for drafting or with dry hydrants; irrigation pumps with access.
- Any other layers specific to local resources or hazards

Restricted Roads and Bridges: Some county roads and bridges have weight or width limitations, or both, that may inhibit use by emergency vehicles. Planners are urged to work with counties and FDs to identify and map all roads and bridges, specifically identifying those that are restricted. Making this data available to FDs and other emergency responders would facilitate route planning. This could also be used to help prioritize fuel treatment

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areas. Since road conditions constantly change, this information should be monitored locally and updated as needed.

Incident Command Staging Areas: These have been identified as an issue in some parts of Nebraska. Local planners can address this by pre-identifying potential staging locations near areas of wildfire concern such as recreation areas and rural subdivisions. Staging areas must be far enough away from a fire to reduce congestion and confusion for incident managers, yet close enough to efficiently provide resources. When a resource is needed, it is deployed from the staging area, with a controlled entry into the hazard zone. Staging areas must be of sufficient size to accommodate multiple fire crews, engines, tankers, support vehicles and equipment storage. Sites should have good access, water, and power availability, and be able to accommodate communications needs. The information gathered for potential staging areas in at-risk locations can be provided to emergency managers, fire chiefs, and others to help them decide where to establish the staging area for a particular incident.

Equipment: Machinery (such as county road graders) has proven useful in many wildfire situations. Counties may want to consider adding an inventory of non-fire department resources to a centralized document.

Geographic Information Systems (GIS): GIS technology can be incorporated into the action plan. A Global Positioning System (GPS) can be utilized to provide locations of tanks, water supplies, and other useful information in each fire district and made available for hand-held devices. Counties and communities that do not already have this information may want to look into acquiring GIS layers for hydrants, well points, water mains, sewer, housing, infrastructure, and bridge limits. Water hydrant systems at golf courses could be mapped and added to this database. GPS locations of stock tanks and other water sources on public lands could also be provided to emergency responders. Other map data that would be useful includes types and locations of pipelines and pumping stations, power substations, power lines, towers and antennas for air resources to avoid, flammable material storage areas, and overhead water refill access points.

In the past there have been issues with sharing map layers between different programs and applications. Many natural resources agencies, including the NFS, now use Avenza™, a mobile map app that allows users to download geospatial-enabled pdf maps for offline use on a smart phone or tablet, using the device's built-in GPS to track their location, plot and record location information, measure distance and area, and more. Some VFDs may also use this app, but there currently is no standardized protocol. Creating such standardization over time would likely prove useful.

Increase Fire Response Reporting for Increased Equipment Availability

Comprehensive fire reporting helps VFDs demonstrate a need for fire equipment such as provided by the FEPP, FFP/State Fire Assistance, and Volunteer Firefighter Assistance programs described earlier in this document. Since reporting is voluntary for fire districts, not all fire districts consistently report their wildfire responses to the NFS. Because of this, limited information is available about the locations and sizes of historic wildfires within the CWPP counties. There is a risk that incomplete reporting could imply that there is no pressing need for this type of equipment. This could potentially put the status of these programs in jeopardy. In response to this, NFS offers an incentive to VFDs for participation: Only departments that report their responses are eligible to apply for this equipment.

Although reporting has increased recently, VFDs are urged to continue stepping up this effort. The information provides data to geographically focus grant assistance on those areas most prone to wildfire. The NFS has a database already in place to facilitate this. Planners and VFDs are urged to work together to gather and report wildfire data to assist fuels mitigation efforts and increase funding opportunities for fire equipment.

Departments can report their wildfire responses online. From the NFS home page, www.nfs.unl.edu, go to

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Programs, Wildland Fire, and navigate to the fire reporting tab. Follow the login instructions the NFS provided to your department (or email trees@unl.edu), then follow the prompts to create the report.

WUI Protection

Prepared communities reduce hazards, protect homes, and increase firefighter safety. Homeowners in WUI areas should be encouraged to establish and expand Firewise® Communities, Fire-Adapted Communities, and 'Ready, Set, Go!' programs across the region. In a wildfire situation, responders often must quickly decide which homes have the best chance of being saved so they can focus their efforts on them. Some Nebraska fire departments have developed 'triage' documents to help firefighters quickly assess these homes and neighborhoods. Consider implementing this practice in the CWPP Areas of Concern. Preparation by property owners prior to a wildfire can contribute to firefighter safety and help them protect structures. See Appendix J.

The original 2015 CWPP made the following recommendations for WUI protection. Some of these are specific to individual fire districts or counties.

Education and involvement of community leaders and landowners is important to achieve reduced hazard and risk. Under certain weather and fuel conditions, fire can be a beneficial tool for removing overabundant fuels and restoring prairie grassland ecosystems. Some prescribed fire is already occurring in some fire districts.

When there are weather extremes of prolonged heat, below-average rainfall, low relative humidity, and high winds, an unintentional spark from a human source or a dry lightning strike can put resources at heightened risk of loss. Under these circumstances, previously completed mitigations can reduce the threat to properties and infrastructure.

Individuals can reduce structure ignitability on their home and outbuildings. For example, cedar shake shingles should be replaced with asphalt shingles or metal roofing so firebrands landing on the roof cannot start the building on fire. New buildings in wooded or dense shrub areas should use construction materials such as steel, stucco, or cement siding that reduce ignitability from firebrands or convective and radiant heat as a fire moves past. Removing flammable materials in a building's ignition zone will increase defensible space and possibly provide a safe zone for the landowner or firefighters.

Limited water supply is a concern in the Verdel area in the Niobrara Fire District. Strategically placed dry hydrants could increase water availability during a fire event. Locations should be investigated along Ponca Creek, Davey Creek, stock ponds, or at the Missouri River, which would be closer than ferrying water from Niobrara and save valuable time.

The area north of Newcastle and State Highway 12 has 17.5% forest and 41% shrubs growing across hills and valleys with some areas of contiguous forest up to 246 acres in size, and larger blocks of mixed forest and shrubs, with few roads or cropland areas to break up the potential for a long fire run. Isolated homes and farmyards should follow Firewise® building principles, create and maintain defensible space, and establish a wildfire response plan.

For the Yankton Fire District in Cedar County, large feed yards should have fire response plans in place and communicated ahead of time with any fire districts that may respond to a call. Prior knowledge of the locations of fuel, chemicals, and stockpiled feed is beneficial to formulate a suppression plan. This would reduce hazards and increase safety for responders in the wildland-industrial mix represented by large feed yards.

The Wynot Fire District includes 7,300 acres along the bluffs and an island in the Missouri River, with 1,641 acres in smaller blocks of woodland near St. Helena, and 180 acres south of Wynot west of Bow

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Creek. These areas contain subdivisions with one-way access. Firewise® protocols should be instituted to reduce fire risk, and mandated for any future development.

In the Dakota-Covington Fire District, fuels reduction could be accomplished, and the logs used for pallets, mulch, or other products that can be removed from the area, decreasing not only the fuel level but also the possibility of hydrophobic soil damage from the heat of prolonged fire presence.

In Knox County, building codes to increase the use of Firewise® construction materials to decrease the flammability of homes and buildings are recommended. Firewise® principles and concepts, especially defensible space, should be practiced around all homes, and should be required in neighborhoods with property owner association covenants.

In addition to the above recommendations from the 2015 CWPP, the following methods of strengthening WUI protection can be considered:

Work with counties and municipalities to evaluate one-way-in/one-way-out subdivisions for potential addition of alternate ingress/egress routes. Estimate costs and identify potential grants or other financial assistance.

County zoning plans can be strengthened to include provisions to limit new construction in areas such as canyon rims that are at high risk from wildfire. Counties may want to consider both the monetary costs to taxpayers and the danger to fire department personnel responding to wildfires in these areas. At the very least, setbacks from the canyon rims, adequate emergency access, and specific Firewise® practices should be considered for implementation in the areas at highest risk. Communities across the planning area can adopt more stringent building codes which may include regulations and requirements to reduce wildfire risk for WUI residents and structures.

Firebreaks and Fuelbreaks

Strategically placed fuelbreaks and firebreaks in the areas most at-risk from wildfire can give firefighters an edge when protecting WUI areas. These two terms are often confused, and it is important to understand the difference.

A fuelbreak (or shaded fuelbreak) is an easily-accessible strip of land of varying width (depending on fuel type and terrain), in which fuel density is reduced, thus improving fire control opportunities. The forest is thinned, and remaining trees are pruned to remove ladder fuels. Brush, heavy ground fuels, snags, and dead trees are disposed of, leaving an open, park-like appearance.³³ Fuelbreaks are commonly used to surround a community and slow the spread of a wildfire. Decreasing the fuel load significantly reduces the risk of extreme fire behavior.³⁴

Fuelbreaks provide quick access for wildfire suppression. Control activities can be conducted more safely due to low fuel volumes. Strategically located, they break up large, continuous tracts of dense timber, thus limiting uncontrolled spread of wildfire. This can aid firefighters greatly by slowing fire spread under normal burning conditions. However, under extreme conditions, even the best fuelbreaks stand little chance of arresting a large fire, regardless of firefighting efforts. Such fires, in a phenomenon called 'spotting,' can drop firebrands ½ mile or more ahead of the main fire, causing very rapid fire spread. These types of large fires may continue until there is a major change in weather conditions, topography, or fuel type.³³

Generally narrower than a fuelbreak, a firebreak is a strip of land, 20 to 30 feet wide (or more), in which all vegetation is removed down to bare, mineral soil each year prior to fire season.³³ A firebreak is a discontinuity in vegetation. It may be a gravel road, a river, or a dozer line. A 'green firebreak' uses grasses with high moisture content, such as winter rye or winter wheat to provide a break in the continuity of the fuel. A firebreak, if it is

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wide enough, will stop the spread of direct flame. However, embers can still be lofted into the air and travel across the line.³⁴

It is critical to understand that both fuelbreaks and firebreaks are lines of defense. Homes and developments between the break and the fire may remain vulnerable.³³ Communities are encouraged to identify the best locations for vegetation breaks to protect the WUI. Fuelbreaks are most effective when placed along an existing firebreak such as a road. Choosing a site along a road also allows easy access for equipment.

There are multiple methods of creating breaks, including mechanical, mulching, herbicide, grazing, prescribed fire, and dozer lines. Each treatment has pros and cons, and some may be better suited to a particular site than others. When choosing a method, consider topography, potential for erosion and other environmental effects, access, aesthetics, and costs.

Fuelbreaks and firebreaks are most effective when they are regularly maintained. Dead vegetation and re-sprouting trees should be removed during maintenance.

Training and Education

Firefighter Training

All VFDs are encouraged to participate fully in wildland training opportunities provided through the NFS, the State Fire Marshal's office, and NEMA. Many of the VFDs in the CWPP region are annual participants in the Nebraska Wildland Fire Academies held at Ponca State Park in Dixon County and Fort Robinson State Park near Crawford. A complete description of these is in the training overview earlier in this document. Those departments that do not currently participate can be encouraged to do so.

Although not all VFDs have mandatory fitness requirements, local departments can be encouraged to maintain such requirements, both for safety and to lower insurance costs.

Educational Opportunities for Property Owners and the Public

The Firewise® and Ready Set Go! programs offer excellent guidelines for reducing the loss from wildfire for both in-town and rural structures. The NFS 'Living with Fire' publications, for both prairie and woodland areas, are also valuable educational tools for property owners. Fire extinguisher inspections and operation training can be offered as part of Firewise® events that participating communities hold annually. Involving local communities in these voluntary programs increases public awareness regarding structure risk mitigation (see Appendix J).

When issuing building permits, county and municipal offices can distribute literature that includes recommended or required setbacks from canyon rims, lists of fire-resistant building materials, and fire-savvy landscaping suggestions. Service groups such as Rotary and Lions, and youth groups such as FFA, also may present opportunities for getting out wildfire planning information. Public events such as county fairs can be used to provide wildfire awareness education. Workshops and seminars can offer specific 'how-to' fire protection information for homeowners and land managers.

The NPS Fire Management Plan for the MNRR includes the following information about fire prevention and education:

'Fire prevention includes all activities designed to reduce the number of human-caused wildfires that occur in MNRR. Prevention activities [are] prevention signs and reminders, prevention messages through interpreters and staff, and vigilance during periods of very high fire danger ... MNRR may participate in fire prevention and safety fairs at local schools ... [and] will provide educational messages through local media that explains prescribed fire and provide wildland fire prevention in conjunction with prescribed fire management education. During periods of high fire danger, the general public and park visitors will be informed of conditions through press releases and interpretive media.'

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Fuels Mitigation Strategies

There are several approaches to reducing wildfire hazard through fuels management. In addition to active participation by property owners in the structural protection programs described above, practices such as prescribed grazing, prescribed fire, and mechanical fuels reduction can work together to provide protection over large areas containing a diversity of terrain and vegetative cover.

Prescribed Grazing

Grazing keeps fine fuels such as grasses in check. But overgrazed pastures are problematic for range and livestock health, as well as for wildlife. Landowners can work with range and wildlife management professionals to develop grazing plans that will benefit livestock while protecting grasslands and wildlife and managing fine fuels to reduce wildfire hazard. The NRCS and the University of Nebraska's Institute of Agriculture and Natural Resources have specialists available to help landowners develop grazing systems to address these concerns.

Prescribed Fire

Some federal and state agencies, non-profit organizations, and private landowners use prescribed fire as a land management tool. Prescribed fire can be extremely efficient for keeping ERC encroachment in check on grasslands. In forested settings, prescribed fire is more effective and safer when used to maintain dense woodlands after they have been mechanically thinned. When tree densities are reduced prior to burning, it is easier to keep the fire on the ground, where it cleans up downed woody fuels without killing many live trees. Crown fires are difficult to control, and they kill healthy trees.

One objective for many of these burns is to reduce heavy fuel loads. Land managers in the CWPP region plan multiple prescribed fires of varying size each year, but weather and resources to conduct the burns impact how many they can complete. Some VFDs assist with these efforts by sharing people and equipment to help with the burns when agency or organizational regulations permit. It is recommended that VFDs continue with these cooperative efforts, as well as continuing participation in training to help them do this safely and effectively.

Mechanical Fuels Reduction in High-Risk Wooded Settings

Many high-risk forested settings within the CWPP boundary are found in wooded recreation sites, rural residential neighborhoods, forested and shrubby lands adjacent to population centers, and in ERC-encroached riparian bottoms. Wooded recreational and 'second home' residential areas add the hazards of seasonal congestion, limited or difficult access, and structures adjacent to highly flammable vegetation. Mechanical thinning will decrease tree density to healthy levels and reduce ERC encroachment in deciduous forests while reducing wildfire hazard.

Slash (unusable limbs and treetops left after thinning) can be chipped, mulched, or piled. Slash piles can present a fire hazard. Disposing of them by burning (during appropriate winter conditions or during green up/wet periods where risk of escape is reduced) or chipping on-site are acceptable means to mitigate this threat. Chips can help reduce soil erosion in disturbed areas. The chips should be spread, not piled, to allow vegetation to become established in these areas. Piles of chips not only prevent or delay revegetation; they can also be sources of spontaneous combustion.

The cost of mechanical fuels reduction depends on access, terrain, and tree density. Utilization of wood products generated by these treatments has the potential to offset the costs of doing the work. However, presently there is little local commercial market for this material. Researchers are currently working with the NFS to expand markets for wood products.

Because mechanical fuels reduction can be expensive, some agencies and organizations offer cost-share assistance to landowners. These programs are described in the overview section of this plan. It is recommended that private and state forest landowners continue to utilize these resources to maximize the acreage they treat

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for hazardous woody fuels. The NFS administers several federal and state grants that provide cost-share to landowners to defray the cost of fuels reduction. Information about these programs can be found online at <https://nfs.unl.edu/fuels-assistance>. Landowners in counties that have a CWPP in place are eligible for these cost-share programs.

Fuels Reduction in High-Risk Non-Forested Settings

Fuels management works best when it is conducted on a landscape basis. In addition to reducing woody fuels in forests, it is also important to manage the grass component in both wooded areas and grasslands. Well-planned grazing and prescribed fire can significantly reduce wildfire risk. Fuels treatments are only as effective as their weakest link. Unmanaged 'islands' of grass within managed areas pose a significant risk to the managed lands. Cost-share programs can encourage landowners to manage their non-forested lands. Property managers can check with their local NRCS office for cost-share program information.

Another threat in grassland environments is the presence of unmanaged windbreaks intended to protect nearby structures. If those shelterbelts lie within the structures' Firewise® zones, they are a direct threat to the buildings and they must be managed. NFS [foresters](#) can provide windbreak management recommendations.

Some communities have expressed concerns about fires jumping over highways that are not properly mowed or managed, and locations along railroad rights-of-way. Regular maintenance of these areas, especially during dry conditions, could help address these concerns.

Much of the fuels reduction activity outside forested areas will involve creating defensible space around rural homes and other structures. The same Firewise® guidelines that apply in forested settings also apply in non-forested settings.

Post-Fire Programs and Response

Wildfires can cause complex problems, from severe loss of vegetation and soil erosion to a decrease in water quality and possible flash flooding. Post-fire recovery [on federally-managed lands] is facilitated through a program called Burned Area Emergency Response (BAER). The program addresses post-fire emergency stabilization and other post-wildfire problems in order to protect public safety and prevent further degradation of the landscape and to mitigate post-fire damages to cultural resources.³⁵ BAER is utilized by all federal land management agencies, including those in the CWPP region.

The NPS Fire Management Plan for the MNRR³ includes the following information:

If a wildfire at MNRR results in the need for utilization of the [BAER] program, contact the regional BAER coordinator ... After the fire is declared out, all flagging, litter and trash associated with the suppression operations will be removed. Fire lines will be rehabbed, and erosion control devices installed as necessary. Brush will be scattered, and stumps will be flush cut and covered with soil. Plow furrows will be rehabilitated by rolling the materials back into the furrow. Public use trails will be patrolled, and measures taken to ensure public safety ... The park unit is responsible for taking prompt action after a wildfire to minimize threats to life or property, and to prevent unacceptable degradation to natural and cultural resources. Damages resulting from wildfires are addressed through four activities:

Suppression Repair: the intent is to repair suppression damages and is the responsibility of the Incident Commander. This activity is paid for from wildfire suppression funding.

Emergency Stabilization: the intent is to protect life and property and critical resource values and is the responsibility of the Superintendent. This activity is paid for from Emergency Stabilization (ES) funding.

Rehabilitation: the intent is to repair wildfire-damaged lands that are unlikely to recover naturally to management-approved conditions, or to repair or replace minor facilities damaged by wildfire. This activity is paid for from Burned Area Rehabilitation (BAR) funds.

Restoration: the intent is to continue the rehabilitation efforts started in the BAR process beyond the time period limitation set by the department. This activity is paid for from regular program funds.

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BAER does not do work on privately-owned lands affected by wildland fire. The scope of work is limited to federally-managed lands only. However, private landowners can benefit greatly when their land neighbors federal land that has been treated by a BAER team.³⁵ Repair, stabilization, rehabilitation, and restoration techniques used by BAER teams can be adapted for use on non-federal lands as well.

Maintenance

Reducing hazardous fuels is not a one-time event. Areas that have been treated by any method to reduce fuels must be maintained on a regular basis because the vegetation continues to grow. NFS fuels treatment agreements include a requirement that the work be maintained for a minimum of ten years after the project is completed. Treatment, particularly mechanical fuels reduction, can be costly, so continued maintenance by keeping regrowth in check prolongs the period of hazard protection and protects the monetary investment made by landowners and the cost-share program.

Monitoring and Evaluation

Monitoring and evaluation are important components of any planning document because they provide information on how well the plan is performing and whether it is achieving its stated goals and objectives. This provides guidance for planning future activities and is an important part of accountability to stakeholders and funding organizations. This section of the CWPP provides a proposed plan maintenance schedule; discussion of monitoring considerations; review of evaluation elements including suggested units of measure for assessing activities and projects; and a table summarizing the five-year action plan.

Because it focuses on preparedness, CWPP monitoring and evaluation is broad in scope, and suggests a method of tracking progress and guiding changes. The CWPP is a coordinating document for activities related to fire protection, fuels treatment, information development, and wildfire outreach and education. This plan is not intended to function as a means of bypassing the individual processes and regulations of the participating entities. Each project must adhere to any pertinent local, state, and federal rules.

For example, the NPS Fire Management Plan for the MNRR³ includes the following information related to fire effects monitoring, program and incident reviews, and plan updates:

Current monitoring efforts are limited to qualitative observations and constant vigilance on the part of MNRR staff. [S]taff will work with the regional fire ecologist to investigate options for fire effect monitoring to support adaptive management.

Fire Program Review

MNRR will be included when the Midwest Fire Management Zone receives a fire program review. The NPS Wildland Fire Program Review Guide describes the review framework.

Wildland Fire Incident Review

All wildland fires and fire-related incidents will be reviewed in accordance with [federal regulations].

Annual Fire Management Plan Update

Fire Management Plans ... remain in effect until superseded by a new or revised plan. However, annual updates are required.

Schedule

The maintenance for this plan will be directed by the county boards in the CWPP region and coordinated with local fire officials and resource managers. Counties or their representatives will annually review the plan to evaluate progress, re-evaluate priorities for action items, and recommend updates as needed.

