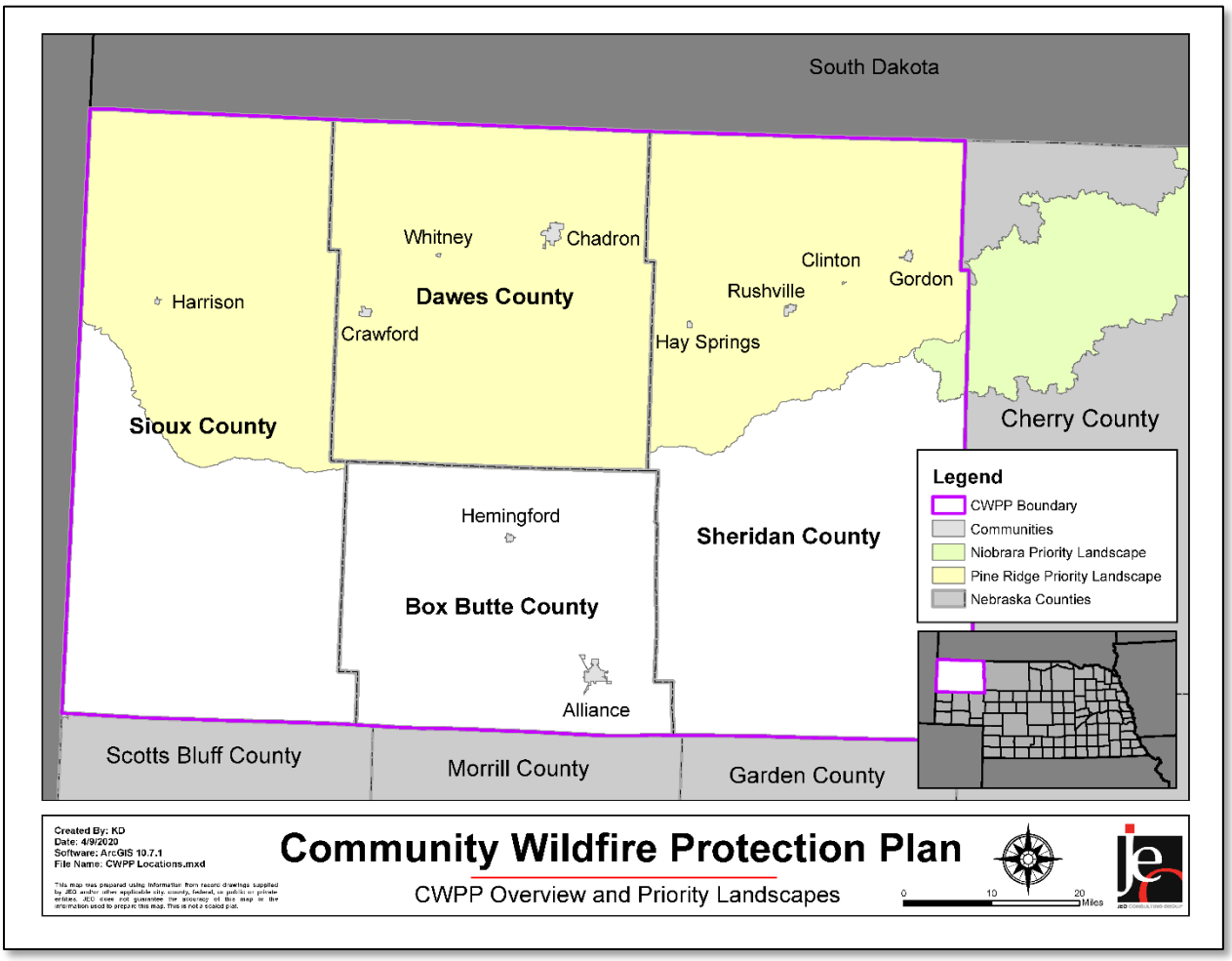
Pine Ridge Area, Nebraska
Community Wildfire Protection Plan

FOR THE COUNTIES OF BOX BUTTE, DAWES, SHERIDAN, AND SIOUX

Photo courtesy of Taylor Aviation

August, 2020 Update



Map 1: Overview of the Pine Ridge CWPP area and Forest Priority Landscapes as described in the Nebraska Forest Service 2020 Forest Action Plan.

Pine Ridge Area Community Wildfire Protection Plan

FACILITATED BY THE

Nebraska Forest Service

IN COLLABORATION AND COOPERATION WITH

BOX BUTTE, DAWES, SHERIDAN, AND SIOUX COUNTIES

LOCAL VOLUNTEER FIRE DISTRICTS

REGION 23 EMERGENCY MANAGEMENT

LOCAL MUNICIPAL OFFICIALS

LOCAL, STATE, AND FEDERAL NATURAL RESOURCES AGENCIES

AREA LANDOWNERS

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Special thanks to JEO Consulting Group, Inc. for sharing regional data and for assistance with public outreach and mapping

Photo courtesy of Todd and Rod Rickenbach

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Community Wildfire Protection Plan Acronyms

Acronym	Meaning
AoC	Area of Concern
BLM	Bureau of Land Management
BNSF	Burlington Northern/Santa Fe Railroad
BUL	Biologically Unique Landscape
CWPP; PRCWPP	Community Wildfire Protection Plan; Pine Ridge Area Community Wildfire Protection Plan
EMA; FEMA	Emergency Management Agency; Federal Emergency Management Agency
FAP	Forest Action Plan
FEPP; FFP	Federal Excess Property Program; Firefighter Property (program)
GIS	Geographic Information System
HMP	Hazard Mitigation Plan
IC/ICS	Incident Commander/Incident Command System
ID	Identification
LEOP	Local Emergency Operations Plan
MA, MAA, MAD	Mutual Aid, Mutual Aid Agreement, Mutual Aid District
MOU	Memorandum of Understanding
NE	Nebraska
NEMA	Nebraska Emergency Management Agency
NFS	Nebraska Forest Service
NGPC	Nebraska Game and Parks Commission
NNLP	Nebraska Natural Legacy Project
NRCS	Natural Resources Conservation Service
NRD	Natural Resources District
NWTF	National Wild Turkey Federation
RA	Risk Assessment
RH	Relative Humidity
RR	Risk Reduction
SEAT	Single Engine Air Tanker
SRIA	Structural Risk & Ignitability Analysis
UNWNRD	Upper Niobrara White Natural Resources District
USFS	US Forest Service
VFD; RFD; FD	Volunteer Fire Department; Rural Fire District/Dept.; Fire District/Dept.
WIRAT	Wildfire Incident Response Assistance Team
WMA	Wildlife Management Area
WUI	Wildland-Urban Interface

Introduction

The purpose of this 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 the Pine Ridge area of Nebraska. 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.

A CWPP can help people be proactive in their approach to wildfire. Some of the CWPP counties have experienced many large wildfires. Between 2000 and 2018, CWPP area volunteer fire departments reported over 2,000 fires that burned nearly half a million acres in the Pine Ridge Area counties.

Large wildfires in 2006 and 2012 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 Pine Ridge and surrounding area as WUI and, for planning purposes, treats each county as a "community." Woody fuels treatment within the forested escarpment mitigates the risk of wildfire within the WUI. This expanded WUI allows the NFS to utilize US Forest Service grant funding to cost share fuels treatments throughout the Pine Ridge CWPP Region.

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 Pine Ridge CWPP region lies within the Sandhills and Shortgrass Prairie Ecoregions identified in the NNLP. All or parts of the Pine Ridge, Oglala Grasslands, Upper Niobrara River, Sandhills Alkaline Lakes, Panhandle Prairies, and Snake River BULs are found within this CWPP boundary. (Appendix A, Map 3).

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. The Pine Ridge Priority Landscape and part of the Niobrara River Priority Landscapes are located within this CWPP boundary (see Map 1 on page ii). A full description of the Priority Landscapes is found in the Nebraska Forest Action Plan: https://nfs.unl.edu/statewide-forest-action-plan.

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 Healthy Forest Restoration Act requirements and other needs identified by stakeholders.

Pine Ridge Area Community Wildfire Planning History

This CWPP is the second update of the 2003 *Wildland Fire and Fuel Management Plan for the Pine Ridge Planning Area #1* (Appendix B), which included only the forested portions of the Chadron and Crawford Fire Districts. The plan identified issues and provided fire hazard assessments for eight Dawes County Wildland Urban Interface (WUI) areas. It outlined mitigation recommendations and fire management response for each. It included detailed descriptions of fuels, slopes, home site development and maintenance, and a risk analysis. The management objective was to effectively and safely protect structures and properties from wildland fire damage via full suppression response. The plan listed triage and site-specific actions and identified suppression considerations including fuel types, vacant buildings, equipment and water availability, evacuation routes, and unique features. The plan included forest fuels hazard reduction targets.

In 2013, the plan was updated and renamed the *Pine Ridge Area Community Wildfire Protection Plan (Update 2013)*. It expanded the boundary of the original plan to include all of the Upper Niobrara White Natural Resources District (UNWNRD), including the Harrison, Crawford, Chadron, Hay Springs, Rushville, Gordon, Hemingford and Alliance Rural Fire Protection Districts, which constituted the plan's "communities." The CWPP provided a "Community Fire Mitigation Plan" for each of those fire districts. The new CWPP boundary encompassed all of Box Butte, Dawes, and Sheridan counties and most of Sioux County. The expanded boundary included the entire pine forest escarpment in the northwest corner of Nebraska and large areas outside the forested region, noting that the ability to identify and quantify at-risk areas both within and outside the forested areas strengthens the usefulness and effectiveness of the document.

This 2020 update further expands the planning boundary to include all of Sioux County, as shown in the overview, Map 1 on page ii. In order to streamline the CWPP preparation process, the Nebraska Forest Service has established a statewide network of CWPPs that follow county boundaries instead of watershed or fire district boundaries. Some NRDs and fire districts lie within more than one CWPP region.

The 2020 CWPP boundary and revised plan format correspond with the other Nebraska CWPPs. Once the plan was reformatted, the planning team reviewed it for outdated and missing items and updated it accordingly.

Plan Integration

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 phase 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] While wildfire is not discussed in detail in most LEOPs, each LEOP contains an "Annex F" that covers fire services and includes a listing of county fire departments and mutual aid (MA) partners, as well as equipment lists. Fire department information is listed in Appendix F of this CWPP. Mutual aid associations are listed in Appendix E.

Nebraska also 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 agencies, Natural Resource Districts (NRDs), and counties to update and maintain multi-

jurisdictional hazard mitigation plans throughout the state.[2] The Pine Ridge CWPP counties are included in the Region 23 HMP (see Appendix B). The Region 23 HMP was updated in 2020 and this CWPP update was incorporated into that process.

As noted in the 2013 plan, this CWPP is consistent with the USFS Nebraska National Forest fire management plan. That plan is consistent with the Federal Wildland Fire Management Policy and Program Review (December 1995) and the Wildland and Prescribed Fire Management Plan (August 1998) and all subsequent updates. In addition, fire management activities endorsed in this CWPP comply with the policies identified in state regulations on wilderness, threatened and endangered species, and culture/historical preservation as well as federal and state regulations for air and water quality. Wildfire events consistently provide both positive and negative environmental impacts to the impacted areas. Potential impacts will be considered and negative impacts will be mitigated, as much as is practical, during implementation of this plan.

This CWPP strives to coordinate 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. It 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.

Goals and Objectives

State Forest Action Plan Goals and Objectives

This CWPP and the results of its implementation relate directly or indirectly to all of the 2020 FAP goals and objectives:

1. Enhance and promote the role of Nebraska's forest and trees for climate mitigation and help Nebraskans adapt to the global change in climate
2. Manage the trees, and forest landscapes to include rural and community forest settings
3. Manage the function of the forest and tree systems in Nebraska for 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 to benefit our forest products, industry, ranching and farming, and our communities, which are vital to Nebraska's economy
8. Maintain the natural environments of Nebraska including our trees and forests, waterways, and rangelands
9. Maintain the water resources of Nebraska and the function of Nebraska's forest and trees
10. Improve air quality and energy conservation
11. Connect people to trees and forests
12. Engage people to enhance their environmental stewardship

Sustainable forest management maintains natural environments and reduces 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, and these ecosystems are better able to cope with a changing climate. Communities that plan for and reduce wildfire risks and engage in environmental stewardship activities may also reap both the 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.

CWPP Goals and Objectives

The planning team adopted the following goals and objectives that are consistent with the state Forest Action Plan and specific to community wildfire protection planning in the Pine Ridge area.

1. Identify wildfire risk potential
    a. Evaluate vegetation, land use, response capacity, and other risk factors associated with wildfire
    b. Identify areas of concern
2. Reduce wildfire risk
    a. Identify, prioritize, and treat hazardous fuels
    b. Suppress unplanned ignitions to protect private property and natural and cultural resources from unacceptable impacts attributable to fire
    c. Support emergency response through training and acquisition of equipment
3. Promote wildfire prevention and education
    a. Partner with natural resources agencies, schools, prescribed fire organizations, and other groups to 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
    b. Increase public awareness of wildfire and damage from uncharacteristic wildfires
    c. Educate the public in *Firewise* landscaping and construction techniques
    d. Promote the use of defensible space to reduce potential fuel loads to protect communities and resources
    e. Encourage communities to develop strategies to reduce wildfire risk; provide communities with tools to address human-caused fires
    f. Integrate fire prevention protocols into plans and procedures for schools; educate youth to prevent and respect wildfires; address accidental ignitions caused by children
4. Restore fire-adapted ecosystems
    a. Provide training to enable rapid assessments of burned lands and the implementation of stabilization techniques
    b. Encourage land managers to control non-native invasive plant species and to actively manage prolific and aggressive native species
5. Enhance communications among fire management agencies
    a. Ensure all relevant Memorandums of Understanding (MOUs) and Mutual Aid Agreements (MAAs) are in place and updated appropriately
    b. Train fire departments in the use of the V-TAC and UHF mutual aid radio channels
    c. Partner with landowners, land managers, fire personnel, natural resources agencies, and/or other organizations to incorporate local concerns and objectives into fire management programs
    d. 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
6. Establish a monitoring and evaluation process
    a. Annually evaluate the CWPP implementation effectiveness and recommend changes as needed
    b. Conduct monitoring of selected collaboratively developed projects and activities to assess progress and effectiveness

Priority Landscapes

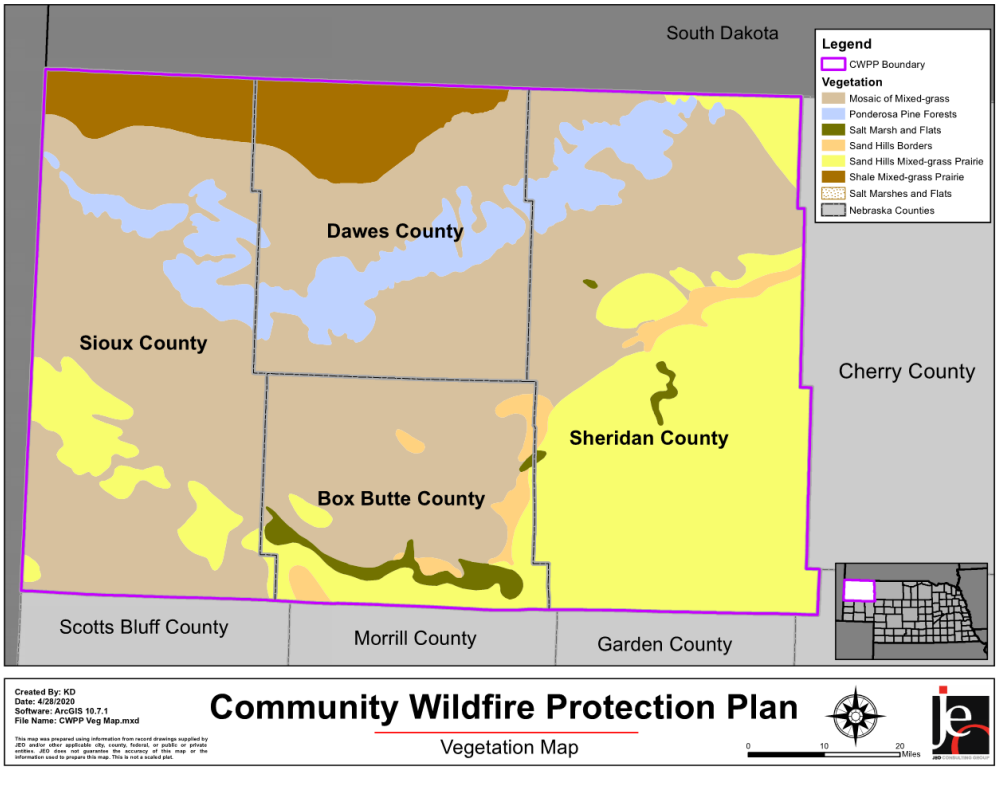
At the state level, the FAP identified Priority Landscapes to help focus effort and funding on landscape-scale projects. This CWPP region includes the Pine Ridge Priority Landscape and the western tip of the Niobrara Priority Landscape (see Map 1 on page ii). The principal Priority Landscapes in this CWPP region are found in the forested Pine Ridge escarpment and along the Niobrara River. These landscapes include many locally-identified "Areas of Concern" where hazard reduction activities can be targeted (see Appendix A).

Priority Landscapes help focus management activities on areas most at-risk. Unnaturally dense and unhealthy woodlands and encroachment of conifers into grasslands continue to create extreme wildfire risk. Drought cycles are predicted to occur with increasing frequency (see the Region 23 HMP, Section Four's drought hazard profile for more information regarding drought frequency and impacts in the planning area). Communities can protect structures by reducing their ignitability, reducing the surrounding woody fuels, and improving access for emergency equipment.

Vegetation Types and Areas of Concern within Priority Landscapes

The Pine Ridge Area Priority Landscapes contain a range of topography and vegetation types, including ponderosa pine forest and savanna, riparian woodlands, shortgrass, mixed-grass, and Sandhills prairie. Within each county, local stakeholders have identified "Areas of Concern"—specific sites that are most at risk for wildfire within the larger landscapes. Most of these lie within the statewide Priority Landscapes. Areas of Concern are shown in Appendix A, Map 6.

Managing the grass component of the forested areas is extremely important. Ponderosa pine ecosystems develop a heavy grass and shrub component which, if not managed appropriately, 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" within managed areas pose a significant risk to the managed lands.



Map 2: Vegetative types in the Pine Ridge CWPP area include ponderosa pine forests, salt marshes and flats, and several types of prairie.[3]

Process

The first step in the CWPP update process was to establish a planning team which included representatives from the Nebraska Forest Service and Region 23 Emergency Management Agency (EMA). Concurrently, JEO Consulting Group was hired by Region 23 EMA to facilitate and update the regional Hazard Mitigation Plan (HMP). The 2020 HMP prioritized the update and integration of the CWPP and JEO served as a consultant for the CWPP update process. The CWPP stakeholder outreach, which included counties, municipalities, and fire departments, was incorporated into the larger HMP public involvement protocol. Refer to *Section Two* in the HMP for more information (see link in Appendix B).

The planning team sought input from county officials, fire department personnel, and others to establish goals and objectives, evaluate local wildfire risk factors, and map areas of concern. This input provided a locally-focused framework for the CWPP update.

The NFS sent a questionnaire to all fire departments in the CWPP region (see Map 4) asking for current contact information, lists of equipment, and pertinent issues, concerns, and priorities. All 13 fire departments provided input. Responses to this survey appear in Appendix F, along with information obtained from Annex F of each county's LEOP for all fire departments located entirely or partially within the CWPP boundary. The fire department survey and distribution list appear in Appendix G.

JEO Consulting Group provided a news release to local newspapers and radio stations describing the planning process and included contact information for the CWPP sponsor and coordinators. The public was also invited and encouraged to attend public meetings held throughout the planning area as part of the HMP and CWPP updates. Meeting and plan update information was posted on the NFS and JEO websites and the NFS social media page. The stakeholder list, outreach letters, and media releases appear in Appendix A of the HMP.

Feedback from counties, local municipalities, emergency response agencies, local fire departments, and other stakeholders was incorporated into the CWPP. The CWPP includes an evaluation of background information (such as historical wildfire events), an in-depth risk assessment, and a planning area specific action plan. The draft CWPP was then posted and available for a 30-day public review period. The input and comments received were integrated into the document, which was sent to county boards for adoption. Final copies were provided to each county and the Region 23 Emergency Management Office. The final plan is available online at https://nfs.unl.edu/documents/CWPP/PRCWPP.pdf.

Overview

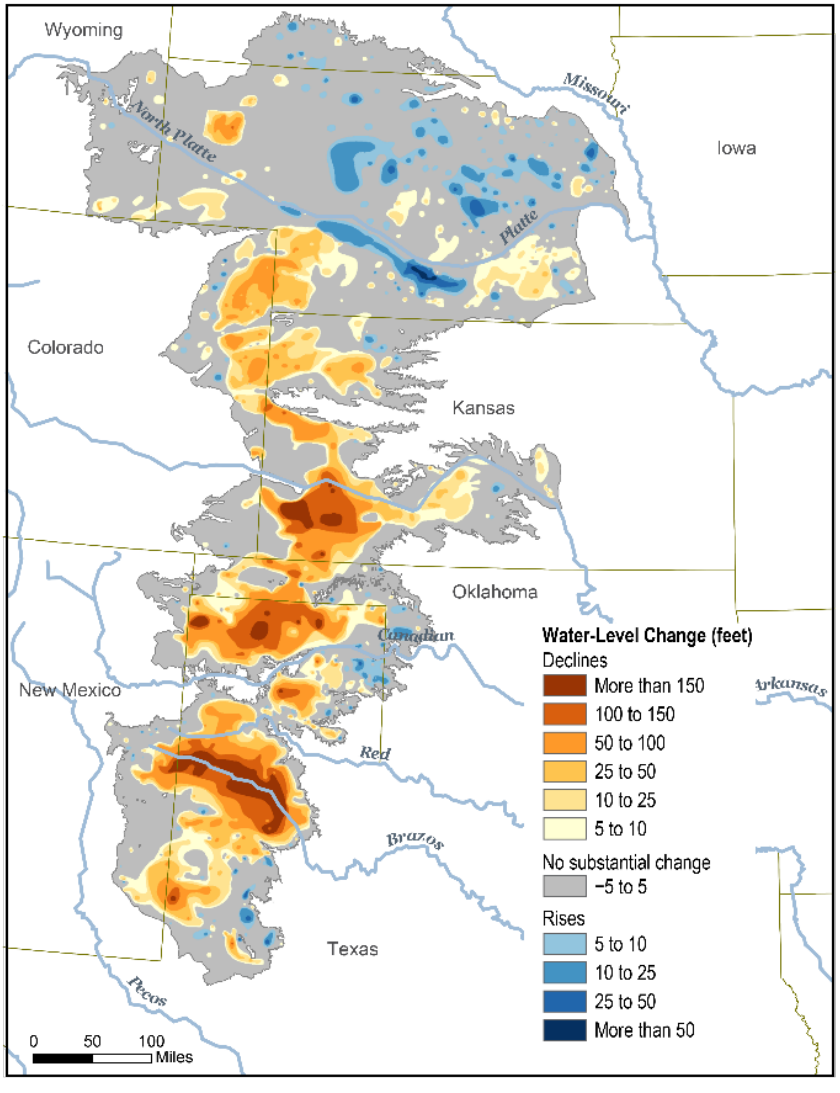
This section contains background information common to all counties within the Pine Ridge Area CWPP region. Information specific to only certain areas is included in the county sections.

Landforms, Climate and Weather

The CWPP region lies within the NNLP Shortgrass Prairie Ecoregion. The region sits atop the Ogallala Aquifer, which underlies about 175,000 square miles in eight states from Texas to South Dakota (see Map 3).

Nebraska's panhandle has a continental climate with cold winters and hot summers. The Pine Ridge area has a semi-arid climate, averaging 17 inches of precipitation annually at Harrison. The National Climatic Data Center reported 2012-2013 as the state's warmest, driest years on record, with some areas receiving less than half of normal rainfall. 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 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.[5] 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 graphic[4] shows the water level change between the early 1900s and 2015.

Weather data was obtained from the University of Nebraska High Plains Regional Climate Center[6] and Iowa State University.[7] Weather factors including temperature, precipitation, humidity, 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 mid- to late July, but there is less growth, and consequently fewer fine fuels to catch sparks from trains, farm equipment, or motorists.

	April			July			October		
County	Max. Temp.	Precip.	Min. RH	Max. Temp.	Precip.	Min. RH	Max. Temp.	Precip.	Min. RH
Box Butte	58.56	1.77	28.5	87.45	2.29	36	62.02	1.16	28.5
Dawes	58.63	1.96	33	87.81	2.26	33	62.18	1.29	26
Sheridan	58.57	1.86	31	86.87	2.58	34	61.91	1.35	32
Sioux	57.80	1.86	35	86.91	2.01	32	61.15	1.24	21

Table 1: Average maximum temperatures (degrees F), precipitation (inches) and median minimum relative humidity (percent) 1982-2019 for April, July, and October for Pine Ridge Area CWPP counties. RH data interpolated from selected weather stations.[8]

Wind is a primary factor in fire spread, even where fuels are light and/or discontinuous as it is in much of the plan area. Some areas are more than half agriculture and grass fuels. Wind rosettes for April, July, and October from five stations in or near the plan area—Alliance, Chadron, Gordon, Scotts Bluff, and Whitman—are in Appendix C.

Vegetation and Natural Communities

The vegetative type in the Pine Ridge is grass/forest mix dominated by ponderosa pine. Open grassland and savannas are found throughout the forested area. The ponderosa pine forestlands ecosystems are in a state of flux, constantly changing to adapt to the forces of nature and the influences of humans. Due to catastrophic wildfires in 2006 and 2012, large expanses of the Pine Ridge region have been burned over, vegetatively reverting to early seral stages.

Coniferous species in the region are primarily ponderosa pine and Rocky Mountain juniper. The principal deciduous tree species are cottonwood, hackberry, box elder, and green ash. Other woody species that can be found locally abundant are snowberry, chokecherry, and wild plum. Most of the deciduous trees and shrubs are found in stringers and patches along the drainages and near the cooler, more humid environments. In general, fuel continuity in the ponderosa pine/grassland areas is high.

Grasslands in the region include shortgrass, mixed-grass, and Sandhills prairie. There are salt marshes and flats in southern Sheridan County. Riparian deciduous woodlands follow some of the drainages. Agricultural fields are a significant component of Box Butte County, the south end of Sioux County, and portions of central Sheridan County. A land cover map appears in Appendix A, Map 7.

