



**DRAFT**

*Draft Programmatic Environmental Assessment*

# Wildfire Hazard Mitigation Projects in the State of South Dakota

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**FEMA**

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## Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
ARSD	Administrative Rules of South Dakota
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe Railway Company
Btu	British Thermal Unit
CAA	Clean Air Act
CATEX	Categorical Exclusion
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
dBA	A-Weighted Decibels
DENR	South Dakota Department of Environment and Natural Resources
DHS	U.S. Department of Homeland Security
DRRA	Disaster Recovery Reform Act of 2018
EA	Environmental Assessment
EHP	Environmental and Historic Preservation
EIA	U.S. Energy Information Administration
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FMAG	Fire Management Assistance Grant
FONSI	Finding of No Significant Impact
FRG	Fire Regime Group
GIS	Geographic Information System
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
LANDFIRE	Landscape Fire and Resource Management Planning Tools
LEB	Log Erosion Barrier
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NIFTT	National Interagency Fuels, Fire & Vegetation Technology Transfer
NO <sub>2</sub>	Nitrogen Dioxide
NPS	National Park Service
NRCS	Natural Resources Conservation Service

NRHP	National Register of Historic Places
NVC	U.S. National Vegetation Classification
NWI	National Wetlands Inventory
NWP	Nationwide Permit
O <sub>3</sub>	Ozone
OEM	South Dakota Office of Emergency Management
PA	Public Assistance
Pb	Lead
PDM	Pre-Disaster Mitigation
PEA	Programmatic Environmental Assessment
PM	particulate matter
RCRA	Resource Conservation and Recovery Act
SDCL	South Dakota Codified Law
SDDOT	South Dakota Department of Transportation
SDGFP	South Dakota Game, Fish, and Parks
SDHS	South Dakota Historical Society
SEA	Supplemental Environmental Assessment
SHPO	State Historic Preservation Office
SILVIS	SILVIS Lab, Department of Forest and Wildlife Ecology, University of Wisconsin
SIP	State Implementation Plan
SMZ	Streamside Management Zone
SO <sub>2</sub>	Sulfur Dioxide
THPO	Tribal Historic Preservation Office
TMDL	Total Maximum Daily Load
TRI	Toxics Release Inventory
UFR	Unified Federal Review
U.S.	United States
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
U.S.C.	U.S. Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WUI	Wildland-Urban Interface

## **SECTION 1. Introduction**

The mission of the Federal Emergency Management Agency (FEMA) is to reduce the loss of life and property and protect our institutions from all hazards by leading and supporting the nation in a comprehensive, risk-based emergency management program of mitigation, preparedness, response, and recovery. An important component of FEMA's mission is hazard mitigation, which includes activities that help communities reduce the future impacts of natural disasters to life and property. This Programmatic Environmental Assessment (PEA) was prepared in accordance with Unified Federal Review (UFR) as outlined in The Sandy Recovery Improvement Act, Section 6. The UFR mandates the establishment of an “...*expedited and unified interagency review process to ensure compliance with environmental and historic requirements under Federal law relating to disaster recovery projects, in order to expedite the recovery process, consistent with applicable law*” (FEMA 2016).

Wildfire hazard mitigation activities are funded under FEMA's Hazard Mitigation Assistance (HMA) programs, as authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (Stafford Act). Wildfire hazard mitigation projects that are eligible for HMA funding must meet requirements as set forth by FEMA. Currently, the requirements for hazard mitigation activities are found in the *Hazard Mitigation Assistance (HMA) Guidance* (FEMA 2015) or as amended.

In 2018, Sections 1201 through 1205 of the Disaster Recovery Reform Act of 2018 (DRRA) amended the Stafford Act and authorized FEMA to provide Hazard Mitigation Grant Program (HMGP) funding in areas that received Fire Management Assistance Grants (FMAG) (under Section 420), which include areas that have experienced a major fire since January 1, 2016. Historically, the FMAG program has provided funding for the mitigation, management, and control of fires on nonfederal lands that threaten such destruction as would constitute a major disaster. Section 1205 of the DRRA explicitly expanded eligible wildfire mitigation activities under the HMA programs to include certain post-fire mitigation activities.

FEMA's Public Assistance (PA) program also may be requested to fund emergency actions needed to remove an immediate threat to the health and safety of the public and improved property. The actions may include removing burned trees and other debris within existing road and utility rights-of-way. The action would only apply to trees and other debris damaged because of the event and that are determined to pose an immediate threat to lives and improved property, according to the *Public Assistance Debris Management Guide* (FEMA 2007).