Review of the recommendations will be necessary as various projects or tasks are accomplished and the at-risk areas decline in hazard rating. Review will also be needed as infrastructure needs change or are met. The review team should include representation of stakeholders who participated in the development of this plan.

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A complete update of the plan every five years is recommended because infrastructure needs, population, and land use can change, fuels reduction projects may be completed, emergency services in outlying areas may change, data are updated, and areas of extreme wildfire hazard decline or increase. Counties are urged, when possible, to coordinate this process with their regional HMP updates. By aligning the update schedules of various planning mechanisms, the goals, priorities, and actions identified can more easily be integrated into other plans.

Monitoring and Evaluation Process

Continued public involvement is needed to accomplish many of these recommendations. It is important that the process allows for continued collaboration with stakeholders on how best to meet their needs, while at the same time achieving the objectives of this plan. Counties and FDs can formally or informally monitor progress and coordinate with agency stakeholders who monitor their efforts according to their internal protocol, documenting accomplishments and redesigning strategies as needed.

Annual assessment of the identified tasks is very important to determine the degree of progress being made. Each agency is encouraged to prepare an after-action report, either per event or annually, to assist in plan maintenance and updates. Units of measure to be considered when updating the plan for the purpose of reporting accomplishments can include, but are not limited to:

1. Number of projects or activities accomplished which aid fire agency/emergency service response time
2. Number of transportation issues resolved that improve road systems for access, ingress/egress
3. Number of water sources added or upgraded to improve firefighting response
4. Number of pieces/types of fire equipment obtained; number of departments that received them
5. Number of firefighters and fire departments receiving training courses; course hours completed
6. Number of properties/acres treated for fuels reduction and type(s) of treatment used
7. Number of new or retrofitted ignition-resistant structures
8. Number of events with prevention message delivery, number of prevention courses attended/conducted, number of news releases or prevention campaigns conducted, and number of prevention team meetings held
9. Number of partners/agencies/groups cooperating on projects and activities
10. Number of people contacted (meetings, courses, etc.) and number of educational items distributed (brochures, etc.)

Each participating agency/organization can assess their activities and projects using units of measure such as those listed above and in Appendix B to determine progress.

Implementing and Updating the Action Plan

Appendix B contains a detailed description of this CWPP's goals, strategies, objectives, and tactics that can be used to implement this plan. It is highly recommended that planners review the appendix in its entirety when developing specific activities to implement this plan. The comprehensive information is intended to assist participants when they initiate action, evaluate progress, and update the CWPP. It may also aid grant writers in accurately describing CWPP targets and organizing funding assistance requests.

The following table briefly summarizes the objectives and the associated tasks needed to achieve each, suggests who might perform the tasks and when, provides benchmarks for evaluation, and identifies opportunities and limitations. When the CWPP is updated at the end of five years, a new action plan can be developed to accommodate new or expand current objectives for the following five years.

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Five-Year Action Plan for the Missouri River Northeast CWPP 2022-2027				
Task(s)	Who	When	Benchmark(s)	Opportunities/Limits
Risk Assessment, Prioritization, and Analysis				
Identify/analyze Risk Assessment elements	Local officials, NFS	Done: reviewed/edited during CWPP update	Updated CWPP	n/a
Establish a Risk Assessment procedure	Local planning staffs, other local decision-makers	2022-2023	Procedure document including the 'what, who, and how'	Opportunity to investigate potential partnerships for assessments.
Assess/prioritize areas based on vulnerability	Local officials & fire departments	2022-2023	Maps, checklist, report	Can further prioritize based on initial risk assessment
Perform individual structure or neighborhood analyses	Fire depts., agencies, contractors, others	Ongoing	Checklist/report	Opportunity: do during fuel reduction or other site visits. Limits: funding and staff availability.
Risk Reduction/Mitigation				
Identify mitigation practices	Local officials, NFS	Done: reviewed/edited during CWPP update	Updated CWPP	n/a
Expand WUI fuels reduction, including mechanical & RxB	Agencies, landowners; local officials (for public property)	Ongoing	# projects; # acres	Utilize existing & seek new cost-share grants
Implement Firewise® & other community protection programs	Local officials, homeowner groups	Ongoing	# of programs established or expanded	NFS has staff available to help communities with this
Evaluate subdivision in/out access	Local officials, VFDs, developers	Ongoing	Report, cost estimates	Explore grant funding to address costs
Increase # of ignition-resistant buildings	Property owners, planning officials, community leaders	Ongoing	# New buildings to code; # bldgs. retrofitted	Retrofits can be costly; best opportunity is for new construction
Plan and implement fire & fuel breaks	Land managers, planning officials	Ongoing	# of vegetative breaks sited/established	Utilize federal, state, and local cost-share programs
Assess and Enhance Local Response Capacity, Effectiveness, and Safety				
Review regional HMPs, VFD info, zoning plans, etc.	Local officials, VFDs, others	2022-2023	Checklist/report	Opportunity to identify gaps and needs
Increase fire response reporting	Fire chiefs	Ongoing	# of departments reporting	Opportunity for VFDs to acquire additional equipment
Increase/update fire equipment	VFDs, NFS	Ongoing	# of departments assisted, # of pieces/types of fire equipment obtained	VFDs can utilize NFS FEPP & FFP programs
Increase participation in firefighter training	VFDs, agencies	Ongoing	# of departments and firefighters receiving training; # hours	Many training options available through NFS & NEMA
Facilitate VFD monitoring of fire weather system indices	VFDs, NFS	Ongoing	# of departments able to monitor indices	Limit: # of weather stations. Opportunity: Weather apps and spot weather forecasts can be used on the fireline.
Develop 'triage' guidelines	VFDs, agencies	2023-2024	# documents created, # of VFDs using them	Increases firefighter safety by enabling quick property assessments during wildfires
Increase Communications Effectiveness				
Review local communications plans	Local and state officials	Annually	Document changes/updates	n/a
Ensure VFDs can communicate on the same radio band during mutual aid	Local and state officials	Ongoing	# VFD's using a common radio band during mutual aid operations	Limited by funding availability. Explore grant funding to address costs.
Ensure prompt notification and involvement process for assessment and assistance on fires	Local and state officials	Ongoing	Checklist/report	Opportunity to expedite response & reduce duplication of efforts

Missouri River Northeast Community Wildfire Protection Plan

Task(s)	Who	When	Benchmark(s)	Opportunities/Limits
Increase Aerial Support Effectiveness				
Train additional SEAT Base Managers	NFS, NEMA	Ongoing	# of new certified managers	Limitation: available personnel
Facilitate sharing managers with other states	NFS, NEMA	Ongoing	# of shared SEAT base managers	Helps trainees become qualified
Increase the number of aerial applicators within the region	NFS, NEMA	Ongoing	# of new applicators	Increases options for fires on non-federal lands
Sustain/increase cooperation & communication with adjacent states' aviation resources	NFS, NEMA, neighboring state officials	Ongoing	# of new & renewed agreements; # of interstate assists	Helps make neighboring jurisdictions aware of available resources, times of planned contracted aviation availability, and enable sharing of resources across state borders
Increase Data Availability				
Identify and map restricted roads/ bridges	Local officials, contractors, others?	Ongoing	# of jurisdictions with restricted road/bridge maps	May be able to piggyback data collection with other tasks
Pre-identify potential staging locations	Local officials, VFDs, emergency managers	2023-2025	# of locations identified	Will expedite staging area placement decisions
Standardize map apps for use by VFDs	VFDs, emergency managers	Ongoing	# of VFDs using a standard map app	Cost depends on software and version.
Establish lists of non-fire equipment such as road graders	Local officials, VFDs	Ongoing	# of jurisdictions with equipment lists created	Can be included in regional mutual aid guide
Acquire GIS layers for locating critical infrastructure, water sources, etc.	Local officials and planners	Ongoing	# of new layers created or acquired	Opportunity: Provide in a format that can be easily accessed by hand-held devices
Increase Coordination Among Partners				
Develop & adopt regional WUI standards	Local officials, VFDs; NFS can assist with WUI info	2024-2027	Creation of regional standards document; # of counties adopting it	Opportunity: HOAs can also adopt standards
Expand inter-jurisdictional cooperation	Local, state, federal officials	Ongoing	# of mutual aid agreements and # MOUs in place & current	Explore MOUs with non-traditional partners, NGOs
Create a statewide Mutual Aid Guide	NFS, emergency managers, VFDs	2024-2026	Creation of document, # distributed	Having a guide in each engine enhances access to resources
Establish a region-wide public awareness program	Agencies, VFDs	2023-2026	# of participating entities; # of outreach activities	NFS can provide assistance
Engage partners to expand WUI fuels reduction and thinning	NFS, other agencies & organizations	Ongoing	# of participating entities, # of projects, # of acres treated	Leverage program effectiveness with multiple agencies, adjacent projects
Develop long-term multi-unit, multi-year fuel hazard reduction projects, including RxB	Agencies, NGOs	Ongoing	# of participating entities, # of projects, # of acres treated	Partners can co-locate projects to expand treated area on a landscape scale
Increase Public Awareness				
News releases, workshops, seminars, etc.	Local officials, planners, VFDs	Ongoing	# of people reached, # of events	NFS has info & materials, can help with planning
Provide literature to homeowners, developers, others	Local officials, planners, VFDs	Ongoing	# of people reached	NFS has brochures & handouts for general use

Missouri River Northeast Community Wildfire Protection Plan

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List of Appendices

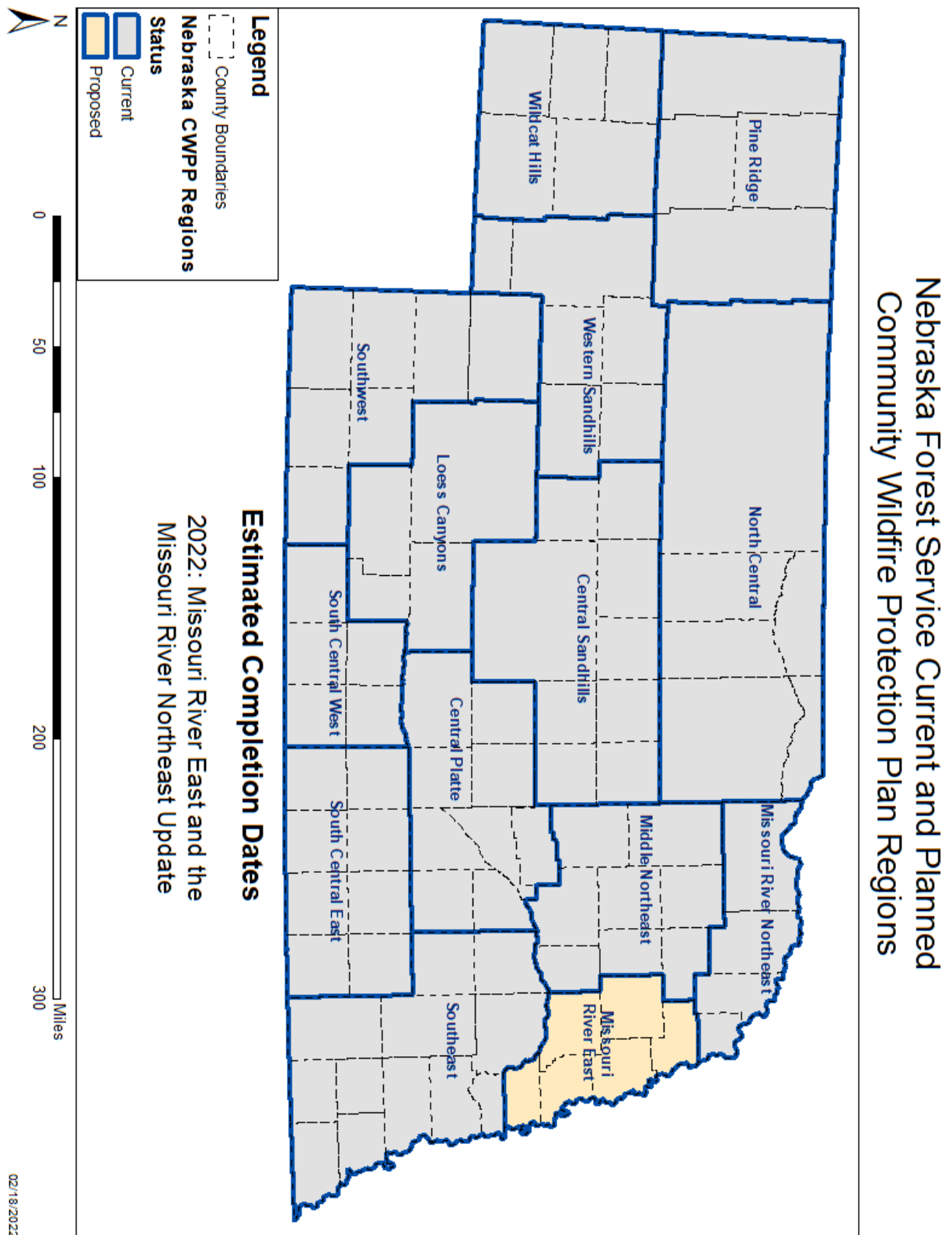
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Appendix A

Maps

1. Nebraska CWPP Regions
2. Nebraska Natural Legacy Project: Biologically Unique Landscapes
3. Missouri River Northeast CWPP Region Land Cover
4. Nebraska Local Mitigation Planning Areas
5. Missouri River Northeast CWPP Region Areas of Concern

Map 1: Nebraska Community Wildfire Protection Plan Regions



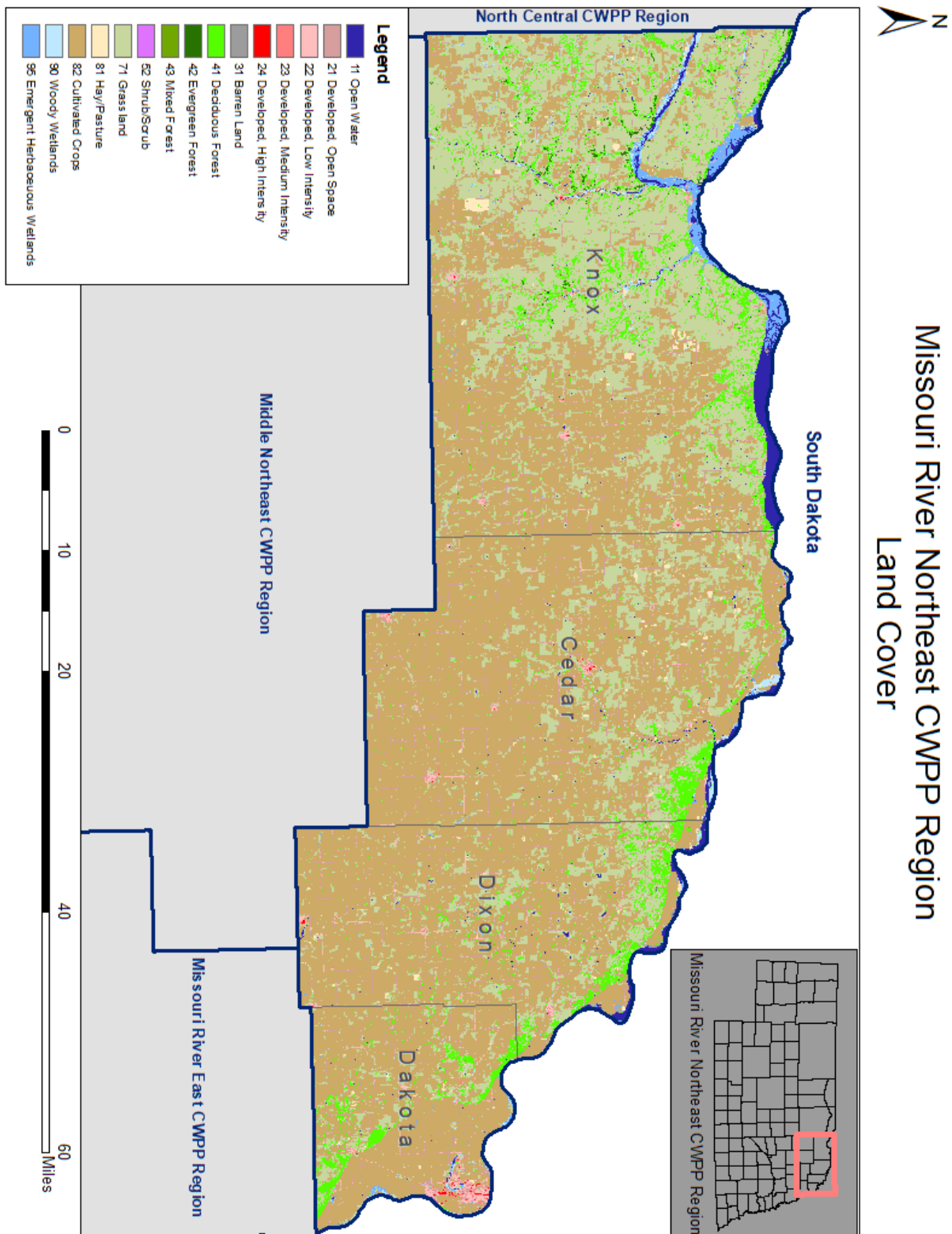
Map 2: Nebraska Natural Legacy Project: Biologically Unique Landscapes



The full document is available at:

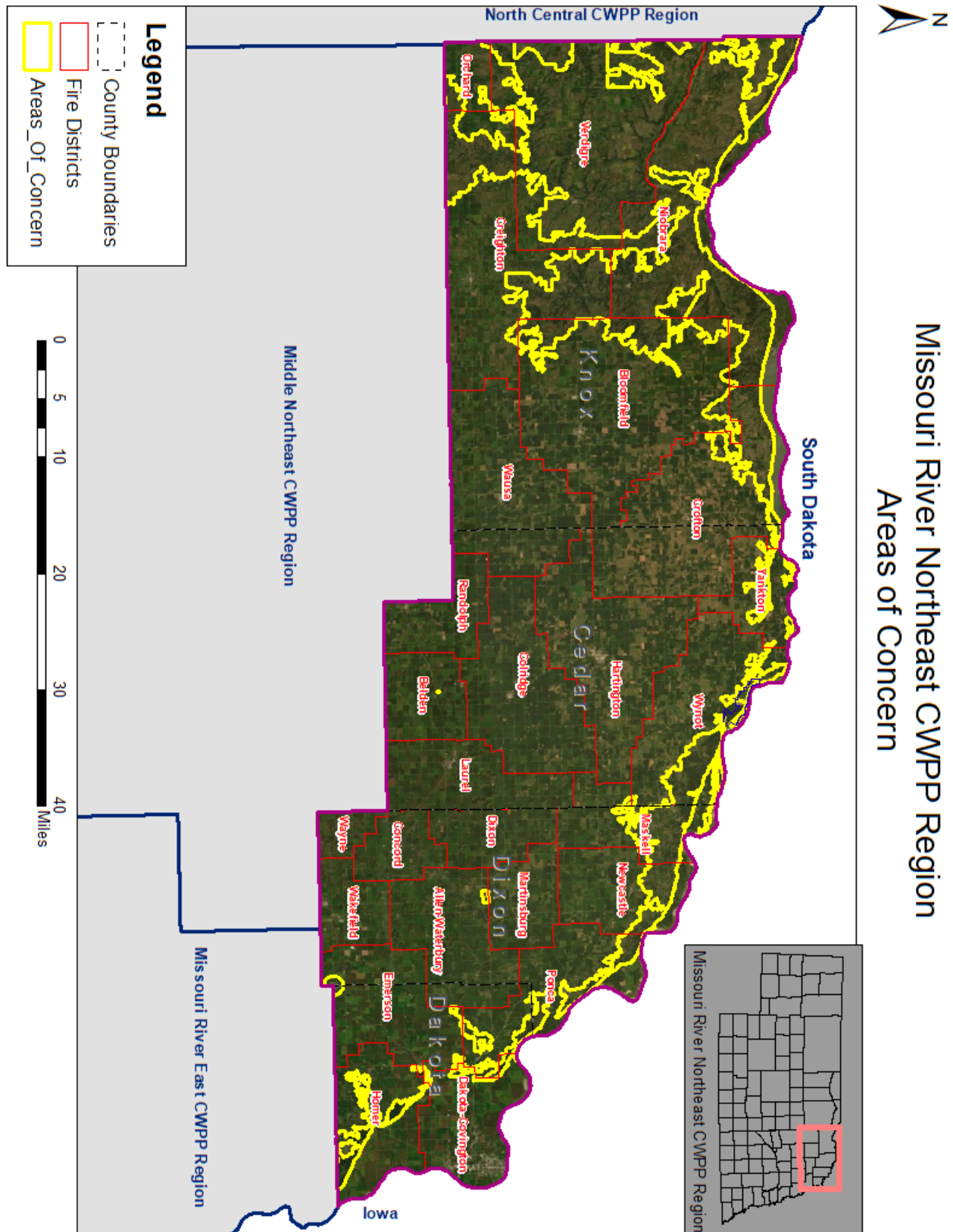
<http://outdoornebraska.gov/wp-content/uploads/2015/09/NebraskaNaturalLegacyProject2ndEdition.pdf>

Map 3: Missouri River Northeast CWPP Region Land Cover





Map 5: Missouri River Northeast CWPP Areas of Concern



Appendix B

Goals, Strategies, Objectives, and Tactics

This appendix is intended to assist planners and grant writers in accurately describing overall CWPP goals, understanding strategies to accomplish them, defining measurable objectives needed to achieve the goals, and provide examples of tactics that could be used to achieve the objectives. Each objective includes suggested metrics, or performance-gauging tools that can be used to measure success.