Land Use

There are about 4,490,240 acres (7,016 sq. mi.) in the Pine Ridge Area CWPP region. Public and conservation lands include 272,403 acres in federal ownership (National Forests, National Grasslands, Agate Fossil Beds National Monument, Bureau of Land Management (BLM), and tribal lands); 68,337 acres in NGPC properties (state parks, recreation areas, and wildlife management areas); 9,900 acres in non-government organization (NGO) conservation lands; and 185,558 acres in state school lands.[9] There are also county and municipal properties in the CWPP region. The remainder of the land in the region 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 10 incorporated municipalities and their immediate surroundings. Land use is primarily agricultural in the region's eight unincorporated communities. Rural residential land use exists in conjunction with agricultural operations. According to US census data, there are just over 26,669 permanent residents within the four counties within the CWPP region.

All counties in the CWPP region except Sioux have county zoning plans in place. There are currently no restrictions in any of the counties pertaining to wildfire preparedness and risk or for building construction in fire-prone areas.

Popular outdoor recreational activities include hunting, fishing, boating, hiking, biking, and camping at federal and state recreation areas in the region, such as Agate Fossil Beds National Monument, National Forest and Grasslands sites, Toadstool Park, Fort Robinson and Chadron State Parks, and state recreation and wildlife management areas.

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 Pine Ridge Area 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. 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. These systems, structures and people are critical to regional functionality. 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. Often fairgrounds or parks 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 Community Profiles sections of the Region 23 HMP identify specific sheltering locations, which are primarily 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.

Utilities/Phone Service

The CWPP region is crossed by several high tension power lines. Rural electric service in all of the counties is provided by Northwest Rural Public Power District. Both cellular and landline telephone services are available region-wide.

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 is 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. Fuels reduction is discussed in detail in the Action Plan section of this document.

Mechanical fuels reduction can be expensive, depending on access, terrain, and tree density. The USFS and the NGPC conduct mechanical fuels treatment on their lands as their budgets permit. The NFS, NGPC, and the Natural Resources Conservation Service (NRCS) offer cost share programs to help private landowners mechanically reduce hazardous woody fuels on their properties. The National Wild Turkey Federation (NWTF) cost-shared on 1,849 state and privately-owned acres in the CWPP region between 2004 and 2019.

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 programs.

Prescribed Fire and Prescribed Burn Associations

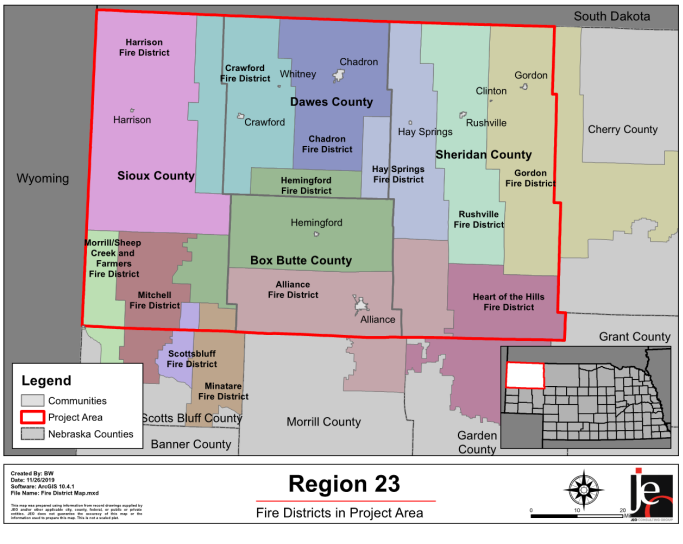
In recent years, prescribed fire has increased as a method of keeping woody encroachment in check, particularly in grasslands. Practitioners include individual landowners, non-profit organizations, and public agencies. The NGPC staff actively use prescribed fire each spring and fall on their properties. The USFS also has an active prescribed fire program on their lands. Although there are no organized prescribed burn associations in the Pine Ridge Area CWPP Region, the USFS, NGPC, and a few landowners planned to jointly burn during the fall of 2020 about 1,200 acres of contiguous land in their separate ownerships. The NWTF has purchased equipment for prescribed fire, as well.

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 conditions 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 section of this CWPP.

Fire Districts and Emergency Management

There are 13 volunteer fire districts all or partially within the CWPP boundary (Map 4). Reported fires for each district are summarized in Table 3.



Map 4: Thirteen fire districts lie all or partly within the Pine Ridge Area CWPP Region.

Each fire department provided current contact information, equipment lists, and a summary of their wildfire issues and concerns. The responses received appear in Appendix F.

All of the Pine Ridge CWPP counties are included in Region 23 Emergency Management. The Region 23 Coordinator served on the CWPP update planning team.

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 2 shows a mean replacement fire interval for ponderosa pine forests of 300 years and 11 to 15 years for the prairies. Low intensity fires were frequent prior to Euro-American influence. Since settlement, however, people became increasingly adept at suppressing wildfire. Without fire, over time, forests became densely overcrowded and woody vegetation encroached on prairies.

		Fire Regime Characteristics			
Vegetation Community	**Fire Severity**	**% of Fires**	**Mean Interval (years)**	**Min. Interval (years)**	**Maximum Interval (years)**
Ponderosa Pine (Black Hills, low elevation)	Replacement	7	300	200	400
	Mixed	21	100	50	400
	Surface or Low	71	30	5	50
Nebraska Sandhills Prairie	Replacement	58	11	2	20
	Mixed	32	20	n/a	n/a
	Surface or Low	10	67	n/a	n/a
Northern Mixed-Grass Prairie	Replacement	67	15	8	25
	Mixed	33	30	15	35

Table 2: Fire intervals for the ponderosa pine, Sandhills prairie, and mixed-grass prairie vegetation types are shown above. The Black Hills low-elevation model is the closest approximation for the Pine Ridge.[10]

Local Fire History

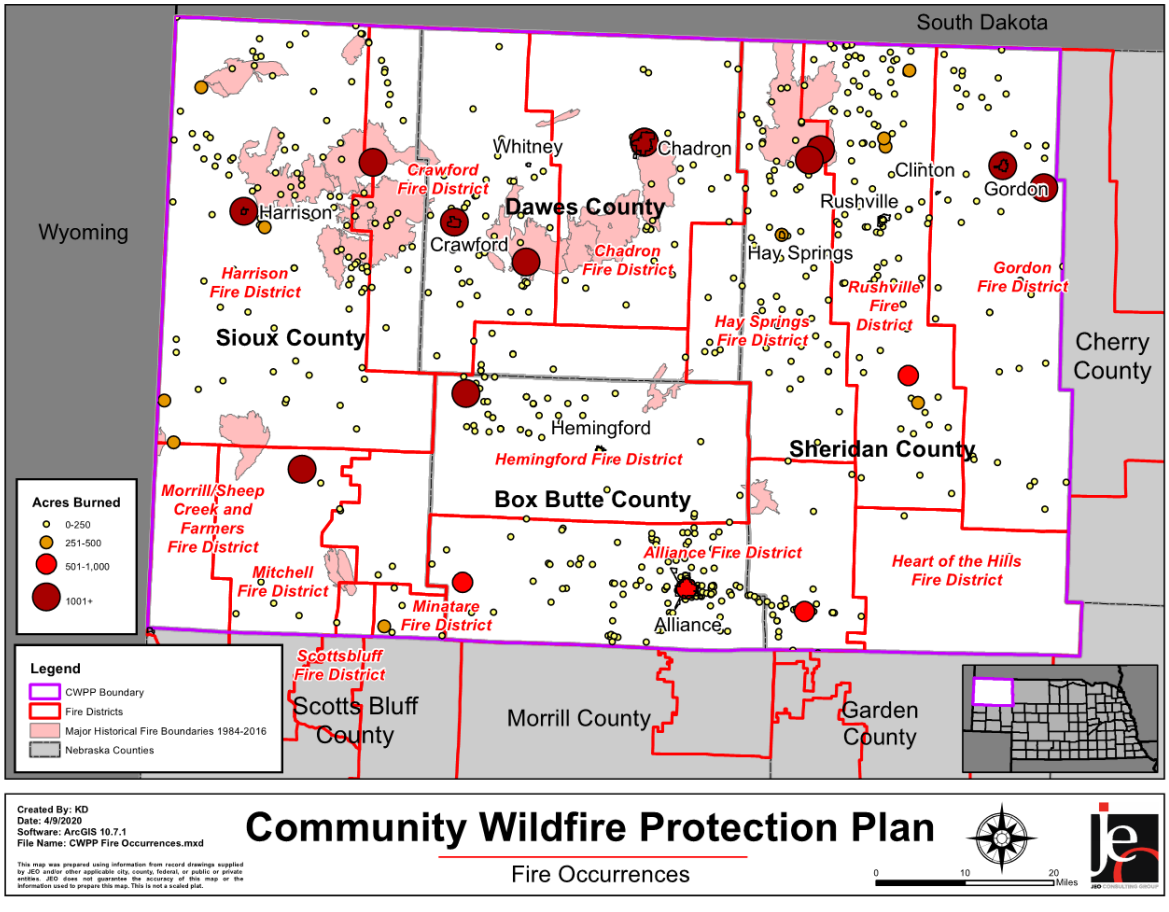
Nebraska is no stranger to extremely large fires. In 1865 the US Army and ranchers intentionally set a 300 mile wide prairie fire during a dispute with Native Americans. The fire blackened the entire section of Nebraska south of the Platte River and west of Fort Kearny. It was visible from Colorado and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

Historically, small and medium-sized fires occurred in the Pine Ridge country frequently. Occasionally, the fires burned large areas, sometimes starting in the grassland type and moving into the timber type. At other times, summer lightning would ignite a fire in a forested area and it would smolder for weeks or months. Sometimes these fires would burn hot and kill an entire stand and at other times they crept along the ground, not creating a lot of heat intensity. The result was usually a mosaic of pine age and size classes along with patterns of aspen which, in some places, tends to proliferate within new forest openings.

Prior to 1900 the forested areas were much more open than they are today. Mature ponderosa pine trees have thick bark and a high tolerance of surface fire. In the past, the open grasslands in this planning area were larger and more connected. Because of the higher tree density in the present environment, many of the wildfires in the ponderosa pine type today burn into the forest canopy (crown fires) and kill the trees.

The CWPP region regularly experiences wildfires, some quite large. Between January, 2000 and August, 2018, CWPP area volunteer fire departments reported 2,088 wildfires that burned a total of 417,798 acres and caused $1,494,582 in property and crop losses. There were 245 homes and other structures threatened, with 69 of those destroyed. Although reporting has improved in recent years, not all fire departments report every year, so the actual numbers are likely much higher. Both 2006 and 2012 were extreme fire years in Nebraska. In 2012, over half a million acres burned in Nebraska, mostly in the Pine Ridge and Niobrara River areas.

Map 5: Some of the larger fires reported in the CWPP area since 1984 are shown in the map below. Since 2000, CWPP area fire departments reported over 2,000 fires that burned nearly half a million acres.



More than 14,000 people (over half of the population of the CWPP area) live in or near the forested Pine Ridge escarpment and are potentially at risk during times of high fire danger. A listing of some of the more significant wildfire events that have occurred in the CWPP region appears below:

- Dead Horse Fire (1973): Burned 3,600 acres north of Chadron State Park.
- Cunningham Creek Fire (1973): Burned 3,190 Dawes Co. acres in that watershed.
- McIntosh Fire (1984): Burned almost 2,300 acres near the east boundary of the Crawford Fire District.
- Crawford Fire District (1985): More than 3,500 acres of grass and timber burned southeast of Crawford.
- Geiser Fire (1985): Burned 3,392 acres in northeast Sioux County.
- Fort Robinson Fire Complex (1989): Burned 49,000 acres in Dawes and Sioux Counties.
- Belmont Fire (1989): The railroad-caused fire burned over 3,000 acres southeast of Crawford.
- Sioux County (1990): An 800-acre fire southwest of Fort Robinson burned in rough terrain.
- Warbonnet Fire (2000): Burned 11,504 acres in northwest Sioux County.
- Sawlog Fire (2000): Burned about 1,000 acres southeast of Crawford.
- Sheridan Co. (2000): the Gordon Fire District reported a 26,000 acre lightning fire and a 2,500 acre equipment fire.

- Thayer Fire (2006): Burned over 40,000 acres northeast of Harrison.
- Sheridan Co. (2006): The Gordon, Rushville, and Hay Springs Fire Departments reported several 300+ acre lightning fires.
- Spotted Tail Fire (2006): The 68,000+ acre fire threatened Chadron and much of the city had to be evacuated.
- Box Butte County (2007): Lightning caused a 3,500-acre fire in northwest Box Butte County along the Niobrara River and an 800-acre fire in the southwest part of the county.
- Dawes County (2007): Four fires in the Soldier Creek Management Area about 10 miles west of Crawford burned 3,155 acres in four days.
- Sheridan County (2012): Nearly 5,800 acres burned near Antioch on the east end of the Alliance Fire District.
- Region 23 Complex (2012): These fires burned 58,450 acres in the Crawford and Chadron Fire Districts.
    - Douthit Fire: Burned 29,730 acres in the Cottonwood/Little Cottonwood watersheds in Sioux and Dawes Counties.
    - West Ash Fire: The 28,720-acre fire forced an evacuation of Whitney. Intense suppression efforts kept this fire from crossing US 385 and moving into the 2006 Spotted Tail burn area. Had these efforts failed, it is likely Chadron would have again been threatened. Many of the areas previously burned, again burned with great intensity.
- Wellnitz Fire (2012): Burned 77,684 acres in Sheridan County and into South Dakota. 48,681 of these acres were in the Hay Springs and Rushville fire districts. A successful back fire was all that kept the fire from threatening Hay Springs.
- Lone Tree Fire (2015): Burned 1,805 acres north of Whitney in the Chadron and Crawford Fire Districts.

Some fire districts voluntarily report their annual fire response data to the NFS. Table 3 shows the fire data reported by fire departments from 2000 to 2018.[11] Because the fire districts vary in their level of reporting, there is no accurate, comprehensive fire history available for the CWPP area. Reporting has improved recently.

Fires Reported 2000-2018							
Department	**# Fires Human**	**# Acres Human**	**# Fires Lightning**	**# Acres Lightning**	**Total # Fires**	**Total # Acres**	**# Mutual Aid Responses**
Alliance	256	4,292	42	1,297	298	5,589	32
Chadron	86	465	75	31,549	161	32,014	9
Crawford	133	982	239	66,284	372	67,266	1
Gordon	48	5,224	58	30,778	106	36,002	40
Harrison	27	252	65	72,312	92	72,564	23
Hay Springs	68	722	57	78,469	125	79,191	21
Heart-of-the-Hills	19	1,595	31	1,554	50	3,149	25
Hemingford	14	98	21	244	35	342	1
Minatare	269	6,139	14	66,938	283	73,077	9
Mitchell	34	4,088	7	7,759	41	11,847	5
Morrill (Sheep Creek & Farmers)	55	1,515	14	2,795	69	4,310	3
Rushville	76	5,251	59	52,310	135	57,561	41
Scottsbluff Rural	322	2,473	8	31	330	2,504	66
Total	**1,407**	**33,096**	**691**	**412,320**	**2,098**	**445,416**	**277**

Table 3: Fires reported by Pine Ridge CWPP fire departments between 2000 and 2018. Departments reported a total of 407,797 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.

Fire Hazard

According to the 2003 CWPP, annual wildland wildfire occurrence in the Pine Ridge area was generally low to moderate after European settlement, when wildfires began to be actively suppressed. According to the NFS and county records, there was an average of 20 to 25 wildfires per year during that period. Today's running average shows more than 100 fires reported by Pine Ridge area fire districts yearly. The frequency of fires over 500 acres and the total number of acres burned has also greatly increased. Flash flooding often occurs in areas where vegetative cover has burned, increasing runoff and leaving soils more susceptible to erosion.

Although there are nearly twice as many human caused fires as lightning fires, over three quarters of the total acres burned are attributed to lightning (see Table 3). During most years the majority of fires are small and do not burn with high intensity because of rain or quick suppression. However, every few years medium-sized and large fires occur and burn with high intensity and extreme fire behavior, posing a threat to rural home areas and damage to major watersheds. Often the fires are wind-driven from the southwest or northwest and they 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. These wildfires, which have burned with high intensity, do not readily regenerate for years afterward even with artificial reforestation efforts. The Dead Horse Fire of 1973 is an example. Fuel continuity throughout the forested areas of this planning area and in some of the open grassland parks is very high to extreme. These areas also have a high rate of spread and in the timber a high resistance to control during very high and extreme fire danger.

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.[12] 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. See Appendix D for more information on fuel models.

Wildfire Hazard is described in detail in the Wildfire section of the Region 23 Multi-Jurisdictional Hazard Mitigation Plan. A link to that plan appears in Appendix B.

Fuel Models

The primary fuels within the planning area are grassland and forested land. NFS fire staff has identified the following fuel models[13] as the most prevalent within the CWPP region:

1) GR4 Moderate Load, Dry Climate Grass. This is the most common fuel model. Even in much of the forested area, grass is the primary carrier of fire and it burns like a grass fire, even though it is technically in a forest understory. In areas that burned in 2006 and 2012 fires, the grass has grown tall and will be the primary fire carrier. Even though all the dead and down burned trees will be fuel, the grass is the main fire carrier. Thus it is a grass fuel model.
2) GR1 Short, Sparse, Dry Climate Grass. In heavily grazed areas and in the grasslands north of Crawford this provides the best fuel model.
3) TU1 Low Load, Dry Climate, Timber-Grass-Shrub. In areas of dense ponderosa pine forest, the timber understory is a mix of grass and timber castings.
4) SB1 Low Load, Activity Fuel. In many of the burned areas, considerable dead, downed woody fuels remain. Some of these approximate this fuel model.

Full descriptions of these fuel models appear in Appendix D.

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

Volunteer fire departments 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 mutual aid agreements with neighboring jurisdictions. The 13 fire departments in the CWPP area belong to one or more of the three mutual aid associations that overlap the region: Pine Ridge MA, Scottsbluff County MA, and Central Panhandle MA. See Appendix E for a complete list of mutual aid associations and member fire departments.

All of the Pine Ridge CWPP Counties are part of Nebraska's Region 23 Emergency Management Area. Locations of the statewide Local Emergency Management Areas appear in Appendix A, Map 4.

In addition to notification by Sheriff's Department personnel and/or dispatch, Emergency Management areas 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 emergency notification, including wildfire. This allows notification of a large geographical area or a group of people. This is an 'opt-in' program which can be used to notify residents in the area of wildfire events, but would likely not reach all members.

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

The Mobile Express program is used to track an incident. The Rapid Tag program helps track volunteers. A volunteer's driver's license is swiped and the data used to print an identification card which is then used by Mobile Express to track the volunteer. The program can also be used to generate a printed "Battle Book" that lists equipment (with picture, description, and ID card) and personnel so that first responders can check into an incident via radio without having to physically check in. Training for this system is ongoing statewide.

Staging Areas and Safety Zones

The Pine Ridge escarpment is a park-forest setting. There are abundant staging areas both within and on the perimeter of the escarpment. The forested drainages throughout the CWPP region are separated by expanses of grasslands and farm ground. There are plentiful 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 city parks are generally good staging areas, depending on the particular location of a wildfire. Safety zone sites are designated by fire officials and will 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. Ranch and farm trails provide additional access for emergency vehicles. See Appendix A, Maps 8-14 for restricted bridges and roads, by county. The 2013 Pine Ridge Area CWPP Update contained plat maps of county-maintained roads with their 911 name designations. These plat maps are readily available to the public, so are not included in this update. A link to them appears in Appendix B. In the Pine Ridge, timber harvest activity from 1990 to 2008 created a vast network of forest access roads on the private and, to a lesser extent, on public land. These roads now serve as access for fire suppression and other emergency vehicles. There is presently no comprehensive mapping system for these logging roads.

Communications

Sioux and Dawes Counties operate on VHF radio. Sheridan and Box Butte Counties operate on UHF radio. The departments that respond into these counties from the south operate on 800 radios. Counties use these types of radios because it is what their county dispatch utilizes. It has been mutually agreed and each department understands that VHF radios will be used in mutual aid scenarios. VHF radios are required to communicate with the Single Engine Air Tanker (SEAT) plane. Each fire department has the ability to utilize VHF radios and has the proper mutual aid frequencies. However, for responses within their own county or district, each department utilizes their primary radio first, and then switches to a VHF mutual aid frequency if needed.

Some radio compatibility issues in Nebraska were addressed after the 2012 wildfire season. 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.

Capabilities and Capacity

Resources to support emergency responder safety and help fire departments prepare for and respond to fire, natural disasters and non-fire emergencies can include vehicles, equipment, air support, and personnel. The resources described in this section are available to volunteer fire departments in the Pine Ridge Area.

Vehicles and Equipment

Through the Federal Excess Property Program (FEPP) and Fire Fighter Property (FFP) program, a cooperative effort with the U.S. Forest Service, 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 2019 there were 879 pieces of FEPP equipment in use by 297 rural fire districts and emergency management areas across Nebraska, valued at $105,225,700. In the Pine Ridge Area CWPP Region, there are 37 pieces of FEPP equipment, valued at $4,669,200 and housed in 11 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.

A listing of apparatus and staffing for each fire district is included in Appendix F.

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. 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 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.

Three of the five permanent (Type 1) SEAT bases in Nebraska serve this CWPP Region: Chadron, Alliance, and Scottsbluff. The other bases are located in Valentine and McCook. In addition, a mobile SEAT base to support operations at airports without a permanent base is stationed at the Ogallala airport. 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 federally "carded" to fly missions on US Forest Service land, so they cannot be utilized on US Forest Service fires in the Pine Ridge.

The NFS, NEMA, and the Civil Air Patrol cooperate to conduct smoke detection flights after lightning storms. If the Pine Ridge receives heavy lightning with minimal precipitation, the Civil Air Patrol provides a plane and pilot to fly to the locations that received ground strikes. The partners are able to print maps to see exactly where ground strikes were located, and an observer will check to see if any strikes have caused a fire. If smoke or fire is observed, the observer notifies dispatch of the location, and then helps the responding fire department navigate to the fire. This provides a very quick response to often smoldering fires that have not yet become running wildfires.

Overhead Teams
In major wildfire situations, overhead teams can be called in to help volunteer fire departments. State assistance starts with a Wildfire Incident Response Assistance Team (WIRAT) response. 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 team 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 FEMA and a Type 1 or 2 team will get 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.

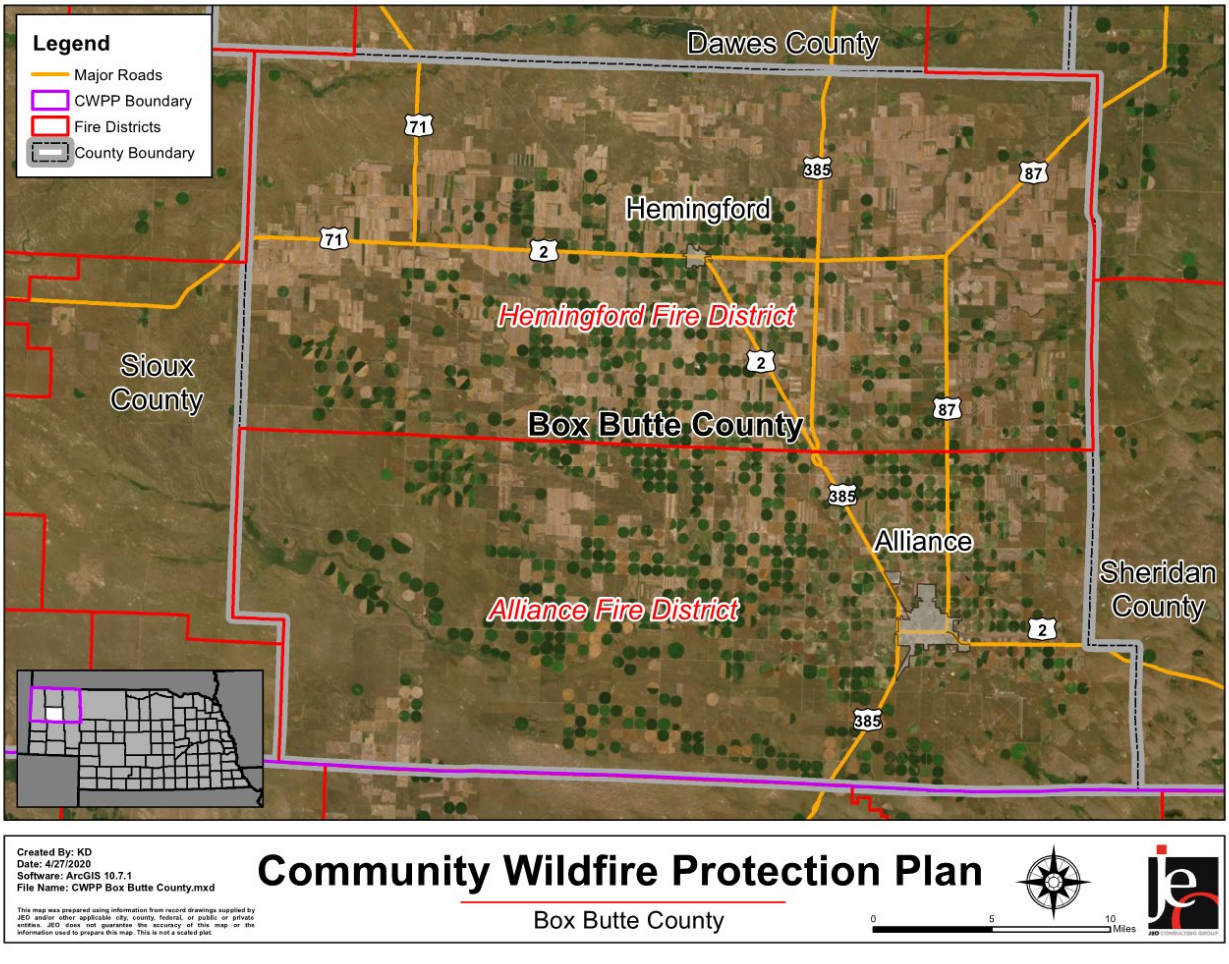
Classes cover a variety of topics ranging from beginning and advanced firefighting techniques, Firewise® landscaping and construction, leadership, to fire prevention education. The classes offer flexibility and can be fine-tuned to meet the needs of local fire departments. NFS delivered and sponsored course hours grew from just 73 in 2007 to 10,506 in 2019. Wildland fire instructors are based in Ainsworth, Chadron, and Lincoln.

Community-Specific Considerations

Topics pertinent to the entire CWPP region appear in the overview portion of this plan. For planning purposes, each county (including its population centers) is considered a community. This section contains elements different for or specific to each county/community. Each community section consists of a "Community Profile" including description, fire history, and fire hazard Infrastructure and "Protection Capabilities" including fire districts, emergency operations, greatest concerns listed by fire departments, and infrastructure such as water sources, roads and bridges. The HMP contains a full geo-located critical infrastructure list; therefore, these community sections include only a brief listing of them and a link to the full list. Critical facilities are determined based on the discretion of the jurisdiction.