The purpose of this PEA is to identify, at a programmatic level, the potential adverse and beneficial impacts associated with FEMA's current eligible wildfire hazard mitigation activities for the State of South Dakota. FEMA's experience in conducting environmental planning and historic preservation (EHP) reviews for wildfire hazard mitigation projects, as part of the National Environmental Policy Act (NEPA) requirements, has provided FEMA with sufficient information to determine the likely impacts of these eligible activities on the human environment. This PEA captures and builds upon this knowledge and experience to evaluate potential environmental effects of FEMA's funding of eligible wildfire hazard mitigation activities. The PEA identifies specific wildfire hazard mitigation actions that may not require



additional NEPA review and actions that would require site-specific reviews that could be tiered under this PEA. Some projects or classes of activities may continue to require project-specific NEPA compliance reviews.

This PEA has been prepared in accordance with NEPA; the Council on Environmental Quality (CEQ) regulations to implement NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508); and agency guidance for implementing NEPA (DHS Instruction 023-01 and FEMA Instruction 108-01-1).

### 1.1 Wildfire Hazard Mitigation

Wildfires are any uncontrolled fires that spread through vegetative fuels such as forests, shrubs, or grasslands, exposing and possibly consuming structures. These unpredictable fires can jump gaps such as roads, rivers, and fuel breaks, allowing fires to reach the built environment before they can be contained.

There are many ways that individuals and local, state, and federal levels of government work to minimize the impacts of wildfires. These include outreach and education for individuals and communities, maintenance of defensible space, hazardous fuels reduction, structural protection through the use of ignition-resistant materials and construction methods, and measures to respond to wildfires and facilitate wildfire suppression. Post-fire activities may include actions that reduce hazards associated with burned landscapes such as erosion and flooding, or that reduce the potential for future fires. These actions may occur on public and private lands in any area where vegetation intermingles with the built environment. For example, the Healthy Forest Restoration Act directs at-risk communities to create community wildfire protection plans that may include buffer zones around towns, civic infrastructure, and evacuation routes.

### 1.2 Background

All of South Dakota is vulnerable in one form or another to wildland fires. The Black Hills region and some southeastern counties of South Dakota have particularly high vulnerability to wildland fires. The probability and severity of fires are highly dependent upon weather conditions and fuel conditions and thus will change from year to year. Fire is predicated on drought conditions and fuel loads. South Dakota's forests and rangeland are more capable of supporting fires during and following drought years. Longer fire seasons caused by long-term changes in weather patterns, lower precipitation, and reduced snowpack have also contributed to the increased level of fire activity in South Dakota. (South Dakota Office of Emergency Management [OEM] 2014).

### 1.3 Area of Study

The area of analysis for this PEA encompasses the State of South Dakota and the tribal lands of the Cheyenne River Sioux Tribe (Cheyenne River Reservation), Crow Creek Sioux Tribe (Crow Creek Reservation), Flandreau Santee Sioux Tribe of South Dakota, Sisseton-Wahpeton Oyate (Lake Traverse Reservation), Lower Brule Sioux Tribe (Lower Brule Reservation), Oglala Sioux Tribe (Pine Ridge Reservation), Rosebud Sioux Tribe (Rosebud Indian Reservation), Santee Sioux Nation, Standing Rock Sioux Tribe of North and South Dakota (Standing Rock Reservation), and Yankton Sioux Tribe of South Dakota (Yankton Reservation) (**Figure 1-1**).