Overall CWPP Purpose: Strengthen Community Wildfire Preparedness

Definitions

1. A **goal** is a broad primary outcome.
2. A **strategy** is the approach taken to achieve a **goal**.
3. An **objective** is a measurable step taken to achieve a **strategy**.
4. A **tactic** is a tool used in pursuing an **objective** associated with a **strategy**.

Goal 1: Reduce wildfire risk

Strategy: Reduce the likelihood of fire entering communities; physical impacts and losses; the negative economic/social impacts by collaborating with stakeholders to define, understand, and address wildfire risks. Suppress unplanned ignitions to protect private property and natural and cultural resources from unacceptable impacts attributable to fire.

Objectives

- Identify wildfire risks (hazards/vulnerability), areas of concern that contain these risks, and a range of mitigation measures (*Metrics:* # risks, # locations, and # measures identified). *Tactics:*
 - Identify a baseline by considering historic data such as causes, frequency, and probability of wildfire
 - Use input from local responders and agency personnel to map specific areas at risk from wildfire
 - Utilize data from multiple sources to help identify appropriate fuels reduction practices for local at-risk areas
- Assess risks in the mapped areas (*Metrics:* Rating system implemented; prioritized list created). *Tactic:*
 - Devise a rating system to assess the degree of risk (i.e., High-Medium-Low) and establish hazard reduction priorities
- Mitigate risks: Implement mitigation measures to create defensible space and reduce structural ignitability (*Metrics:* # practices implemented, # projects implemented, # acres/structures protected). *Tactics:*
 - Use cost-share programs and coordinate with partners to assist WUI landowners implementing mitigation activities such as mechanical fuels treatment, thinning, prescribed fire and grazing
 - Coordinate among adjacent large ownerships and/or public lands to protect communities on a landscape scale

Goal 2: Support emergency response

Strategy: Collaborate to assess local preparedness and capabilities, identify gaps and needs, and develop ways to enhance preparedness and response capability and improve firefighter readiness and safety.

Objectives

- Assess local response capacity (*Metrics:* # of VFD survey responses; list of items from HMP review, # of needs/gaps identified). *Tactics:*
 - VFD survey; review HMP data; consult with local officials
- Enhance local response capacity (*Metrics:* # pieces of equipment added or updated, # of VFDs able to monitor indices, # aerial applicators participating, # restricted roads/bridges mapped, # evacuation routes/staging locations identified, # of treatments conducted to improve access, # of water resources improved or added, # of WUI guidelines added). *Tactics:*
 - Increase and update equipment via VFD assistance programs
 - Facilitate VFD monitoring of the federal wildland fire weather system indices
 - Aerial support: Recruit and train additional aerial applicators and SEAT Managers
 - Roads/transportation:
 - Obtain critical infrastructure GIS layers
 - Map restricted roads/bridges
 - Identify evacuation routes, potential staging locations
 - Evacuation route treatments to improve access, including roads, development ingress/egress

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- Community planning:
 - Expand/improve water resources
 - To protect firefighters, property owners, and structures, consider developing county-level standards for buildings in WUI areas
 - WUI guidelines or regulations for new construction
 - Guidelines for retrofitting existing structures
- Increase firefighter readiness and safety (*Metrics: # of trainings offered, # VFDs participating, # of firefighter training hours completed*). *Tactic:*
 - Provide wildland fire training to VFDs
- Enhance communication among fire management agencies (*Metrics: # of agreements in place and current, # of VFDs trained in radio channel use, # of partners coordinating fire management programs, statewide mutual aid guide created/updated, quick notification process implemented*). *Tactics:*
 - Ensure all relevant Memorandums of Understanding (MOUs) and Mutual Aid Agreements (MAAs) are in place and current
 - Train fire departments in the use of the V-TAC and UHF mutual aid radio channels; educate fire departments and 911 dispatchers about notifying assisting mutual aid departments which V-TAC or UHF channel will be used when arriving at an event
 - Partner with landowners, land managers, fire personnel, natural resources agencies, and other organizations to incorporate local concerns and objectives into fire management programs
 - Create a statewide Mutual Aid Guide
 - Ensure quick notification and involvement process for assessment and assistance on fires, when needed (i.e., Wildfire Incident Response Assistance Team, Type 3 Team, FEMA and Type 1 or 2 teams)

Goal 3: Promote an informed and active citizenry for wildfire preparedness

Strategy: Partner with natural resources agencies, schools, prescribed fire organizations, and other groups to implement a CWPP region-wide public awareness and engagement program to improve wildfire hazard conditions within the WUI. Educate homeowners, neighborhoods, schools, municipalities, and others about wildfire risks and engage them in community preparedness actions. Ensure that outreach targets a broad audience, including the agricultural community, schools, landowners, home and business owners, recreationists, and the general public; identify specific ways to address this.

Objectives

- Increase local knowledge of wildfire risk and prevention (*Metrics: # handouts or news releases distributed, # of events or activities held, # of people reached*) *Tactics:*
 - Work with partners to establish a region-wide public awareness program
 - Use brochures/handouts and news releases to increase wildfire awareness and publicize mitigation activities
 - Offer mitigation/prevention-focused workshops, seminars, school presentations/activities
- Engage stakeholders in preparedness activities that promote the use of defensible space to reduce fuel loads to protect communities and resources (*Metrics: # landowners creating defensible space, # community programs established/expanded*). *Tactic:*
 - Introduce and encourage participation in programs such as Firewise, Fire-Adapted Communities, and Ready-Set-Go, as well as WUI fuels treatment programs

Goal 4: Restore fire-adapted ecosystems

Strategy: Work with partners to restore native fire-adapted ecosystems to increase community protection, enhance firefighter safety, and improve habitat health.

Objectives

- Encourage land managers to reduce heavy understory fuels in woodlands (*Metrics: # land managers reached, # of landowners implementing fuels reduction practices*). *Tactics:*
 - (See tactics listed under Goal 1, Objective 3)
- Encourage land managers to control non-native invasive plant species and to actively manage prolific and aggressive native species (*Metrics: # land managers reached, # of landowners implementing control/management practices*). *Tactics:*
 - Educate land managers in plant identification and control measures
 - Use cost-share programs to defray landowner costs
- Encourage land managers to use native plant species when restoring ecosystems (*Metrics: # land managers reached, # land managers using native species*). *Tactics:*
 - Educate land managers about the benefits of using native plant species
 - Help land managers locate and obtain appropriate native plant species

Missouri River Northeast Community Wildfire Protection Plan

- Safely incorporate prescribed fire into historically fire-adapted ecosystems, using trained personnel and standard operating procedures (*Metrics: # acres treated safely*). *Tactic:*
 - Offer fire training

Goal 5: Enhance post-fire recovery

Strategy: Work with partners to quickly assess and stabilize burned lands to reduce erosion and protect property.

Objective

- Enable rapid assessments of burned lands and the implementation of stabilization techniques. (*Metrics: # trainings offered, # acres stabilized*). *Tactics:*
 - Provide training on burned area assessment
 - Provide financial assistance

Goal 6: Establish and implement a CWPP monitoring and evaluation process

Strategy: Strengthen CWPP effectiveness by working with stakeholders to evaluate progress and update regularly.

Objectives

- Annually evaluate progress in implementing the CWPP and recommend changes as needed. (*Metrics: Checklist and framework created, # projects/activities implemented*). *Tactic:*
 - Create a review checklist and framework for providing recommendations
- Conduct monitoring of selected projects and activities to assess progress and effectiveness (*Metrics: Process established, # of projects/activities/acres monitored*). *Tactic:*
 - Determine number of assessments needed and establish a process for choosing and evaluating them
- Improve grant eligibility (*Metric: # of successful grant applications*). *Tactic:*
 - Regularly review and update CWPP and other planning documents to ensure they reflect current activities and needs

Appendix C

Links to Other Planning Documents

Due to their large file sizes, these documents are available only online

2015 Missouri River Northeast CWPP (Original plan)

https://nfs.unl.edu/documents/CWPP/MRNE_CWPP_Final2.pdf

Cedar-Dixon Multi-Jurisdictional HMP

<https://jeo.com//cedar-dixon-hmp>

Papio-Missouri River HMP (Includes Dakota County)

<https://papiomitigation.org/>

Tri-County HMP (Includes Knox County)

https://nfs.unl.edu/documents/CWPP/tricounty-HMP_Holt_Knox_Antelope.pdf

Nebraska Forest Action Plan

<https://nfs.unl.edu/statewide-forest-action-plan>

Nebraska Natural Legacy Project

<http://outdoornebraska.gov/wp-content/uploads/2015/09/NebraskaNaturalLegacyProject2ndEdition.pdf>

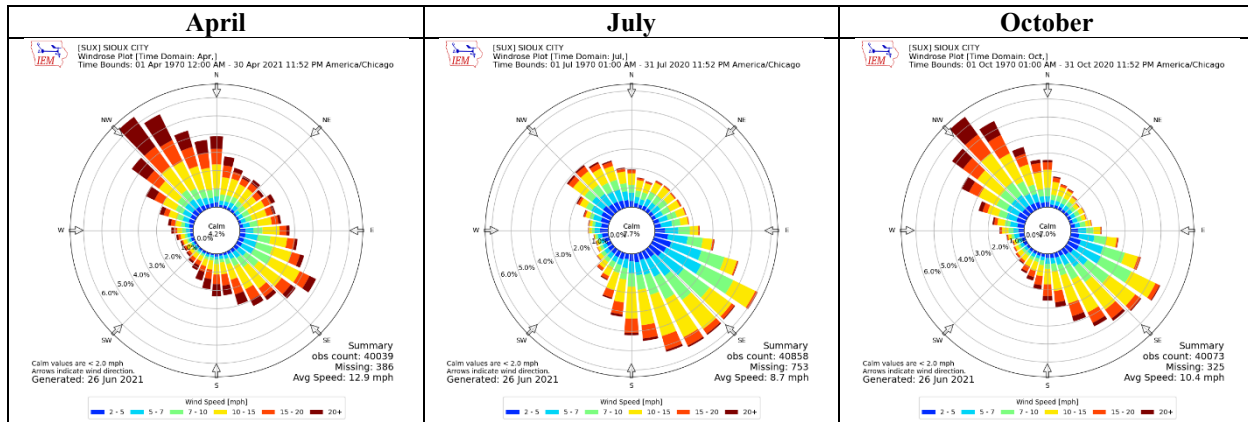
Appendix D

Wind Rosettes For Selected Stations closest to the Missouri River Northeast CWPP Region

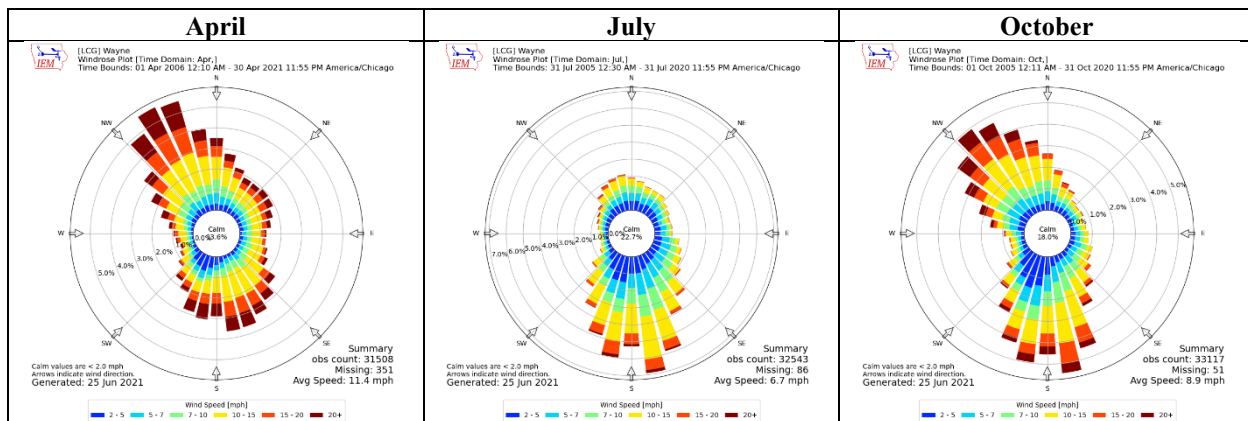
- a. Sioux City, Iowa
- b. Wayne, Nebraska
- c. Yankton, South Dakota

Missouri River Northeast Community Wildfire Protection Plan

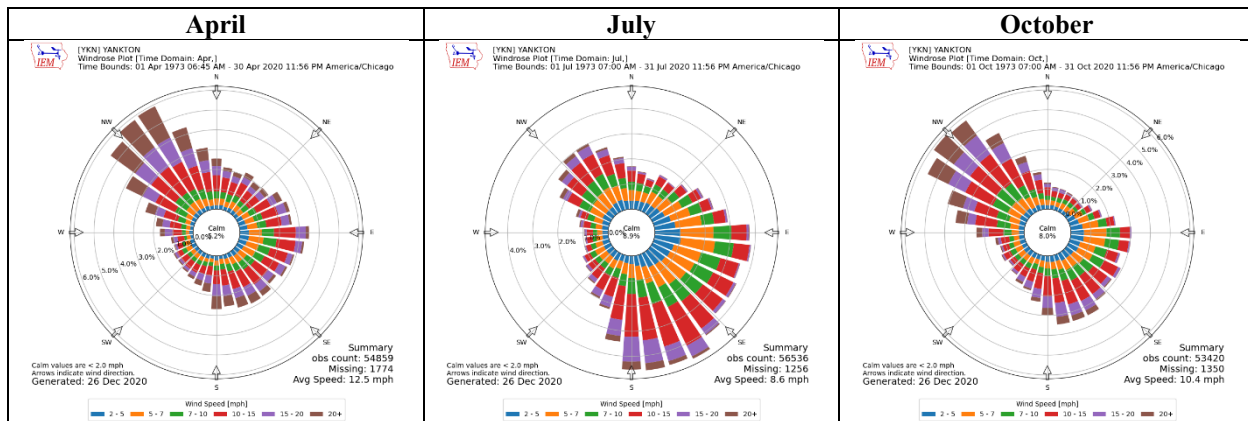
Sioux City, Iowa Wind Direction and Speed 1970-2021



Wayne, Nebraska Wind Direction and Speed 2005-2021



Yankton, South Dakota Wind Direction and Speed 1973-2020



Appendix E

Fuel Models for the Missouri River Northeast CWPP Region

Due to its length, the full Appendix E appears only in the online version of this document:

<https://nfs.unl.edu/documents/CWPP/MRNECWPP.pdf>



United States
Department
of Agriculture

Forest Service

Rocky Mountain
Research Station

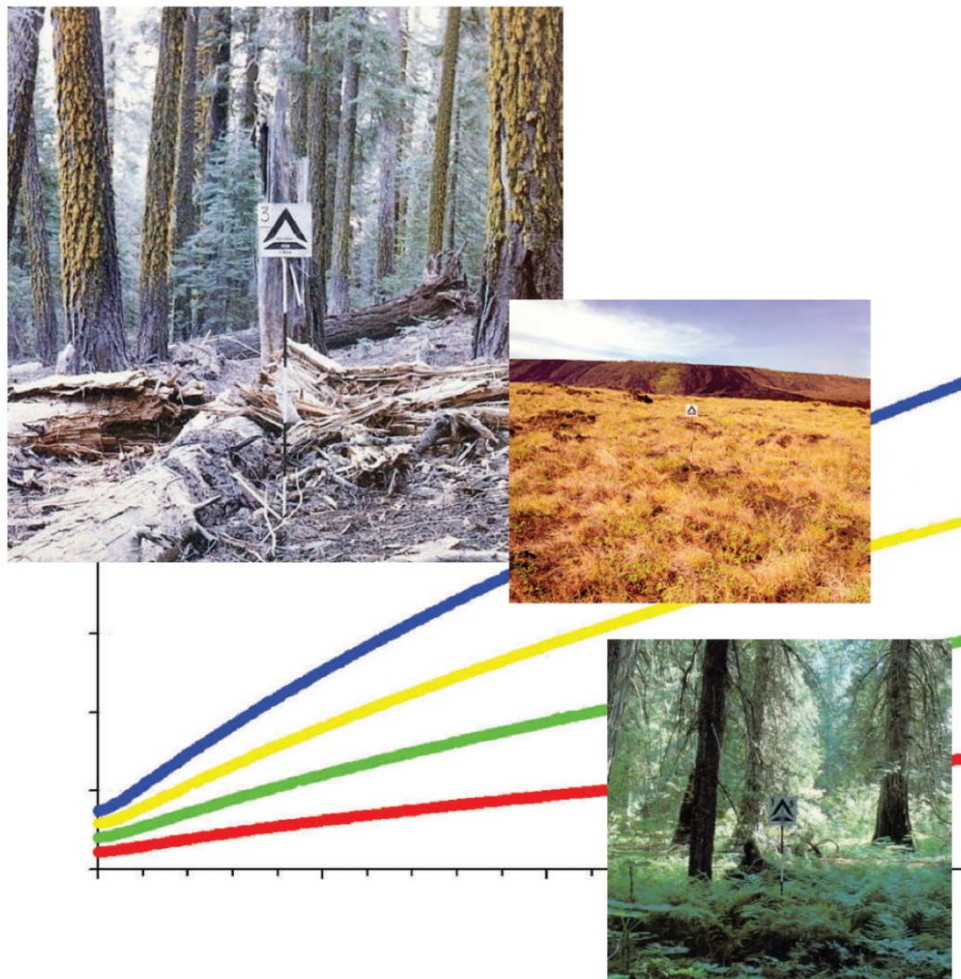
General Technical
Report RMRS-GTR-153

June 2005



Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model

Joe H. Scott
Robert E. Burgan



Missouri River Northeast Community Wildfire Protection Plan

Fuel Models

In this section we list the fuel model parameters and describe each fuel model and fuel type.

Fuel Model Parameters

Parameters of the new fuel models include load by class and component, surface-area-to-volume (SAV) ratio by class and component, fuel model type (static or dynamic), fuelbed depth, extinction moisture content, and fuel particle heat content (table 7). Fuel inputs not listed are constant for the entire set: 10-hr dead fuel SAV ratio is 109 l/ft, and 100-hr SAV ratio is 30 l/ft. Total fuel particle mineral content is 5.55 percent; effective (silica-free) mineral content is 1.00 percent. Oven-dry fuel particle density is 32 lb/ft³.

Fuel Type Page

A fuel type page consists of a brief description of the fuel type followed by a pair of charts depicting predicted fire behavior over a range of midflame wind speeds, one for headfire spread rate and one for headfire flame length. These charts are for moisture scenario D2L2 (low dead fuel moisture, two-thirds cured live herbaceous, low live woody fuel moisture). The moisture contents by class and category are:

Dead 1-hr	6 percent
Dead 10-hr	7
Dead 100-hr	8
Live herbaceous	60 (2/3 cured)
Live woody	90

Use the charts to compare the relative behavior of the various models within a fuel type, but be aware that the relative behavior may be different at other moisture contents.

Fuel models with herbaceous load are sensitive to live herbaceous moisture content. The herbaceous fuel in moisture scenario D2L2 is two-thirds cured, which means that 67 percent of the herbaceous load is actually at the dead 1-hr moisture content, while the remaining 33 percent retains the 60 percent moisture content.

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Table 7—Fuel model parameters.