Box Butte County

1,078 sq. miles
2017 population: 10,886



Community Profile

Box Butte County lies in the south central part of the CWPP region. It is bounded on the west by Sioux County, on the north by Dawes County, on the east by Sheridan County, and on the south by Morrill County. Incorporated municipalities include the county seat of Alliance (pop. 8,164) and Hemingford (pop. 781). Berea (2010 pop. 41) is an unincorporated community. Burlington Northern Santa Fe (BNSF) rail lines and state and

federal highways connect Alliance and Hemingford with points northwest, south, and east. Other than municipal properties and 30,833 acres in school lands, there are no public lands within the county.

Most of the county lies within the mixed-grass and shortgrass prairie vegetation zone. There is a small strip of Sandhills/mixed-grass prairie between Snake Creek and the south county line, and there are some salt marshes and flats in the county's southeast corner. Agriculture crop fields, hayland, and grazing lands cover most of the county. The Niobrara River crosses the northwest corner of the county. There are no forests in Box Butte County. There are a few isolated pockets of deciduous woodlands along the river and its tributaries.

Fire History
Since European settlement, wildfire activity has been mostly limited to small fires which were rapidly and effectively controlled. However, NFS records show that lightning caused a 3,500-acre fire in August, 2007 in the northwest corner of Box Butte County just south of the Niobrara River and an 800-acre fire in June, 2007 in the southwestern part of the county.

Fire Hazard
Drought conditions contribute to wildfire risk in the county's grasslands. The BNSF rail corridor is an "at-risk" area due to ignition potential from heavy rail traffic. Center pivot irrigated acres comprise much of the county's agricultural land. These normally present less fire risk than that associated with non-irrigated agricultural land.

The areas most at-risk from wildfire are the lands surrounding municipalities and recreational/residential areas where there are heavy fuels and limited access. Although Box Butte County does not include traditional WUI lands, rural areas surrounding municipalities still have their own fire risk variables. No specific areas of concern were identified by the planning team or fire departments, but the statewide Priority Lands analysis indicated potential concerns surrounding Alliance and Hemingford. All of Box Butte County lies within the boundaries of the WUI as defined in the introduction to this CWPP.

Infrastructure and Protection Capabilities

Fire Districts and Emergency Operations
Box Butte County lies within the Alliance and Hemingford Fire Districts. These districts also include lands in Sioux and Sheridan Counties. See Appendix F for their contact information, equipment lists, and responses to the VFD survey.

The Alliance and Hemingford Volunteer Fire Departments are responsible for fire protection and other emergencies in their fire protection districts. The Box Butte County Sheriff's department provides assistance as needed.

Water Sources
Reliable water sources are limited within Box Butte County. The only developed water systems are in Alliance and Hemingford. With the exception of the Niobrara River, most streams have only intermittent flow and are not dependable. Kilpatrick Reservoir is located on Snake Creek in the western portion of the county. Smaller reservoirs, ponds and stock tanks are located throughout the county. During drought conditions many reservoirs and ponds are unreliable. There are irrigation canals along the Niobrara River in the northwest corner of the county and along Snake Creek downstream from Kilpatrick Reservoir. These could be emergency water sources during normal streamflows. Windmills are abundant in the county and can provide water when they are operational.

Roads and Bridges
Box Butte County is served by US 385 and Nebraska Highways 2, 87, and 71. These are augmented by a network of county-maintained roads. No restricted bridges or roads which could restrict truck/lowboy passage were

identified within the county. See link in Appendix B for detailed maps of county-maintained roads with their 911 name designations.

Infrastructure Mapping
The city of Alliance has municipal GIS layers for hydrants, well points, water mains, sewer, and electric lines. They have not mapped buildings or bridge limits.[14]

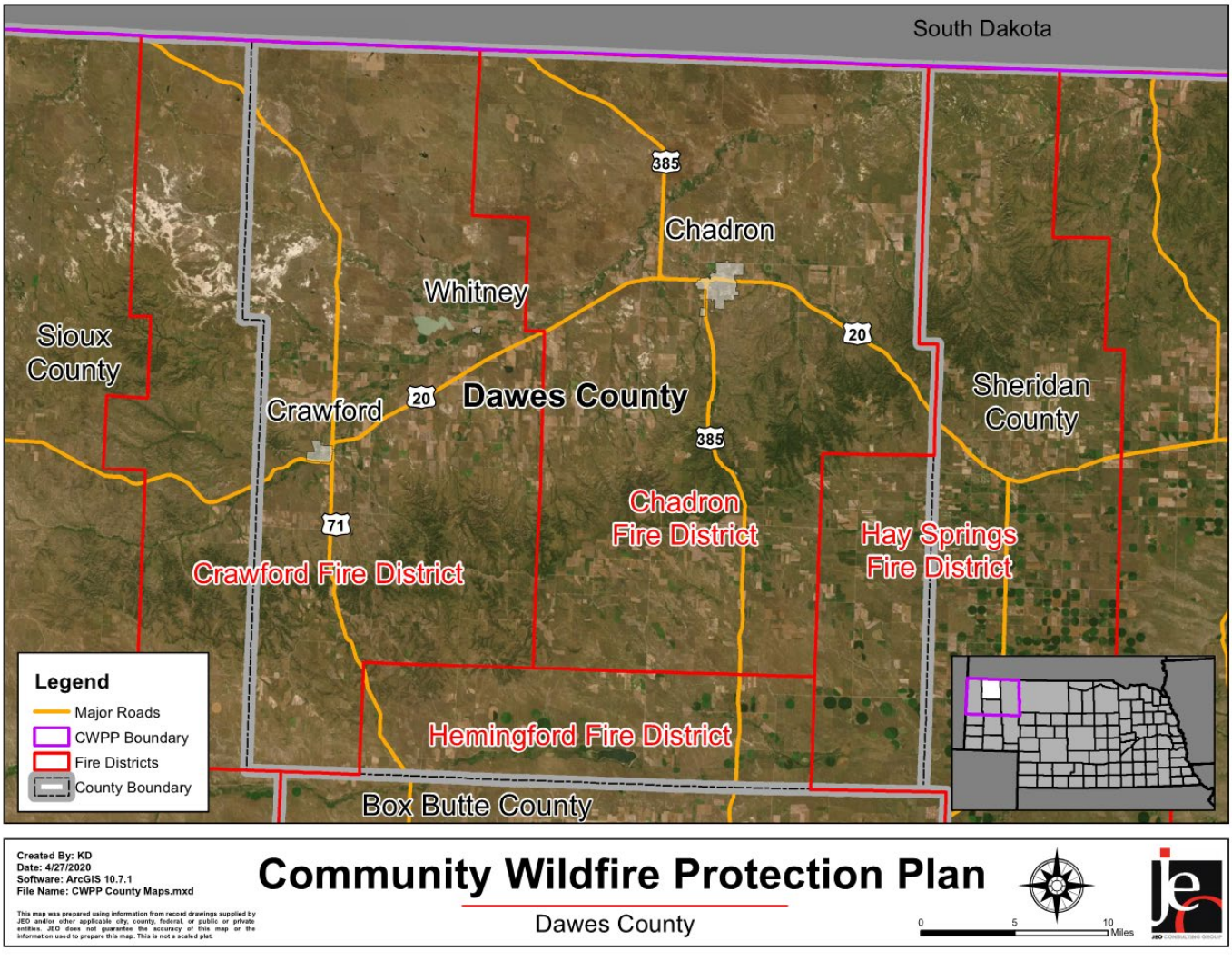
Critical Infrastructure
Critical facilities identified by local jurisdictions (Box Butte County, City of Alliance, and the Village of Hemingford) include law enforcement and fire departments, municipal and county buildings, public works, lagoons, airport, warning sirens, electrical substations, water towers and underground reservoir, wells, radio towers, state roads department, utility companies, railroad facilities and viaducts, hospitals and clinics, nursing homes and senior living facilities, apartment buildings, fairgrounds, churches, American Legion building, community center, public health district, and schools. The Region 23 HMP contains the complete list: https://jeo.com/region-23-hazard-mitigation-plan-update.

Greatest Concerns
The fire departments were asked to list their greatest concerns for their district, shown in the table below:

Department	**Greatest Concerns**
Alliance	Being able to stop a fire
Hemingford	Outer areas away from town

Dawes County

1,401 sq. miles
2017 population: 8,890



Community Profile

Dawes County lies in the north central part of the CWPP region. It is bounded on the west by Sioux County, on the south by Box Butte County, on the east by Sheridan County, and on the north by South Dakota. Incorporated municipalities include the county seat of Chadron (pop. 5,648), Crawford (pop. 953), and Whitney (pop. 74). Fort Robinson, Belmont, and Marsland (no pop. data available) are unincorporated communities. The US Forest Service operates the Pine Ridge Job Corps just south of Chadron in the forested area on top of the Pine Ridge escarpment. It is not in an incorporated municipality, but it is a population center that houses over 100 students and employs more than 50 people.

The county is crossed east/west by US 20 and north/south by US 385 and Nebraska Highway 2/71. The BNSF Railroad crosses the west side of the county north/south. The Dakota Minnesota and Eastern railroad connects/terminates with the BNSF in Crawford and connects with Chadron and Rapid City SD. The Nebkota Railway, Inc. runs from Chadron east along US 20 into Sheridan County, eventually terminating in Cherry County at Merriman.

Although the primary land use is agriculture and livestock operations, recreation on both public and privately owned property is rapidly growing. Federal lands include 102,430 acres managed by the US Forest Service (102,348 acres) and the US Bureau of Land Management (82 acres). The NGPC manages 43,073 acres in seven state parks, recreation areas, and wildlife management areas. The balance of the land within the county is primarily privately owned. There are 38,432 acres in state school lands. Non-government conservation organizations manage 1,251 acres in the county.

Most of the county lies within the mixed-grass and shortgrass prairie vegetation zones. The Pine Ridge ponderosa pine forests and savannas occupy the central part of the county. Much of this area burned in the catastrophic wildfires of 2006 and 2012 and has returned to early seral-stage vegetation. The Niobrara River runs along the southern edge of the county, and the White River enters the west edge of the county near Fort Robinson and runs northeast, exiting into South Dakota in the northeast corner of the county. Riparian woodlands exist along the rivers and tributaries. Agriculture crop fields are concentrated primarily in the southeast quadrant; hayland and grazing lands occupy most of the county.

Fire History

From the time this area was settled by Europeans until the early 1970s, wildfire activity was limited to small fires which were rapidly and effectively controlled. In 1973, wildfire occurrence and intensity began to increase sharply.

In 1973 the Dead Horse fire burned 3,600 acres north of Chadron State Park and the Cunningham Creek fire burned 3,190 acres in the watershed bearing the same name. The McIntosh fire burned almost 2,300 acres near the east boundary of the Crawford fire district in 1984. In July, 1985 more than 3,500 acres of grass and timber burned southeast of Crawford. In 1989 the Fort Robinson fire complex burned 49,000 acres and the railroad-caused Belmont fire burned over 3,000 acres in the southeast part of the Crawford fire district.

In September 2000, the Sawlog fire burned about 1,000 acres southeast of Crawford. In 2006 the Spotted Tail, Roberts Track, and Rudloff fires burned significant areas within the Chadron and Crawford districts. According to the *Rapid City Journal*, "Some 68,000 acres of Pine Ridge forest in Dawes and Sioux counties burned following a string of intense lightning fires on July 26. At least four homes and several other structures along with about 500 miles of fences were destroyed. One of the fires, the Spotted Tail Fire, began about 12 miles south of Chadron and burned to the edge of the Chadron State College campus. At least 1,000 firemen from 20 states helped battle the blazes. Temperatures of more than 100 degrees added to the misery." [15]

In 2012, over half a million acres burned in Nebraska. In Dawes County, the Region 23 Complex burned 58,450 acres in the Crawford and Chadron districts. Over 29,730 acres burned in the Cottonwood Creek and Little Cottonwood watersheds. Many of the areas previously burned (Cunningham and Roberts Track fires) again burned, with great intensity, in the West Ash Fire. The Wellnitz fire burned 77,684 acres in Nebraska and South Dakota. 48,681 of these acres were in the Hay Springs and Rushville fire districts in Dawes and Sheridan Counties. See Map 5, *Historic Fires of the Pine Ridge*, for locations of many fires which have burned in the Pine Ridge area over the last four decades.

Fire Hazard

Although lightning is the ignition source for just over half of the reported fires from the county's fire districts, it accounts for the lion's share of acreage burned. Between 2000 and 2018, lightning fires charred 176,546 acres, vs. just 2,267 acres burned by human-caused fires (see Table 3). Increasingly, large fires burn with high intensity, posing a threat to rural homes and damaging watersheds. This situation challenges fire suppression personnel and agency managers. Fuel continuity throughout the forested areas and in some of the open grasslands is very high to extreme. During high fire danger conditions, wildfires in these areas have a high rate of spread and a high resistance to control efforts.

Exclusion of low-intensity ground fire, limited active forest management, and prolific pine regeneration following timber harvest activities have contributed to the ever-increasing fire danger in the forested areas within the county. This, in combination with drought, set the stage for the explosive conditions in 2012 and the subsequent catastrophic wildfires the county experienced. Drought also contributes to high risk conditions in the grasslands. The railroad corridors are considered at risk because historically they have been vulnerable to railroad-caused fires.

The areas most at-risk from wildfire are the lands surrounding municipalities and rural recreational/residential areas where there are heavy fuels and limited access. In Dawes County, local officials have identified the Pine Ridge and the Niobrara River as being at high risk. Chadron, Crawford, Fort Robinson State Park, and Marsland all lie within areas of concern. Crow Butte Resources, a uranium mining operation in the Squaw Creek watershed, sits near the forested Pine Ridge and also lies within the area of concern.

The 2003 CWPP specifically identified eight Dawes County rural home developments in the WUI as being of paramount concern. These are Squaw Creek (24 sites), West Ash Creek (21 sites), East Ash Creek (16 sites), Cunningham/Indian Creek (10 sites), Trunk Butte Creek (5 sites), Dead Horse Creek (27 sites), Chadron Creek (200 sites), and Bordeaux Creek (17 sites). See Appendix B for a link to detailed descriptions of these areas, site-specific risk analysis, suppression considerations, and forest fuels hazard reduction targets.

Those portions of the county which lie outside the mapped Areas of Concern do have their own fire risk variables; however the agricultural practices in these areas are not as fire prone as are those within the Pine Ridge. Specific Areas of Concern are shown in Appendix A, Map 6. All of Dawes County lies within the boundaries of the WUI as defined in the introduction to this CWPP.

Protection Capabilities and Infrastructure

Fire Districts and Emergency Operations

The Chadron, Crawford, Hay Springs, and Hemingford fire districts lie all or partly within Dawes County. The Crawford, Hay Springs, and Hemingford districts also include lands in Sioux, Sheridan, and Box Butte Counties, respectively. See Appendix F for their contact information, equipment lists, and responses to the VFD survey.

The fire departments are responsible for fire protection and other emergencies in their fire protection districts. The Dawes County Sheriff's department provides assistance as needed. The Rural Fire Protection Districts maintain a mutual aid agreement.

Water Sources

Reliable water sources are limited within the county. The only developed water systems are in Chadron, Chadron State Park, the Pine Ridge Job Corps Center, Crawford, and Fort Robinson State Park. The Chadron city dams south of Chadron have served as a reliable source of water for fire suppression. Whitney Lake is the largest irrigation storage reservoir in the Crawford Fire District. Other reservoirs, ponds and stock tanks are located throughout the county. During drought conditions many reservoirs and ponds are unreliable. With the exception of the Niobrara and White Rivers, most streams have only intermittent flow and are not dependable. Several irrigation canals along the Niobrara River near Marsland and the White River near Whitney and Crawford are used for agriculture and could be emergency water sources when the rivers are flowing normally. Windmills are abundant in the county and can provide water when they are operational.

Roads and Bridges

Dawes County is served by US Highways 385 and 20 and Nebraska Highway 71. These are augmented by a network of county-maintained roads. The 2013 CWPP Update identified two roads which could restrict truck/lowboy passage within the county. Both Pleasant Ridge and Whitman roads were highlighted as having narrow sections. Appendix A, Map 11 shows restricted bridges and roads. See link in Appendix B for detailed

maps of county-maintained roads with their 911 name designations. In the Pine Ridge, the timber harvest activity from 1990 to 2008 created a vast network of forest access roads on the private and, to a lesser extent, on public land. These roads now serve as access for fire suppression and other emergency vehicles. There is presently no comprehensive mapping system for these logging roads.

Infrastructure Mapping
According to the Hay Springs fire chief, the fire district, which lies in both Dawes and Sheridan Counties, has GIS layers for housing, infrastructure, hydrants and other water sources, and bridge limits.

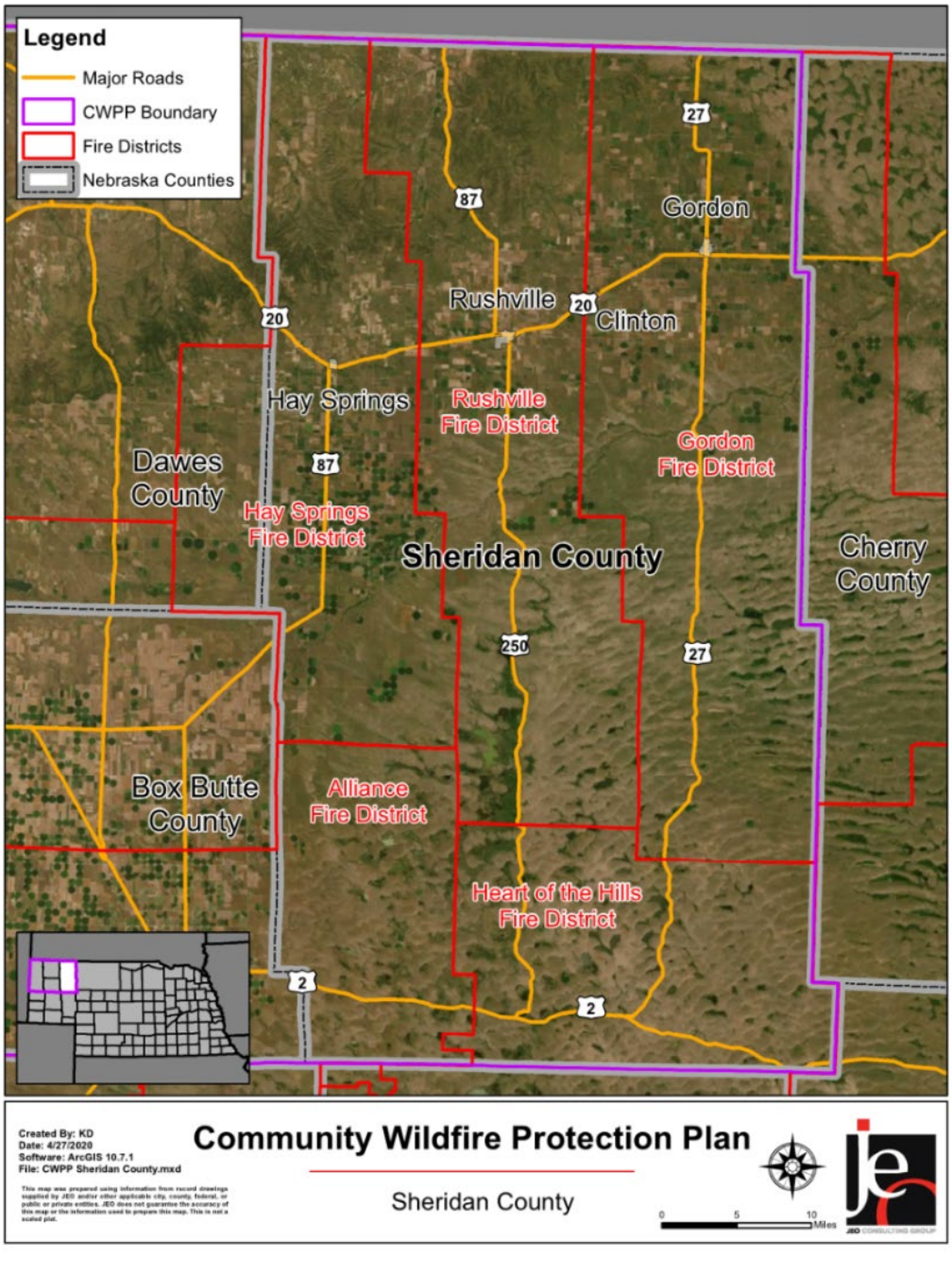
Critical Infrastructure
Critical facilities identified by local jurisdictions (Dawes County, Region 23 EMA, Upper Niobrara White NRD, City of Chadron, City of Crawford, and Chadron Public Schools) include law enforcement, fire departments, Region 23 EMA office, municipal and county buildings, VFD training building, street department, radio towers, cell towers, state park, sewer plants, lift stations, warning siren, power companies and electrical substations, sanitation companies, health services, hospitals and clinics, nursing homes and senior living facilities, schools, fairgrounds, grocery stores/pharmacies, churches, state college, NRD office, senior center, and community building. The Region 23 HMP contains the complete list: https://jeo.com/region-23-hazard-mitigation-plan-update.

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

Department	**Greatest Concerns**
Chadron	Firefighter and public safety, property safety, and natural resource conservation
Crawford	Resource availability
Hay Springs	Distance and rough terrain
Hemingford	Northern border area

Sheridan County

2,470 sq. miles
2017 population: 5,289



Community Profile

Sheridan County forms the east boundary of the CWPP region. It is bounded on the west by Box Butte and Dawes Counties, on the north by South Dakota, on the east by Cherry and Grant Counties, and on the south by Garden County. Incorporated communities include the county seat of Rushville (pop. 873), Clinton (pop. 40), Gordon (pop. 1,545), and Hay Springs (pop. 545). Unincorporated communities include Antioch (no pop. data available), Bingham (no pop. data available), Ellsworth (2000 pop. 32), Lakeside (no pop. data available), and Whiteclay (2000 pop. 14). The Pine Ridge Reservation is located just north of the county, in South Dakota.

The county is crossed east/west by US Highway 20 and Nebraska Highway 2. North/south routes are Nebraska Highways 87, 250, and 27. The Nebkota Railway, Inc. parallels US Highway 20 across the northern part of the county.

Although the primary land use is agriculture and livestock operations, recreation on both public and privately owned property is growing. The forested area of the Pine Ridge escarpment lies north of US Highway 20, primarily in the northwest part of the county.

Land ownership within the county is mostly private, but federal lands include 108 acres managed by the US Bureau of Land Management and 552 acres are part of the Pine Ridge Reservation. The NGPC manages 4,109 acres in one state recreation area and two wildlife management areas. There are 60,777 acres in state school lands. Non-government conservation organizations manage 846 acres in the county.

The portion of the county south of the Niobrara River lies within the Sandhills/mixed-grass prairie vegetation type. North of the river, prairies are in the mixed-grass/shortgrass zone. The Pine Ridge ponderosa pine forests and savannas occupy the northwestern part of the county. Much of this area burned in the catastrophic wildfires of 2006 and 2012. The Niobrara River crosses the central part of the county south of US 20, and White Clay Creek rises in the Pine Ridge escarpment and flows north into the White River in South Dakota. Riparian woodlands exist along some parts of the perennial streams. Agriculture crop fields are concentrated primarily south of Hay Springs and around Gordon; grazing lands and hayland occupy most of the county. A large portion of the southern end of the Hay Springs Fire District is comprised of the Mirage Flats Irrigation Project.

Fire History

From the time this area was settled by Europeans until the early 1970s, wildfire activity was limited to small fires which were rapidly and effectively controlled. In 1973, wildfire occurrence and intensity began to increase sharply.

Some of the larger fires reported for Sheridan County include a 26,000 acre lightning fire and a 2,500 acre equipment fire in the Gordon fire district in 2000 and several 300+ acre lightning fires in 2006 in the Gordon, Rushville, and Hay Springs fire districts. In 2012 the Wellnitz fire burned 77,684 acres in Nebraska and South Dakota. 48,681 of these acres were in the Hay Springs and Rushville fire districts. That same year, nearly 5,800 acres burned near Antioch on the east end of the Alliance fire district. See Map 5, *Historic Fires of the Pine Ridge*, for locations of many fires which have burned in the Pine Ridge area over the last four decades.

Fire Hazard

Although there are nearly twice as many human-caused fires as lightning fires reported by the county's fire districts, lightning fires account for over 90% of the acres burned. Between 2000 and 2018, lightning fires charred nearly 165,000 acres, vs. just over 17,000 acres burned by human-caused fires (see Table 3).

Exclusion of low-intensity ground fire, limited active forest management, and prolific pine regeneration following timber harvest activities have contributed to the ever-increasing fire danger in the forested areas within the county. This, in combination with drought, set the stage for the explosive conditions in 2012 and the subsequent catastrophic wildfires the county experienced. Drought also contributes to high risk conditions in the grasslands. The railroad corridors are considered at risk because historically they have been vulnerable to railroad-caused fires.

The areas most at risk from wildfire are the lands surrounding municipalities and recreational/residential developments where there are heavy fuels and limited access. In Sheridan County, NFS staff has identified the Wellnitz Fire footprint and the north central part of the county where there are homesteads with limited access

and difficult terrain as being at high risk. The NFS priority landscape analysis indicated the immediate surroundings of Hay Springs and Gordon as at-risk WUI. The 2013 CWPP identified all of the area north of Highway 20 as an area of concern, as well as the communities of Rushville and Whiteclay. It was also noted that eastern redcedar encroachment in pasture lands of southern Sheridan County is creating an increasing fire risk.

The Hay Springs fire department identified the area west of Beaver Road as an area of concern due to difficult access, rough terrain, one way in/out, heavy fuels, and lack of water within effective distance. The Gordon fire department and Alliance fire departments did not identify specific locations, but have general concerns about areas with rough terrain, difficult access, heavy fuels, lack of water within effective distance and multiple structures. The Rushville fire department is concerned about timbered areas.

Those portions of the county which lie outside mapped Areas of Concern do have their own fire risk variables; however the agricultural practices in these areas make them less fire prone than the Pine Ridge. Specific Areas of Concern are shown in Appendix A, Map 6. All of Sheridan County lies within the boundaries of the WUI as defined in the introduction to this CWPP.

Protection Capabilities and Infrastructure

Fire Districts and Emergency Operations

The Alliance, Gordon, Hay Springs, Heart of the Hills, and Rushville fire districts lie all or partly within Sheridan County. The Hay Springs, Gordon, Alliance, and Heart of the Hills districts also include lands in Dawes, Cherry, Box Butte, and Garden Counties, respectively. See Appendix F for their contact information, equipment lists, and responses to the VFD survey.

The fire departments are responsible for fire protection and other emergencies in their fire protection districts. The Sheridan County Sheriff's department provides assistance as needed. The Rural Fire Protection Districts maintain a mutual aid agreement.