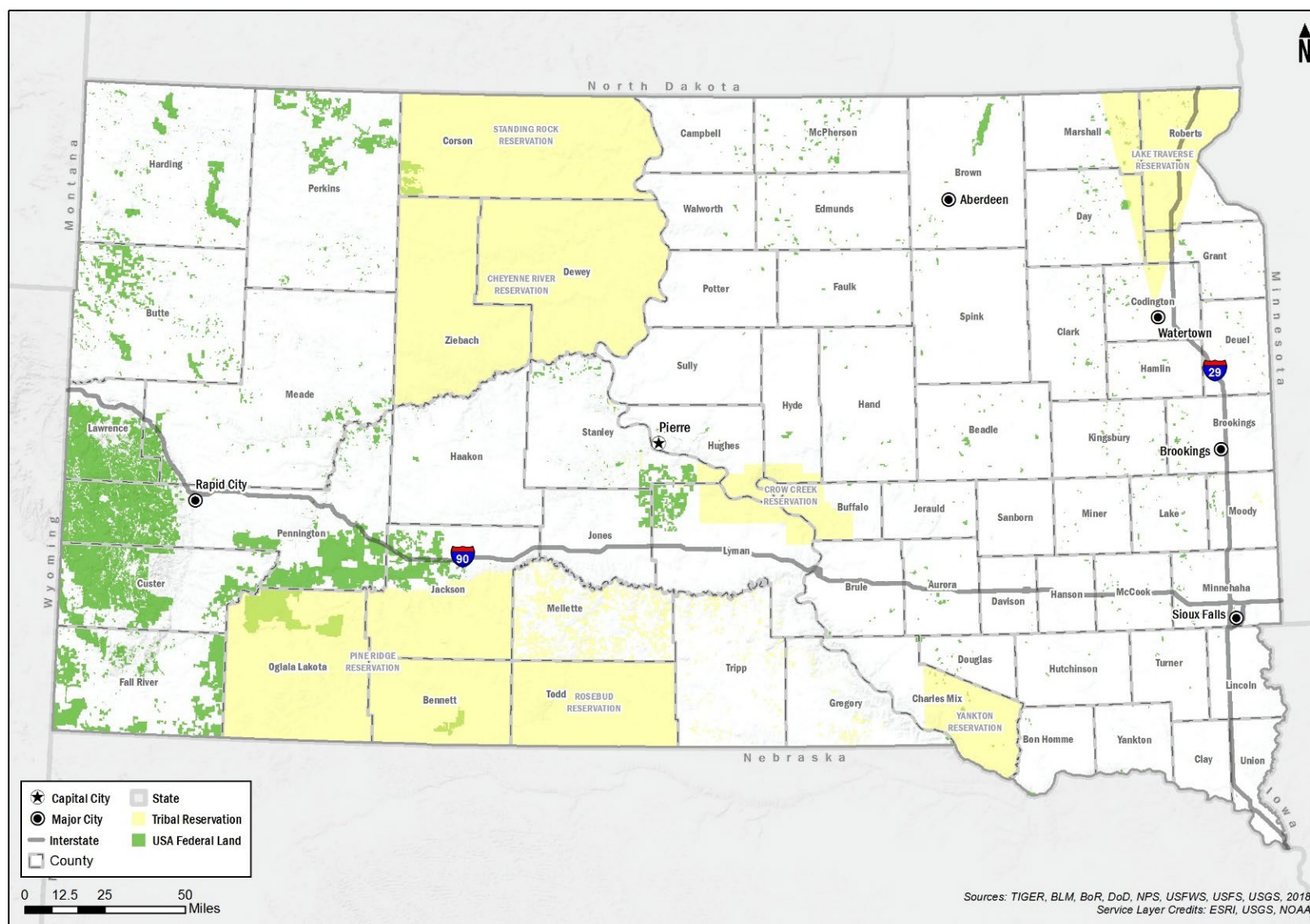


Figure 1-1: Study Area

South Dakota is 48,881,920 acres in size (Congressional Research Service 2017). About 94.6 percent (46,232,503 acres) of land in the state is owned and managed privately, or by state and local governments; and 5.4 percent (2,649,417 acres) is owned and managed by federal government agencies. Wildfire hazard mitigation assistance is generally limited to nonfederal and tribal lands in areas eligible for funding under FEMA's HMA programs. HMA grant assistance is limited to projects with the objective of reducing wildfire hazards and related hazards to people, buildings, and structures in the wildland-urban interface (WUI) or other areas that have a defined wildfire risk.

### 1.4 Process for the Use of This PEA

The CEQ regulations at 40 CFR 1500.4(i), 1502.4, and 1502.20 encourage the development of program-level NEPA environmental documents and tiering from those programmatic documents to eliminate repetitive discussions, allowing for site-specific reviews that are focused on a narrower scope specific to the subsequent action. A PEA is used to address a group of projects that are similar in scope, scale, magnitude, and the nature of the impact. In addition, CEQ regulation 40 CFR 1501.3(b) allows agencies to prepare an environmental assessment (EA) on any action at any time in order to assist agency planning and decision-making. FEMA has developed this PEA under these CEQ authorities.

For a project to qualify under this PEA, the scope of the project and the nature of impacts must be evaluated by this PEA and a finding that the project conforms to the PEA must be documented using the compliance checklist in **Appendix A**. Additional project-specific analyses may be required if the context and intensity of proposed project is different from those described in the PEA. All projects using this PEA must undergo standard compliance procedures with other federal laws as described in the checklist (e.g., Endangered Species Act [ESA], National Historic Preservation Act [NHPA], Executive Orders (EOs) for Floodplain Management, Protection of Wetlands, Environmental Justice, etc.).