Fuel model code	Fuel load (t/ac)					Fuel model type ^a	SAV ratio (1/ft) ^b			Fuel bed depth (ft)	Dead fuel extinction moisture (percent)	Heat content BTU/lb ^c
	1-hr	10-hr	100-hr	Live herb	Live woody		Dead	Live herb	Live woody			
GR1	0.10	0.00	0.00	0.30	0.00	dynamic	2200	2000	9999	0.4	15	8000
GR2	0.10	0.00	0.00	1.00	0.00	dynamic	2000	1800	9999	1.0	15	8000
GR3	0.10	0.40	0.00	1.50	0.00	dynamic	1500	1300	9999	2.0	30	8000
GR4	0.25	0.00	0.00	1.90	0.00	dynamic	2000	1800	9999	2.0	15	8000
GR5	0.40	0.00	0.00	2.50	0.00	dynamic	1800	1600	9999	1.5	40	8000
GR6	0.10	0.00	0.00	3.40	0.00	dynamic	2200	2000	9999	1.5	40	9000
GR7	1.00	0.00	0.00	5.40	0.00	dynamic	2000	1800	9999	3.0	15	8000
GR8	0.50	1.00	0.00	7.30	0.00	dynamic	1500	1300	9999	4.0	30	8000
GR9	1.00	1.00	0.00	9.00	0.00	dynamic	1800	1600	9999	5.0	40	8000
GS1	0.20	0.00	0.00	0.50	0.65	dynamic	2000	1800	1800	0.9	15	8000
GS2	0.50	0.50	0.00	0.60	1.00	dynamic	2000	1800	1800	1.5	15	8000
GS3	0.30	0.25	0.00	1.45	1.25	dynamic	1800	1600	1600	1.8	40	8000
GS4	1.90	0.30	0.10	3.40	7.10	dynamic	1800	1600	1600	2.1	40	8000
SH1	0.25	0.25	0.00	0.15	1.30	dynamic	2000	1800	1600	1.0	15	8000
SH2	1.35	2.40	0.75	0.00	3.85	N/A	2000	9999	1600	1.0	15	8000
SH3	0.45	3.00	0.00	0.00	6.20	N/A	1600	9999	1400	2.4	40	8000
SH4	0.85	1.15	0.20	0.00	2.55	N/A	2000	1800	1600	3.0	30	8000
SH5	3.60	2.10	0.00	0.00	2.90	N/A	750	9999	1600	6.0	15	8000
SH6	2.90	1.45	0.00	0.00	1.40	N/A	750	9999	1600	2.0	30	8000
SH7	3.50	5.30	2.20	0.00	3.40	N/A	750	9999	1600	6.0	15	8000
SH8	2.05	3.40	0.85	0.00	4.35	N/A	750	9999	1600	3.0	40	8000
SH9	4.50	2.45	0.00	1.55	7.00	dynamic	750	1800	1500	4.4	40	8000
TU1	0.20	0.90	1.50	0.20	0.90	dynamic	2000	1800	1600	0.6	20	8000
TU2	0.95	1.80	1.25	0.00	0.20	N/A	2000	9999	1600	1.0	30	8000
TU3	1.10	0.15	0.25	0.65	1.10	dynamic	1800	1600	1400	1.3	30	8000
TU4	4.50	0.00	0.00	0.00	2.00	N/A	2300	9999	2000	0.5	12	8000
TU5	4.00	4.00	3.00	0.00	3.00	N/A	1500	9999	750	1.0	25	8000
TL1	1.00	2.20	3.60	0.00	0.00	N/A	2000	9999	9999	0.2	30	8000
TL2	1.40	2.30	2.20	0.00	0.00	N/A	2000	9999	9999	0.2	25	8000
TL3	0.50	2.20	2.80	0.00	0.00	N/A	2000	9999	9999	0.3	20	8000
TL4	0.50	1.50	4.20	0.00	0.00	N/A	2000	9999	9999	0.4	25	8000
TL5	1.15	2.50	4.40	0.00	0.00	N/A	2000	9999	1600	0.6	25	8000
TL6	2.40	1.20	1.20	0.00	0.00	N/A	2000	9999	9999	0.3	25	8000
TL7	0.30	1.40	8.10	0.00	0.00	N/A	2000	9999	9999	0.4	25	8000
TL8	5.80	1.40	1.10	0.00	0.00	N/A	1800	9999	9999	0.3	35	8000
TL9	6.65	3.30	4.15	0.00	0.00	N/A	1800	9999	1600	0.6	35	8000
SB1	1.50	3.00	11.00	0.00	0.00	N/A	2000	9999	9999	1.0	25	8000
SB2	4.50	4.25	4.00	0.00	0.00	N/A	2000	9999	9999	1.0	25	8000
SB3	5.50	2.75	3.00	0.00	0.00	N/A	2000	9999	9999	1.2	25	8000
SB4	5.25	3.50	5.25	0.00	0.00	N/A	2000	9999	9999	2.7	25	8000

^a Fuel model type does not apply to fuel models without live herbaceous load.

^b The value 9999 was assigned in cases where there is no load in a particular fuel class or category.

^c The same heat content value was applied to both live and dead fuel categories.

Missouri River Northeast Community Wildfire Protection Plan

Fuel Model Page

A fuel model page consists of:

- The three-part fuel model naming
- A set of three photos
- A brief description of the fuel model
- A summary of computed fuel model characteristics
- A pair of charts depicting fire behavior over a range of midflame wind speeds

Further details follow.

Naming—The fuel model code and number (in parentheses) are displayed on the first line, followed on the next line by the full fuel model name. The fuel model code is used for oral and written communication and for input to fire behavior models. The fuel model number is used internally by some fire behavior models and for mapping applications. The fuel model name is a brief description of the fuel model.

Photos—Up to three representative photos were selected to illustrate each fuel model. Conditions other than those illustrated may still be appropriate for the fuel model; use the photos as a general guide only.

Description—Main characteristics of each fuel model are briefly described.

Summary characteristics—Summary characteristics of each fuel model include fine fuel load, characteristic surface-area-to-volume ratio (SAV), packing ratio, and extinction moisture content.

Fine fuel load is defined as the dead 1-hr load plus the live herbaceous and live woody loads. Across the new set of 40 fuel models, fine fuel load ranges from 0.30 to 13.05 tons/acre.

Characteristic SAV is the average SAV across all fuel classes and categories, weighted by the surface area within each class and category. Characteristic SAV ranges from 1,144 to 2,216 1/ft in this new set of fuel models.

Packing ratio is the fraction of fuelbed volume that is occupied by fuel particles, a function of fuel load, fuelbed depth, and fuel particle density. In this fuel model set, packing ratio varies from 0.00143 to 0.04878 (dimensionless).

Extinction moisture content is the weighted average dead fuel moisture content at which the fire spread model predicts spread will not take place. More important, the amount by which the extinction moisture content exceeds the actual determines (in part) fire behavior. Thus, for a given dead fuel moisture content, predicted fire spread increases with increasing extinction moisture content.

Fire behavior charts—A pair of charts depicts predicted fire behavior (spread rate and flame length) for each fuel model over a range of midflame wind speeds. All predictions use live moisture scenario L2 (60 percent live herbaceous moisture content, 90 percent live woody), which corresponds to a two-thirds cured herbaceous fuelbed. The four lines on each chart refer to dead fuel moisture scenarios (table 3).

Nonburnable Fuel Type Models (NB)

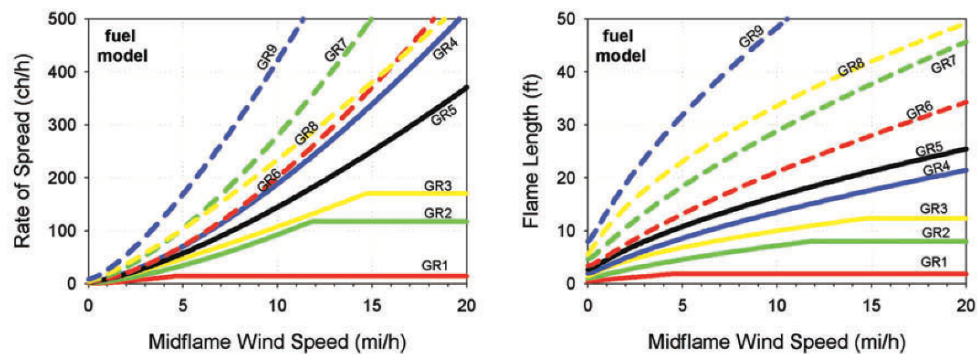
The nonburnable “fuel models” are included on the next five pages to provide consistency in how the nonburnable portions of the landscape are displayed on a fuel model map. In all NB fuel models there is no fuel load—wildland fire will not spread.

Missouri River Northeast Community Wildfire Protection Plan

Grass Fuel Type Models (GR)

The primary carrier of fire in the GR fuel models is grass. Grass fuels can vary from heavily grazed grass stubble or sparse natural grass to dense grass more than 6 feet tall. Fire behavior varies from moderate spread rate and low flame length in the sparse grass to extreme spread rate and flame length in the tall grass models.

All GR fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong.



Missouri River Northeast Community Wildfire Protection Plan

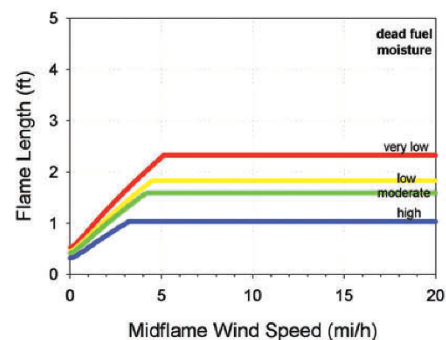
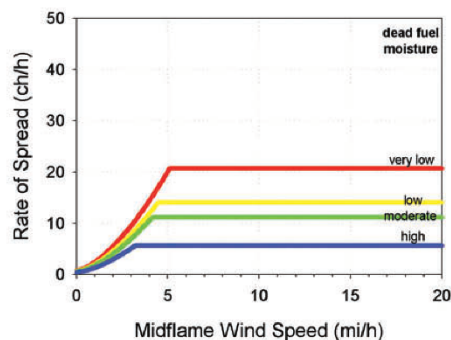
GR1 (101)

Short, Sparse Dry Climate Grass (Dynamic)



Description: The primary carrier of fire in GR1 is sparse grass, though small amounts of fine dead fuel may be present. The grass in GR1 is generally short, either naturally or by grazing, and may be sparse or discontinuous. The moisture of extinction of GR1 is indicative of a dry climate fuelbed, but GR1 may also be applied in high-extinction moisture fuelbeds because in both cases predicted spread rate and flame length are low compared to other GR models.

Fine fuel load (t/ac)	0.40
Characteristic SAV (ft-1)	2054
Packing ratio (dimensionless)	0.00143
Extinction moisture content (percent)	15



Missouri River Northeast Community Wildfire Protection Plan

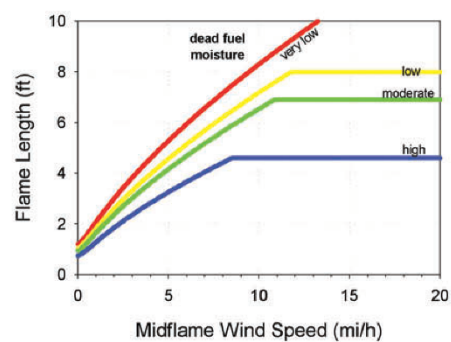
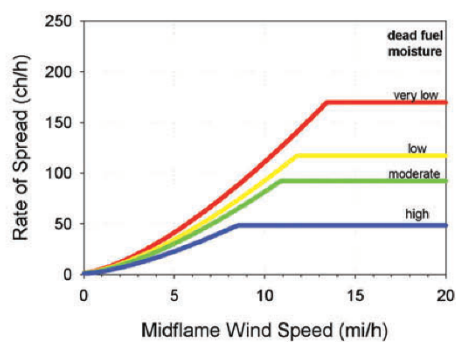
GR2 (102)

Low Load, Dry Climate Grass (Dynamic)



Description: The primary carrier of fire in GR2 is grass, though small amounts of fine dead fuel may be present. Load is greater than GR1, and fuelbed may be more continuous. Shrubs, if present, do not affect fire behavior.

Fine fuel load (t/ac)	1.10
Characteristic SAV (ft-1)	1820
Packing ratio (dimensionless)	0.00158
Extinction moisture content (percent)	15



Missouri River Northeast Community Wildfire Protection Plan

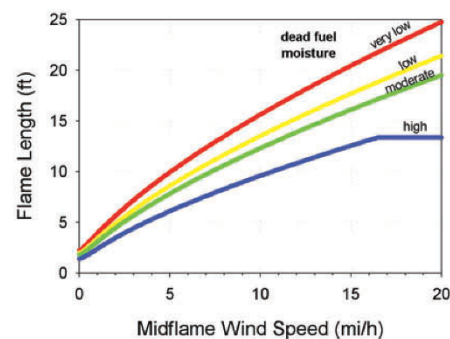
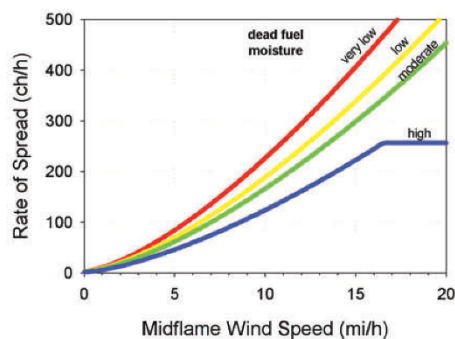
GR4 (104)

Moderate Load, Dry Climate Grass (Dynamic)



Description: The primary carrier of fire in GR4 is continuous, dry-climate grass. Load and depth are greater than GR2; fuelbed depth is about 2 feet.

Fine fuel load (t/ac)	2.15
Characteristic SAV (ft-1)	1826
Packing ratio (dimensionless)	0.00154
Extinction moisture content (percent)	15



Missouri River Northeast Community Wildfire Protection Plan

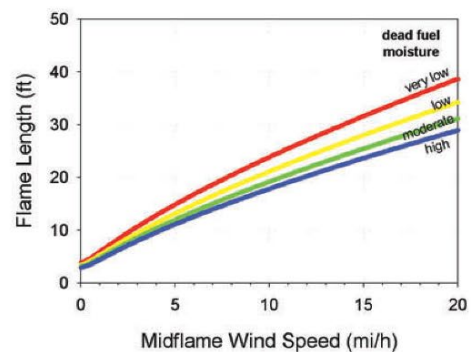
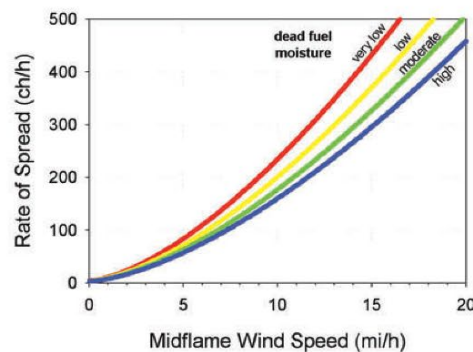
GR6 (106)

Moderate Load, Humid Climate Grass (Dynamic)



Description: The primary carrier of fire in GR6 is continuous humid-climate grass. Load is greater than GR5 but depth is about the same. Grass is less coarse than GR5.

Fine fuel load (t/ac)	3.5
Characteristic SAV (ft-1)	2006
Packing ratio (dimensionless)	0.00335
Extinction moisture content (percent)	40



Missouri River Northeast Community Wildfire Protection Plan

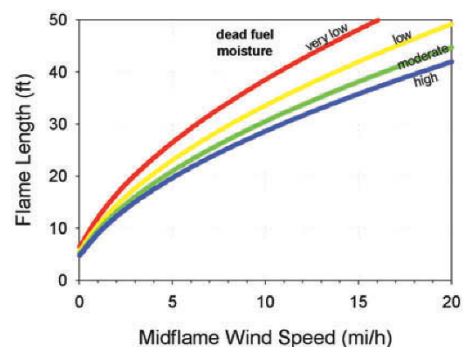
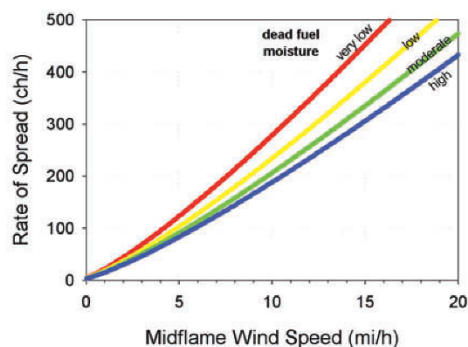
GR8 (108)

High Load, Very Coarse, Humid Climate Grass (Dynamic)



Description: The primary carrier of fire in GR8 is continuous, very coarse, humid-climate grass. Load and depth are greater than GR6. Spread rate and flame length can be extreme if grass is fully cured.

Fine fuel load (t/ac)	7.8
Characteristic SAV (ft-1)	1302
Packing ratio (dimensionless)	0.00316
Extinction moisture content (percent)	30

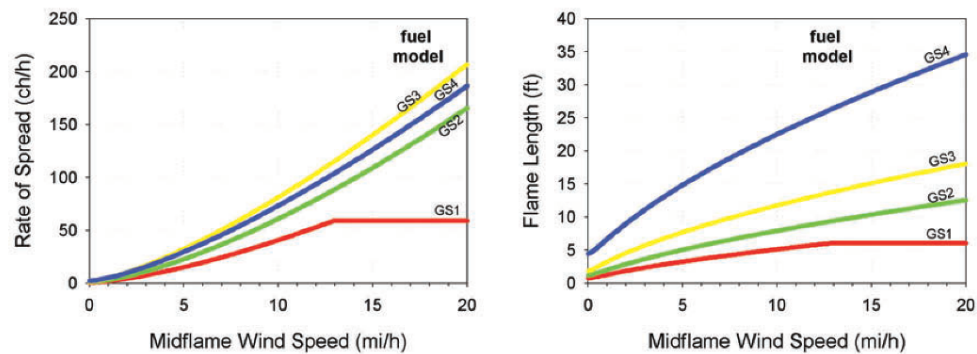


Missouri River Northeast Community Wildfire Protection Plan

Grass-Shrub Fuel Type Models (GS)

The primary carrier of fire in the GS fuel models is grass and shrubs combined; both components are important in determining fire behavior.

All GS fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong and depends on the relative amount of grass and shrub load in the fuel model.



Missouri River Northeast Community Wildfire Protection Plan

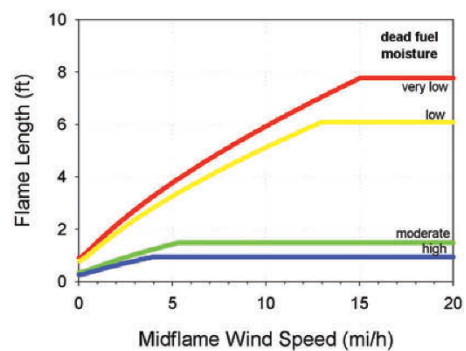
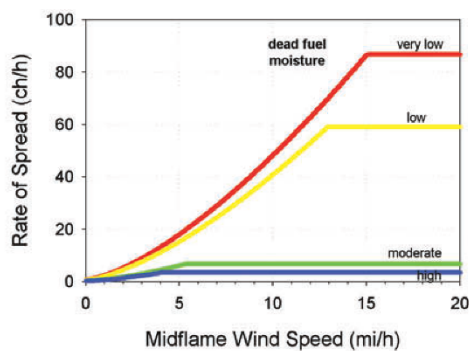
GS1 (121)

Low Load, Dry Climate Grass-Shrub (Dynamic)



Description: The primary carrier of fire in GS1 is grass and shrubs combined. Shrubs are about 1 foot high, grass load is low. Spread rate is moderate; flame length low. Moisture of extinction is low.

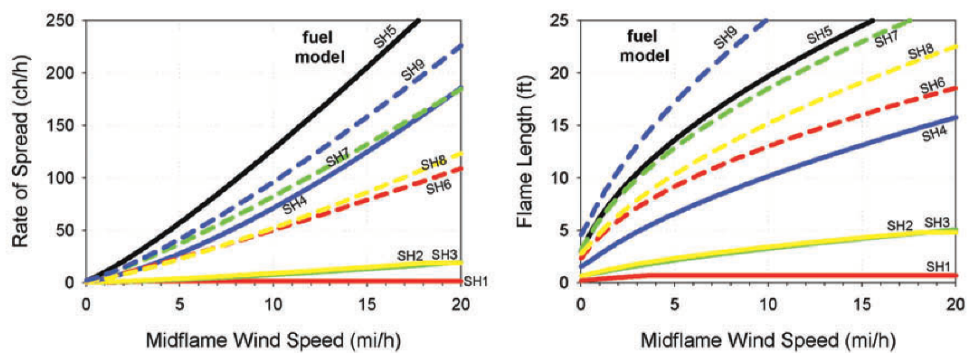
Fine fuel load (t/ac)	1.35
Characteristic SAV (ft-1)	1832
Packing ratio (dimensionless)	0.00215
Extinction moisture content (percent)	15



Missouri River Northeast Community Wildfire Protection Plan

Shrub Fuel Type Models (SH)

The primary carrier of fire in the SH fuel models is live and dead shrub twigs and foliage in combination with dead and down shrub litter. A small amount of herbaceous fuel may be present, especially in SH1 and SH9, which are dynamic models (their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content). The effect of live herbaceous moisture content on spread rate and flame length can be strong in those dynamic SH models.



Missouri River Northeast Community Wildfire Protection Plan

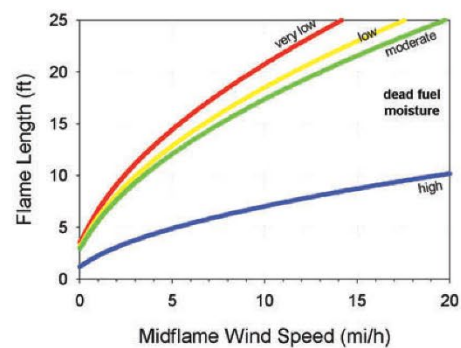
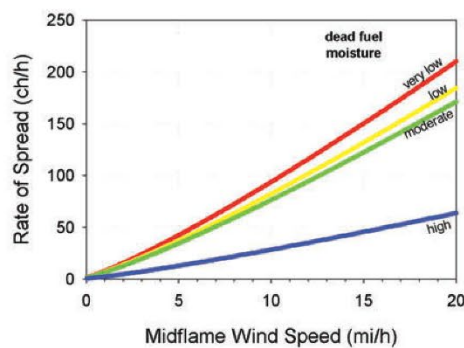
SH7 (147)

Very High Load, Dry Climate Shrub



Description: The primary carrier of fire in SH7 is woody shrubs and shrub litter. Very heavy shrub load, depth 4 to 6 feet. Spread rate lower than SH7, but flame length similar. Spread rate is high; flame length very high.