Water Sources

Reliable water sources are limited within the county. The only developed water systems are in Gordon, Hay Springs, and Rushville. Walgren Lake, located just south of Hay Springs, is a dependable source of water. Smith and other Sandhills lakes located south of Rushville, south of Gordon, and in the eastern part of the Alliance Fire District are also reliable. Other reservoirs, ponds and stock tanks are located throughout the county. During drought conditions many reservoirs and ponds are unreliable. With the exception of the Niobrara River, most streams have only intermittent flow and are not dependable. There are irrigation canals along the Niobrara River south of Hay Springs. These could be emergency water sources when the river is flowing normally. Windmills are abundant in the county and can provide water when they are operational.

Roads and Bridges

Sheridan County is served by US Highway 20 and Nebraska Highways 2, 87, 27, and 250. These are augmented by a network of county-maintained roads. The 2013 CWPP Update identified 68 roads and bridges which could restrict truck/lowboy passage within the county. These are shown in Appendix A, Maps 13-14. See link in Appendix B for detailed maps of county-maintained roads with their 911 name designations. In the Pine Ridge, the timber harvest activity from 1990 to 2008 created a vast network of forest access roads on the private and, to a lesser extent, on public land. These roads now serve as access for fire suppression and other emergency vehicles. There is presently no comprehensive mapping system for these logging roads. The southern Sandhills portion of the county is sparsely populated and has a very limited public road system.

Infrastructure Mapping

According to the Hay Springs fire chief, the fire district, which lies in both Sheridan and Dawes Counties, has GIS layers for housing, infrastructure, hydrants and other water sources, and bridge limits.

Critical Infrastructure

Critical facilities identified by local jurisdictions (Sheridan County and the cities of Gordon, Hay Springs, and Rushville) include law enforcement and fire departments, municipal and county buildings, hospitals and clinics, nursing homes and senior living facilities, electrical substations, utility companies, sewer plant, lift station, lagoons, water storage facilities, community buildings and senior centers, American Legion buildings, schools, churches, and state recreation areas. The Region 23 HMP contains the complete list: https://jeo.com/region-23-hazard-mitigation-plan-update.

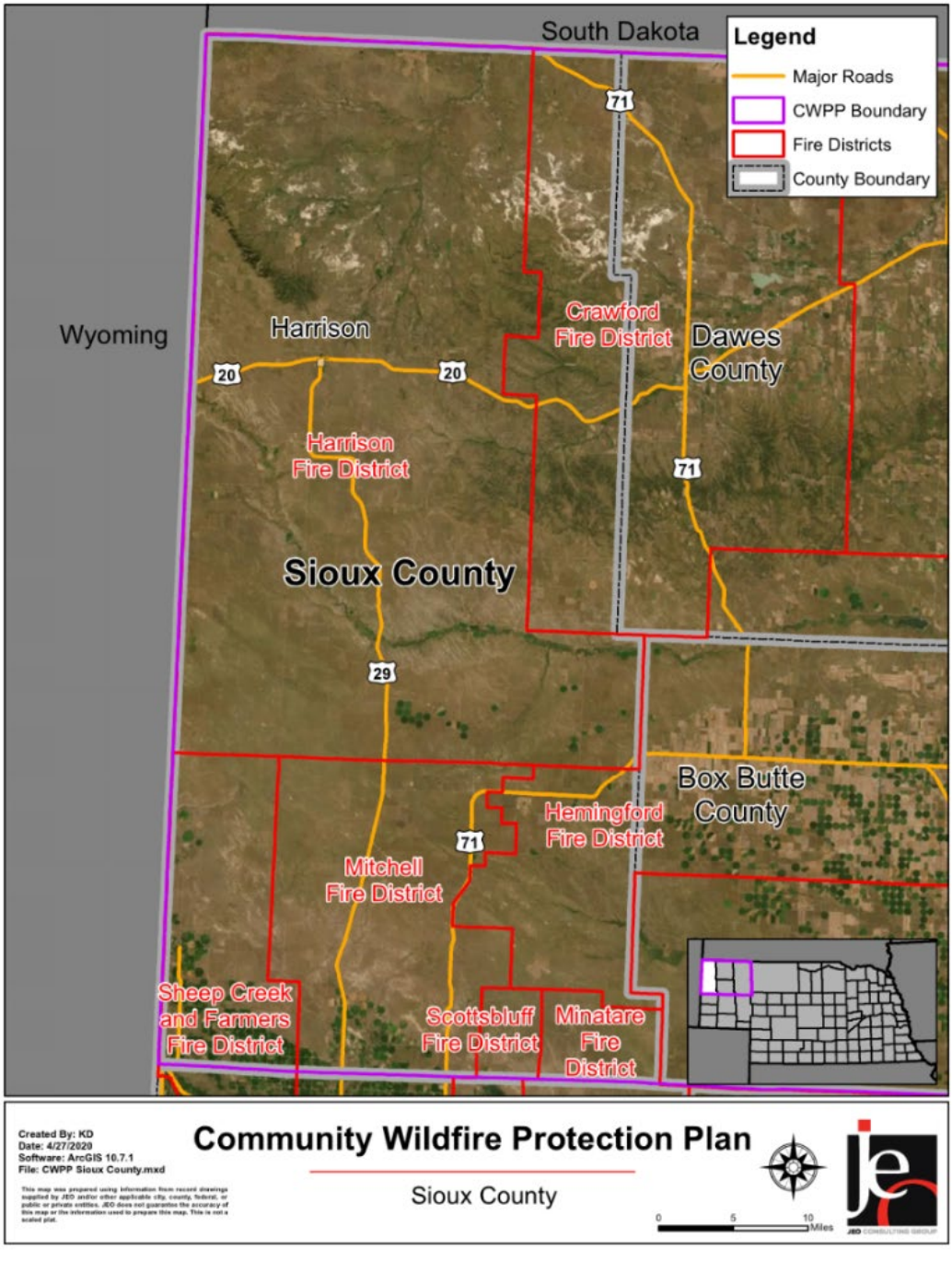
Greatest Concerns

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

Department	**Greatest Concerns**
Alliance	Being able to stop fires
Gordon	Getting to fires when the roads are flooded
Hay Springs	Distance and rough terrain
Heart of the Hills	Manpower to run equipment
Rushville	Timbered areas

Sioux County

2,067 sq. miles
2017 population: 1,203



Community Profile

Sioux County comprises the west end of the CWPP area. It is bounded on the south by Scotts Bluff County, on the east by Box Butte and Dawes Counties, on the north by South Dakota, and on the west by Wyoming. The county seat of Harrison (pop. 230) is the only incorporated municipality. There are no unincorporated population centers in the county.

The county is crossed east/west by US Highway 20. Nebraska Highway 2/71 runs north and east from Scottsbluff through the Mitchell and Hemingford fire districts before exiting into Box Butte County. Nebraska Highway 29 runs south from Harrison to Mitchell, in Scotts Bluff County. The BNSF Railroad angles across the northeast corner of the county, and the Union Pacific Railroad cuts across the southwest corner. The now-abandoned Chicago Northwestern railroad crosses the county, roughly paralleling US 20.

Although the primary land use is agriculture and livestock operations, recreation on both public and privately-owned property is growing, particularly in the forested areas of the Pine Ridge escarpment, which occupy parts of the north and east portions of the county.

Land ownership within the county is mostly private, but federal lands include 169,313 acres managed by the US Forest Service (national grasslands and forest/wilderness), National Park Service (Agate Fossil Beds National Monument), and the BLM (23 scattered tracts). The NGPC manages 21,155 acres in one state park area and two wildlife management areas. There are 55,516 acres in state school lands. Non-government conservation organizations manage 7,802 acres in the county.

Most of Sioux County lies within the shortgrass/mixed-grass prairie vegetation types. The Pine Ridge ponderosa pine forests and savannas occupy the northeastern part of the county. Much of this area burned in the catastrophic wildfires of 2006 and 2012.

The Niobrara River crosses the central part of the county. The White River rises southeast of Harrison and flows northeast into Dawes County on its way to South Dakota. Riparian woodlands exist along some parts of the perennial streams. Agriculture crop fields are concentrated in the extreme southwest corner of the county, west of Highway 2/71; grazing lands and hayland occupy most of the county.

Fire History

From the time this area was settled by Europeans until the mid-1980s, wildfire activity was limited to small fires which were rapidly and effectively controlled. One exception was the Five Points fire which burned a portion of the forested Hat Creek watershed in the late 1950s or early 1960s. In 1985, the Geiser fire burned almost 3,400 acres in the county's northeast corner. In 1989 the 49,000 acre Fort Robinson fire burned in both the Crawford and Harrison districts.

In the early 1990s the Glen and Warbonnet fires burned primarily on privately owned land. In 2006, the Rudloff fire burned in both the Crawford and Harrison districts. Also in 2006, the Thayer fire burned over 40,000 acres northeast of Harrison. In June, 2012 the Little Cottonwood fire burned an area in the upper reaches of that watershed. In August and September of 2012 the Douthit (Region 23 Complex) fire burned 29,730 acres in the Cottonwood/Little Cottonwood watersheds. See Map 5, *Historic Fires of the Pine Ridge*, for locations of many fires which have burned in the Pine Ridge area over the last four decades.

Fire Hazard

Although about 70% of fires reported by Sioux County fire districts are human-caused, lightning fires account for about 93% of total acres burned. Between 2000 and 2018, lightning fires charred 216,119 acres, vs. 15,449 acres burned by human-caused fires (see Table 3).

Exclusion of low-intensity ground fire, limited active forest management, and prolific pine regeneration following timber harvest activities have contributed to the ever-increasing fire danger in the forested areas within the county. This, in combination with drought, set the stage for the explosive conditions in 2012 and the subsequent catastrophic wildfires the county experienced. Drought also contributes to high risk conditions in the grasslands. The railroad corridors are considered at risk because historically they have been vulnerable to railroad-caused fires.

The areas most at risk from wildfire are the lands surrounding municipalities and recreational/residential areas where there are heavy fuels and limited access. In Sioux County, NFS staff has identified the historic large fire footprints and the remaining green areas of the Pine Ridge, especially where there are homesteads with limited access and difficult terrain as being at high risk. The NFS priority landscape analysis indicated Niobrara River as at risk. The 2013 CWPP identified the Village of Harrison and the Agate Fossil Beds National Monument as areas of concern.

The Minatare/Melbeta fire department identified the sandy hills north of Lake Minatare that extend into the southeast corner of Sioux County as an area of concern due to difficult access, rough terrain, one way in/out, heavy fuels, and lack of water within effective distance. The Morrill/Sheep Creek and Farmers fire department noted concerns about areas along the railroad tracks, Sheep Creek, and Niobrara River with rough terrain and difficult access. They also have concerns about being unfamiliar with some portions of the fire district because of private property or access to the property itself. Additionally, the department noted that starting seven miles north of Morrill the soil becomes very sandy and it is tough terrain to get around on. This includes the area from the Wyoming border to the end of north and east boundaries of the district. The Scottsbluff Rural Fire Department identified 24 square miles in southern Sioux County with few water resources, several trailers and buildings on one-way roads, grassland, no roads. Only one road—the sugar factory road—serves this area, and it is bad in wet conditions. The NGPC said that the Gilbert Baker WMA in Sioux County, four miles north of Harrison, has rough terrain with limited access by truck. It is heavily forested, although some thinning is taking place along Monroe Canyon Rd. There is a fuelbreak along the west side of the WMA.

Those portions of the county which lie outside mapped Areas of Concern do have their own fire risk variables; however the agricultural practices in these areas make them less fire prone than the Pine Ridge. Specific Areas of Concern are shown in Appendix A, Map 6. All of Sioux County lies within the boundaries of the WUI as defined in the introduction to this CWPP.

Protection Capabilities and Infrastructure

Fire Districts and Emergency Operations

The Harrison, Crawford, Morrill (Sheep Creek and Farmers), Mitchell, Scottsbluff, and Minatare/Melbeta fire districts lie all or partly within Sioux County. The Crawford district also includes part of Dawes County. The Morrill, Mitchell, Scottsbluff, and Minatare/Melbeta districts also include lands in Scotts Bluff County. See Appendix F for their contact information, equipment lists, and responses to the VFD survey.

The fire departments are responsible for fire protection and other emergencies in their fire protection districts. The Sioux County Sheriff's department provides assistance as needed. The Rural Fire Protection Districts maintain a mutual aid agreement.

Water Sources

Reliable water sources are limited within the county. The only developed water systems are in Harrison and at Agate Fossil Beds National Monument. Reservoirs, ponds, and stock tanks are located throughout the county. During drought conditions many reservoirs and ponds are unreliable. With the exception of the Niobrara and White Rivers, most streams have only intermittent flow and are not dependable. During the drought conditions in 2012 the upper reaches of the Niobrara River ran dry. There are irrigation canals along the Niobrara River south of Harrison and at the extreme southern end of Sioux County in the Mitchell and Morrill Fire Districts. These are reliable and could be an emergency water source during normal river flows. Windmills are abundant in the county and can provide water when they are operational.

Roads and Bridges

Sioux County is served by US 20, NE 2/71, and NE 29. These are augmented by a network of county-maintained roads. The 2013 CWPP Update identified 23 roads and bridges which could restrict truck/lowboy passage within the county. These are shown in this document's Appendix A, Maps 9-10. See link in Appendix B for detailed

maps of county-maintained roads with their 911 name designations. In the Pine Ridge, the timber harvest activity from 1990 to 2008 created a vast network of forest access roads on the private and, to a lesser extent, on public land. These roads now serve as access for fire suppression and other emergency vehicles. There is presently no comprehensive mapping system for these logging roads.

Critical Infrastructure

Critical facilities identified by local jurisdictions (Sioux County and the Village of Harrison) include law enforcement and fire departments, municipal and county buildings, radio towers, electric generator, light and water plant, pump, sewer lift station, water tower, senior center, VFW hall, and schools. The Region 23 HMP contains the complete list: https://jeo.com/region-23-hazard-mitigation-plan-update.

Greatest Concerns

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

Department	**Greatest Concerns**
Harrison	Distance to a water source, lost rangeland, and the ability to protect structures
Crawford	Resource availability
Morrill	Communication with other departments and good routes to take to the fire
Minatare/Melbeta	Lack of personnel and communication (15 different radio frequencies and lack of radios)
Mitchell	None listed
Scottsbluff	Protection of lives and property; water resources; mutual aid

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 includes wildfire risk reduction strategies, recommendations for increasing emergency preparedness, fuels mitigation practices, training, education, and maintenance. The final part of the action plan 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 assessment requires calculations of the two primary components of risk: the magnitude of the potential loss and the probability that the loss will occur. For the WUI, a risk assessment is a step that identifies any feature/element of the landscape and structures that could create potential harm to a homeowner or community.[16]

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 of fuels, 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.[17] Note that in the Region 23 HMP, the term 'Hazard' is used to define individual types of natural weather events or man-made events, with a subsequent description of risk vulnerability and impacts. See HMP *Section Four: Risk Assessment* for more information.

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 F. Defensible space and structural ignitability are addressed in this section of the plan.

The 2020 Region 23 HMP identifies the planning area as being 100 percent at risk of wildfire. Some of these fires can be expected to exceed 100 acres in size. The following jurisdictions identified wildfire as a top hazard: Region 23, Upper Niobrara White NRD, Box Butte County, City of Alliance, Village of Hemingford, Dawes County, City of Chadron, City of Crawford, Sheridan County, City of Gordon, City of Hay Springs, City of Rushville, Sioux County, Village of Harrison, Chadron Public Schools, and Hemingford Public Schools. The HMP includes a list of current and completed mitigation projects for these entities.

Fire Risk Rating and 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. 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.

Prioritization

Appendix A, Map 6 of this plan is 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 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 isolated or surrounded by areas of natural fuels. [18]

The community pages of 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 coniferous forests of the Pine Ridge Escarpment and the woodlands along the Niobrara and White Rivers and their tributaries have high priority for hazardous woody fuels reduction, as do areas with recreational and rural residential subdivisions, such as those along US Highway 385 in Dawes County. Further assessments may identify additional priority areas.

The 2003 CWPP (https://nfs.unl.edu/documents/CWPP/PRCWPP_2003.pdf) specifically identified eight rural home developments in the WUI as being of paramount concern. It provided detailed descriptions of these areas, including natural fire hazards, fuels, slopes, and home site development and maintenance. It provided a risk analysis for each, including recommendations for reducing vulnerability to wildfire. It identified issues pertaining to hazards, risks, and vulnerability which were used to guide the mitigation planning process. It provided a wildfire response plan based on aggressive and full suppression of every wildfire. The plan was intended to coordinate and communicate strategies and tactics to accomplish the planning area goals and objectives. It listed triage and site-specific responses consistent with the response plans for the Nebraska National Forest and the State of Nebraska. For each subdivision, it provided a management objective (effectively and safely protect structures and properties from wildland fire damage), a list of suppression constraints and considerations (bullet lists including fuel types, vacant buildings, equipment availability, unique features (such as recreation sites, group use areas, and communications towers), water availability, evacuation routes, turn-off locations, etc.), and planned actions (full suppression response within drainage area). The action plan included forest fuels hazard reduction targets for specific WUI protection strategies such as fuels treatment. Future detailed risk assessments for other areas can be patterned after these.

All of the population centers, unincorporated residential developments, and dispersed recreational developments have high priority for fuels treatment and Firewise® preparation. This CWPP region does not yet have a certified Firewise® Community. The requirements and procedures to become recognized as such are arduous and require much coordination among homeowners. However, when landowners implement fuels reduction treatments using NFS cost share programs, or if a landowner asks for suggestions, NFS adheres to accepted Firewise® standards. Many homeowners who do not reside within an officially designated Firewise® Community have utilized those standards. NFS staff is currently working to help homeowners near Chadron establish a formal Firewise® Community, using Chadron State Park as the anchor.

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 the community 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 communities can undertake to become more fire-adapted. 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.

Homeowners can 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 structure more resistant to ignition. To reduce the risk for the long term, actions need to be maintained over time. [18]

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 I 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 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 fire departments
- 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 I)
- Conduct maintenance to reduce risk (tree care and public landscape maintenance programs)
- Reduce risk through land use planning (landscaping 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.

Recommendations for Increasing Emergency Preparedness

Communication

Having and using a comprehensive communications plan is integral to maintaining smooth operations. Regularly review local communications plans, revising as needed. 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.

In the Pine Ridge Area CWPP region, various fire departments still use VHF, UHF, or 800 radios. Departments using different types of radios cannot use their regular radios to speak with each other. The departments have agreed to use VHF radios in mutual aid scenarios and when communicating with the SEAT plane. Although each department has the ability to utilize VHF radios and has the proper mutual aid frequencies, the best—but expensive—solution is to get all departments on the same type of radio. It is recommended that the region address this ongoing issue as funding and technology allow.

Coordination

Coordination between responders is crucial in any emergency response situation. Local emergency managers need to be able to tie in their responses with neighboring and outside assisting jurisdictions. This framework is already in place and used by local emergency managers. One of the gaps common to many county-level LEOPs is the 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 information and support these LEOPs and the Region 23 HMP.

The Pine Ridge Mutual Aid District (Alliance, Chadron, Crawford, Gordon, Harrison, Hay Springs, Hemingford, and Rushville, plus Merriman, Ardmore SD, and the USFS) meets quarterly throughout the year. The Morrill, Hemingford, Minatare, and Scottsbluff Rural fire districts are part of the Scottsbluff County Mutual Aid District, which also meets quarterly. The Alliance and Heart of the Hills fire districts are part of the Central Panhandle Mutual Aid District.

VFD leaders and officials in the Pine Ridge Area CWPP Region already do an exceptional amount of coordinating and cooperating with county, state, and federal land and natural resource agencies. The following opportunities identified in the original plan have been updated to reflect current issues and concerns:

1) Consider developing county standards for WUI issues. This could be done through county zoning, for those counties that have zoning in place.

2) Utilize the national Firewise® Communities program to decrease risk in areas of concern.

3) Continue to engage partners such as the USFS, NGPC, and the National Wild Turkey Federation to expand WUI fuels reduction and thinning on a landscape basis through the use of NFS and other cost share programs for private landowners.

4) Continue to 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) VFDs in the CWPP region should 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. The USFS and NGPC have strong prescribed fire plans for the future. VFDs assist with these burns. Investigate potential grant opportunities to assist landowners with prescribed burns on private lands.

7) Facilitate VFD monitoring of the federal wildland fire weather system indices. Currently the NFS SEAT Manager sends lightning maps and fuel conditions reports to VFDs when conditions are conducive to rapid fire growth.

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 to see what each department has 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 Team, 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 Manager at Chadron has made the following recommendations:

1) 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 Pine Ridge CWPP region. Currently the region has only two applicators because there are not as many agricultural fields or spraying operations as in other parts of the state. This 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

Restricted Roads: Some county roads and bridges have weight and/or width limitations that may inhibit use by emergency vehicles. If bridges were removed or are in poor condition, detours are needed. The 2013 CWPP update mapped the locations of restricted roads and bridges in all of the Region 23 counties. These maps are included in Appendix A of this update. Since roads and road conditions constantly change, it was determined that rather than update these maps every five years during the CWPP update, it would make more sense for local planners to work with county road departments to update these maps as needed. Distributing updated maps to fire departments and other emergency responders will facilitate better route planning. This information can also be used to help prioritize fuel treatment areas.

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 need to 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 the most 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—other than fire equipment—has proven useful in many wildfire situations. Counties may want to consider adding an inventory of non-fire department resources (such as county road graders) to a centralized document.

GIS Information: Within the Pine Ridge CWPP region, the City of Alliance in Box Butte County has municipal GIS layers for hydrants, well points, water mains, sewer, and electric lines. According to the Hay Springs fire chief, the fire district, which lies in both Dawes and Sheridan Counties, has GIS layers for housing, infrastructure, hydrants and other water sources, and bridge limits. Other counties and communities may want to look into acquiring or implementing this type of data collection. Other map data that can be useful, especially in a format that can be easily accessed by hand-held devices, include 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. GPS locations of stock tanks and other water sources on public lands could also be provided to emergency responders.

Other: Counties can use technology to provide early detection systems and real-time fire weather information by retrofitting units and establishing new ones to complete the existing network.

Increase Fire Response Reporting for Increased Equipment Availability

Since reporting is voluntary for fire districts, not all fire districts consistently report their wildfire responses to the NFS. Because of this, there is limited information available about the locations and sizes of historic wildfires within the CWPP counties. Increased reporting would provide data to geographically focus grant assistance on those areas most prone to wildfire. The NFS has a database already in place that can easily be used to help with this. Planners and fire departments 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 Programs, Wildland Fire, and navigate to the fire reporting tab. Follow the login instructions the NFS provided to your department (or email to request instructions, trees@unl.edu), then follow the prompts to create the report.

Comprehensive fire reporting helps volunteer fire districts demonstrate a need for fire equipment such as that provided by the FEPP, Fire Fighter Property/State Fire Assistance, and Volunteer Firefighter Assistance programs described earlier in this document. 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 the program in jeopardy. As an incentive for participation, fire departments that report their responses are eligible to apply for this equipment.

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 I.

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 to address these issues.

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 residents and community buildings.

Training and Education

Firefighter Training

All volunteer fire departments are encouraged to participate fully in wildland training opportunities provided through the NFS, the State Fire Marshal's office, and NEMA. Most of the fire departments in the Pine Ridge Area CWPP region are annual participants in the Nebraska Wildland Fire Academy held at Fort Robinson State Park. A complete description of this 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 volunteer fire departments have mandatory fitness requirements, local departments can be encouraged to establish them, both for safety and lowering 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 I).

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 to the public.

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 University of Nebraska's Institute of Agriculture and Natural Resources and the Natural Resources Conservation Service have specialists available to help landowners develop grazing systems that will address these concerns.

Prescribed Fire

Several federal and state agencies and some private landowners use prescribed fire as a land management tool. On grasslands, prescribed fire can be extremely efficient for keeping eastern redcedar encroachment in check. In forested settings, prescribed fire is more effective and safer when used to maintain woodlands after dense areas 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 live trees. Crown fires are difficult to control, and they kill healthy trees.

Currently, most of the prescribed burns in the region are completed in forested areas on USFS and NGPC lands. The primary objective for most burns is to reduce heavy fuel loads. Both agencies plan multiple prescribed fires of varying size each year, but weather and resources to conduct the burns impact how many they complete.

VFDs work with these agencies by sharing people and equipment to help with the burns. It is recommended that VFDs continue with these cooperative efforts, as well as continuing to participate in the training available to help them do this safely and effectively.

Mechanical Fuels Reduction in High-Risk Wooded Settings
High-risk forested settings within the CWPP boundary are found mostly in wooded recreation areas and rural residential neighborhoods and in forested and shrubby lands surrounding population centers. In recreational and residential sites there are added hazards of seasonal congestion, sometimes-limited or difficult access, and structures adjacent to highly-flammable conifers. Mechanical thinning will decrease tree density to healthy levels while reducing wildfire hazard.

Much of the Pine Ridge area has experienced extreme fire behavior over the last three decades, as described in the overview section of this document. The severely burned areas continue to experience fire risk equal to or greater than the green forests. Fire-killed trees are a heavy fuel load that persists for decades after a fire. These areas have the potential to burn again at an even greater intensity than the original burn. Where economically feasible, these burned areas should also receive fuels mitigation treatment. The NFS has developed prescription parameters (link in Appendix B, #2b) for addressing burned forests. It is extremely important to protect unburned or lightly burned "green islands," which are seed sources for pine regeneration in adjacent areas that burned in high-intensity fires.

Slash (unusable limbs and tree tops left after thinning or logging) can present a fire hazard. There are still many old slash piles left over from timber harvesting in the Pine Ridge during the 1990s and early part of this century. Fuels reduction treatments continue to produce new slash residues. Slash can be chipped, mulched, or piled. Disposing of piles by either burning during appropriate winter conditions 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 also can be sources of spontaneous combustion.

Because mechanical fuels reduction is expensive, several 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 for hazardous woody fuels.

Utilization of wood products generated by these treatments has the potential to offset fuels treatment costs. However, presently there is little local commercial market for this material. Researchers are currently working with the NFS and others to encourage markets for wood products.

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 on both wooded areas and grasslands. Well-planned grazing can significantly reduce fire 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. Land managers can check with the NRCS for cost share program information.

Outside of forests, grass is the main hazardous fuel, and grazing is the primary tactic that is used to control that fuel load. This is recommended for the Pine Ridge area. Although prescribed fire can be used, it is not generally used for that purpose in these counties.

Another threat in grassland environments is the unmanaged shelterbelts that 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.

Some communities have expressed concerns about fires jumping over highways that are not properly mowed or managed, and areas along railroad right-of-ways. 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.

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 treatment, can be costly, so continued maintenance (keeping regrowth in check) not only prolongs the period of hazard protection, it also 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 recap of lessons learned from earlier practices, which helped shape this update; 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.