It is expected that some wildfire mitigation projects will be more complicated and involve larger-scale efforts than those contemplated in this PEA. If a specific action is expected to 1) create impacts not described in this PEA; 2) create impacts greater in magnitude, extent, or duration than those described in this PEA; or 3) require mitigation measures to keep impacts below significant levels that are not described in this PEA, then a supplemental environmental assessment (SEA) would be prepared to address the specific action. The SEA would be tiered from this PEA in accordance with CEQ's NEPA implementing regulations. Actions that are determined during the preparation of the SEA to require a more detailed or broader environmental review may require the preparation of a stand-alone EA or other applicable NEPA process.

This PEA is intended to facilitate FEMA's compliance with environmental and historic preservation requirements by providing a framework to address potential impacts of wildfire hazard mitigation actions. FEMA coordinates and integrates to the maximum extent possible the review and compliance processes required by other federal laws and policies such as Section 106 of the National Historic Preservation Act (NHPA), Section 7 of the ESA, the eight-step process of EOs 11988 and 11990, and others. This PEA provides a framework for integrating these requirements with the NEPA compliance for wildfire hazard mitigation projects.

## **SECTION 2. PURPOSE AND NEED**

### **2.1 Project Purpose**

The purpose of wildfire hazard mitigation assistance provided through FEMA's HMA grant program is to reduce risks associated with wildfire hazards affecting people, buildings, and structures. Pre-fire activities are intended to reduce hazards to people and the built environment from wildfires while post-fire activities are intended to reduce hazards that may occur in areas that have experienced a wildfire. Pre-fire activities may reduce the severity of future potential wildfires, increase the ability to control wildfires, and minimize potential risks to human life, public safety, property, and the natural environment. Post-fire activities may mitigate erosion and flooding hazards resulting from fire, restore damage from fire suppression activities, and reduce the risk of fire recurring in an area.

FEMA has a responsibility to provide for effective wildfire hazard mitigation and to provide for national consistency in the use of federal funds. Hazard mitigation implemented by FEMA is aimed at preventing loss of life and property and reducing disaster recovery costs. Uniform provision of hazard mitigation assistance is an essential goal of both the HMA program.

### **2.2 Project Need**

There is an increasing need to provide for effective wildfire hazard mitigation, which arises from the following factors:

- Expansion of development in the WUI has increased the number of individuals and structures at risk.
- The frequency and intensity of wildfires are predicted to increase.
- Flooding after wildfires increases the risk to life safety and improved property.
- The potential for loss of life and property damage is increasing, as are disaster recovery costs.

Continued population growth into the WUI and an increasing frequency of elevated fire weather conditions present major challenges to residents. From 1974 to 2012, total fire suppression costs in South Dakota were approximately \$11.7 million, averaging about \$306,500 per year. These suppression costs do not include losses to structures, utilities, and forest resources, which, depending on the severity of the wildfire, can cost millions of dollars to replace. South Dakota has experienced an increase in the size and intensity of fires because of changes in land management practices, forest health, and changing climate conditions (OEM 2014).

The SILVIS lab at the Department of Forest and Wildlife Ecology, University of Wisconsin-Madison, has developed a software model to identify the WUI in each state based on census data for housing and wildland vegetation classes from the National Land Cover Dataset (SILVIS 2010). The model identifies two types of WUI: 1) Intermix WUI, the area where houses and wildland vegetation directly intermingle and 2) Interface WUI, where settled areas abut wildland vegetation. In 2010, the State of South Dakota is estimated to have 342,349 acres of WUI as

shown in **Figure 2-1** (SILVIS 2010). This represents about 0.7 percent of the total land area in the state. A substantial portion of WUI is in southwestern South Dakota in the Black Hills region and around cities such as Rapid City and Pierre (**Figure 2-1**).

In identifying areas where the FEMA HMA programs are likely to be needed or applicable, it is important to consider risk. **Figure 2-2** shows areas of severe wildfire hazard ratings in the state based on wildfire hazard potential data developed by the U.S. Forest Service (USFS) (USFS 2018). Wildfire risk is a function of vegetation types, climate, and other factors that contribute to the severity of the hazards present in an area. The main difference between **Figure 2-1** and **Figure 2-2** is that **Figure 2-2** introduces risk or the likelihood of a fire in the state.

South Dakota has experienced a significant number of wildfires in the past few decades. A summary of these historic wildfires is provided in **Table 2-1** and shown in **Figure 2-3**.