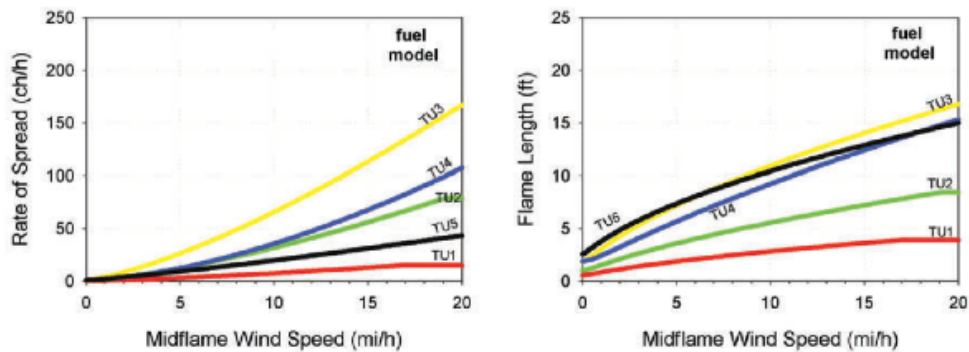
Fine fuel load (t/ac)	6.9
Characteristic SAV (ft-1)	1233
Packing ratio (dimensionless)	0.00344
Extinction moisture content (percent)	15



Missouri River Northeast Community Wildfire Protection Plan

Timber-Understory Fuel Type Models (TU)

The primary carrier of fire in the TU fuel models is forest litter in combination with herbaceous or shrub fuels. TU1 and TU3 contain live herbaceous load and are dynamic, meaning that their live herbaceous fuel load is allocated between live and dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong and depends on the relative amount of grass and shrub load in the fuel model.



Missouri River Northeast Community Wildfire Protection Plan

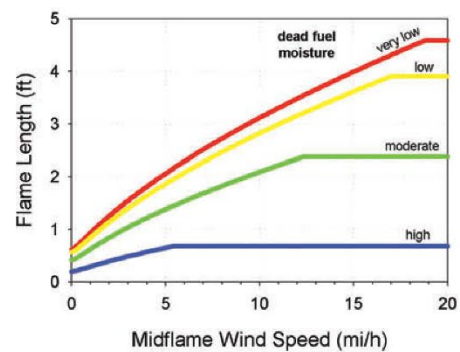
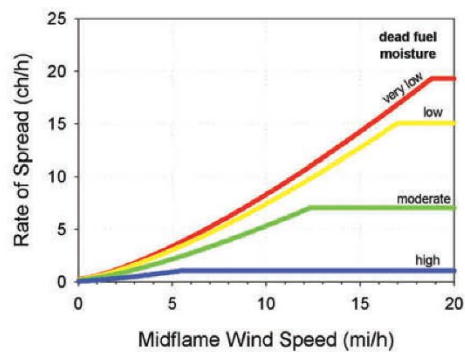
TU1 (161)

Low Load Dry Climate Timber-Grass-Shrub (Dynamic)



Description: The primary carrier of fire in TU1 is low load of grass and/or shrub with litter. Spread rate is low; flame length low.

Fine fuel load (t/ac)	1.3
Characteristic SAV (ft-1)	1606
Packing ratio (dimensionless)	0.00885
Extinction moisture content (percent)	20



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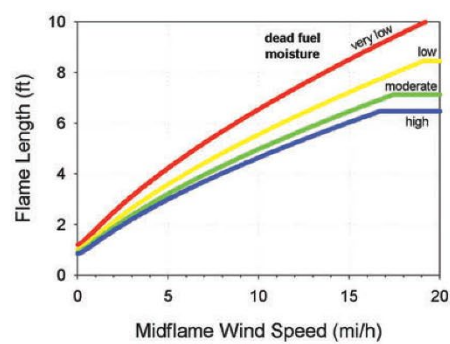
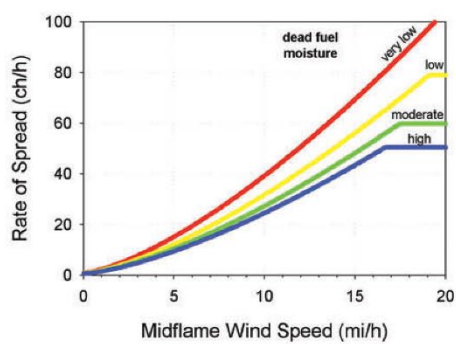
TU2 (162)

Moderate Load, Humid Climate Timber-Shrub



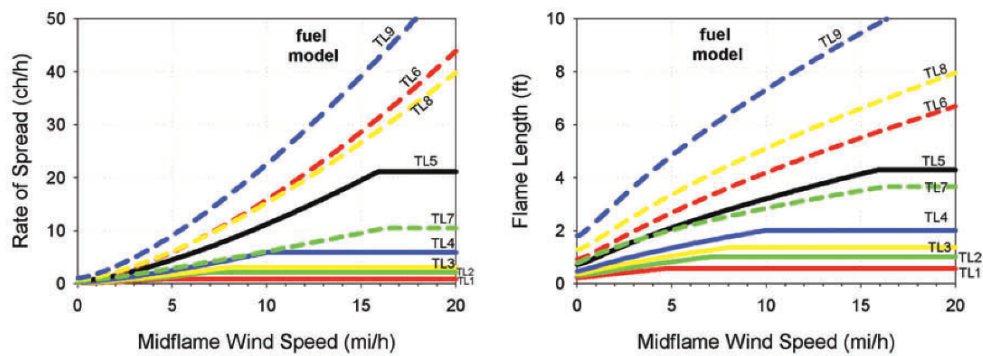
Description: The primary carrier of fire in TU2 is moderate litter load with shrub component. High extinction moisture. Spread rate is moderate; flame length low.

Fine fuel load (t/ac)	1.15
Characteristic SAV (ft-1)	1767
Packing ratio (dimensionless)	0.00603
Extinction moisture content (percent)	30



Timber Litter Fuel Type Models (TL)

The primary carrier of fire in the TL fuel models is dead and down woody fuel. Live fuel, if present, has little effect on fire behavior.



Missouri River Northeast Community Wildfire Protection Plan

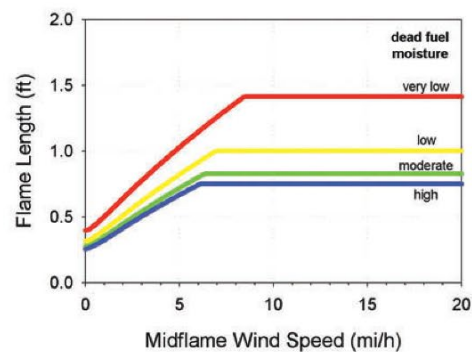
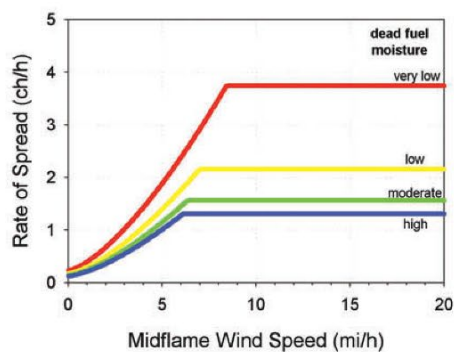
TL2 (182)

Low Load Broadleaf Litter



Description: The primary carrier of fire in TL2 is broadleaf (hardwood) litter. Low load, compact broadleaf litter. Spread rate is very low; flame length very low.

Fine fuel load (t/ac)	1.4
Characteristic SAV (ft-1)	1806
Packing ratio (dimensionless)	0.04232
Extinction moisture content (percent)	25



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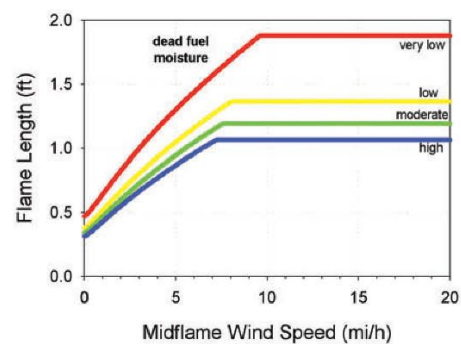
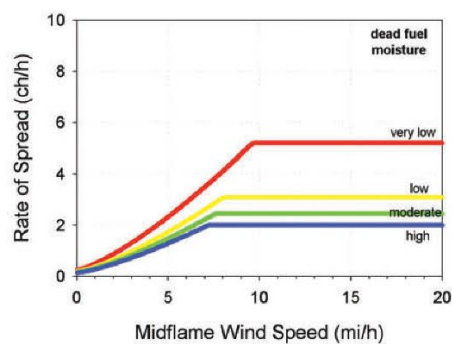
TL3 (183)

Moderate Load Conifer Litter



Description: The primary carrier of fire in TL3 is moderate load conifer litter, light load of coarse fuels. Spread rate is very low; flame length low.

Fine fuel load (t/ac)	0.50
Characteristic SAV (ft-1)	1532
Packing ratio (dimensionless)	0.02630
Extinction moisture content (percent)	20



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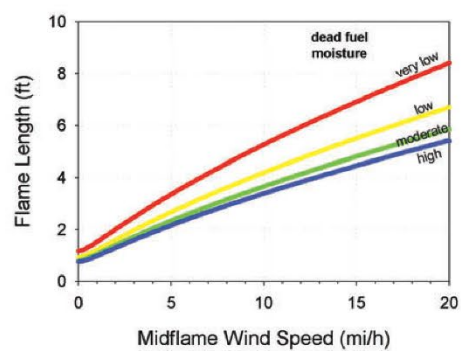
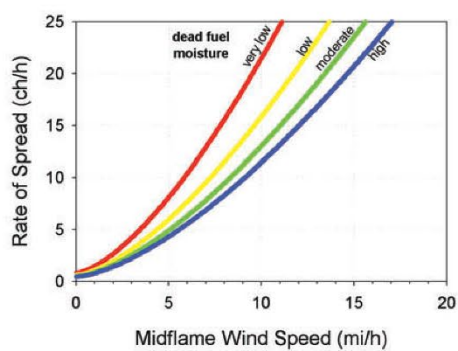
TL6 (186)

Moderate Load Broadleaf Litter



Description: The primary carrier of fire in TL6 is moderate load broadleaf litter, less compact than TL2. Spread rate is moderate; flame length low.

Fine fuel load (t/ac)	2.4
Characteristic SAV (ft-1)	1936
Packing ratio (dimensionless)	0.02296
Extinction moisture content (percent)	25



Missouri River Northeast Community Wildfire Protection Plan

Appendix F

Nebraska Mutual Aid Associations

Updated 1/19/2022

3 & 33 MA

Adams Fire, Adams Rescue, Alexandria, Ambulance Dist. 33, Barneston, Beatrice, Beatrice RFD, Blue Springs, Clatonia Fire, Clatonia Rescue, Cortland, Dewitt, Daykin, Diller, Fairbury RFD, Filley, Hallam, Homestead Nat. Mon., Jansen, Odell, Pickrell, Plymouth, Public Health Solutions, Steele City, Swanton, Western, Wilbur, Wymore Fire & Rescue, Wymore Rural Fire, Wymore EMS, Gage Co. EMA, Saline Co. EMA, Jefferson Co. EMA, Beatrice Community Hospital, Jefferson Community Health & Life

40 - 12 MA

Bloomfield, Brunswick, Creighton, Crofton, Magnet, Neligh, Niobrara, Orchard, Osmond, Page, Pierce, Plainview, Santee, Verdigre, Wausa

Big 8 MA

Bellwood, Columbus, David City, Duncan, Osceola, Rising City, Shelby, Stromsburg

Big 9 MA

Belden, Carroll, Coleridge, Concord, Crofton, Dixon, Fordyce, Hartington, Laurel, Magnet, Newcastle, Randolph, Wynot, Wausa

Boyd/Holt Counties MA

Atkinson, Bartlett, Bristow, Butte, Chambers, Ewing, Lynch, Naper, O'Neill, Page, Spencer, Stuart

Buffalo County MA

Amherst, Elm Creek, Gibbon, Kearney, Miller, Pleasanton, Ravenna, Shelton, Buffalo Co. Sheriff's Dept., Kearney Police Dept., Buffalo County EM, Good Samaritan Hospital EMS

Burt County MA

Craig, Decatur, Lyons, Oakland, Tekamah

Butler Co. MA

Abie, Bellwood, Brainerd, Bruno, David City, Dwight, Linwood, Rising City, Ulysses

Cass Co. MA

Alvo, Ashland, Avoca, Cedar Creek, Eagle, Elmwood, Greenwood, Louisville, Murdock, Murray, Nehawka, Plattsmouth, Union, Weeping Water

Central Nebraska MA

Ansley, Eddyville, Mason City, Miller, Oconto, Sumner

Central Nebraska Volunteer Fire Association MA

Alma, Amherst, Arapahoe, Axtell, Bertrand, Elm Creek, Franklin, Funk, Gibbon, Hildreth, Holdrege, Kearney, Loomis, Miller, Minden, Naponee, Orleans, Overton, Oxford, Red Cloud, Republican City, Stamford, Upland, Wilcox

Central Panhandle MA

Alliance, Banner Co., Bayard, Bridgeport, Broadwater, Dalton, Gurley, Heart of the Hills, Lisco/Garden Co., Oshkosh/Garden Co., Rackett, USFWS NP Refuge

Cherry County MA

Ainsworth, Barley RFD, Cody, Colome SD, Kilgore, Merriman, Mid-Cherry RFD, Mission SD, Mullen, St. Francis SD, Thedford, US Fish and Wildlife, US Forest Service, Valentine, White River SD, Wood Lake

Colfax County MA

Clarkson, Howells, Leigh, Schuyler

Cuming County MA

Bancroft, Beemer, Pilger, West Point, Wisner

Custer County MA

Anselmo, Ansley, Arnold, Broken Bow, Callaway, Comstock, Mason City, Merna, Oconto, Sargent

Dodge County MA

Dodge, Fremont, Fremont Rural, Hooper, Nickerson, North Bend, Scribner, Snyder, Uehling

Missouri River Northeast Community Wildfire Protection Plan

Elkhorn Valley MA

Battle Creek, Carroll, Hadar, Hoskins, Madison, Meadow Grove, Norfolk, Pierce, Stanton, Wayne, Winside

Fillmore County MA

Bruning, Exeter, Fairmont, Geneva, Grafton, McCool Junction, Milligan, Ohioa, Shickley, Sutton

Frenchman Valley MA

Bartley, Beaver Valley (Danbury & Lebanon), Benkelman, Culbertson, Curtis, Haigler, Hayes Center, Imperial, Indianola, Lamar, Maywood/Wellfleet, McCook, Palisade, Red Willow Western, Stratton, Trenton, Wallace, Wauneta

Hamilton County MA

Aurora, Giltner, Hampton, Hordville, Marquette, Phillips, Hamilton County EMS

Hastings Area MA

Ayr (Hastings RFD), Bladen, Blue Hill, Campbell, Central Community College, Edgar, Fairfield, Glenville, Harvard, Hastings, Hastings CD, Holstein, Juniata, Kenesaw, Lawrence, Hruska MARC, Roseland, Trumbull

KBR&C MA

Ainsworth, Bassett, Calamus, Johnstown, Long Pine, Newport, Raven, Springview, Wood Lake

Lancaster County MA

Alvo, Ashland, Bennet, Ceresco, Clatonia, Cortland, Crete, Douglas, Eagle, Firth, Greenwood, Hallam, Hickman, Lincoln, Malcolm, NE Air Guard, Palmyra, Pleasant Dale, Raymond, Rural Metro, Southeast RFD, Southwest RFD, Valparaiso, Waverly

Loup Platte MA

Arcadia, Ashton, Litchfield, Loup City, Ravenna, Rockville

Loup Platte #2 MA

Central City, Chapman, Clarks, Fullerton, Hordville, Marquette, Osceola, Palmer, Polk, Shelby, Silver Creek, Stromsburg

Loup Valley MA

Arcadia, Bartlett, Burwell, Elba, Ericson, Greeley, North Loup, Ord, Primrose, Scotia, Spalding, Wolbach

Mid-Nebraska MA

Albion, Belgrade, Cedar Rapids, Columbus, Columbus RFD, Creston, Duncan, Fullerton, Genoa, Humphrey, Leigh, Lindsay, Madison, Monroe, Newman Grove, Platte Center, Silver Creek, St. Edward

Mid Plains MA

Arnold, Brady, Curtis, Hershey, Maywood, Maxwell, North Platte, Stapleton, Sutherland, Tyron, Wallace, Wellfleet

Nemaha County MA

Brock FD, Brownville FD / Rescue, Johnson FD, Julian FD, Nemaha FD / Rescue, Peru FD / Rescue, Nemaha County Emergency Management, Cooper Nuclear Station, Auburn Police Dept., Nemaha County Sheriff's Office

Northeast MA

Allen, Bancroft, Concord, Dakota City, Dixon, Emerson, Homer, Martinsburg, Newcastle, Pender, Ponca, Rosalie, South Sioux City, Thurston, Wakefield, Walthill, Wayne, Winnebago

Northeast Fireman's Association

Antelope Co., Burt Co., Butler Co., Cedar Co., Colfax Co., Cuming Co., Dakota Co., Dixon Co., Dodge Co., Douglas Co., Knox Co., Madison Co., Pierce Co., Platte Co., Stanton Co., Sarpy Co., Thurston Co., Washington Co., Wayne Co., Saunders Co.

Otoe County MA

Burr, Cook, Douglas, Dunbar, Nebraska City, Otoe, Palmyra, Syracuse, Talmage, Unadilla

Phelps County MA: Bertrand, Funk, Holdrege, Holdrege RFD, Loomis

Pine Ridge MA

Alliance, Ardmore SD, Chadron, Crawford, Gordon, Harrison, Hay Springs, Hemingford, Merriman, Rushville, US Forest Service

Platte Valley MA (was GI Area MA) Alda, Cairo, Chapman, Doniphan, Grand Island, Grand Island SFD, Phillips, Wood River

Missouri River Northeast Community Wildfire Protection Plan

Quad Cities MA (includes former Franklin Co. MA)

Alma, Axtell, Bloomington, Campbell, Franklin, Hildreth, Minden, Naponee, Republican City, Riverton, Upland, Wilcox, Kearney County EMA

Richardson County MA

Dawson, Falls City, Falls City RFD, Humboldt, Rulo, Salem, Shubert, Stella, Verdon

Saline County MA

Crete, DeWitt, Dorchester, Friend, Swanton, Tobias, Western, Wilbur, Saline County Sheriff, Saline County Emergency Management

Sandhills MA

Anselmo, Arnold, Arthur, Brewster, Dunning, Halsey, Hyannis, Keystone-Lemoyne, McPherson Co., Mid-Cherry, Mullen, Purdum, Stapleton, Thedford, US Fish & Wildlife, US Forest Service

Saunders County MA

Ashland, Cedar Bluffs, Ceresco, Colon, Ithaca, Malmo, Mead, Morse Bluff, Prague, Valparaiso, Wahoo, Weston, Yutan

Scotts Bluff County MA

Banner Co., Gering/Gering Rural, Lyman/Kiowa, McGrew, Minatare-Melbeta, Mitchell, Morrill (includes former Henry VFD), Scottsbluff, Scottsbluff RFD, Western Nebraska Regional Airport Fire Dept., Torrington WY, US Fish & Wildlife Service, Scotts Bluff County Communications Center, Region 22 Emergency Management, Hemingford VFD (Box Butte Co.), Bayard VFD (Morrill Co.)