Lessons Learned

Fuels Mitigation Practices. The objective of fuels mitigation treatments in forested settings is to reduce the stand density to levels which will remain effective for 20 to 30 years. The NFS maintains a database that quantifies the time and level of treatment performed under NFS agreements on forested properties statewide. This helps resource managers to evaluate when and where resources for future fuel treatments should be directed.

The extreme fire behavior in Nebraska during 2012 tested many of the fuels reduction treatments that were previously implemented. Wildfires provided an opportunity to observe the effectiveness of various types and intensities of treatments. Lessons learned from the 2012 fire season strengthened resource managers' ability to plan suitable fuels mitigation treatments for Nebraska's landscapes.

State Wildfire Support to Volunteer Fire Departments. During the 2012 wildfires, the NFS learned that the state needed to provide additional wildfire support to VFDs. LB 634, the Wildfire Control Act of 2013, was enacted to provide this support. It created more wildfire training opportunities for VFDs and established the SEAT program to assist VFDs in keeping small fires small.

Emergency Management. A major lesson learned from the 2012 wildfires from a Region 23 perspective was the importance of having relationships between the USFS, NFS, the local VFDs, NEMA and Region 23 in place prior to the events. Knowing how each agency/department works and what their main objectives are when the fire crosses jurisdictional boundaries and being able to come together in a Unified Command helps manage the event more efficiently. ICS training and exercising together is a crucial component. One other area of

improvement was that the VFDs have become more aware of the importance of tracking and documenting expenses early on in an incident. Trying to backtrack and piece together documentation from dispatch records is very time consuming; it is much easier to track and document costs from the beginning.

Volunteer Fire Departments. The VFDs most likely also learned lessons from the 2012 wildfires, particularly concerning successful tactics, communications, and interagency cooperation. Because of these wildfire events, departments had to make adjustments on the fly, but then were able to review and fine-tune protocols after the fact.

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 review the plan on an annual basis to evaluate progress, re-evaluate priorities for action items, and recommend updates as needed.

Review of the strategy 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 and should include representation of stakeholders who participated in the development of this plan.

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 expand, data are updated, and areas of extreme wildfire hazard decline or increase. This update is being prepared at the same time as the Region 23 HMP update. By aligning the update schedules of various planning mechanisms the goals, priorities, and actions identified can more easily be integrated into other plans.

Monitoring

Continued public involvement is needed to accomplish many of these recommendations. It is important that the process allows for ongoing collaboration with stakeholders on how best to meet their needs, while at the same time achieving the objectives of this plan. Agency stakeholders will monitor their efforts according to their internal protocol, documenting accomplishments and redesigning strategies as needed.

Evaluation

Annual assessment of the identified tasks is very important to determine whether or not progress is 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 in the future for the purpose of reporting accomplishments are listed below:

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 equipment obtained
5. Number of firefighters and fire departments receiving training courses
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 involved
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 the units of measure listed above to determine progress. This plan is not intended to function as a means of bypassing the individual processes and regulations of the participating agencies. Each project must adhere to any pertinent local, state and federal rules. The CWPP is a coordinating document for activities related to education and outreach, information development, fire protection, and fuels treatment.

Five-Year Action Plan

The following Action Plan summary table is intended to assist planners implement, evaluate, and keep the CWPP up to date. It lists the objectives developed by the planning team and the associated tasks needed to achieve each objective, 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 expanded objectives for the ensuing five-years.

Five-Year Action Plan for the Pine Ridge Area CWPP by Objective 2020-2025				
Task(s)	**Who**	**When**	**Benchmark(s)**	**Opportunities/Limits**
Risk Assessment				
Identify/analyze RA elements	Local officials, NFS	Done	Checklist/report	n/a
Prioritize Areas of Concern				
Assess/prioritize based on vulnerability	Local officials & fire departments	2020-2022	Maps, checklist, report	Opportunity to further prioritize based on risk assessment
Structural Risk & Ignitability Analysis				
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/Increase Emergency Preparedness				
Review county zoning plans for treatment of high fire risk areas	Local planning staffs	2020-2022	# of recommendations to county officials	Consider building setbacks from canyon rims, access, building materials
Identify mitigation practices	Local Officials, NFS	Done	Checklist/report	n/a
Increase WUI Protection				
Expand WUI fuels reduction, including RxB	Agencies, landowners; local officials (for public property)	Ongoing	# projects, # acres	Continue seeking grants for cost share
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	Homeowners, planning officials	Ongoing	# New buildings to code; # bldgs. retrofitted	Retrofits can be costly; opportunity for new construction
Increase Communications Effectiveness				
Review local communications plans	Local and state officials	Annually	Document changes/updates	n/a
VFDs will have the capability of communicating 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

Task(s)	Who	When	Benchmark(s)	Opportunities/Limits
Increase Coordination Among Partners				
Develop & adopt regional WUI standards	Local officials, VFDs; NFS can assist	2021-2023	# of counties adopting standards	Opportunity: HOAs can also adopt standards
Expand inter-agency cooperation	Local, state, federal officials	Ongoing	# of mutual aid agreements, # MOUs	Explore MOUs with non-traditional partners, NGOs
Facilitate VFD monitoring of fire weather system indices	VFDs, NFS	Ongoing	# of departments able to monitor indices	Limit: # of weather stations. Opportunity: Weather apps can be used on the fireline.
Create a statewide "Mutual Aid Guide"	Region 23, VFDs, NFS	2021-2022	Created document	A guide in each engine enhances access to resources
Establish region-wide public awareness plan	Agencies, VFDs	2020-2023	# of participating entities	NFS can provide assistance
Engage partners to expand WUI fuels reduction and thinning	NFS, other agencies	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	Ongoing	# of participating entities, # of projects, # of acres treated	Partners can co-locate projects to expand treated area on a landscape scale
Increase Data Availability				
Update county maps of restricted roads/ bridges	Local officials, contractors	Ongoing	# of jurisdictions with updated maps	May piggy back data collection with other tasks
Pre-identify potential staging locations	Local officials, VFDs, Region 23	2020-2022	# of locations identified	Will expedite staging area placement decisions
Create lists of non-fire equipment	Local officials, VFDs	Ongoing	# of equipment lists	Can be included in regional mutual aid guide document
Acquire GIS layers for locating critical infrastructure, water sources, etc.	Local officials and planners	Ongoing	# of new layers created	Opportunity: Provide in a format that can be easily accessed by hand-held devices
Realtime fire weather information	State, Local	Ongoing	# of units	Retrofit units and establish new to complete network
Provide early detection systems using technology	State, Local	Ongoing	# of units	May retrofit some units and establish new units
Enhance VFD Effectiveness and Safety				
Increase fire response reporting	Fire chiefs	Ongoing	# of departments reporting	Opportunity for VFDs to acquire additional equip.
Increase participation in firefighter training	VFDs, agencies	Ongoing	# of depts, firefighters receiving training	Many training options available via NFS & NEMA
Develop "triage" guidelines	VFDs, agencies	2020-2022	Document created	Increases firefighter safety during wildfires
Increase Aerial Support Effectiveness				
Train additional SEAT Base Managers	NFS, NEMA	Ongoing	# of new certified managers	Limit: 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 agreements; # of interstate assists	Helps ensure that all are aware of available resources, times of planned contracted aviation availability, and enable sharing of resources across state borders
Increase Public Awareness				
News releases, workshops, seminars, etc.	Local officials, planners, VFDs	Ongoing	# of people reached	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

Endnotes

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2 Nebraska Emergency Management Agency. State of Nebraska Hazard Mitigation Plan. https://nema.nebraska.gov/sites/nema.nebraska.gov/files/doc/hazmitplan.pdf. Accessed October 4, 2018.

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16 Wildland Urban Interface Wildfire Mitigation Desk Reference Guide. (August, 2014). Retrieved from http://www.nwcg.gov/pms/pubs/pms051.pdf December 3, 2018.

17 Baker County Community Wildfire Protection Plan. (Oregon. February 15, 2006).

18 International Fire Chiefs Association. *Community Wildfire Protection Plan: A Fire Service Leader's Guide.* Definitions retrieved from https://www.iafc.org/topics-and-tools/resources/resource/community-wildfire-protection-plan-leaders-guide December 3, 2018.

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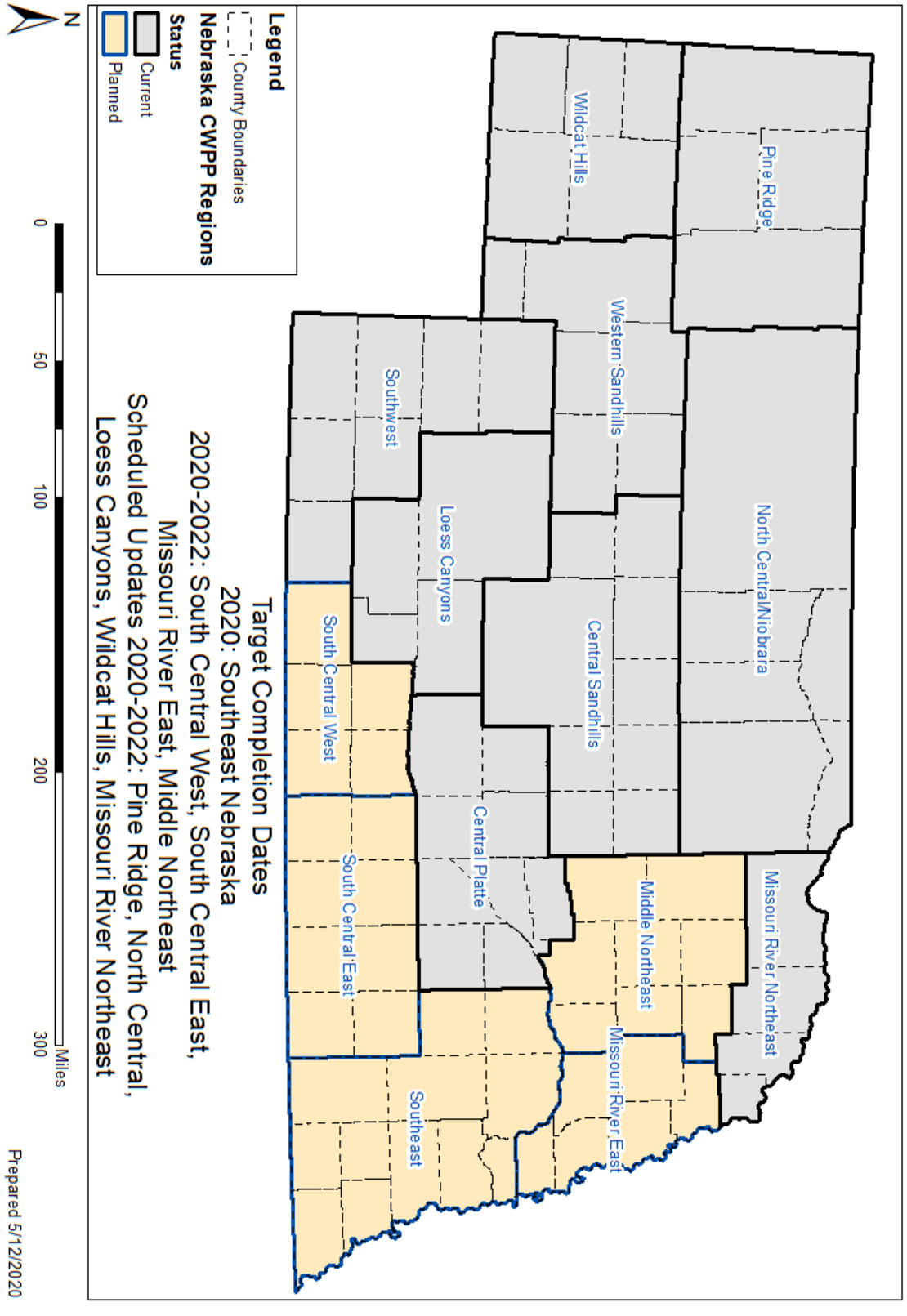
Appendix A

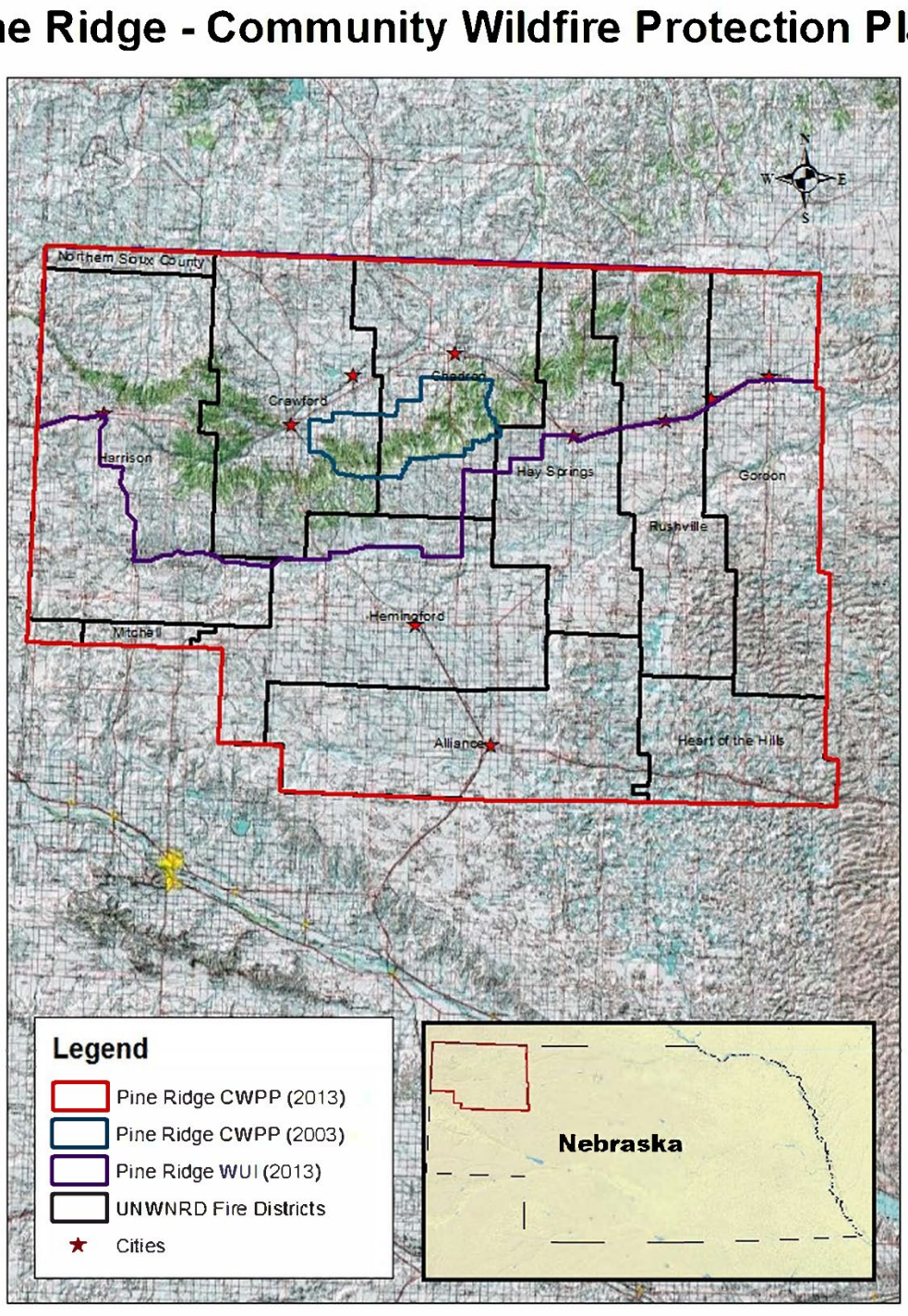
Maps

1. Nebraska CWPP Regions
2. Previous Pine Ridge Area CWPP Boundaries
3. Nebraska Natural Legacy Project: Biologically Unique Landscapes
4. Nebraska Local Emergency Management Areas
5. Nebraska Local Mitigation Planning Areas
6. Pine Ridge Area CWPP Areas of Concern
7. Pine Ridge Area CWPP Land Cover
8. Hazardous Roads in Pine Ridge Area CWPP Region (7 maps)

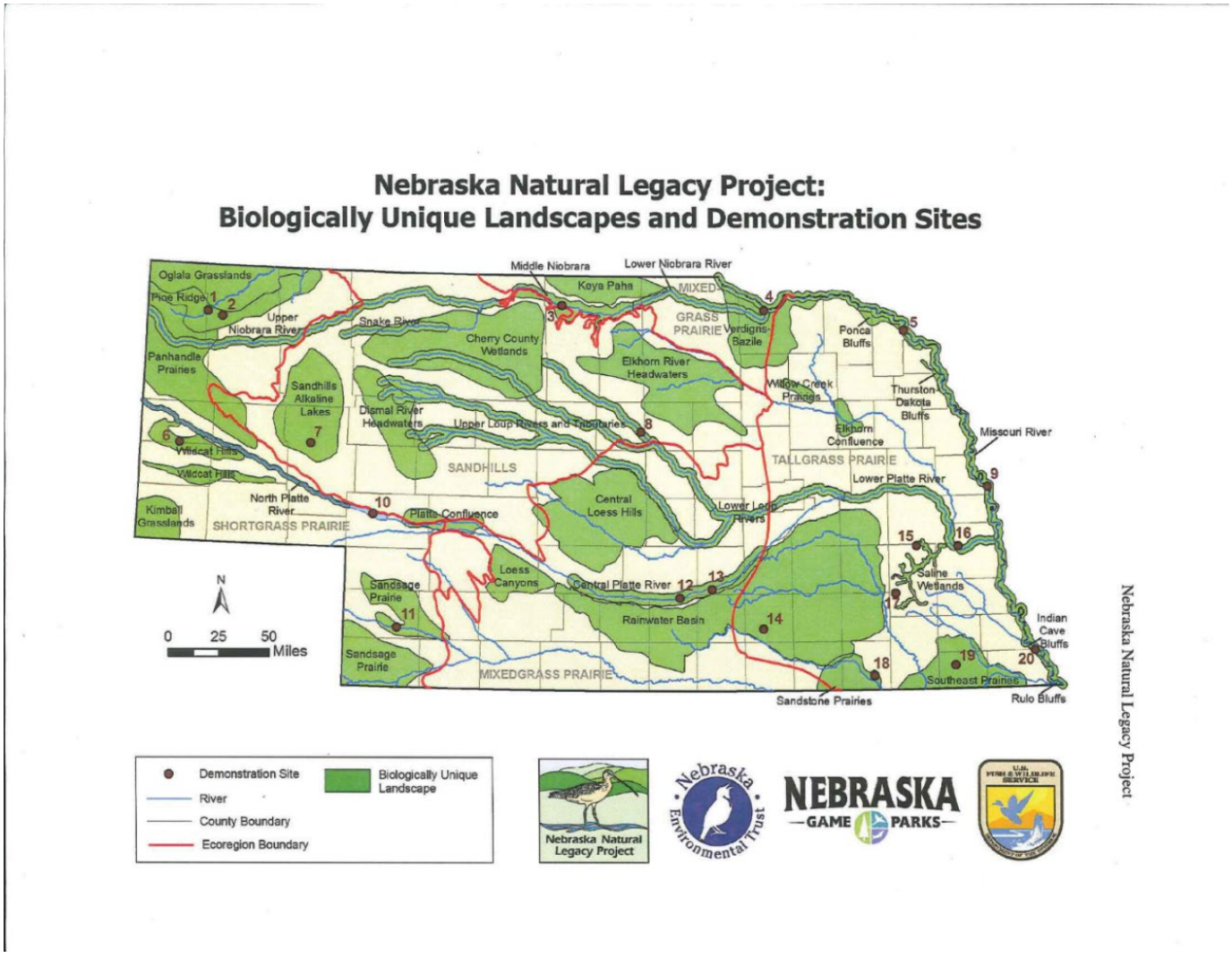
Map 1: Nebraska Community Wildfire Protection Plan Regions



Map 2: Previous Pine Ridge Area CWPP Boundaries



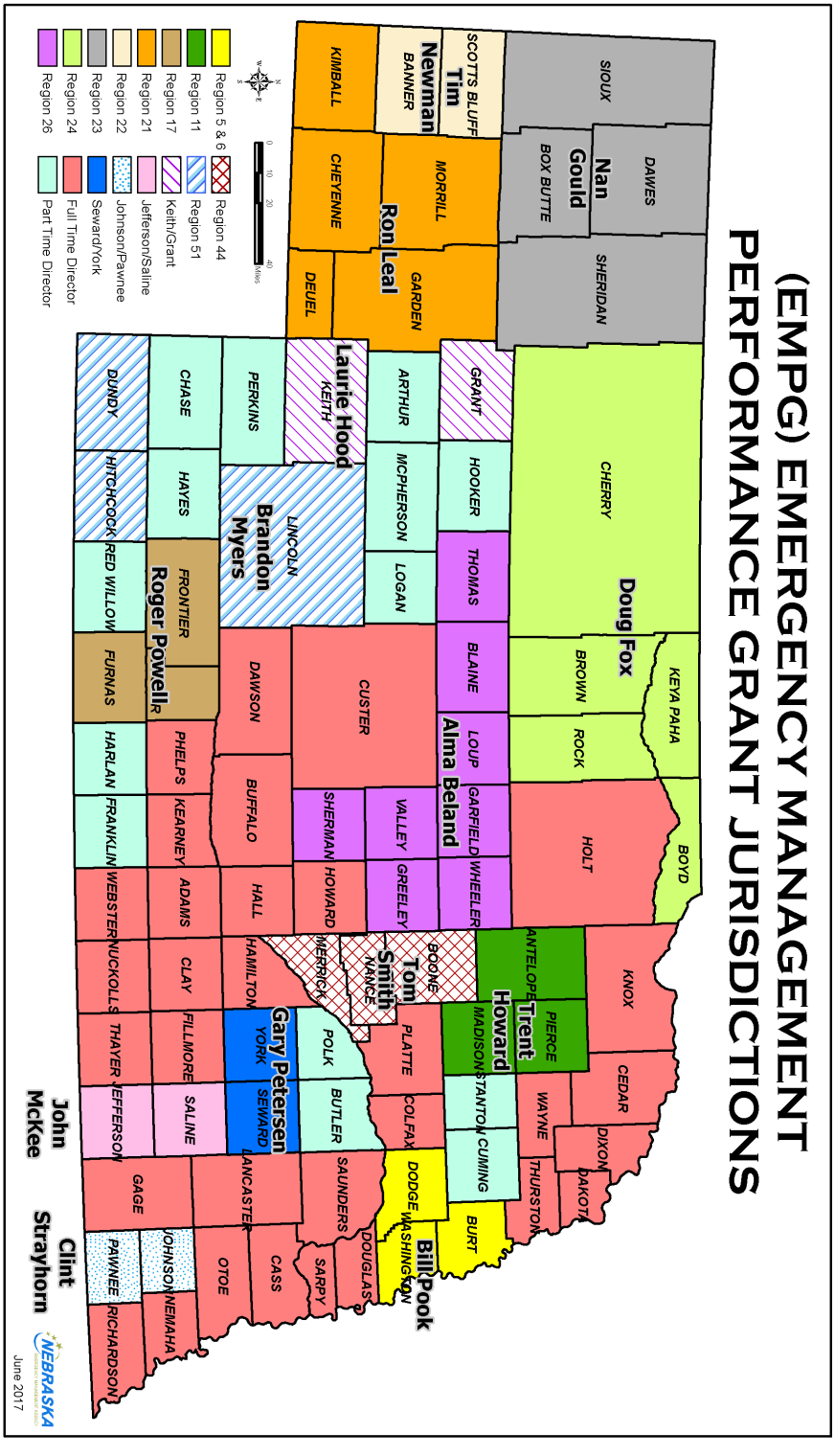
Map 3: Nebraska Natural Legacy Project: Biologically Unique Landscapes



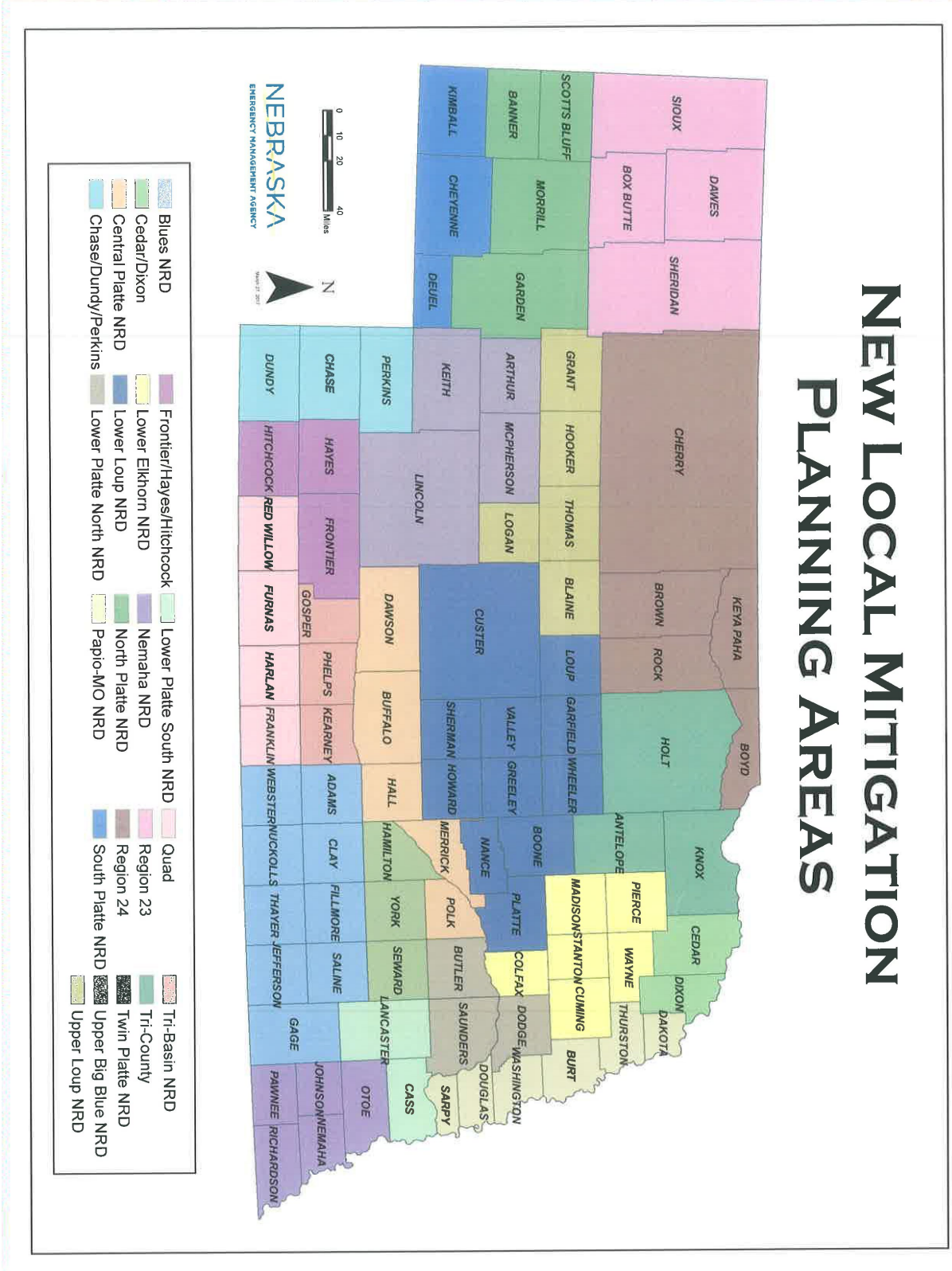
The full document is available at:

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

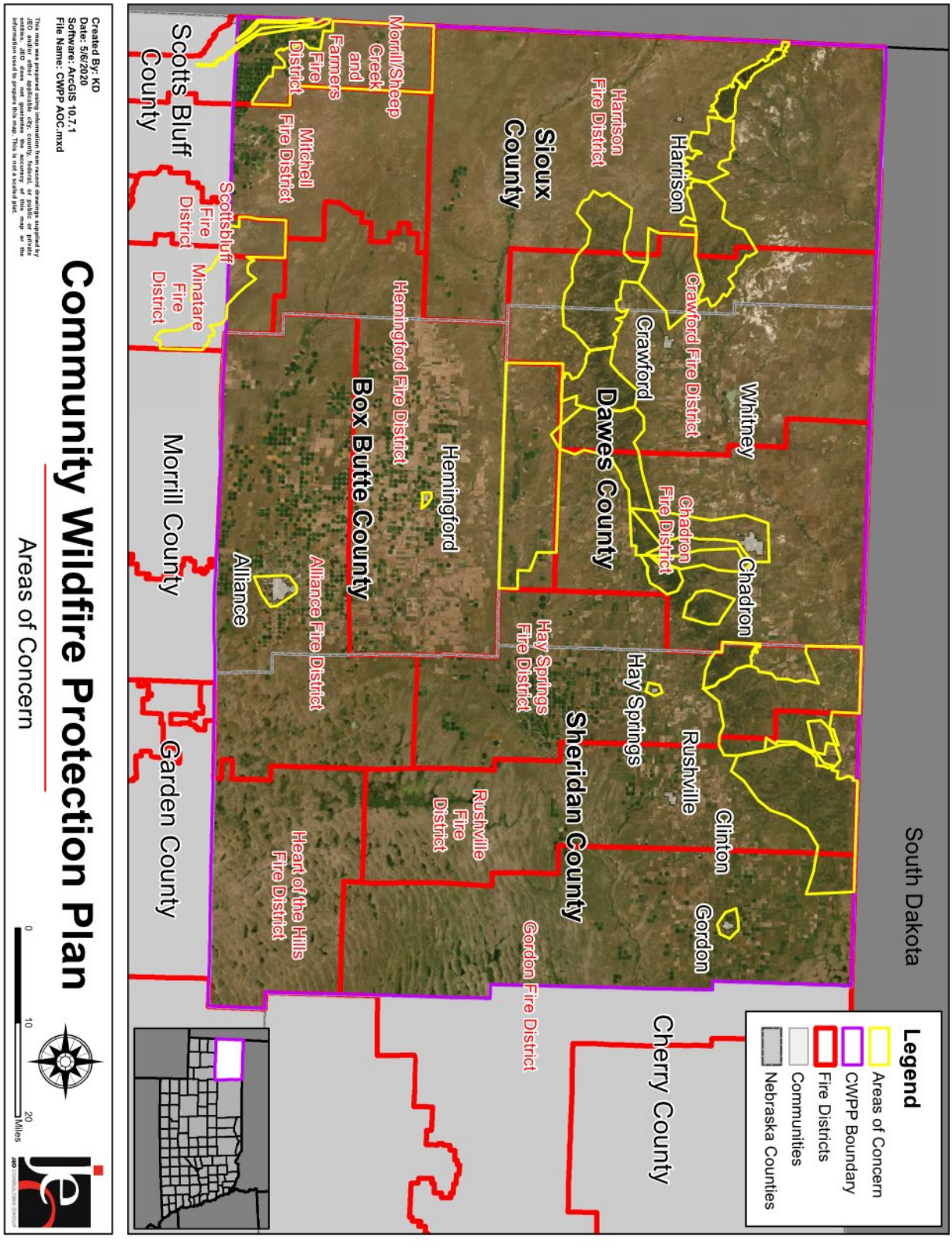
Map 4: Nebraska Local Emergency Management Areas



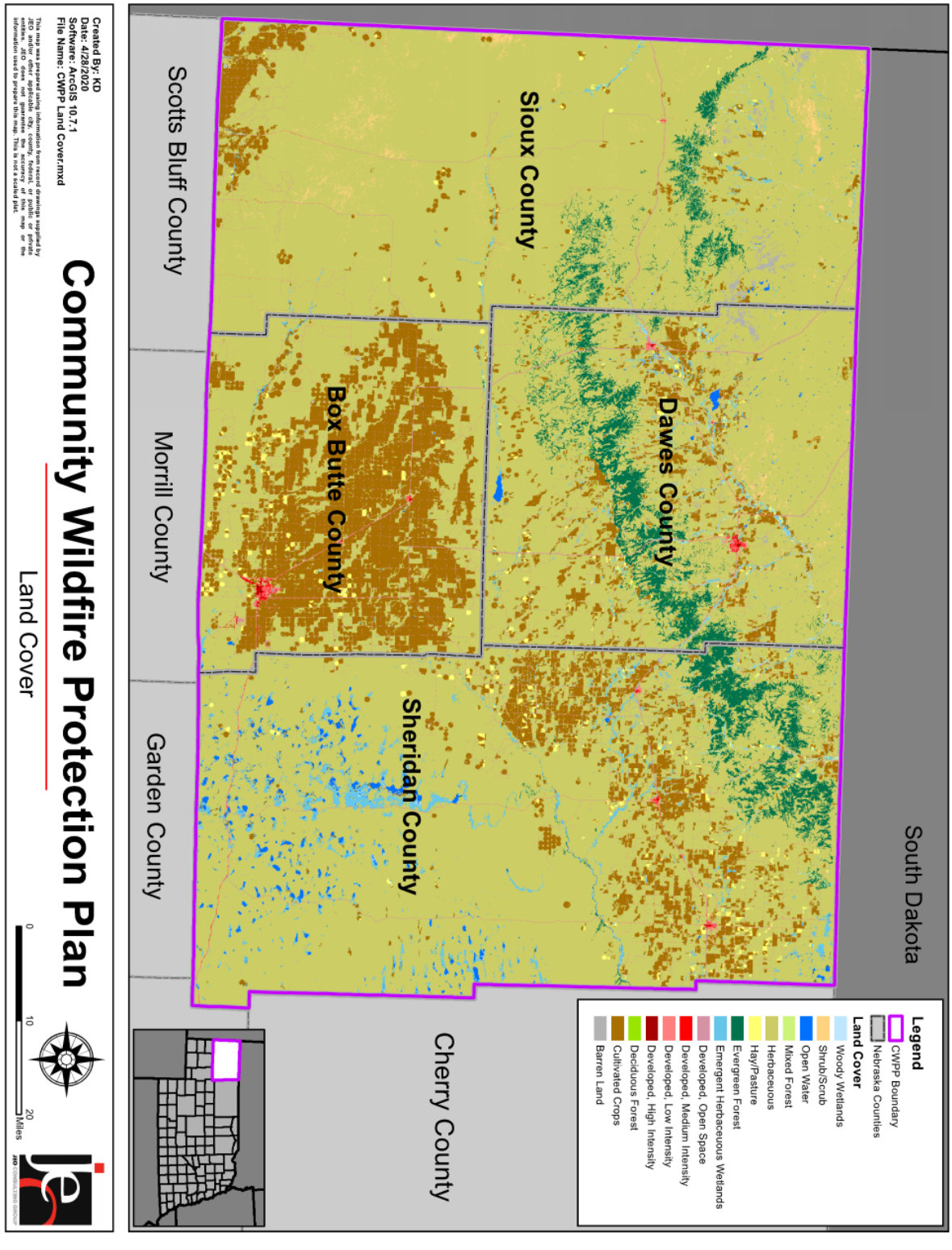
Map 5: Nebraska Local Mitigation Planning Areas



Map 6: Pine Ridge Area CWPP Areas of Concern



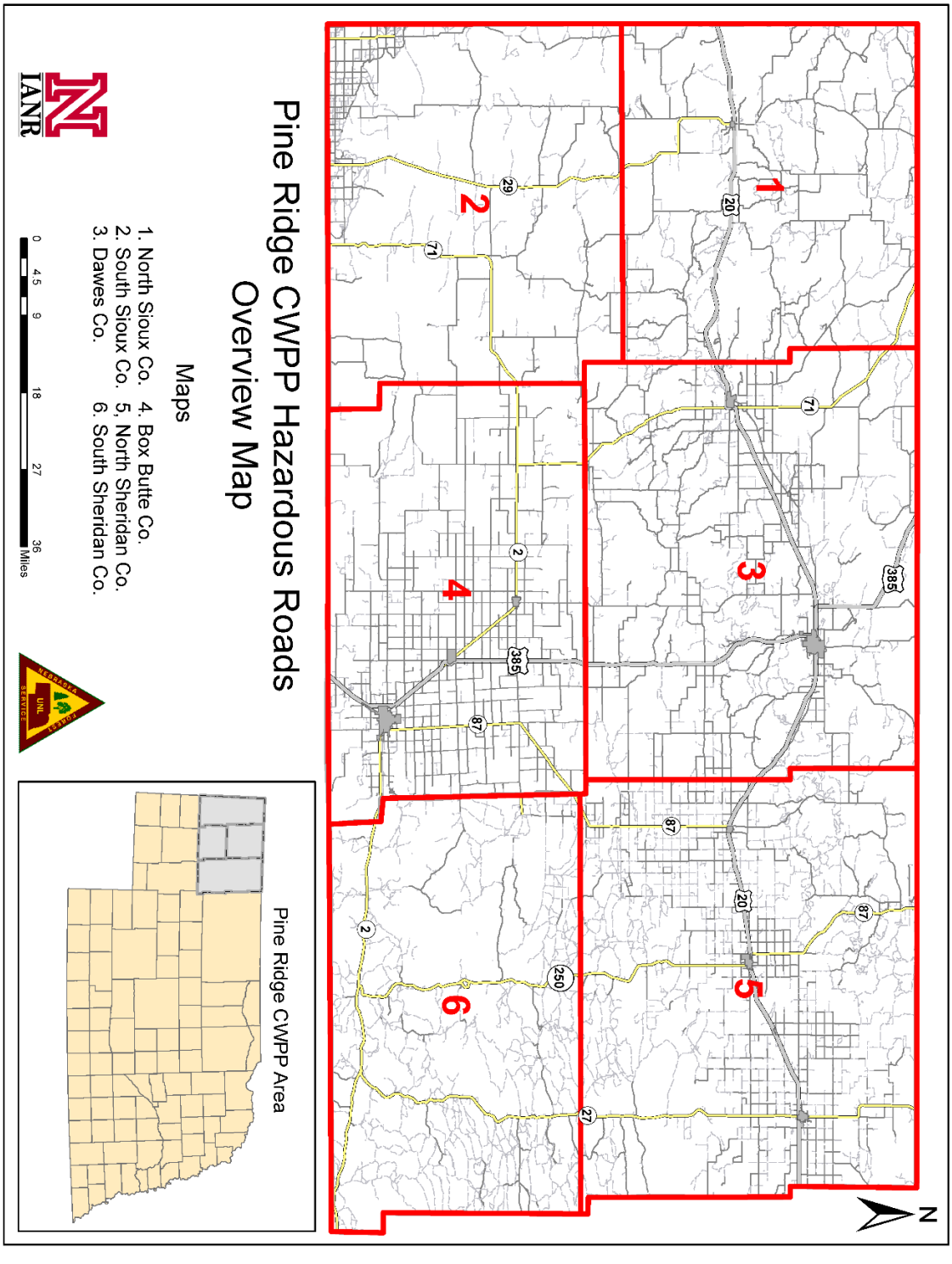
Map 7: Pine Ridge Area CWPP Region Land Cover



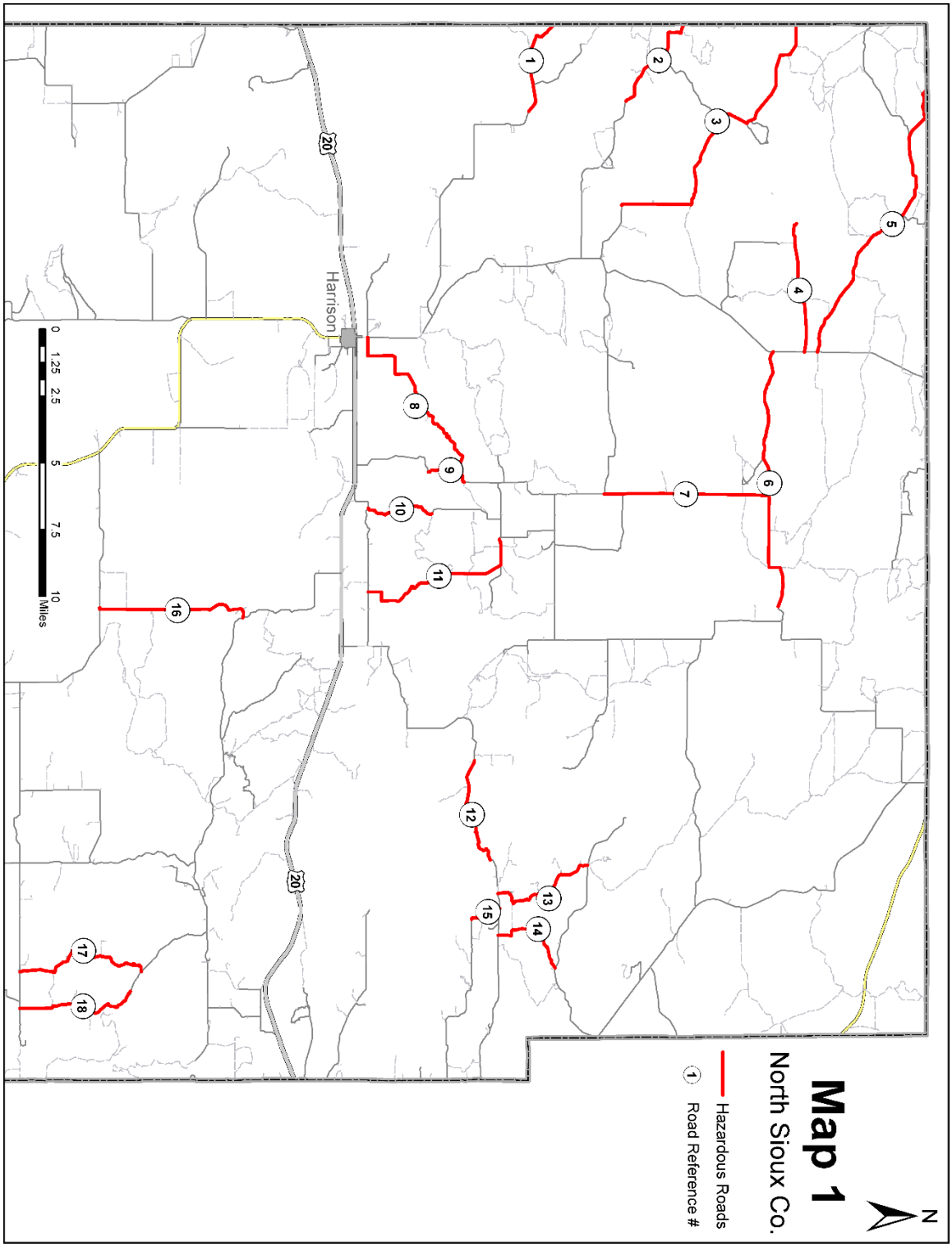
Maps 8-14: Hazardous Roads in the Pine Ridge CWPP Region

(Note: These maps appeared in the 2013 CWPP. Check with county road departments for updated information)

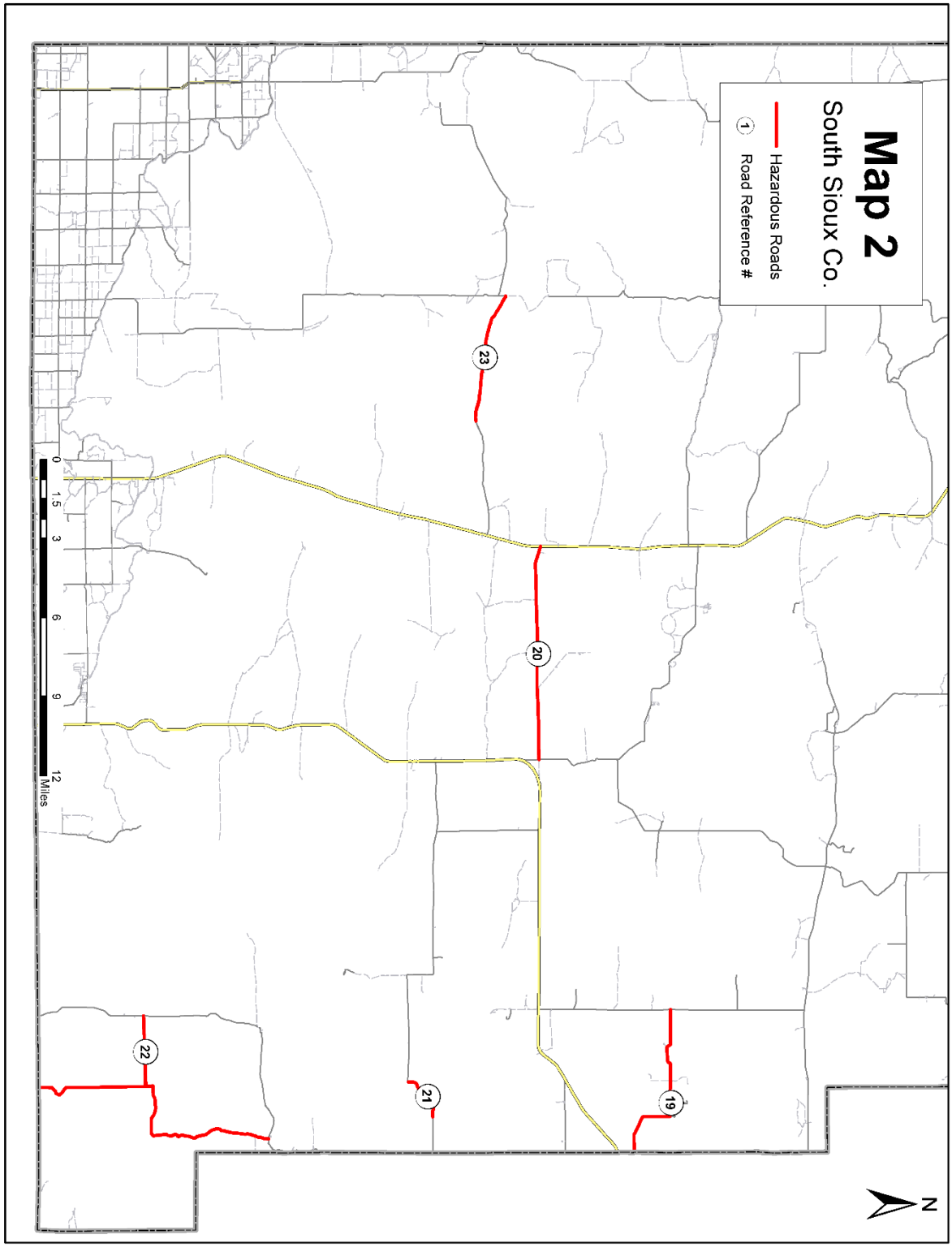
Map 8: 2013 Overview of Hazardous Roads in the Pine Ridge CWPP Region



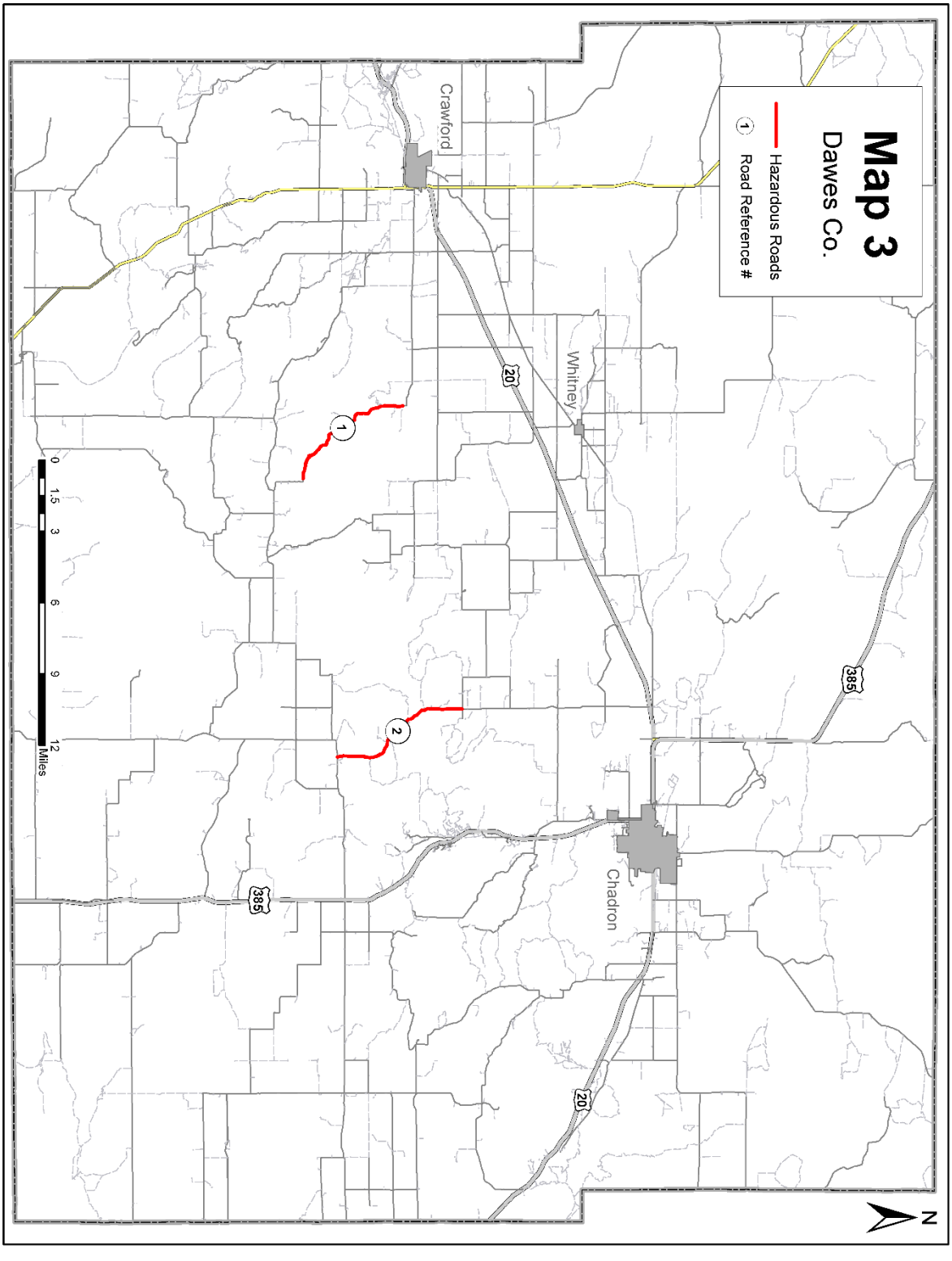
Map 9: 2013 Hazardous Roads in North Sioux County



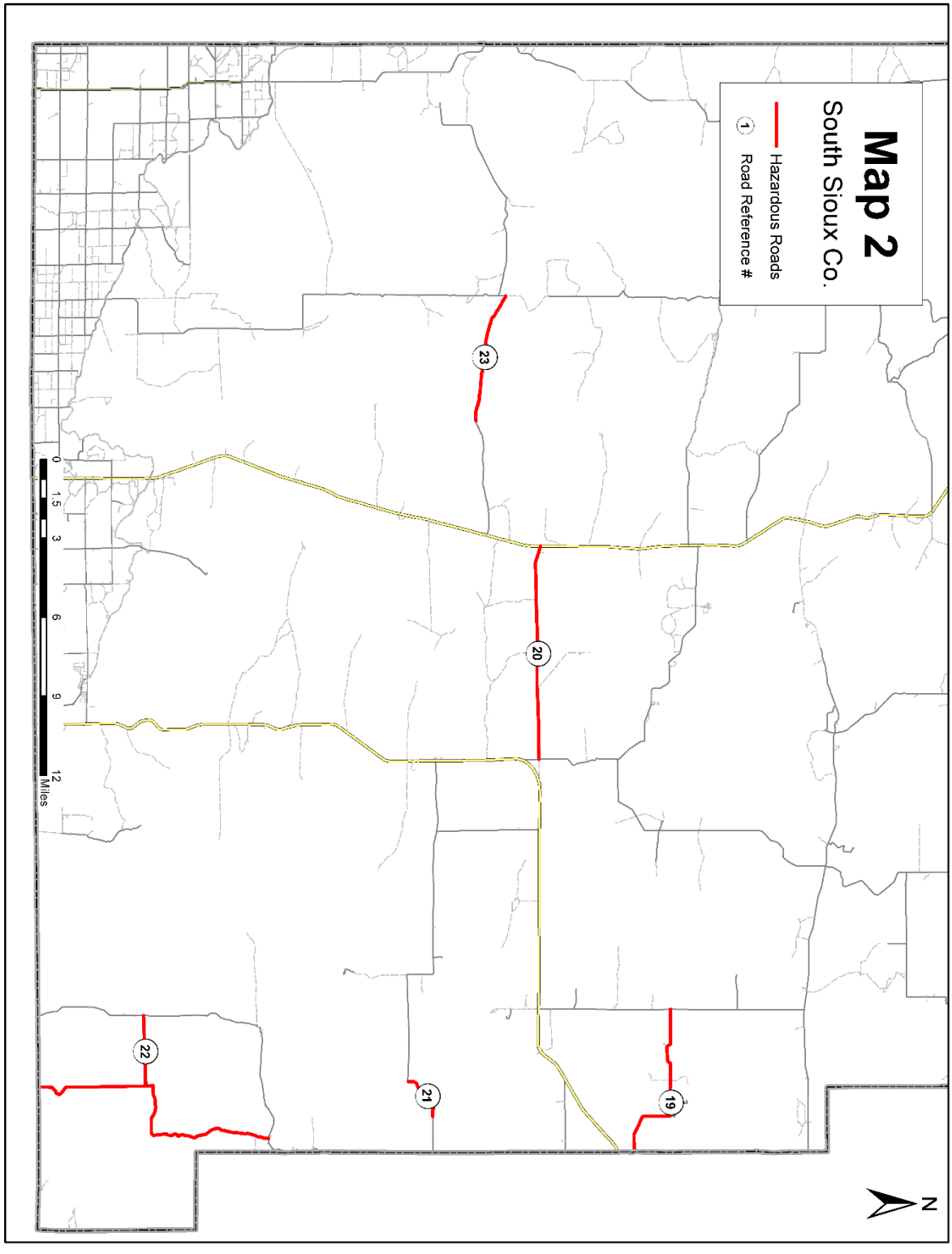
Map 10: 2013 Hazardous Roads in South Sioux County