Seward County MA

Beaver Crossing, Bee, Cordova, Garland, Goehner, Milford, Pleasant Dale, Seward, Staplehurst, Tamora, Utica

South Central Nebraska MA

Brady, Cozad, Curtis, Elwood, Eustis, Farnam, Gothenburg, Johnson Lake EMS, Lexington, Overton

South Central #2 MA

Clay Center, Davenport, Edgar, Fairfield, Glenvil, Hardy, Lawrence, Nelson, Ong, Ruskin, Shickley, Superior, Sutton, Clay County EM

Southeast MA

Adams, Burchard, Cook, Du Bois, Elk Creek, Johnson, Pawnee City, Steinauer, Sterling, Summerfield (KS), Table Rock, Tecumseh

Southwest MA

Arthur, Big Springs, Blue Creek, Brule, Chappell, Elsie, Grant, Imperial, Keystone-Lemoyne, Lamar, Lisco, Madrid, Ogallala, Oshkosh, Paxton, Sutherland, Venango, Wallace

Stateline MA

Bladen, Blue Hill, Campbell, Guide Rock, Lawrence, Red Cloud, Riverton, Superior

Thayer County MA

Alexandria, Belvidere, Bruning, Byron, Carlton, Chester, Davenport, Deshler, Eustis, Gilead, Hebron, Hubbell

Tri-Mutual Aid (a.k.a. Tri-County MA)

Arlington, Bellevue, Bennington, Blair, Boys Town, Carter Lake, Cedar Bluffs, Elkhorn, Eppley Airport, Fremont, Ft. Calhoun, Gretna, Irvington, Kennard, LaVista, Louisville, Millard, Offutt AFB, Omaha FD, Papillion, Plattsmouth, Ponca Hills, Ralston, Springfield, Valley, Waterloo, Yutan

Tri-Valley MA

Arapahoe, Bartley, Beaver City, Cambridge, Edison, Holbrook, Oxford, Stamford, Wilsonville

Twin Loups MA

Ashton, Boelus, Dannebrog, Elba, Farwell, Rockville, St. Libory, St. Paul

Washington County MA

Arlington, Blair, Ft. Calhoun, Herman, Kennard

York County MA

Benedict, Bradshaw, Gresham, Henderson, McCool Junction, Waco, York

Appendix G

Fire Department Equipment and Contact Information for the Missouri River Northeast CWPP Region

This section includes Annex F from county Local Emergency Operations Plans plus additional information from the departments that responded to the CWPP questionnaire.

Due to its length, the full Appendix G appears only in the online version of this document, which may be accessed at:

<https://nfs.unl.edu/documents/CWPP/MRNECWPP.pdf>

Missouri River Northeast Community Wildfire Protection Plan

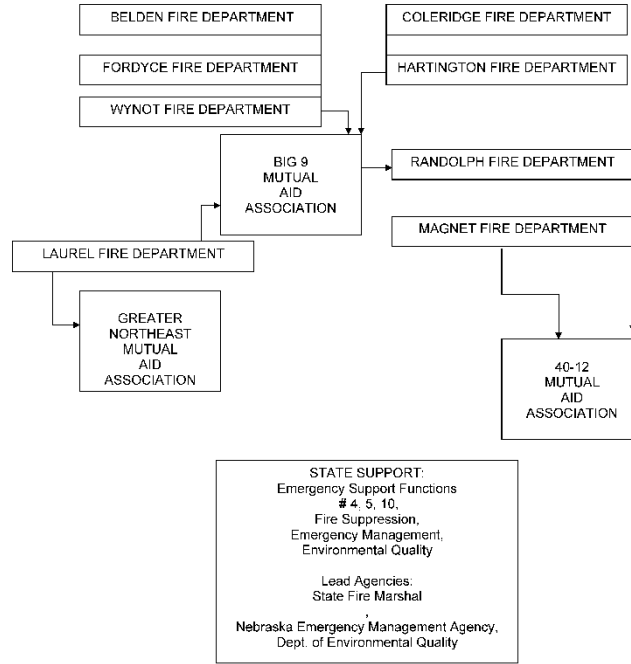
Cedar County

Information from Cedar Co. LEOP, Annex F:

CEDAR COUNTY LEOP

ANNEX F

FIRE SERVICES



F-1

2016

CEDAR COUNTY FIRE RESOURCES

(List numbers of equipment)

FIRE DEPARTMENT	PHONE	AERIAL	PUMPER	TANKER	PUMPER/TANKER	GRASSWEED TRUCK	UTILITY TRUCK	RESCUE UNITS	KINDS/TYPES/SPECIAL-TEAMS	KINDS/TYPES/SPECIAL EQUIPMENT	RADIO-LOGICAL EQUIPMENT Yes/No
BELDEN	NONE	0	1	1	0	1	1	0		Rope Rescue	NO
COLERIDGE	402-283-4218	0	2	2	0	1	2	0		Hazmat Decon Trailer	NO
FORDYCE	402-357-3565	0	1	1	0	1	1	0			NO
HARTINGTON	402-254-7209	0	2	2	0	1	1	0			NO
LAUREL	NONE	0	2	2	0	1	1	0			NO
MAGNET	NONE	0	2	0	0	0	0	0			NO
RANDOLPH	402-337-1312	0	2	2	0	1	2	0		Rope Rescue	NO
WYNOT	402-357-2401	0	1	2	0	2	1	0			NP
Norfolk HAZMAT Response Team	402-644-8700								Hazmat	Hazmat	NO
TOTALS 42		0	13	12	0	8	9	0			

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2016

CEDAR COUNTY LEOP

ANNEX F
ATTACHMENT 1

Missouri River Northeast Community Wildfire Protection Plan

Survey Responses from Cedar County Fire Departments

Belden Vol. Fire Department

Counties: Cedar

Street Address: 207 Nebraska St. **Mailing Address:** PO Box 84, Belden, NE 68717

Dept. Phone: 402-360-3714; 402-640-3719 **Dept. Email:** bvfdreports@abbnebraska.com

Chief: Jerry Gross; 402-360-3714; bvfdreports@abbnebraska.com

Ass't. Chief: Jodi (Jody) Campbell; 402-640-5636

Ass't. Chief: Gene Olrich; 402-980-7521

Sec/Treas.: Robert Patefield; 402-985-2193, 402-640-3719; bvfdreports@abbnebraska.com

Personnel

20 (18) Vol.:

MAD(s): Big 9 Mutual Aid

Other MA agreements: Wausa, Magnet, Crofton, Newcastle, Carroll, Dixon, Concord

Equipment

Engines

1 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members

1 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members

1 Type 6: Wildland: 50 GPM, 150 gal. capacity, two crew members

(Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

1 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members

Other

2 Equipment trucks

2 Other (Describe): Ambulance; Suburban carries equipment & first response vehicle; has grain rescue & road rescue equipment, water rescue equipment, jaws of life, AED, cribbing, PPE, traffic control items.

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? Yes. No, but issues 2,3,4,&6 were checked

Location1: Farmland and feedlots

Issues:

x Difficult access

x Lack of water within effective distance

x Other: Bridges that don't support enough weight

Location2: Bible camp ¼ mile north of Highways 20 & 57

Issues:

x Multiple structures

x Rough terrain

x 1 way in/out

x Lack of water within effective distance

x Other: Propane tank on property. Houses many children in summer.

Location3: Abandoned farms

Issues:

x 1 way in/out

Bridges that won't support equipment weight: Yes. Bridges in town and on county roads do not have a high enough weight limit. Some bridges are very old compared to the newer & bigger equipment.

GIS layer & contact info: No

Greatest concerns: Property damage, personal injury, water access

Rank:

1 Housing

3 Infrastructure

2 Bridge limits

4 Hydrants

5 Other water sources

Missouri River Northeast Community Wildfire Protection Plan

Comments: The age of our vehicles is high. Some have tires that are not made any more. There are railroads in our jurisdiction. All vehicles are over 30 years old.

Coleridge Volunteer Fire Dept.

Counties: Cedar

Street Address: 211 E Broadway St. **Mailing Address:** PO Box 276, Coleridge, NE 68727

Dept. Phone: 402-283-4464 **Dept. Email:** colfire@nntc.net

Chief: Jeff Hansen; 402-841-7751; zephyr@nntc.net

Ass't. Chief: George Hefner; 402-369-1285, 402-283-4333; ghefner@nntc.net

Secretary: Brady Heitman; 402-283-4464; colfire@nntc.net

Treasurer: Travis Kalin; 402-283-4464; colfire@nntc.net

Personnel

25 **Vol.:**

MAD(s): Big Nine

Equipment

Engines

2 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members

1 Type 3 Wildland: 150 GPM, 500 gal. capacity, three crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

1 T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members

Other

1 Equipment trucks

1 Other (Describe): Personnel carrier

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No

Bridges that won't support equipment weight: No

GIS layer & contact info: No

Greatest concerns: Lack of adequate water supply, lack of personnel

Rank:

1 **Other water sources**

Comments: Our equipment is housed in a fire station, not a barn.

Crofton VFD: (See listing in Knox County)

Hartington VFD: (Survey not returned)

Laurel Volunteer Fire Department

Counties: Cedar

Street/Mailing Address: (not provided)

Dept. Phone/Email: (not provided)

Chief: Craig Bathke; 402-841-5026; craigbathke72@gmail.com

Ass't. Chief: Dustin Thompson; 402-841-1331; dthompson34@hotmail.com

Treasurer: Scott Rath; 402-369-0794

Personnel

24 **Vol.:**

MAD(s): Big Nine MA and Northeast Nebraska MA

Equipment

Engines

3 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

2 T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members

Other

1 Equipment trucks

Missouri River Northeast Community Wildfire Protection Plan

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No

Location: Locations not named, but noted the following issue:

Issues:

Lack of water within effective distance

Bridges that won't support equipment weight: A few bridges aren't heavy enough for our trucks.

GIS layer & contact info: No

Greatest concerns: Don't have any

Rank:

x Other water sources

Newcastle/Maskell VFD: (Survey not returned)

Randolph VFD

Counties: Cedar, Wayne, Pierce

Street Address: 202 S. Main St. Mailing Address: PO Box 715, Randolph, NE 68771

Dept. Phone: 402-337-1312 Dept. Email: randolphfire@cableone.net

Chief: Jim Scott; 402-360-4849, 402-337-0555; james.scott@cvacoop.com

Ass't. Chief: Brent Billerbeck; 402-360-3150; brent_billerbeck@yahoo.com

Sec/Treas.: Denton Kuhl; 402-360-3915; dentonkuhl@hotmail.com

Personnel

25 Vol.:

MAD(s): Big 9 and 40/12

Equipment

Engines

1 Type 1 Structural: 1,000 GPM, ~~300~~ 1,000 gal. capacity, ~~four~~ five crew members

1 Type 2 Structural: ~~500~~ 1,250 GPM, ~~300~~ 3,000 gal. capacity, ~~3~~ 2 crew members, 'Pumper/Tanker'

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

1 T-1 (tactical): 250 GPM pump, ~~2,000~~ 2,100 gallon capacity, 2 crew members

1 T-2 (tactical): 250 GPM pump, ~~1,000~~ 2,000 gallon capacity, 2 crew members

Other

1 Equipment truck: '97 Chevy 2500 Utility, no water

2 Other: '09 Ford F550 Rescue Truck, no water; '08 Ford F550 Grass Rig, 250 gpm, 600 gal. tank

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? Yes

Location: T28N R1W, west part of Sec. 27. The CVA Coop is a large coop with fertilizer, chemical, and grain storage; just north of the junction of US Highways 20 and 81.

Issues:

x Multiple structures

x Heavy fuels

Bridges that won't support equipment weight: Yes, 558 Rd. just west of Randolph will be replaced with the current floodplain project.

GIS layer & contact info: No

Greatest concerns: Water supply

Rank:

3 Housing

4 Infrastructure

5 Bridge limits

2 Hydrants

1 Other water sources

Missouri River Northeast Community Wildfire Protection Plan

Wausa VFD: (See Knox County listing)

Wynot VFD: (Survey not returned)

Yankton Fire Department

Counties: Cedar (Nebraska) and Yankton (South Dakota)

Street Address: 201 W. 23rd St. **Mailing Address:** PO Box 176, Yankton, SD 57078

Dept. Phone: 605-668-5228 **Dept. Email:** Inickles@cityofyankton.org

Chief: (Temporary) Brad Moser; 605-668-5228; bmoser@cityofyankton.org

Deputy Chief: Larry Nickles; 605-668-5228, 605-661-2785; Inickles@cityofyankton.org

Personnel

42 **Vol.:**

1 **PT:**

2 **FT:**

MAD(s):

Other MA agreements: In Nebraska, Cedar and Knox Counties. Formal MA agreements are in progress.

Equipment

Engines

- 4 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members
- 3 Type 2 Structural: 500 GPM, ~~300~~ 1650-2000gal. capacity, three crew members, 4x4
- 2 Type 6: Wildland: 50 GPM, 150 gal. capacity, ~~two~~ 4-5 crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

- T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members
- T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members
- S-1 (support): 300 GPM pump, 4,000 gallon capacity, 1 crew member
- S-2 (support): 200 GPM pump, 2,500 gallon capacity, 1 crew member
- S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member

Other

- 1 Equipment trucks: 100' platform aerial, 2000 gpm pump
- 4 Other (Describe): 1- rescue; 2- 6x6 UTVs w/100 gal. + pumps ea.; 1- 3000 gal. tanker

Equipment housed away from main barn? Yes, we have 3 stations-2 city, 1 lake area.

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? Yes.

Location: South Dakota/Nebraska border along Lewis & Clark Lake and Missouri River.

Issues:

- x Difficult access
- x Rough terrain
- x 1 way in/out
- x Heavy fuels
- x Multiple structures-high home density, infrastructure, populated areas along and above Lewis & Clark Lake on both SD and Nebraska sides.

Bridges that won't support equipment weight: Yes. Meridian Bridge, Yankton, mainly turned into a walking bridge.

GIS layer & contact info: Yes, in South Dakota. Yankton County, City of Yankton, 605-668-5249

Greatest concerns: Structure protection and access

Rank:

- 1 **Housing**
- 2 **Infrastructure**
- 5 **Bridge limits**
- 3 **Hydrants**
- 4 **Other water sources**

Comments: Mutual aid agreements are in progress. Radio communication has improved; Nebraska channels have been added for departments along border.

Missouri River Northeast Community Wildfire Protection Plan

Dakota County

Information from Dakota Co. LEOP, Annex F:

DAKOTA COUNTY LEOP

ANNEX F

FIRE SERVICES

DAKOTA CITY FIRE DEPARTMENT

EMERSON/HUBBARD FIRE
DEPARTMENT

HOMER FIRE DEPARTMENT

SOUTH SIOUX CITY FIRE
DEPARTMENT

NORTHEAST
MUTUAL
AID
ASSOCIATION

STATE SUPPORT:
Emergency Support Functions
4, 5, 10,
Fire Suppression,
Emergency Management,
Environmental Quality

Lead Agencies:
State Fire Marshal
Nebraska Emergency Management Agency,

F-1

2015

DAKOTA COUNTY FIRE RESOURCES

(List numbers of equipment)

FIRE DEPARTMENT	PHONE	AERIAL	PUMPER	TANKER	PUMPER/ TANKER	GRASS-MOWED TRUCK	UTILITY TRUCK	RESCUE UNITS	KINDS/TYPES/ SPECIAL- TEAMS	KINDS/TYPES SPECIAL EQUIPMENT	RADIO- LOGICAL EQUIPMENT Yes / No
Dakota City	402-987-3101	0	3	4	0	0	1	3	Rope Rescue	Light Trailer Grain Rescue Jaws Boat	No
Emerson	402-695-2431	0	2	2	0	2	0	2	None	Jaws Grain Rescue	No
Homer	402-698-2342	0	2	1	0	2	1	2	Rope Rescue Trent Rescue	2 Jaws & Spreaders Grain Rescue Boat 2 UTVs	No
South Sioux City	402-494-7508	1	3	0	0	0	1	2		Grain Rescue Jaws	No
Sioux City Haz Mat	Station 7 712-279-6262 Station 8 712-279-6263										
Norfolk Haz Mat	402-644-2050										

DAKOTA COUNTY LEOP

ANNEX F
ATTACHMENT 1

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2015

Missouri River Northeast Community Wildfire Protection Plan

Survey Responses from Dakota County Fire Departments:

Allen-Waterbury Fire Department: (See listing under Dixon County)

Dakota City (Dakota-Covington) Fire Department

Counties: Dakota

Street Address: 208 S. 21st St. **Mailing Address:** PO Box 46, Dakota City, NE 68731

Dept. Phone: 402-987-3326 **Dept. Email:** dakotacityfire@aol.com

Chief: Clint Rasmussen; 402-508-6426, 402-987-3326; cerasmussen42@gmail.com

Ass't. Chief: Pat Moore; 712-898-2381, 402-987-3326; dakotacityfire@aol.com

Secretary: Bob Kratky; 712-281-3507, 402-987-3326; dakotacityfire@aol.com

Treasurer: Jim Guston; 712-253-9260, 402-987-3326; dakotacityfire@aol.com

Personnel

25 Vol.:

MAD(s): Northeast MA

Other MA agreements: Sioux City Fire & Rescue for Hazmat

Equipment

Engines

2 Type 1 Structural: 1,000 GPM, ~~300~~ 1,000 gal. capacity, ~~four~~ 5 and 2 crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

2 T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members

3 T-2 (tactical): 250 GPM pump, ~~1,000~~ 1,500 gallon capacity, 2 crew members

Other

1 Equipment trucks: Grass rig, 250 gal. 'Aare' (?) pump, 4x4, 4-door

2 Other (Describe): ATVs = grass rig

2 Road Dept. Equip. (describe): Stop signs, posted signs to slow down

Equipment housed away from main barn? Yes, Jackson fire house has 2 tankers, 1 pumper, 1 ambulance

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No, but said:

Location: There are homes along the bluffs with high density wooded areas and only one driveway

Issues:

Multiple structures

Difficult access

Rough terrain

1 way in/out

Heavy fuels

Lack of water within effective distance

Other:

Bridges that won't support equipment weight: Yes, bridge by Jackson, NE

GIS layer & contact info: No

Greatest concerns: Equipment

Rank:

4 Housing

2 Infrastructure

5 Bridge limits

1 Hydrants

3 Other water sources

Emerson VFD

Counties: Dakota, Dixon, Thurston

Street Address: 205 N Main St. **Mailing Address:** PO Box 68, Emerson, NE 68733

Chief: Richard McCabe; 712-333-6436; dmccabe@abbnebraska.com

Ass't. Chief: Marc Anderson; 402-508-5250; anders031@hotmail.com

Sec/Treas.: Dena Bartels; 712-898-7430; mdbartels4@gmail.com

Missouri River Northeast Community Wildfire Protection Plan

Personnel

32 Vol.:

MAD(s): Northeast Nebraska MA

Equipment

Engines

- 1 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members
- 1 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members
- 2 Type 5: Wildland: 50 GPM, 400 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

- 2 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members
- S-1 (support): 300 GPM pump, 4,000 gallon capacity, 1 crew member
- S-2 (support): 200 GPM pump, 2,500 gallon capacity, 1 crew member
- S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member

Equipment housed away from main barn? Yes. We have a company 3 in Hubbard Fire Hall

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No

Location: None specified, but the following issues were checked:

Issues:

- x Multiple structures
- x Difficult access
- x Rough terrain
- x 1 way in/out
- x Lack of water within effective distance

Bridges that won't support equipment weight: Yes. Currently we have one closed for the 3rd year.

GIS layer & contact info: No

Greatest concerns: What is in the path of the fire.

Rank:

- 1 **Housing**
- 2 **Infrastructure**
- 2 **Bridge limits**
- 1 **Hydrants**
- 2 **Other water sources**

Homer Vol. Fire

Counties: Dakota

Street Address: 112 John St. **Mailing Address:** PO Box 135, Homer, NE 68030

Dept. Phone: 402-698-2136

Chief: Dale Barclay; 712-899-4915; barclay.dale@yahoo.com

Ass't. Chief/Secretary: Dave Dziurawiec; 712-574-2416; dziurawiec3@gmail.com

Treasurer: Cheryl Ickler; 712-560-5031; emtickler@yahoo.com

Personnel

16 Vol.:

MAD(s): Northeast Nebraska MA (18 departments in the MA district)

Equipment

Engines

- 2 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members
- 2 Type 3 Wildland: 150 GPM, 500 gal. capacity, three crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

- 1 T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members

Other

- 1 Equipment trucks

Equipment housed away from main barn? No

Missouri River Northeast Community Wildfire Protection Plan

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No

Bridges that won't support equipment weight: No

GIS layer & contact info: No

Greatest concerns: To stop the fire before it reaches any structures.

Rank:

- 3 **Housing**
- 4 **Infrastructure**
- 5 **Bridge limits**
- 2 **Hydrants**
- 1 **Other water sources**

Ponca Volunteer Fire Department: (*See listing under Dixon County*)

South Sioux City Municipal Fire Department: (*Survey not returned*)

Missouri River Northeast Community Wildfire Protection Plan

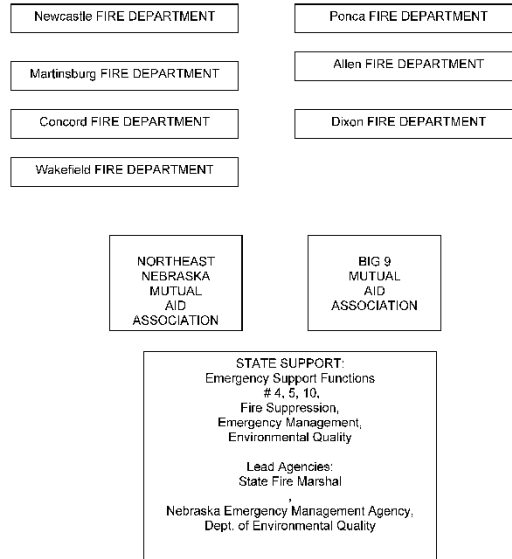
Dixon County

Information from Dixon Co. LEOP, Annex F:

DIXON COUNTY LEOP

ANNEX F

FIRE SERVICES



F-1

2018

DIXON COUNTY FIRE RESOURCES

(List numbers of equipment)

FIRE DEPARTMENT	PHONE	AERIAL	PUMPER	TANKER	PUMPER/TANKER	GRASS-WEED TRUCK	UTILITY TRUCK	RESCUE UNITS	KINDS/TYPES SPECIAL TEAMS	KINDS/TYPES SPECIAL EQUIPMENT	RADIO-LOGICAL EQUIPMENT Yes / No
Allen/Waterbury	635-2141		2	2			1	2		2 Dump Tanks	
Concord	254-6884		1	2		1				2 Dump Tanks	
Dixon	254-6884		1	2		1		2			
Emerson	695-2431		1	1		1		2			
Martinsburg	945-2025		1	2		2		1		Dump Tanks	
Newcastle	355-2370		1	2		2	1	2		Portable Cascade	
Ponca	755-2781		1	2	1	2	1	2	Rope Rescue	Cascade Rescue Boat UTV	
Wakefield	254-2574		2	2			1	2		Cascade	
Nearest HAZMAT Response Team											

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2018

DIXON COUNTY LEOP

ANNEX F
ATTACHMENT 1

Missouri River Northeast Community Wildfire Protection Plan

Survey Responses from Dixon County Fire Departments:

Allen-Waterbury Fire Dept.

Counties: Dixon, Dakota

Street Address: 2012 S Harrison **Mailing Address:** PO Box 62, Allen, NE 68710

Dept. Phone: 402-635-2141

Chief: Rodney Strivens; 402-833-8072, 402-635-2074; rod.strivens@hotmail.com

Ass't. Chief: Hank Shummer; 308-233-1227; hshumer2012@gmail.com

Secretary: Stacey Orem; 402-922-0964

Treasurer: Shelly Klug; 712-212-1579

Personnel

25 **Vol.:**

MAD(s): Dixon, Dakota, Cedar (Northeast MA)

Equipment

Engines

2 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members

3 Type 4: Wildland: 50 GPM, 750 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

1 T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members

Other

1 Equipment trucks

Other (Describe):

Road Dept. Equip. (describe):

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No

Location: Not defined, but said these issues are specific to all areas that store bales, such as the Dixon Co. Feed Yard and the dairy south of town.

Issues:

x Multiple structures

x Difficult access

x Rough terrain

x 1 way in/out

x Lack of water within effective distance

Bridges that won't support equipment weight: No

GIS layer & contact info: Yes. The fire chief has a phone app (Who's Responding) with hydrant locations

Greatest concerns: Feedyards; manpower

Rank:

1 **Housing**

1 **Infrastructure**

4 **Bridge limits**

2 **Hydrants**

3 **Other water sources**

Concord VFD

Counties: Dixon

Street/Mailing Address: 212 Lincoln St., Concord, NE 68728

Chief: Warren Hanson; 402-375-8439; warrenhanson80@gmail.com

Ass't. Chief: Scott Huetig; 402-360-0282

Sec/Treas.: Doug Olson; 402-369-0501

Personnel

17 **Vol.:**

MAD(s): Big Nine

Missouri River Northeast Community Wildfire Protection Plan

Equipment

Engines

- 1 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members
1 Type 6: Wildland: 50 GPM, 150 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

- 2 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No

Bridges that won't support equipment weight: No

GIS layer & contact info: No

Greatest concerns: (None listed)

Rank: (left this blank)

- Housing
- Infrastructure
- Bridge limits
- Hydrants
- Other water sources

Dixon Volunteer Fire & EMS

Counties: Dixon

Street Address: 105 1st St. Mailing Address: PO Box 105, Dixon, NE 68732

Dept. Phone: 402-584-2245 Dept. Email: dixonvfd@nntc.net

Chief: John "Chip" Young; 402-518-8341; dixonvfd@nntc.net

Ass't. Chief: Jeff Nelson; 402-649-1685; dixonvfd@nntc.net

Secretary: Marvin Nelson; 402-584-2380; dixonvfd@nntc.net

Treasurer: LeRoy Bathke; 402-584-2380; pbathke@nntc.net

Personnel

19 Vol.:

MAD(s): Big 9 MA and Northeast MA

Equipment

Engines

- 1 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

- 1 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members

- 1 S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member

Other

- 1 Other (Describe): Grass Rig 250 & Ambulance

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No

Bridges that won't support equipment weight: Yes, some rural bridges won't support the weight of trucks.

GIS layer & contact info: Yes, hydrants only. NDOT maintains bridge data. Kevin Garvin, 402-640-4650, dixonvfd@nntc.net

Greatest concerns: Manpower, water supply, road conditions

Rank:

- 5 Housing
- 4 Infrastructure
- 3 Bridge limits
- 1 Hydrants
- 2 Other water sources

Comments: Manpower is short, especially during the day

Emerson VFD: (See listing under Dakota County)

Missouri River Northeast Community Wildfire Protection Plan

Martinsburg Fire Dept.: (Survey not returned)

Newcastle-Maskell Fire Dept.: (Survey not returned)

Ponca Volunteer Fire Department

Counties: Dixon & Dakota

Street Address: 111 Nebraska St. **Mailing Address:** PO Box 152, Ponca, NE 68770

Dept. Phone: 402-755-2781

Chief: Brad Krohn; 712-223-3980, 402-755-4131; krohncarcare@gpcom.net

Ass't. Chief/Treasurer: Mark Cook; 402-943-7433; mcook@gpcom.net

Secretary: Jason Johan; 712-490-3733; jwjohansen@bluestemtech.com

Personnel

33 **Vol.:**

MAD(s): Northeast Nebraska MA

Equipment

Engines

2 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members

2 Type 6: Wildland: 50 GPM, 150 gal. capacity, two crew members

1 Type 7: Wildland: 10 GPM, 50 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

1 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members

1 S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member

Other

1 Equipment trucks

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? Yes

Location: River bluffs; land bordering the river

Issues:

x Difficult access

x Rough terrain

Bridges that won't support equipment weight: No

Greatest concerns: (None indicated)

Rank:

4 **Housing**

3 **Infrastructure**

5 **Bridge limits**

2 **Hydrants**

1 **Other water sources**

Wakefield Fire Dept.: (Survey not returned)

Wayne Fire Dept.

Counties: Wayne, Dixon

Street/Mailing Address: 510 Tomar Dr., Wayne, NE 68787

Dept. Phone: 402-375-3443 **Dept. Email:** firechief@cityofwayne.org

Chief: Phillip Monahan; 402-369-1712; firechief@cityofwayne.org

Ass't. Chief: Tim Reinke; 402-375-1733

Secretary: Tom Schmitz; 402-375-1733

Treasurer: Shawn Pearcy; 402-375-1733

Personnel

32 **Vol.:**

Missouri River Northeast Community Wildfire Protection Plan

MAD(s): Little Northeast, Big Northeast (these MAs are not listed in the master list)

Other MA agreements: Yes (not specified)

Equipment

Engines

3 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members

3 Type 6: Wildland: 50 GPM, 150 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

2 T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members

1 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members

Other

1 Equipment trucks

2 Other (Describe): 1 Rescue Truck; 1 Command Car

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No

Location: Not specified, but the following issue was checked

Issues:

Lack of water within effective distance

Bridges that won't support equipment weight: Yes, location not specified

GIS layer & contact info: Yes, Joel Hanson, 402-375-1733

Greatest concerns: (none indicated)

Rank:

1 **Bridge limits**

1 **Hydrants**

2 **Other water sources**

Other

About 3,000 acres of the Winnebago Reservation is located in the southeast corner of Dixon County. The following information appeared in the Winnebago Tribe of Nebraska CWPP:

Dispatch Operations Winnebago Agency Fire Personnel (Fires on the Winnebago Reservation)

The Thurston County Enforcement Services, Dispatch Center has the responsibility of dispatching initial attack forces for agency fires. The Dispatch Center determines where the fire is located and dispatches the appropriate Volunteer Fire Department and B.I.A. initial attack team. During extended or large agency fires, the B.I.A. takes over communication duties from the Dispatch Center and communication unit responsibilities are centered at the Winnebago Agency office. Agency Fire Management operates on the South Dakota State narrow banding trunked communication system.

Winnebago Volunteer Fire Department

The Winnebago Volunteer Fire Department has a 16 member roster of active firefighters. The department currently operates out of one fire station located in Winnebago community.

Dispatch Operations for Winnebago VFD

The Winnebago Volunteer Department is dispatched through the 911 center located at the Thurston County Dispatch center. When the call center receives a report of a fire they determine the location in the reservation and dispatch the appropriate fire department. All of the fire apparatus is equipped with mobile radios. Any requests for mutual aid are made through the call center which then dispatches the requested departments.

Missouri River Northeast Community Wildfire Protection Plan

Knox County

Information from Knox Co. LEOP, Annex F:

KNOX COUNTY LEOP

ANNEX F

FIRE SERVICES

BLOOMFIELD FIRE DEPARTMENT

CREIGHTON FIRE DEPARTMENT

CROFTON FIRE DEPARTMENT

NIOBRARA FIRE DEPARTMENT

SANTEE FIRE DEPARTMENT

VERDIGRE FIRE DEPARTMENT

WAUSA FIRE DEPARTMENT

40-12
MUTUAL
AID
ASSOCIATION

STATE SUPPORT:
Emergency Support Functions
4, 5, 10,
Fire Suppression,
Emergency Management,
Environmental Quality

Lead Agencies:
State Fire Marshal
Nebraska Emergency Management Agency.

F-1

2018

KNOX COUNTY FIRE RESOURCES

(List numbers of equipment)

FIRE DEPARTMENT	PHONE	AERIAL	PUMPER	TANKER	PUMPER/TANKER	GRASS-WEED TRUCK	UTILITY TRUCK	RESCUE UNITS	KINDS/TYPES/SPECIAL-TEAMS	KINDS/TYPES/SPECIAL EQUIPMENT	RADIO, LOGICAL EQUIPMENT Yes / No
Bloomfield/Lindy	911		2	2	1	4	1	2			No
Creighton	911		2	4	1	3	1	2		1 side by side; 1 crew truck	No
Crofton	911		2	2			2	1			No
Niobrara	911		2	1	1	2	1	1			No
Santee	911				1	3		2			No
Verdigre	911		2	3		3	1	2		1 Rescue Gator	No
Wausa	911		2	3		1	1	2			No
Nearest HAZMAT Response Team	Norfolk										

F-11

2018

KNOX COUNTY LEOP

ANNEX F
ATTACHMENT 1

Missouri River Northeast Community Wildfire Protection Plan

Survey Responses from Knox County Fire Departments

Bloomfield (Bloomfield/Lindy) Volunteer Fire

Counties: Knox

Street Address: 115 W Bazile **Mailing Address:** PO Box 234, Bloomfield, NE 68718

Chief: Steve True; 402-533-8888, 402-373-2673; sbtrue@gpcom.net

Ass't. Chief: Ben Lauck; 402-369-3133

Secretary: McGwire Mackeprang; 402-358-0639

Personnel

33 **Vol.:**

MAD(s): 40-12

Equipment

Engines

1 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members

2 Type 5: Wildland: 50 GPM, 400 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

1 Tanker: 250 GPM pump, 3,000 gallon capacity, 2 crew members

Other

1 Other (Describe): 4x4 wildland truck, 1,200 gal.

Equipment housed away from main barn? No

Bridges that won't support equipment weight: Yes, weight limits

Greatest concerns: (None listed)

Rank:

4 **Housing**

1 **Infrastructure**

3 **Bridge limits**

5 **Hydrants**

2 **Other water sources**

Creighton Fire Department

Counties: Knox, Antelope

Street Address: 603 Redick Ave. **Mailing Address:** PO Box 42, Creighton, NE 68729

Chief: Kevin Sonnichsen; 402-360-3795; sonnichk@hotmail.com

Ass't. Chief: Corey Horstmann; 402-841-2035

Secretary: Tyler Futchman; 402-419-3166; tylerfutchman@hotmail.com

Personnel

34 **Vol.:**

MAD(s): 40-12

Equipment

Engines

2 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members

1 Type 5: Wildland: 50 GPM, 400 gal. capacity, two crew members

2 Type 6: Wildland: 50 GPM, 150 gal. capacity, two crew members

1 Type 7: Wildland: 10 GPM, 50 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

1 T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members

2 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members

Other

1 Equipment trucks

Equipment housed away from main barn? No

Missouri River Northeast Community Wildfire Protection Plan

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? Yes

Location: N of Hwy 108 and N of Hwy 59 in Creighton Fire District

Issues:

- x Difficult access
- x Rough terrain
- x Heavy fuels
- x Lack of water within effective distance

Bridges that won't support equipment weight: Yes, low weight limits for larger trucks

GIS layer & contact info: No

Greatest concerns: Water sources, terrain

Rank:

- 3 **Housing**
- 4 **Infrastructure**
- 5 **Bridge limits**
- 2 **Hydrants**
- 1 **Other water sources**

Crofton VFD

Counties: Knox, Cedar

Street Address: 205 W Iowa St., Crofton, NE 68730

Chief: Dave Hansen; 605-660-5985; dhansen@mountmarty.edu

Ass't. Chief: Michael Guenther; 605-660-3761

Sec/Treas.: Ryan Loecker; 605-760-3428

Personnel

35 **Vol.:**

MAD(s): 40-12, Yankton

Other MA agreements: Yankton Fire, South Dakota

Equipment

Engines

- 3 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members
- 1 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members
- 1 Type 3 Wildland: 150 GPM, 500 gal. capacity, three crew members
- 1 Type 5: Wildland: 50 GPM, 400 gal. capacity, two crew members
- 1 Type 6: Wildland: 50 GPM, 150 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

- 2 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members

Other

- 1 Equipment trucks-Equipment van

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? Yes

Location: Devils Nest, lake area

Issues:

- x Multiple structures
- x Difficult access
- x Rough terrain
- x 1 way in/out
- x Heavy fuels
- x Lack of water within effective distance
- x Other: red cedars

Bridges that won't support equipment weight: Yes, 895 Road, west of Hwy 121

Missouri River Northeast Community Wildfire Protection Plan

GIS layer & contact info: No

Greatest concerns: Devils Nest & lake area, lots of red cedars

Rank:

- | | |
|---|----------------------------|
| 1 | Housing |
| 5 | Infrastructure |
| 4 | Bridge limits |
| 2 | Hydrants |
| 3 | Other water sources |

Niobrara VFD: (Survey not returned)

The Niobrara Fire Department did not respond to the survey, but the following information appears in the Santee Nation CWPP for fires located on the Santee Reservation:

Niobrara Volunteer Fire Department

The Niobrara Volunteer Fire Department has a 21 member roster of active firefighters. The department currently operates out of one fire station located in downtown Niobrara.

Dispatch Operations for Niobrara VFD

The Niobrara Volunteer Fire Department is dispatched through the 911 center located at the Knox County Dispatch center.

When the call center receives a report of a fire they determine the location in the reservation and dispatch the appropriate fire department. All of the fire apparatus is equipped with mobile radios. Any requests for mutual aid are made through the call center which then dispatches the requested departments.

Orchard Fire & Rescue

Counties: Holt, Antelope, Knox

Street Address: 240 Windom; **Mailing Address:** PO Box 141, Orchard, NE 68764

Chief: Duane Risinger; 402-893-4355, 402-893-2085

Ass't. Chief: Kyle Maxwell

Secretary: Irene Risinger; 402-893-4355, 402-750-0023

Treasurer: Kathy Belik; 402-929-0707

Personnel

32 **Vol.:** Firefighters/EMTs

MAD(s): 40-12

Other MA agreements: Bloomfield, Brunswick, Creighton, Crofton, Hartington, Magnet, Neligh, Niobrara, Orchard, Osmond, Plainview, Pierce, Randolph, Royal, Santee, Verdigre, Wausa, Page

Equipment

Engines

1 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members

1 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members

1 Type 5: Wildland: 50 GPM, 400 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

1 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members

Other

1 Equipment trucks: Jaws equipment

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? Yes

Location1: Grove Lake Wildlife area. 1-2 miles north of Royal, east side of road.

Issues:

Multiple structures

Difficult access

Rough terrain

1 way in/out

Heavy fuels

Lack of water within effective distance

Missouri River Northeast Community Wildfire Protection Plan

Location2: Royal Hub CVA. 3 miles east of Orchard.

Issues:

- Multiple structures
- 1 way in/out
- Heavy fuels
- Lack of water within effective distance

Greatest concerns: Towns of Orchard and Royal

Rank:

- 1 **Housing**
- 2 **Infrastructure**
- 5 **Bridge limits**
- 3 **Hydrants**
- 4 **Other water sources**

Santee VFD: (Survey not returned)

The Santee Fire Department did not respond to the survey, but the following information appears in the Santee Nation CWPP:

Dispatch Operations Winnebago Agency Fire Personnel (Santee Reservation fires)

The Knox County Enforcement Services, Dispatch Center has the responsibility of dispatching initial attack forces for agency fires. The Dispatch Center determines where the fire is located and dispatches the appropriate Volunteer Fire Department and B.I.A. initial attack team. During extended or large agency fires, the B.I.A. takes over communication duties from the Dispatch Center and communication unit responsibilities are centered at the Winnebago Agency office. Agency Fire Management operates on the South Dakota State narrow banding trunked communication system.

Santee Volunteer Fire Department

The Santee Volunteer Fire Department has a 6 member roster of active firefighters. The department currently operates out of one fire station located in Santee community.

Dispatch Operations for Santee VFD

The Santee Volunteer Department is dispatched through the 911 center located at the Knox County Dispatch center.

When the call center receives a report of a fire they determine the location in the reservation and dispatch the appropriate fire department. All of the fire apparatus is equipped with mobile radios. Any requests for mutual aid are made through the call center which then dispatches the requested departments.

Verdigre Fire

Counties: Knox

Street Address: 106 3rd Ave. **Mailing Address:** PO Box 155, Verdigre, NE 68783

Dept. Phone: 402-668-2824 **Dept. Email:** verdigrefiredpt@gmail.com

Chief: Jeff Bartling; 402-394-5906; jbart.66chief@gmail.com

Ass't. Chief: Rick Horstmann; 402-358-1501

Secretary: Cole Kopejtka; 402-394-1442; ckopejtka2016@gmail.com

Treasurer: Virgil Miller; 402-394-7054

Personnel

28 **Vol.:**

MAD(s): 40-12

Other MA agreements: Lynch and Springfield, South Dakota

Equipment

(No info provided)

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? Yes

Location: West hillside of the Village of Verdigre

Issues:

- x Multiple structures
- x Difficult access

Missouri River Northeast Community Wildfire Protection Plan

- x Rough terrain
- x 1 way in/out
- x Heavy fuels

Bridges that won't support equipment weight: Yes. 885 Rd. (Hwy. 14) is due to be replaced within the next 2 years.

GIS layer & contact info: No

Greatest concerns: Getting it stopped with the least amount of damage

Rank:

- 2 **Housing**
- 1 **Infrastructure**
- 3 **Bridge limits**
- 4 **Hydrants**
- 4 **Other water sources**

Wausa Volunteer Fire Department

Counties: Knox, Cedar, Pierce

Street Address: 405 E Broadway **Mailing Address:** PO Box 167, Wausa, NE 68786

Dept. Phone: 402-586-2722 **Dept. Email:** wausafiredepartment@gmail.com

Chief: Brian Wakeley; 402-841-6205, 402-586-2282; brianwakeley@icloud.com

Battalion Chief: Rich Hoppe; 402-841-9218, 402-586-2282

Sec/Treas.: Amy Johnson; 402-860-5342

Personnel

31 **Vol.:**

MAD(s): 40-12 and Big 9

Equipment

Engines

- 1 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members
- 1 Type 6: Wildland: 50 GPM, 150 gal. capacity, two crew members

Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)

- 1 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members
- 1 S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member

Other

- 1 Equipment trucks

Equipment housed away from main barn? No

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No

Bridges that won't support equipment weight: Possibility of bridges on certain gravel or minimum maintenance roads

GIS layer & contact info: No

Greatest concerns: Having enough manpower and equipment

Rank:

- 2 **Housing**
- 4 **Infrastructure**
- 4 **Bridge limits**
- 3 **Hydrants**
- 3 **Other water sources**

Appendix H: Fire Department Survey and Distribution List

Fire Department Survey

Distributed 11/2/2021 to all departments all or partly in the CWPP Region

Nebraska Fire Department Survey

Contact Information:

Department Name	County(s)
Street Address	Mailing Address
Dept. Phone	Dept. Email
Chief Name:	Best Phone
Email:	Alt. Phone
Assistant Chief Name:	Best Phone
Email:	Alt. Phone
Secretary Name:	Best Phone
Email:	Alt. Phone
Treasurer Name:	Best Phone
Email:	Alt. Phone

Personnel:

Number	Type
	Volunteer
	Part-time
	Full-time

What Mutual Aid District(s) is your department in? _____

If you have mutual aid agreements outside of formal MA districts please name the departments:

Missouri River Northeast Community Wildfire Protection Plan

Equipment:

Engines		
(Fill in number of each type of equipment below)		
Number	Type	Description
	Type 1	Structural: 1,000 GPM, 300 gal. capacity, four crew members
	Type 2	Structural: 500 GPM, 300 gal. capacity, three crew members
	Type 3	Wildland: 150 GPM, 500 gal. capacity, three crew members
	Type 4	Wildland: 50 GPM, 750 gal. capacity, two crew members
	Type 5	Wildland: 50 GPM, 400 gal. capacity, two crew members
	Type 6	Wildland: 50 GPM, 150 gal. capacity, two crew members
	Type 7	Wildland: 10 GPM, 50 gal. capacity, two crew members
Tenders (see below) Definition: Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive		
Number	Type	Description
	T-1 (tactical)	250 GPM pump, 2,000 gallon capacity, 2 crew members
	T-2 (tactical)	250 GPM pump, 1,000 gallon capacity, 2 crew members
	S-1 (support)	300 GPM pump, 4,000 gallon capacity, 1 crew member
	S-2 (support)	200 GPM pump, 2,500 gallon capacity, 1 crew member
	S-3 (support)	200 GPM pump, 1,000 gallon capacity, 1 crew member
Other		
Number	Type	
	Equipment trucks	
	Other (Describe):	
	Road Dept. Equipment (describe)	
Yes/No (Circle)	Is any equipment housed away from the main fire barn?	Describe:

Missouri River Northeast Community Wildfire Protection Plan

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? ☐ Yes ☐ No

If yes, please describe where and why:

Township _____ Range _____ Section _____ Local Name: _____

Location Description:

Issues (check all that apply):

- ☐ Multiple Structures
- ☐ Difficult Access
- ☐ Rough Terrain
- ☐ One way in and out
- ☐ Heavy fuels
- ☐ Lack of water within effective distance
- ☐ Other (specify): _____

Additional areas:

Township _____ Range _____ Section _____ Local Name: _____

Location Description:

Issues (check all that apply):

- ☐ Multiple Structures
- ☐ Difficult Access
- ☐ Rough Terrain
- ☐ One way in and out
- ☐ Heavy fuels
- ☐ Lack of water within effective distance
- ☐ Other (specify): _____

Missouri River Northeast Community Wildfire Protection Plan

Are there bridges in your jurisdiction that won't support equipment weight?