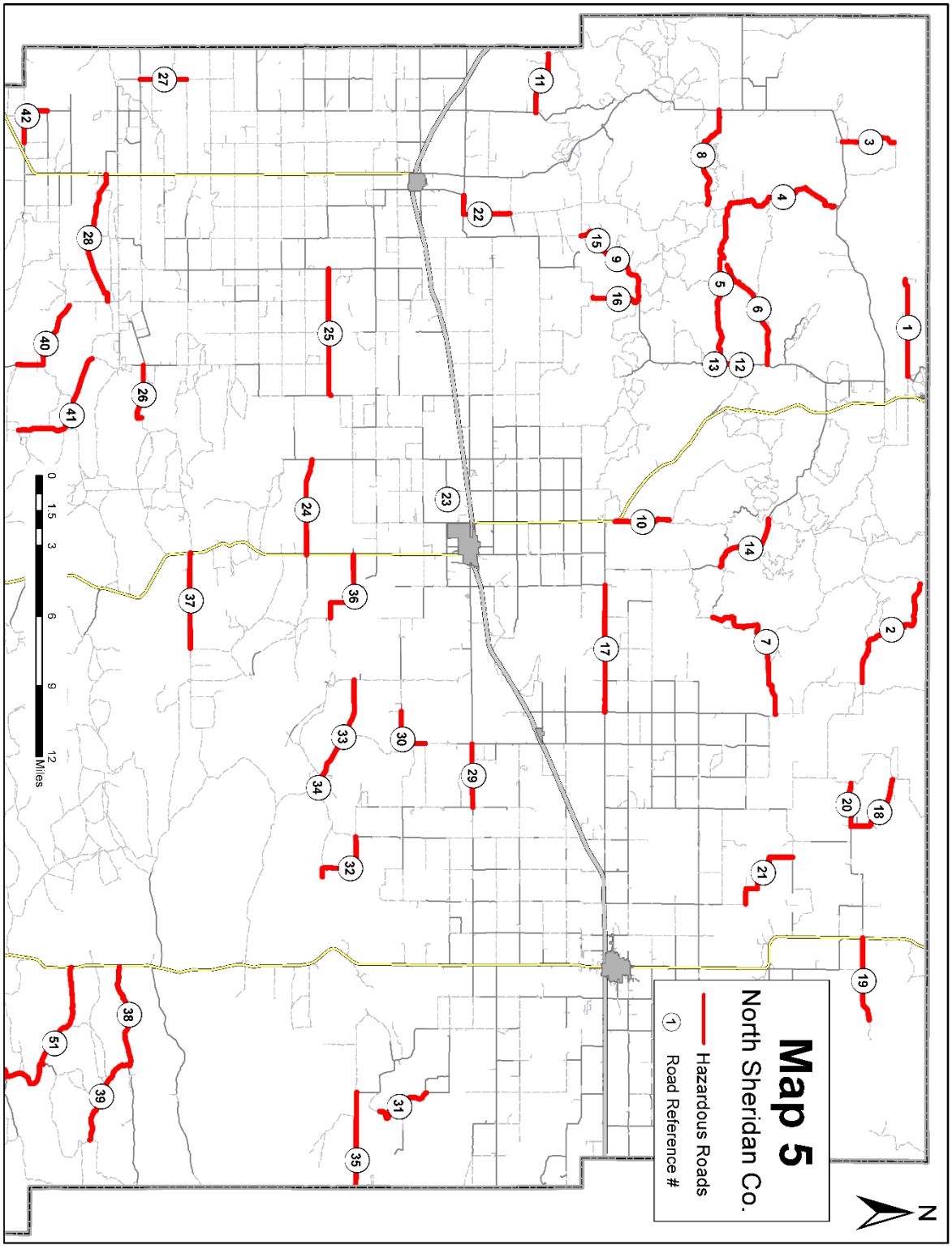
Map 11: 2013 Hazardous Roads in Dawes County



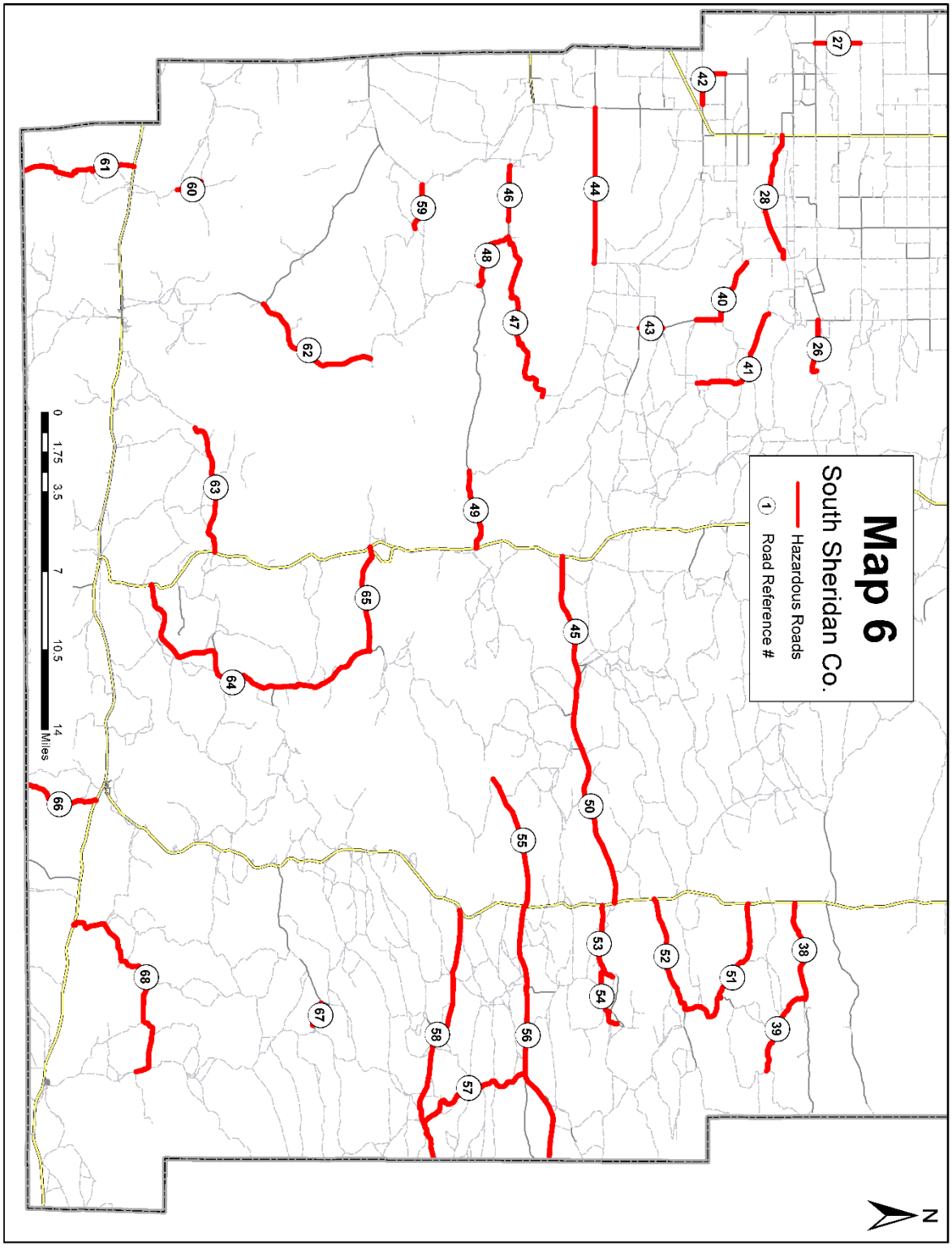
Map 12: 2013 Hazardous Roads in Box Butte County



Map 13: 2013 Hazardous Roads in North Sheridan County



Map 14: 2013 Hazardous Roads in South Sheridan County



Appendix B

Links to Other Planning Documents

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

2003 Wildland Fire and Fuel Management Plan (Original CWPP):

https://nfs.unl.edu/assessmentstrategy/Appendix%20C.pdf

2013 Pine Ridge Area CWPP Update:

https://nfs.unl.edu/documents/CWPP/Pine%20Ridge%20Area%20CWPP%20Update%20Jan%202014.pdf

Region 23 Multi-Jurisdictional Hazard Mitigation Plan:

https://jeo.com/region-23-hazard-mitigation-plan-update

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

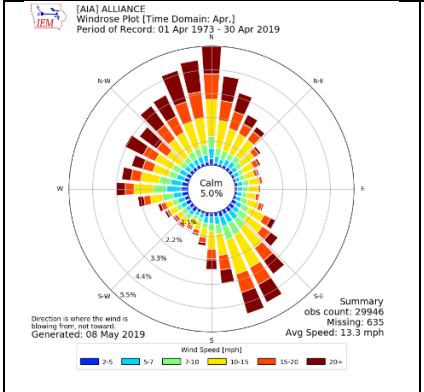
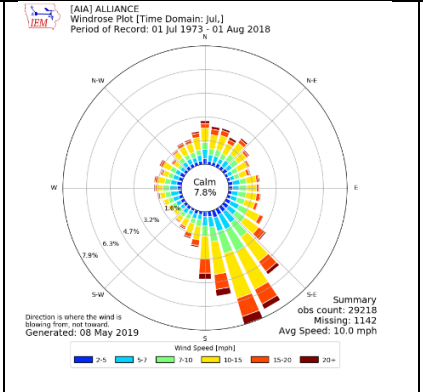
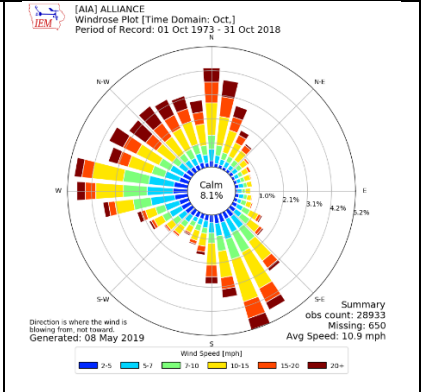
Appendix C

Wind Rosettes For Selected Stations in or near the Pine Ridge Area CWPP Region

a. Alliance
b. Chadron
c. Gordon
d. Scotts Bluff
e. Whitman

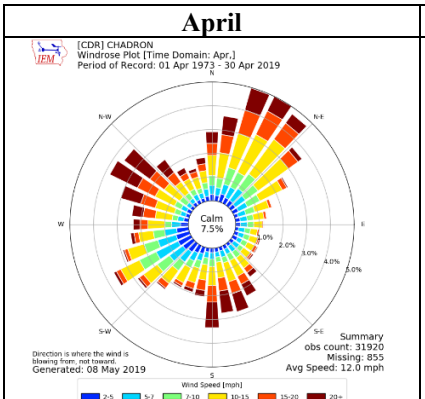
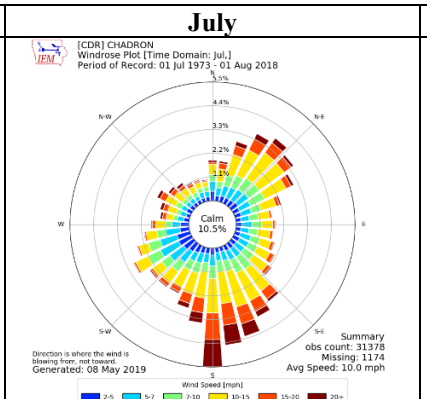
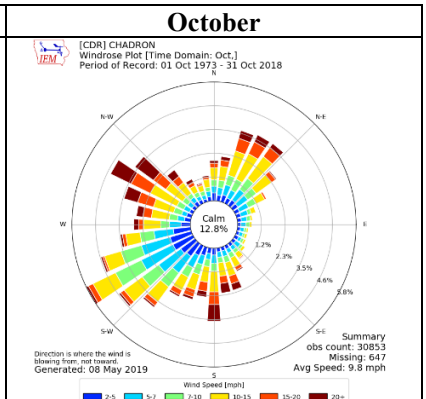
Alliance, Nebraska

Wind Direction and Speed 1973-2018

April	July	October
		

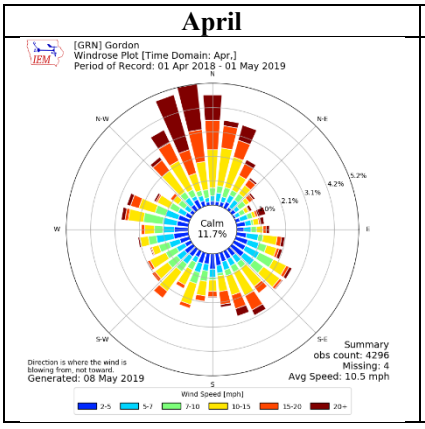
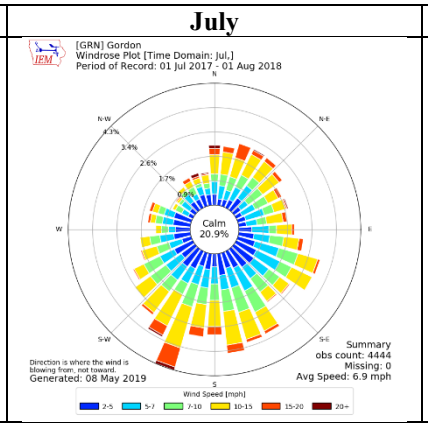
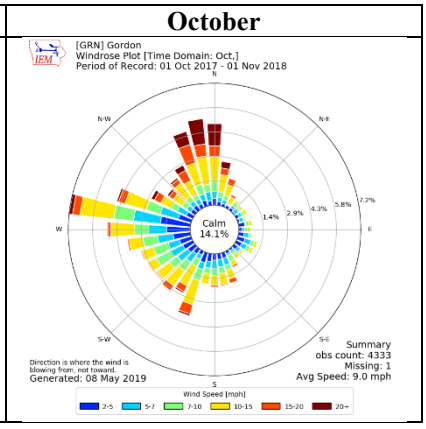
Chadron, Nebraska

Wind Direction and Speed 1973-2018

April	July	October
		

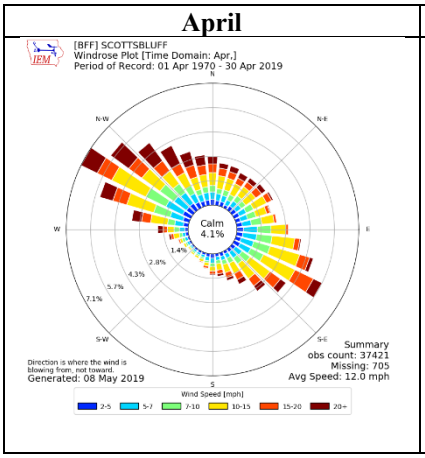
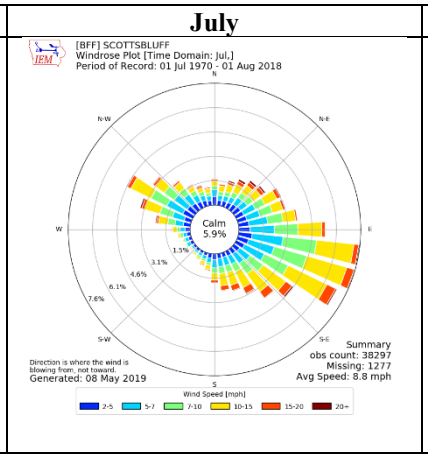
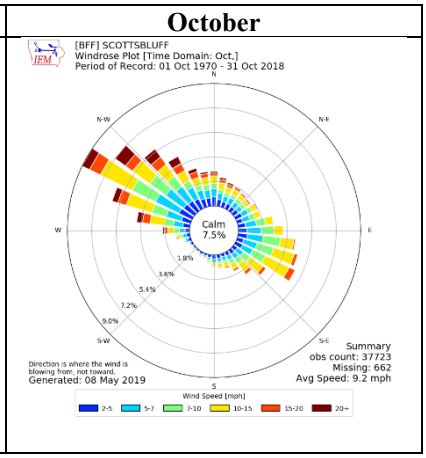
Gordon, Nebraska

Wind Direction and Speed 2017-2019

April	July	October
		

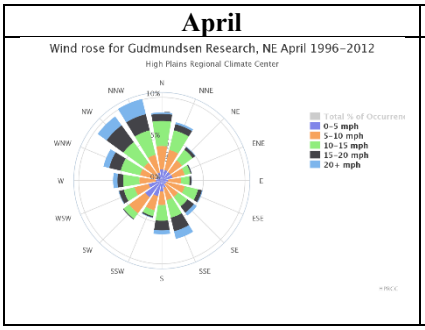
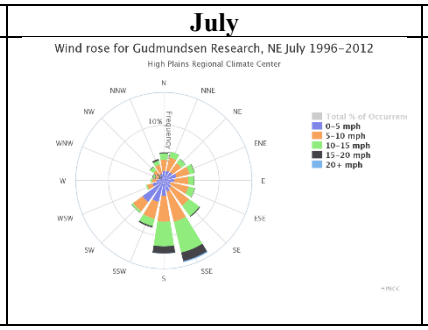
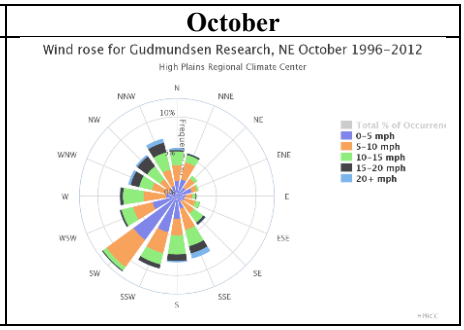
Scotts Bluff, Nebraska

Wind Direction and Speed 1970-2018

April	July	October
		

Whitman, Nebraska

Wind Direction and Speed 1996-2012

April	July	October
		

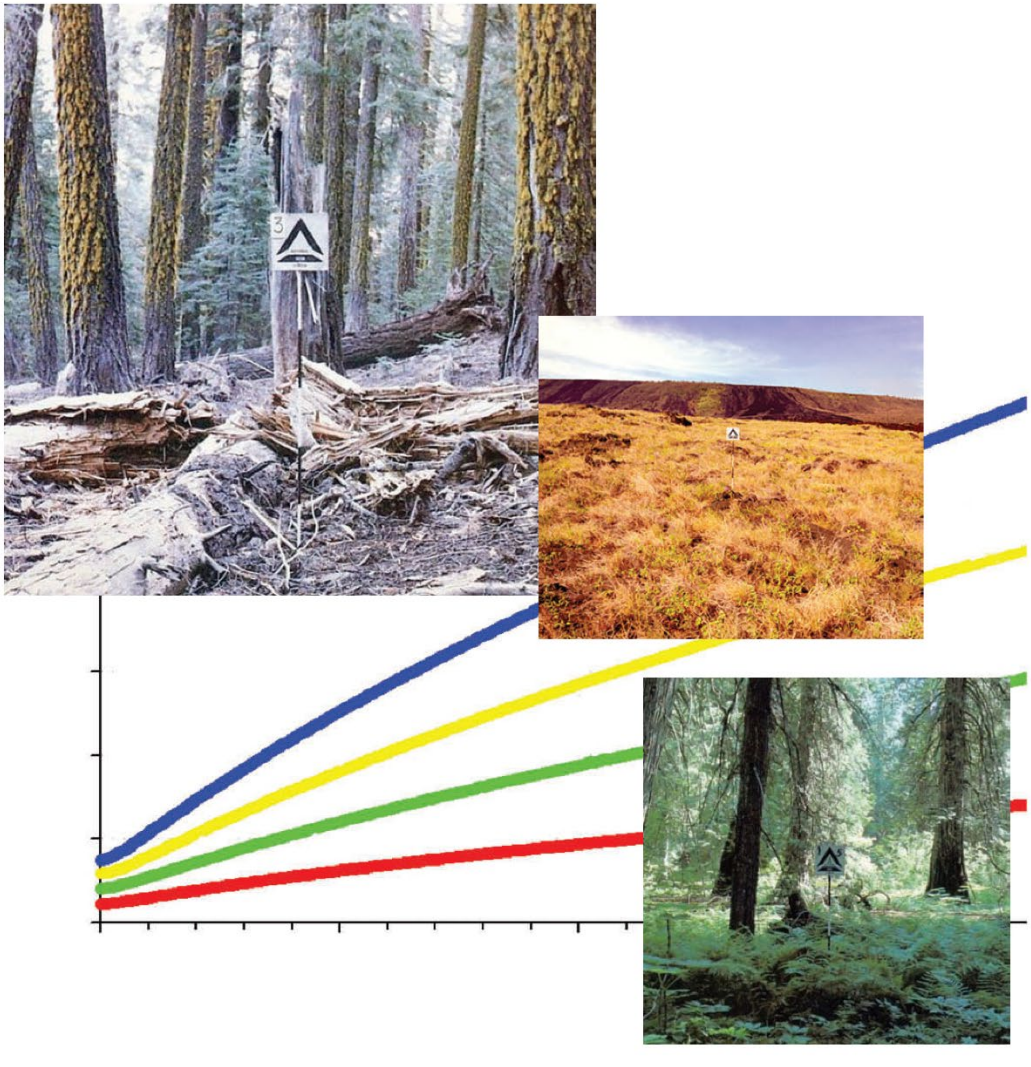
Appendix D

Fuel Models for the Pine Ridge Area CWPP Region

USDA 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



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 1/ft, and 100-hr SAV ratio is 30 1/ft. Total fuel particle mineral content is 5.55 percent; effective (silica-free) mineral content is 1.00 percent. Ovendry fuel particle density is 32 lb/ft^3.

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.

Table 7—Fuel model parameters.

Fuel model code	Fuel load (t/ac) 1-hr	10-hr	100-hr	Live herb	Live woody	Fuel model type[a]	SAV ratio (1/ft)[b] Dead 1-hr	Live herb	Live woody	Fuel bed depth (ft)	Dead fuel extinction moisture (percent)	Heat content BTU/lb)[c]
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.

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).

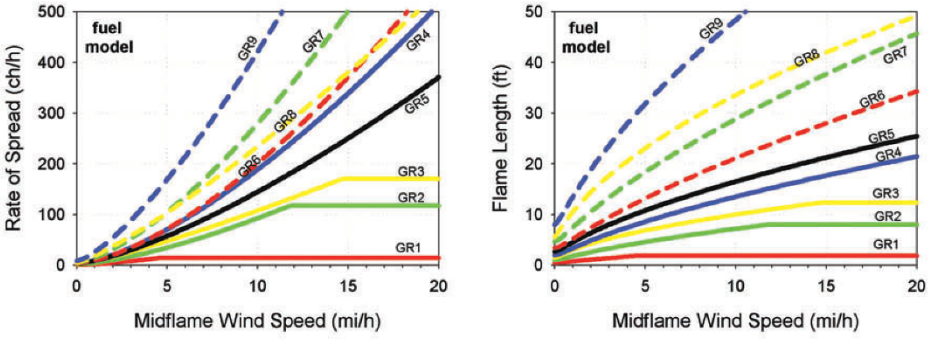
Nonburnable Fuel Type Models (NB)

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.

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.



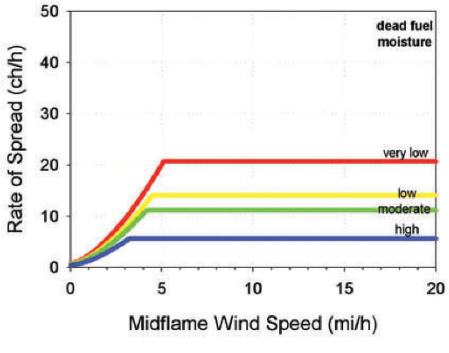
USDA Forest Service Gen. Tech. Rep. RMRS-GTR-153. 2005 25

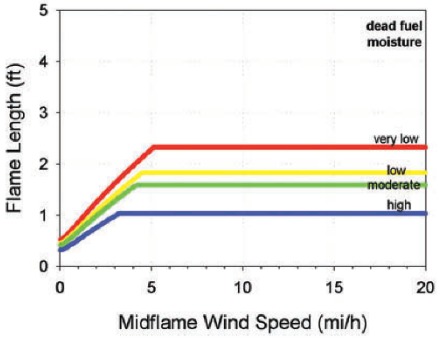
GR1 (101)

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





26

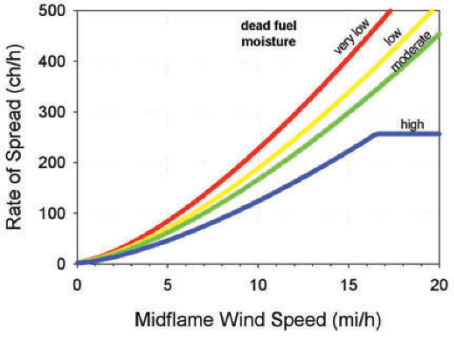
USDA Forest Service Gen. Tech. Rep. RMRS-GTR-153. 2005

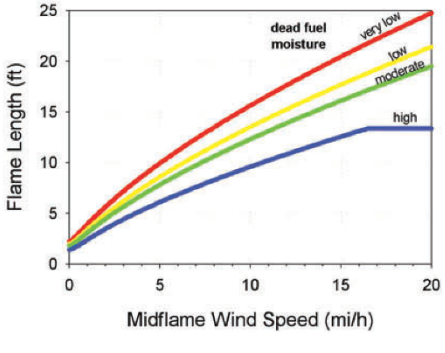
GR4 (104)

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





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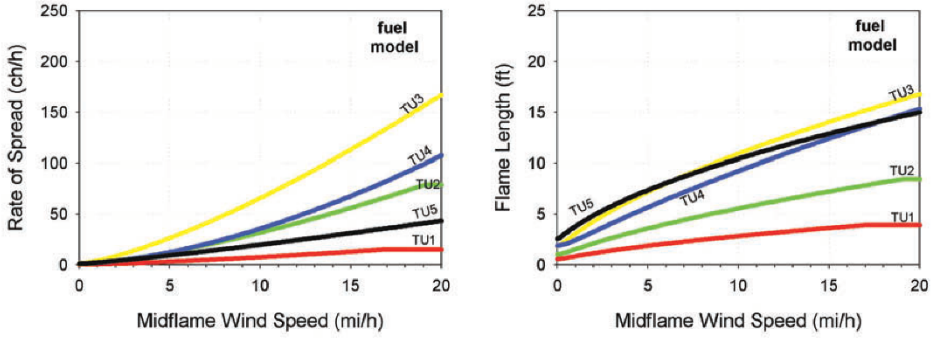
Timber-Understory Fuel Type Models (TU)

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.