☐ Yes ☐ No

If yes, please describe:

Are there other areas in your jurisdiction with high home density, infrastructure or other resources at high risk, or populated areas with one way in/out? ☐ Yes ☐ No

If yes, please describe:

What are your greatest concerns if a wildfire were to start in or enter your jurisdiction?

Does your jurisdiction have GIS layer(s) that show housing, infrastructure, bridge limits, hydrants and other water sources (other than the county assessor's GIS information)? ☐ Yes ☐ No

If yes, please provide contact information:

Name: _____

Phone: _____ Email: _____

Which of these is of greatest concern in your jurisdiction?
(Please rank 1 to 5 with 1 being most important)

- _____ Housing
- _____ Infrastructure
- _____ Bridge limits
- _____ Hydrants
- _____ Other water sources

Is there anything else you think we should know? _____

Thank you for providing this information.

Please email a scan of the completed form to sbenenson4@unl.edu or mail a hard copy to:

Nebraska Forest Service (Attn: Sandy Benson)
PO Box 830815
Lincoln, NE 68583-0815

Fire Department Survey Distribution List

Fire Departments

Allen-Waterbury
Belden
Bloomfield/Lindy
Coleridge
Concord
Creighton
Crofton
Dakota-Covington (Dakota City)
Dixon
Emerson
Hartington/Fordyce
Homer
Laurel
Martinsburg
Newcastle-Maskell
Niobrara
Orchard
Ponca
Randolph
Santee
South Sioux City
Verdigre
Wakefield
Wausa
Wayne
Wynot
Yankton

Information also provided by:

Bureau of Indian Affairs, Santee Nation and Winnebago Tribe of Nebraska CWPPs
and
National Park Service, Missouri National Recreation River staff

Appendix I

Public Engagement

This section includes steering committee members, outreach documents, media releases, and stakeholders list

Steering Committee

Name	Title/Affiliation
Alvares, Marisa	NEMA Emergency Management Planning Specialist
Bergstrom, Pam	Northeast Area Forester, Upper Elkhorn NRD
Fiedler, Scott	Lewis and Clark NRD
Fields, Jeff	NGPC Parks Division-NE Pod
Filo, Linda	USACE Biological Science Technician
Garvin, Kevin	Cedar County Emergency Mgmt. Director
Hagberg, Deanna	Dakota County Emergency Mgmt. Director
Hindt, Lexy	NEMA Deputy State Hazard Mitigation Officer
Hintz, Laura	Knox County Emergency Mgmt. Director
Jacobsen, Stephanie	Lewis and Clark NRD
Jessen, Rebekah	NRCS District Conservationist
Julesgard, Terry	Manager, LNNRD
Lammers, Myles	Water Resource Coordinator, LCNRD
Larkin, Leo	NEMA Program Specialist
McCauley, Jason	NRCS Resource Conservationist
Negus, Lucas	NGPC Wildlife Division Pub. Lands-NE District
Podany, Drew	NPS Chief Ranger, Missouri National Rec. River
Reisen, Dave	State Training/Exercise Officer/NEMA
Schumacher, Terry	Land & Water Programs Coordinator, PMRNRD
Scollard, Shea	Dixon County Emergency Mgmt. Director
Smith, Jorden	NFS Papio Missouri River Forester
Stewart, Todd	Natural Resources Technician, LENRD
Thomason, Carmen	BLM Fire Mitigation Spec.
Traversie, Duwayne	BIA Fuels Specialist
Wessel, Scott	NGPC Wildlife Division Pvt. Lands-NE District
Wienk, Cody	NPS MWR Fire Ecologist
Wood, Chris	NFS Forester
Benson, Sandy	CWPP Coordinator/Nebraska Forest Service

Missouri River Northeast Community Wildfire Protection Plan

Outreach Documents

This document was shared with county boards and emergency managers October 7, 2021

Updating Your Community Wildfire Protection Plan

The Missouri River Northeast Community Wildfire Protection Plan (CWPP) was originally prepared in 2015, covering Cedar, Dakota, Dixon, and Knox Counties. The Nebraska Forest Service (NFS) is launching an update for this plan to ensure that it remains a useful tool for protecting communities during wildfire situations. Over the next several months, planners will review the 2015 plan, update outdated information, add any new topics that have emerged, and delete material that is no longer pertinent.

Your CWPP is part of a statewide network of CWPPs that work in conjunction with your Local Emergency Operations Plan and Hazard Mitigation Plan to help obtain funding for wildfire mitigation, maximize safety, bolster communications between local and state resources, and help communities understand the evolving role fire plays in Nebraska's landscape. Landowners in counties that have a CWPP in place are eligible to apply for a fuels reduction cost-share program that helps defray the costs of protecting structures and emergency access routes from wildfire.

We invite you to designate an individual to participate on the steering committee to help with the update to ensure that pertinent changes are included in the plan and that local issues remain front and center. Most counties have designated emergency management staff to do this. Due to the large size of the planning region and everyone's busy schedules, no travel will be required, and we estimate a maximum of four hours of committee members' time will be needed over the course of the entire planning process, which should take about six months. Committee work is designed to occur via email and telephone. County boards will be invited to review the draft update and adopt it when it is finalized.

It is important that local officials are aware of the update process and we welcome your county's participation. There is **no cost** to your county for this.

If you have questions, please contact Sandy Benson at 402-684-2290 or sbenson4@unl.edu.

Missouri River Northeast Community Wildfire Protection Plan

Media Releases

Print Media and Radio

A public invitation to participate was sent via news release to local newspapers and radio stations November 19, 2021:

Community Wildfire Protection Plan update underway

Local counties, emergency managers, fire departments, and others who deal with wildfire are working with the Nebraska Forest Service to update the Community Wildfire Protection Plan (CWPP) adopted in 2015 for the Missouri River Northeast region of Nebraska. This document is a wildfire-specific resource that coordinates with area emergency and hazard mitigation plans.

Landowners and others in counties with a CWPP in place can apply for federal and state cost-share funds for local woody fuels reduction and other hazard mitigation efforts within the CWPP region. There is no cost to counties.

The plan is part of a statewide CWPP network. It assists communities in gathering resources, evaluating wildfire risk, and identifying strategies and mitigation actions to reduce overall vulnerability to wildfire events. This CWPP encompasses the entirety of Cedar, Dakota, Dixon, and Knox Counties and the fire districts located within them.

Over the next several months, planners will review the 2015 plan, update outdated information, add any new topics that have emerged, and delete material that is no longer pertinent.

Community participation is welcome throughout the update process. Everyone who works with land management, fire, and community preparedness—particularly counties, local fire districts, natural resources agencies, as well as the general public—is encouraged to provide input on wildfire concerns.

The 2015 CWPP can be viewed or downloaded at https://nfs.unl.edu/documents/CWPP/MRNE_CWPP_Final2.pdf. For further information or to provide comments, email sbenson4@unl.edu or call 402-684-2290.

* * *

Follow-up News Releases

Media releases for draft review and publication of final plan were distributed in the spring and summer of 2022.

Online Outreach

Information about the CWPP update process was placed on the Nebraska Forest Service website's CWPP page:

<https://nfs.unl.edu/community-wildfire-protection-plan> and the Nebraska CWPP Facebook page:

<https://www.facebook.com/groups/451134565293952/> on November 2, 2021. During the planning process, links to periodic updates and the draft and final documents were also posted to these locations.

Stakeholders List

County boards, emergency management, and municipalities in: Cedar, Dakota, Dixon, and Knox Counties

Fire Departments: See Appendix G

Natural Resources Districts: Lewis and Clark, Lower Elkhorn, Lower Niobrara, Papio-Missouri River

State Agencies: Nebraska Forest Service, Nebraska Game and Parks Commission, Nebraska State Fire Marshal's Office, Board of Educational Lands and Funds, Nebraska Emergency Management Agency

Federal Agencies: Natural Resources Conservation Service, National Park Service, US Army Corps of Engineers, Bureau of Indian Affairs, Bureau of Land Management

Tribal Entities: Santee Sioux Nation, Winnebago Tribe of Nebraska

Non-Government Conservation Organizations: The Nature Conservancy, Pheasants/Quail Forever

Prescribed Fire Associations: Northeast Nebraska PBA, Lower Niobrara PBA

Interested Individuals

Appendix J

- Wildland Urban Interface Mitigation Strategies
- Structural Ignitability Reduction Practices
- Firewise® Landscaping
- Nebraska Fire-Resistant Plant List

Missouri River Northeast Community Wildfire Protection Plan

Wildland Urban Interface Mitigation Strategies and Structural Ignitability Reduction Practices

- 1) Develop a program to increase awareness of Firewise® standards for community defensibility and designate, for firefighter safety, which homes and/or parts of communities are not defensible
- 2) Introduce and expand the understanding of the “Home Ignition Zone” and emphasize how survivability depends on maintenance necessary to reduce and manage home ignition potential
- 3) Create guidelines for developers and property owners who intend to construct roads, driveways and dwellings to provide the following:
 - a. Name, address, and GPS location for each road, driveway, and building site
 - b. Fuel treatment standards for the areas between building sites
 - c. Evidence that Firewise® building standards and defensible space information has been provided to every lot and homebuyer or develop Firewise® based requirements for new building construction standards
 - d. Road construction and maintenance standards that accommodate emergency equipment
 - e. Require at least two access routes for developed areas and subdivisions
 - f. Designate locations for maintained safety zones and water facilities
- 4) Subdivision residents can work together to improve defensibility of their whole subdivision; this could include connecting home site defensible space areas and/or fuel hazard reduction and thinning 150 to 200 feet from buildings
- 5) Develop accurate maps for subdivisions and access roads
- 6) Treat fuels along strategic roads
- 7) Long driveways in wooded areas should be graveled and provided with terminus turnaround that has at least a 45-foot radius or a pull-in and pull-out facility
- 8) Mark driveways without turnaround or with steep slopes with a sign indicating limitations
- 9) Mark safety zones and helispots where fuel continuity is dense and zones are not obvious
- 10) Develop and implement a standard for signing roads and addressing and marking homes for more efficient emergency access

Web Sources: Wildfire Preparedness

FEMA: Local Mitigation Planning: <https://www.fema.gov/local-mitigation-planning-resources>

Fire-Adapted Communities®: <http://www.fireadapted.org/>

Firewise® Communities: <http://www.firewise.org/>

Firewise Guide to Landscaping and Construction: <https://www.nfpa.org/-/media/Files/Firewise/Brochures-and-Guides/FirewiseGuideToLandscapeandConstruction.ashx>

Nebraska Forest Service Wildland Fire Protection Program: <https://nfs.unl.edu/fires-nebraska>

Nebraska Wildfire Risk Explorer: <https://nebraskawildfirerisk.com/>

Ready, Set, Go! <http://www.wildlandfirersg.org/>

USFS Wildfire Risk to Communities interactive website: <https://wildfirerisk.org/>

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Firewise® Landscaping and Nebraska Fire-Resistant Plant List

Firewise® Landscapes

Homeowners value landscapes for the natural beauty, privacy, shade and recreation they offer and frequently select properties that include or are near woodlands or other natural areas to visually expand the landscape. One of the risks of properties adjoined to natural areas, however, is that they can be more vulnerable to wildfires.

Creating Defensible Space

In fire-prone areas, property owners can take measures to minimize the risk of wildfire damage by creating a “defensible space” around the home or other buildings. Some of the ways to create more Firewise® landscapes include:

- Planting lower-growing plants or groundcovers near the home to form low, dense mats with strong root systems
- Avoiding the use of tall grasses close to buildings since they can ignite easily and burn rapidly
- Mulching with rocks, gravel or other hardscaping around the foundation instead of bark, pine needles or other flammable mulches
- Paving patio areas and creating raised beds to create firebreaks
- Planting low-growing succulent shrubs rather than taller, resinous evergreen shrubs
- Spacing trees so that tree crowns are 10 feet from each other
- Pruning dead limbs
- Removing dried annuals or perennials
- Raking leaves and litter as they build up
- Placing screens beneath decks to keep leaves or woody debris from collecting underneath
- Keeping wood piles at least 30 feet away from the house
- Providing open access for firefighting equipment that is not limited by fences, trees, or other obstructions
- Keeping propane tanks a good distance from buildings, and taking care when refueling garden equipment
- Using non-flammable outdoor furniture

Selecting Firewise Plant Materials

No plant species is entirely fireproof. Virtually any vegetation can fuel a fire, but some species are more resistant than others. The following information can help property owners select more fire-resistant plant materials, but where they are planted and how they are cared for can be just as important as the plants themselves.

- Planting a variety of sizes and species of plants in small, irregular clusters creates a better barrier than large masses of a single species
- Groundcovers or other plants that grow close to the ground offer less fuel
- Conifers or other plants are high in very flammable resin, so it’s best to keep them thinned and pruned—especially close to the ground
- Conifers with thick bark and long needles are more able to withstand fire
- Salt-tolerant plants tend to be somewhat more fire-resistant
- Deciduous plants have higher moisture content, are less flammable and, when dormant, offer less fuel
- Drought-tolerant plants tend to be more fire-resistant as they are likely to contain lots of moisture (succulents) or to shed leaves or needles during extreme drought
- Plants with open, loose branches and minimal vegetation (such as currant and mountain mahogany) are less of a hazard, as are plants that grow slowly and need little pruning
- Plants, like aspen, that can resprout following a fire will more quickly rejuvenate a landscape

Using Native Prairie Plants

In Nebraska it is often the case that a “Firewise” landscape should also be a “waterwise” landscape where drought-tolerant plants are an important part of the mix. Obviously our native plants have evolved to grow under natural moisture conditions and many of them are suitable for both a “waterwise” and a “Firewise” landscape. Just a little water here and there can go a long way to keeping such plants green and viable. Another important aspect of using native plants is that they play a vitally important role in supporting biodiversity and all the benefits derived from it. We strongly recommend that native plants be utilized within any landscape, including the Firewise landscape. The trick is to use them appropriately, especially near the home.

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Although native prairie grasses and forbs make a lot of sense in a “waterwise” landscape, they can also be highly combustible when they are brown and dry. For a Firewise landscape, prairie plants, especially taller grasses, should be used sparingly and judiciously within the 30 foot “Lean, Clean and Green Zone” nearest the home. A few scattered here and there for ornamental affect are fine, but they should not be massed tightly close to the home. A prairie meadow or thick border planting should be reserved for those areas farther away from important structures.

Lawn and Groundcover

One of the best ways to defend a structure against wildfire is to maintain a closely-cropped green zone near the home. This typically means the maintenance of a green lawn, but turf grass is not the only choice. Cool-season lawn grasses such as Kentucky bluegrass and tall fescue are good choices, although they can require significant amounts of supplemental irrigation to keep green in dry weather. For sunny areas, a good alternative is buffalo grass, which requires much less moisture than other lawn grasses. Our native blue grama can also be used as a turf alternative, however it will need to be mowed higher – at 8-10” while green and then mowed short when dormant. Recent years has brought the advent of many sedge species as lawn alternatives especially for more shady zones.

Groundcovers don’t need to be grasses or grass-like plants requiring mowing. There are several species of “Firewise” groundcover perennials that make sense including such things as vinca, bergenia, hosta, bugleweed, geranium, sedum, primrose, pussytoes, snow in summer, Virginia creeper, wild strawberry and yarrow.

Introduced Perennials and Ornamental Grasses

As with native plants, there are many great non-native species that can be used in a “Firewise” landscape that is also “waterwise.” The trick is to place them appropriately and cut them back (clean them up) when they die back late in the season. Some of our favorites include sedum, geranium, coral bells, daylily, lambs ear, feather reed grass, Korean reed grass, and fountain grass.

Trees and Shrubs

Although nearly any tree or shrub could burn in a severe fire, it is the highly volatile evergreen species including pine, spruce, fir, juniper, and cedar that pose the most risk when growing near homes or other structures. Within the area nearest the home (30-foot interior zone) it is advisable to exclude volatile evergreens entirely. However, because deciduous trees are so important at casting shade and cooling the home and its surroundings, and because they are not nearly as prone to burning, they can be utilized relatively close to the home. Keep in mind that any branches directly overhanging the roof should be removed. Some of the best deciduous trees for planting near homes include our tough native species including hackberry, bur oak, coffeetree, and honeylocust.

Most deciduous shrubs are acceptable for use in a Firewise landscape. Nearest the home, the shrubs should be kept lower than 30 inches and they should not be massed in tight groupings. Beyond the 30-foot interior zone, the shrubs can be taller and more tightly spaced, however grouping should still be kept relatively small until at least 50 feet from the home. Native species will do the most for biodiversity. Species to consider include mountain mahogany, rabbit brush, sumac, serviceberry, currant, snowberry, gooseberry, plum, and chokecherry.

Firewise Plants for Nebraska

Perennials & Groundcovers

Artemisia
Bergenia
Blanket flower, *Gaillardia*
Bugleweed, *Ajuga*
Candytuft, *Iberis*
Catmint, *Nepeta*
Coneflowers, *Rudbeckia*
Columbine, *Aquilegia*
Coral bells, *Heuchera*
Coreopsis
Daylily, *Hemerocallis*
Flax, *Linum*
Geranium
Hens and chicks, *Sempervivum*
Iris
Lambs ear, *Stachys*
Penstemon
Pinks, *Dianthus*
Primrose, *Oenothera*
Pussytoes, *Antennaria*
Sage, *Salvia*
Sedum
Snow-in-summer, *Cerastium*
Violets, *Viola*
Virginia creeper, *Parthenocissus*
Wild ginger, *Asarum*
Wild strawberry, *Fragaria*
Yarrow, *Achillea*

Shrubs

Buffaloberry, *Shepherdia*
Cherry and plum, *Prunus*
Cinquefoil, *Potentilla*
Coralberry, snowberry, *Symphoricarpos*
Cotoneaster
Currant and gooseberry, *Ribes*
Dogwood, *Cornus*
Lilac, *Syringa*
Mahonia
Mock orange, *Philadelphus*
Mountain mahogany, *Cercocarpus*
Ninebark, *Physocarpus*
Rose, *Rosa*
Sumac, *Rhus*

Trees

Aspen, cottonwood and poplar, *Populus*
Birch, *Betula*
Black cherry, *Prunus*
Boxelder, *Acer*
Bur, Gambel, Chinkapin oak, *Quercus*
Hackberry, *Celtis*
Maple and boxelder, *Acer*
Ohio buckeye, *Aesculus*
Willow, *Salix*

Appendix K: Emergency Assistance for Wildfire Control

Link to the Nebraska Forest Service “Yellow Book” Emergency Assistance for Wildfire Control

<https://nfs.unl.edu/documents/Yellowbook.pdf>

This reference is a ‘must have’ for Nebraska’s emergency responders. It contains:

- Contact information for state, federal and private agencies that have emergency suppression resources or can provide technical expertise in the suppression of wildfires
- Aerial Applicator and Foam Retardant Directory
- Deployment procedures and forms you will need to follow to order a Single Engine Air Tanker (SEAT)
- Map of cooperating aerial applicators and SEAT base locations