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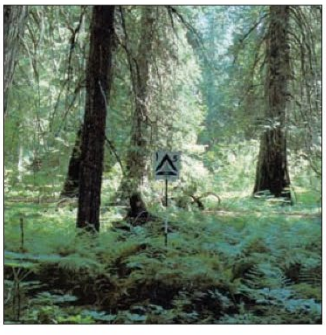
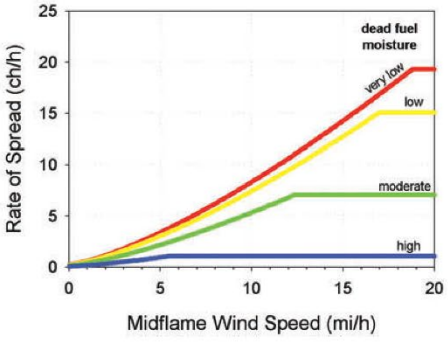
TU1 (161)

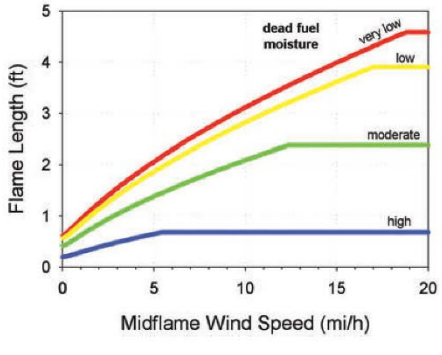
Low Load Dry Climate Timber-Grass-Shrub (Dynamic)



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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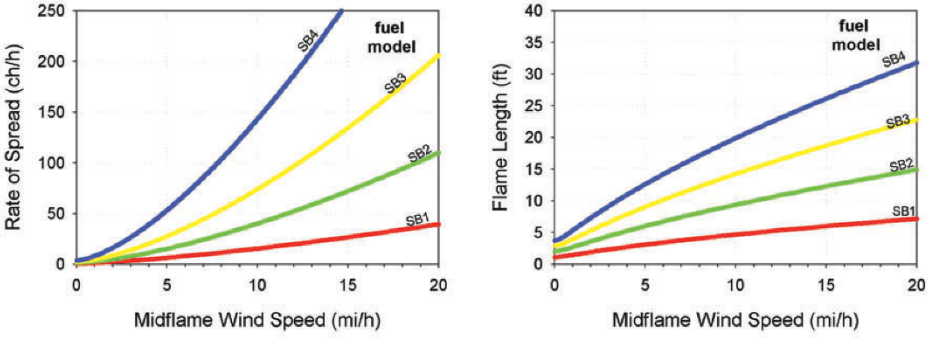
Slash-Blowdown Fuel Type Models (SB)

The primary carrier of fire in the SB fuel models is activity fuel or blowdown. Forested areas with heavy mortality may be modeled with SB fuel models.



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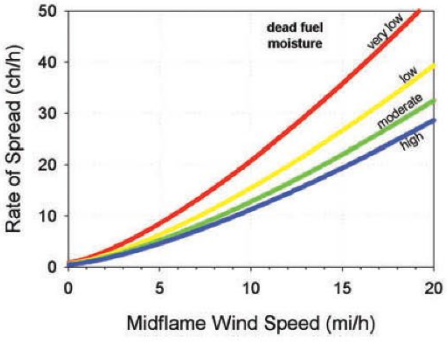
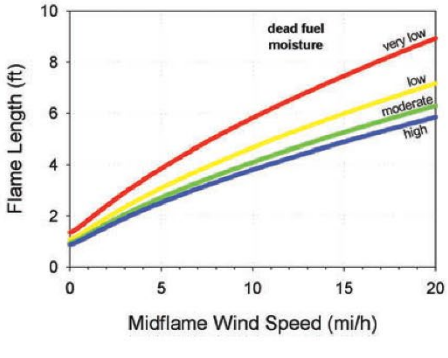
SB1 (201)

Low Load Activity Fuel

Description: The primary carrier of fire in SB1 is light dead and down activity fuel. Fine fuel load is 10 to 20 t/ac, weighted toward fuels 1 to 3 inches diameter class, depth is less than 1 foot. Spread rate is moderate; flame length low.

Fine fuel load (t/ac)	1.50
Characteristic SAV (ft-1)	1653
Packing ratio (dimensionless)	0.02224
Extinction moisture content (percent)	25





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Appendix E

Nebraska Mutual Aid Associations

Updated 1/11/2019

3 & 33 MA
Adams, Barneston, Beatrice, Beatrice RFD, Blue Springs, Clatonia, Cortland, Dewitt, Diller, Fairbury RFD, Filley, Jansen, Odell, Pickrell, Plymouth, Swanton, Wymore

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

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, Ohiowa, 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

Quad Cities 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

Scottsbluff County MA
Banner Co., Gering, Henry, Lyman, McGrew, Minatare-Melbeta, Mitchell, Morrill, Scottsbluff, Scottsbluff RFD, Scottsbluff Co. Airport, Torrington WY, US Fish & Wildlife Service

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
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 F

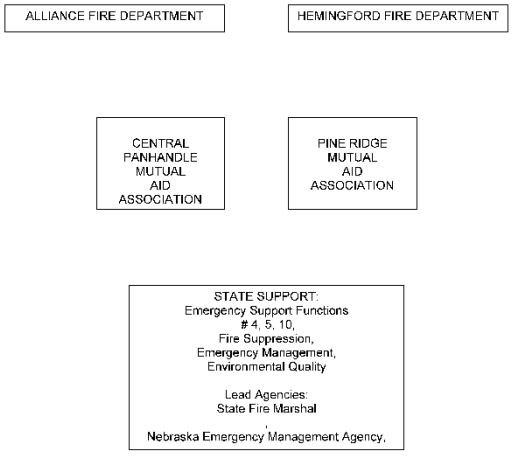
Fire Department Equipment and Contact Information for the Pine Ridge Area CWPP Region

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

Box Butte County

Information from Box Butte Co. LEOP, Annex F:

FIRE SERVICES



BOX BUTTE 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
Alliance	308-762-2151	1	2	4		6	2	4		IC Trailer	Y
Hemingford	308-487-5242		2	2		2	2	2			Y
Nearest HAZMAT Response Team											
Scottsbluff	308-630-6231										

Survey Responses from Box Butte County Fire Departments:

Alliance Fire Department
Counties: Box Butte, Morrill, Sheridan
Street/Mailing Address: 315 Cheyenne Ave, Alliance NE 69301
Dept. Phone: 308-762-2151 **Dept. Email**: firechief@cityofalliance.net
Chief: Troy Shoemaker; 308-762-2151, 308-760-7682; tshoemaker@cityofallliance.net
Ass't. Chief: Brad Schrum; 308-760-3946; bschrum@cityofalliance.net
Ass't. Chief: John Dahlberg; 308-763-8635; john.dahlberg@blackhillscorp.com

Personnel
43 **Vol.**:
4 **FT**:

MAD(s): Pine Ridge MA, Central Panhandle MA
Other MA agreements: Als intercept agreement with Grant Co. Rescue Squad

Equipment
Engines
1 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members
4 Type 6: Wildland: 50 GPM, 150 gal. capacity, two crew members
Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)
3 S-2 (support): 200 GPM pump, 2,500 gallon capacity, 1 crew member
1 S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member
Other
1 Equipment trucks

Equipment housed away from main barn? Yes
2,500 Gal. Hewitt and 1,000 gal. 6x6 at our south station in Morrill County

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No
Location: No location provided, but the following issues may apply to the entire district
Issues:
x Difficult access
x Rough terrain

Bridges that won't support equipment weight: Not completely sure

GIS layer & contact info: Possible. Check with Brent Kusek, Community Development Director, Alliance; 308-762-5400; bkusek@cityofalliance.net

Greatest concerns: Stopping it
Rank:
Housing
Infrastructure
Bridge limits
Hydrants
1 **Other water sources** (water access locations)

Hemingford VFD
Counties: Box Butte, Dawes, Sheridan, Sioux
Street Address: 517 Niobrara **Mailing Address**: PO Box 598, Hemingford, NE 69348
Dept. Phone: 308-487-5242 **Dept. Email**: hemfire@bbc.net
Chief: Shad Bryner; 308-760-3341; sbryner@bbc.net
Ass't. Chief: Jim Miles; 308-760-2826
Secretary: Michelle Kluver; 308-289-4442
Treasurer: Jodine Sorenson; 308-760-3203; jsorenson@bbc.net

Personnel
30 **Vol.**

MAD(s): Pine Ridge MA & Scottsbluff County MA

Equipment
Engines
2 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)*
1 T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members
2 S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member
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: Areas out in the fringes of district are always a concern because of time to get there. We utilize MA departments, but distance to travel for all departments causes concern. There are some isolated pockets with few houses; our other areas have good access.
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: Distance to get there

Bridges that won't support equipment weight: Yes, there are a few private bridges that may not support tenders or pumpers.

GIS layer & contact info: No

Greatest concerns: Outer areas away from town and northern border.
Rank:
4 **Housing**
3 **Infrastructure**
5 **Bridge limits**
2 **Hydrants**
1 **Other water sources**

Dawes County

Information from Dawes Co. LEOP, Annex F:

FIRE SERVICES

CHADRON FIRE DEPARTMENT

CRAWFORD FIRE DEPARTMENT

PINE RIDGE 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,
Dept. of Environmental Quality

DAWES 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
Chadron VFD 308-432-0521	308-432-0510	1	3	2		4	1	2		Decon Trailer	Yes
Crawford VFD 308-665-2211	308-432-0510		3	2		5	1	2			Yes
Nearest HAZMAT Response Team											
Scottsbluff	308-630-6231										

Survey Responses from Dawes County Fire Departments:

Chadron VFD
County: Dawes
Street/Mailing Address: 300 Morehead, Chadron NE 69337
Dept. Phone: 308-432-0521
Chief: Jack Rhembrandt; 308-430-3802; jrhem2582@gmail.com
Ass't. Chief: Brandon Martins; 316-217-1100
Secretary: Nate Rau; 402-760-3814
Treasurer: Jarad Young; 308-430-1518

Personnel
40 **Vol.**:

MAD(s): Pine Ridge

Equipment
Engines
3 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members
3 Type 4: Wildland: 50 GPM, 750 gal. capacity, two crew members
5 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 S-1 (support): 300 GPM pump, 4,000 gallon capacity, 1 crew member
Other
2 Equipment trucks; ambulance, rescue extrication truck
4 Other (Describe): Command, SUV, two 4-wheelers

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: 385 Corridor/Whispering Pines/Chadron State Park. Area around Chadron State Park with subdivision of homes on the east side of highway. This area is the largest WUI concern.
Issues:
x Multiple structures
x Difficult access
x Rough terrain
x 1 way in/out
x Heavy fuels

Location2: Egan Road North. East of Chadron: an island of green trees is created between Bordeaux Rd., Egan Rd., and Hwy. 20. There are very few firebreaks or good roads to access this area of green trees.
Issues:
x Difficult access
x Rough terrain
x Heavy fuels
x Lack of water within effective distance

Location3: (General comment) 2012 or 2006 fire scars have many dead and down/standing trees; very heavy fuel loading.

Bridges that won't support equipment weight: No; county roads have good bridges.

GIS layer & contact info: No, but possibly the USFS does.

Greatest concerns: Firefighter and public safety, property safety, natural resource conservation

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

Crawford Fire & Rescue

Counties: Dawes & Sioux
Street Address: 3450 Hwy. 20
Mailing Address: PO BOX 184, Crawford NE 69339
Dept. Phone: 308-665-2334 **Dept. Email**: crawfire@bbc.net
Chief: Brian Prosser; 308-430-1958; doc7769@yahoo.com
Ass't. Chief: Bill Lux; 308-665-5939; crawfire@bbc.net
Secretary: Jeremy Kennedy; 308-430-4517
Treasurer: Dave Flock; 308-430-3565

Personnel
42 **Vol.**:

MAD(s): Pine Ridge

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
1 Type 5: Wildland: 50 GPM, 400 gal. capacity, two crew members
4 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
3 Equipment trucks

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: Resource availability
Rank:
x **Other water sources**

Hay Springs VFD
Counties: Sheridan, Dawes
Street Address: 111 S 1st St. **Mailing Address**: PO BOX 308, Hay Springs NE 69347
Dept. Email: craighoush@yahoo.com
Chief: Craig Housh; 308-249-5744; craighoush@yahoo.com
Ass't. Chief: Gary Schramm; 308-430-5347
Secretary: Ron Reed; 308-430-1456
Treasurer: Tim Feiter; 605-441-6883

Personnel
21 **Vol.**:
MAD(s): Pine Ridge

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 3 Wildland: 150 GPM, 500 gal. capacity, three crew members
1 Type 4: Wildland: 50 GPM, 750 gal. capacity, two crew members
3 Type 6: Wildland: 50 GPM, 150 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
1 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members
Other
Road Dept. Equip. (describe): Sheridan Co. Roads Dept.
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: T33N R46W Sec. 33, west side Beaver Rd.
Issues:
Difficult access, Rough terrain, 1 way in/out, Heavy fuels, Lack of water within effective distance

Bridges that won't support equipment weight: No

GIS layer & contact info: Yes. Craig Housh; 308-249-5744; craighoush@yahoo.com

Greatest concerns: Distance and rough terrain

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

Hemingford VFD
Counties: Box Butte, Dawes, Sheridan, Sioux
(See listing in Box Butte County section)

Sheridan County

Information from Sheridan Co. LEOP, Annex F:

FIRE SERVICES

GORDON FIRE DEPARTMENT

HAY SPRINGS FIRE DEPARTMENT

RUSHVILLE FIRE DEPARTMENT

HEART OF THE HILLS FIRE DEPARTMENT

PINE RIDGE 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,

SHERIDAN 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
Gordon	308-282-1770		2	2		8		3			
Hay Springs	308-638-7475		1	1		4	1	2			
Rushville	308-327-2398		2	2		4	1	2			
Heart of the Hills	308-760-6285			4		5					
Nearest HAZMAT Response Team											
Scottsbluff	308-630-6231										

Survey Responses from Sheridan County Fire Departments:

Alliance Fire Department
Counties: Box Butte, Morrill, Sheridan
(See listing in Box Butte County section)

Gordon VFD
Counties: Sheridan, Cherry
Street Address: 208 N Elm **Mailing Address**: PO Box 777, Gordon, NE 69343
Dept. Phone: 308-282-1770
Chief: Richard Haller; 308-360-1652, 308-282-2762; rich.haller@farmcoop.com
Ass't. Chief: Leonard Haller; 308-360-8566
Ass't. Chief: Chad Allison; 308-360-3853
Sec/Treas.: Suesie Content; 308-360-1247

Personnel
35 **Vol.**:

MAD(s): Pine Ridge MA
Other MA agreements: Northern Great Plains

Equipment
Engines
2 Type 1 Structural: 1,000 GPM, 300 gal. capacity, four crew members
4 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members
4 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
1 S-2 (support): 200 GPM pump, 2,500 gallon capacity, 1 crew member
Other
1 Equipment trucks: Crash
1 Other (Describe): Chief G-61 ¾ ton 4x4 crew

Equipment housed away from main barn? Yes
Wildland trucks 14?

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? No
Location: Location was left blank, but the following issues were checked:
Issues:
x Multiple structures
x Difficult access
x Rough terrain
x Heavy fuels
x Other: Manpower

Bridges that won't support equipment weight: Yes, bridges over small creeks

GIS layer & contact info: No

Greatest concerns: Getting to it with roads under water

Rank:

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

Hay Springs VFD
Counties: Sheridan, Dawes
(See listing in Dawes County section)

Heart of the Hills Rural Fire Protection District
Counties: Sheridan and Garden
Mailing Address: PO BOX 37, Lakeside NE 69351 **Dept. Phone**: none **Dept. Email**: none
Chief: Arnold Butch Black; 308-762-4587
Ass't. Chief: R. D. Sutphen; 308-763-1449
Sec/Treas.: Edward Dentler; 308-762-6107

Personnel
25 **Vol.**:

MAD(s): Central Panhandle Mutual Aid and Pine Ridge Mutual Aid
Other MA agreements: Hyannis, Nebraska Fire Department

Equipment
Engines
1 Type 3 Wildland: 150 GPM, 500 gal. capacity, three crew members
8 Type 5: Wildland: ~~50~~ 150 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 (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)
3 S-2 (support): 200 GPM pump, 2,500 gallon capacity, 1 crew member
2 S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member

Equipment housed away from main barn? Yes
6 are at ranches in the district

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: Manpower to run equipment

Rank:

1 **Housing**
2 **Infrastructure**
5 **Bridge limits**

1 **Hydrants**
3 **Other water sources**

Rushville Fire Department
Counties: Sheridan
Street Address: 201 W. 2nd **Mailing Address**: PO Box 498, Rushville, NE 69370
Dept. Phone: 308-327-2398 **Dept. Email**: napa@gpcom.net
Chief: Dwaine Sones; 308-360-3900, 308-327-2817
Ass't. Chief: Jerry Kearns; 308-360-0810, 308-282-0810; napa@gpcom.net
Secretary: Logan Calwell; 308-207-2016
Treasurer: Mark Haller; 605-490-0379

Personnel
30 **Vol.**:

MAD(s): Pine Ridge MA
Other MA agreements: Pine Ridge, Batesland, Forest Service

Equipment
Engines
4 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members
4 Type 3 Wildland: 150 GPM, 500 gal. capacity, three crew members
7 Type 6: Wildland: 50 GPM, 150 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
1 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members
1 S-2 (support): 200 GPM pump, 2,500 gallon capacity, 1 crew member
Other
3 Equipment trucks
1 Other (Describe): (not described)

Equipment housed away from main barn?
Yes, 7 type 6

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, wooden

Greatest concerns: Timber

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

Sioux County

Information from Sioux Co. LEOP, Annex F:

FIRE SERVICES

HARRISON FIRE DEPARTMENT

PINE RIDGE 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,

SIOUX 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
Harrison	308-668-2515		2		3	6		2		1 CRASH	Yes
Nearest HAZMAT Response Team											
Scottsbluff	308-630-6231										

Survey Responses from Sioux County Fire Departments:

Harrison VFD
Counties: Sioux
Street Address: 382 Grace **Mailing Address**: PO Box 213, Harrison, NE 69346
Dept. Phone: 308-668-2414
Chief: JW Geiser; 308-665-5915, 308-453-2515; Dub@gwtc.net
Ass't. Chief: Slim Reece; 308-665-5256; slim.kate@yahoo.com
Sec/Treas.: Sarah Bannan; 308-665-5115

Personnel
30 **Vol.**:

MAD(s): Pine Ridge

Equipment
Engines
1 Type 2 Structural: 500 GPM, 300 gal. capacity, three crew members
1 Type 3 Wildland: 150 GPM, 500 gal. capacity, three crew members
7 Type 6: Wildland: 50 GPM, 150 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
3 Other (Describe): 2 ambulances; 1 chief's car

Equipment housed away from main barn? Yes
Three Type 6 engines and one Type 2 tender out in county

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: Distance to a water source. Rangeland lost. Ability to protect structures.

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

Minatare/Melbeta Fire and Rescue
Counties: Scottsbluff, Sioux
Street Address: 211 Main **Mailing Address**: PO Box 165, Minatare NE 69356
Dept. Phone: 308-783-2763 **Dept. Email**: minatarefiredepartment@gmail.com
Chief: Brian Lore; 308-631-7479

Ass't. Chief/Treasurer: Brandi Ehler; 308-765-0303
Secretary: Vern Eberhardt; 308-783-2763

Personnel
14 **Vol.**:

MAD(s): Scottsbluff County
Other MA agreements: Bayard

Equipment
Engines
1 Type 5: Wildland: 50 GPM, 400 gal. capacity, two crew members #21
1 Type 6: Wildland: 50 GPM, 150 gal. capacity, two crew members #23
Tenders (Tactical Tenders: 4x4, 6x6, 8x8 all-wheel drive)
1 T-1 (tactical): 250 GPM pump, 2,000 gallon capacity, 2 crew members #41
1 T-2 (tactical): 250 GPM pump, 1,000 gallon capacity, 2 crew members #22
1 S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member #40
Other
1 Equipment trucks: Command unit #60
1 Other (Describe): Yamaha side-by-side
Road Dept. Equip. (describe):

Equipment housed away from main barn? Yes
Tender in Melbeta

Have you identified any areas in your district that you are more concerned about than others if a wildfire starts nearby? Yes
Location: Sandy hills north of Lake Minatare
Issues:
x Difficult access
x Rough terrain
x 1 way in/out
x Heavy fuels
x Lack of water within effective distance

Bridges that won't support equipment weight: Yes, private wooden bridges with little maintenance

GIS layer & contact info: (not answered)

Greatest concerns: Personnel and lack of communication (15 different radio frequencies and lack of radios)

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

Mitchell Fire Department
Counties: Scotts Bluff, Sioux
Street Address: 1203 Center Ave., Mitchell, NE 69357

Dept. Phone: 308-623-1311
Chief: Jon Wurdeman; 308-631-1311; jwurdeman56@gmail.com
Ass't. Chief: Jesse Wurdeman; 308-641-3258; jjw264@gmail.com
Secretary: Ray Schultz
Treasurer: Jeff Jenkins; 308-641-3457; jjenkins@gmail.com

Personnel
37 **Vol.**:

MAD(s): Scotts Bluff County Mutual Aid Association

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

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

GIS layer & contact info: Yes: Susie Wick; 308-633-1806; swick@scottsbluffcounty.org

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

Morrill(Sheep Creek & Farmers) Vol. Fire & Rescue
Counties: Scottsbluff, Sioux
Street Address: 314 Center Ave. **Mailing Address**: PO Box 207, Morrill, NE 69358
Dept. Phone: 308-247-2321 **Dept. Email**: morrillfire@gmail.com
Chief: Matt Hinman; 308-641-8619; mhinman47@gmail.com
Ass't. Chief: Art Steiner; 308-631-0885; art.steiner@simplot.com
Sec/Treas.:Tony Schuler; 308-641-4533

Personnel
30 **Vol.**

MAD(s): Scottsbluff County 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
3 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
4 S-3 (support): 200 GPM pump, 1,000 gallon capacity, 1 crew member
Other
1 Equipment trucks: 4-door Ford V8
3 Other (Describe): 1 command vehicle (2500 Chevy Silerado) & 2 rescue units
1 Road Dept. Equip. (describe): Mobile light plant

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: 7 miles north of Morrill, soil becomes very sandy and tough terrain to get around on. This terrain is from the Wyoming border to the end of our district north and east.
Issues:
x Difficult access
x Rough terrain
x Heavy fuels
x Lack of water within effective distance

Locations 2, 3, & 4: Along UP railroad tracks, Sheep Creek, and Niobrara River
Issues:
x Difficult access
x Rough terrain
x Other: Unfamiliar with some of the area – portions of the fire district – because of private property or access to the property itself.

Bridges that won't support equipment weight: Yes, in the areas of concern described above

GIS layer & contact info: Yes; Anthony Murphy, 308-631-0996, amurphy@scottsbluff.org

Greatest concerns: 1) Communication with other departments 2) Good routes to take to the fire

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

Scottsbluff Rural Fire Department
Counties: Scotts Bluff, Sioux
Street/Mailing Address: 1717 E 15th St., Scottsbluff, NE 69361
Dept. Phone: 308-635-1654
Chief: Paul Reisig; 308-641-3748, 308-635-1654; sbruralfire@gmail.com
Ass't. Chief: None at this time / Trk Capt. #3, Chris Canley; 308-631-6009; sbruralfire@gmail.com
Sec/Treas.: Robert Wells; 308-641-6117; bscco@brownsheep.com

Personnel

24 **Vol.**:

MAD(s): Scottsbluff-Banner Co.

Equipment

Engines

2 Type 1 Structural: ~~1,000~~ 1,500 GPM, ~~300~~ 1,000 gal. capacity, four crew members
2 Type 2 Structural: 500 GPM, ~~300~~ gal. capacity, three crew members
1- 1,000 gal. capacity; 1-2,000 gal. capacity
2 Type 5: Wildland: ~~50~~ 250 GPM, ~~400~~ 600 gal. capacity, two crew members
2 Type 6: Wildland: ~~50~~ 150 GPM, ~~150~~ 175 gal. capacity, two crew members

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

2 Other: Conventional tenders, 1-200 GPM pump, 2,000 gallon capacity
1- 200 GPM pump, 1,500 gallon capacity

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: 24 square miles in southern Sioux County with few water resources, several trailers and buildings on one-way roads, grassland, no roads, only one road – the sugar factory road – serves the area. Bad in wet conditions.

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: No

Greatest concerns: Protection of lives and property; water resources; mutual aid

Rank:

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

Appendix G

Fire Department Survey

Distributed to all departments in the CWPP Region 1/22/2020

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:

_____

_____

_____

1

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:

2

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): _____

_____

_____

3

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 sbenson4@unl.edu or mail a hard copy to:

Nebraska Forest Service (Attn: Sandy Benson)
PO Box 0815
Lincoln, NE 68583-0815

4

Fire Department Survey Distribution List

(Participation rate: 100% – All departments returned the survey.)

Fire Departments
Alliance Fire Department
Chadron VFD
Crawford Fire & Rescue
Gordon VFD
Harrison VFD
Hay Springs VFD
Heart-of-the-Hills Rural Fire Protection District
Hemingford VFD
Minatare/Melbeta Fire & Rescue
Mitchell Fire Department
Morrill/Sheep Creek & Farmers Vol. Fire & Rescue
Rushville Fire Department
Scottsbluff Rural Fire Department

Also returned survey:
Nebraska Game and Parks/Ponderosa Field Office

Appendix H

Public Engagement

Public engagement was conducted in conjunction with the Region 23 Multi-jurisdictional Hazard Plan 2020 Update.
Outreach documents, media releases, and stakeholders list can be accessed at:
https://jeo.com/region-23-hazard-mitigation-plan-update

Appendix I

- Wildland Urban Interface Mitigation Strategies
- Structural Ignitability Reduction Practices
- Firewise® Landscaping
- Nebraska Fire-Resistant Plant List

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

I Am Responding (Emergency responder supplemental dispatch notification system): https://iamresponding.com/v3/Pages/Default.aspx

Nebraska Forest Service Wildland Fire Protection Program: https://nfs.unl.edu/fires-nebraska

Ready, Set, Go! http://www.wildlandfirersg.org/

USFS Wildfire Risk to Communities interactive website: https://wildfirerisk.org/

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.

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, *Fragraria*
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 J

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