**Table 2-1: South Dakota Wildland Fires 2002–2017**

Year	Number of Wildland Fires	Acres Burned
2002	639	30,679
2003	206	34,471
2004	365	1,465
2005	1,242	15,926
2006	2,342	237,807
2007	1,505	78,013
2008	957	8,936
2009	823	10,056
2010	1,078	12,461
2011	1,248	97,230
2012	2,784	274,606
2013	889	4,475
2014	918	13,127
2015	1,032	72,985
2016	1,216	81,561
2017	1,420	77,386

Source: National Interagency Fire Center 2019





**Figure 2-1: Wildland-Urban Interface**



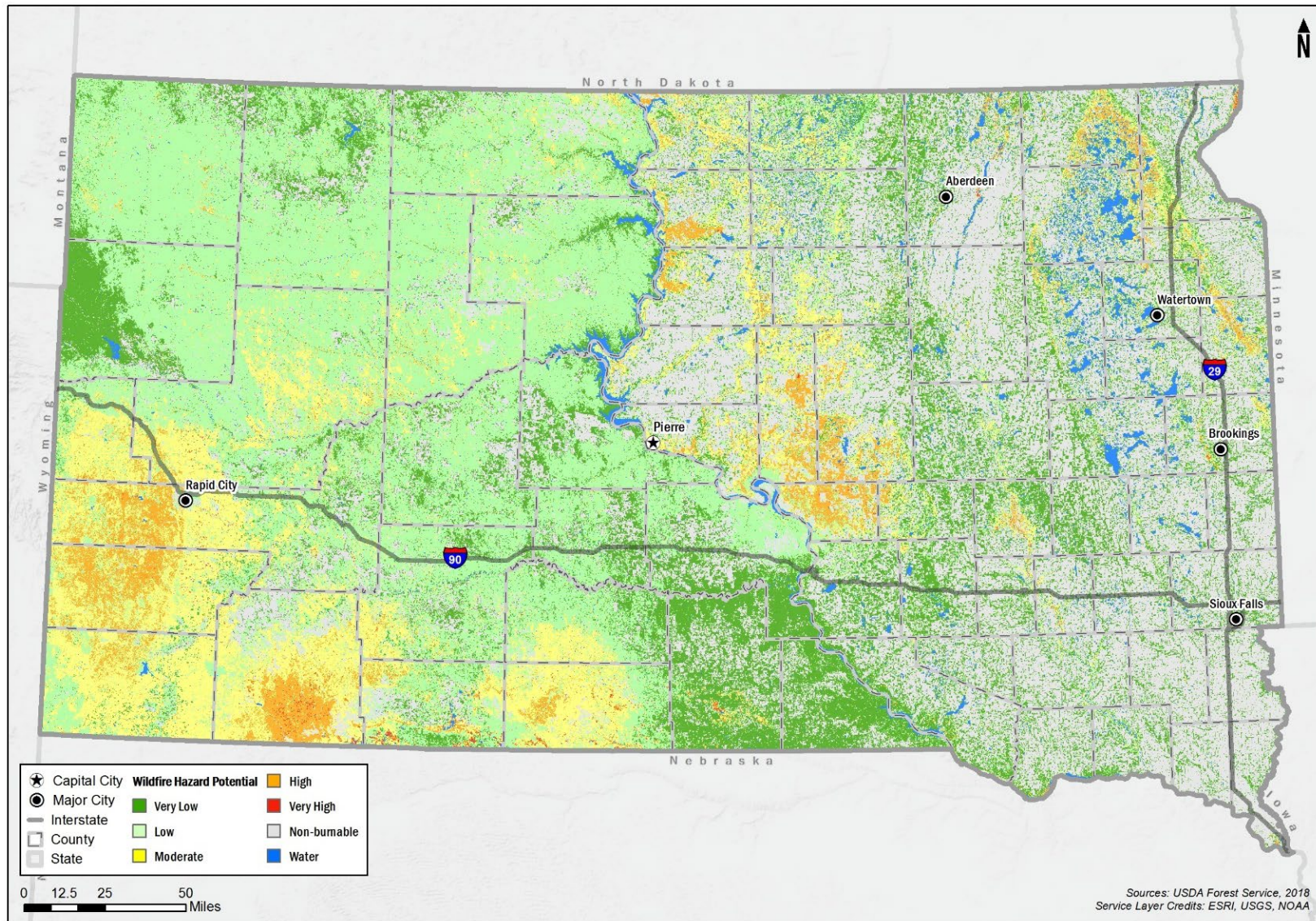


Figure 2-2: Wildfire Hazard Potential

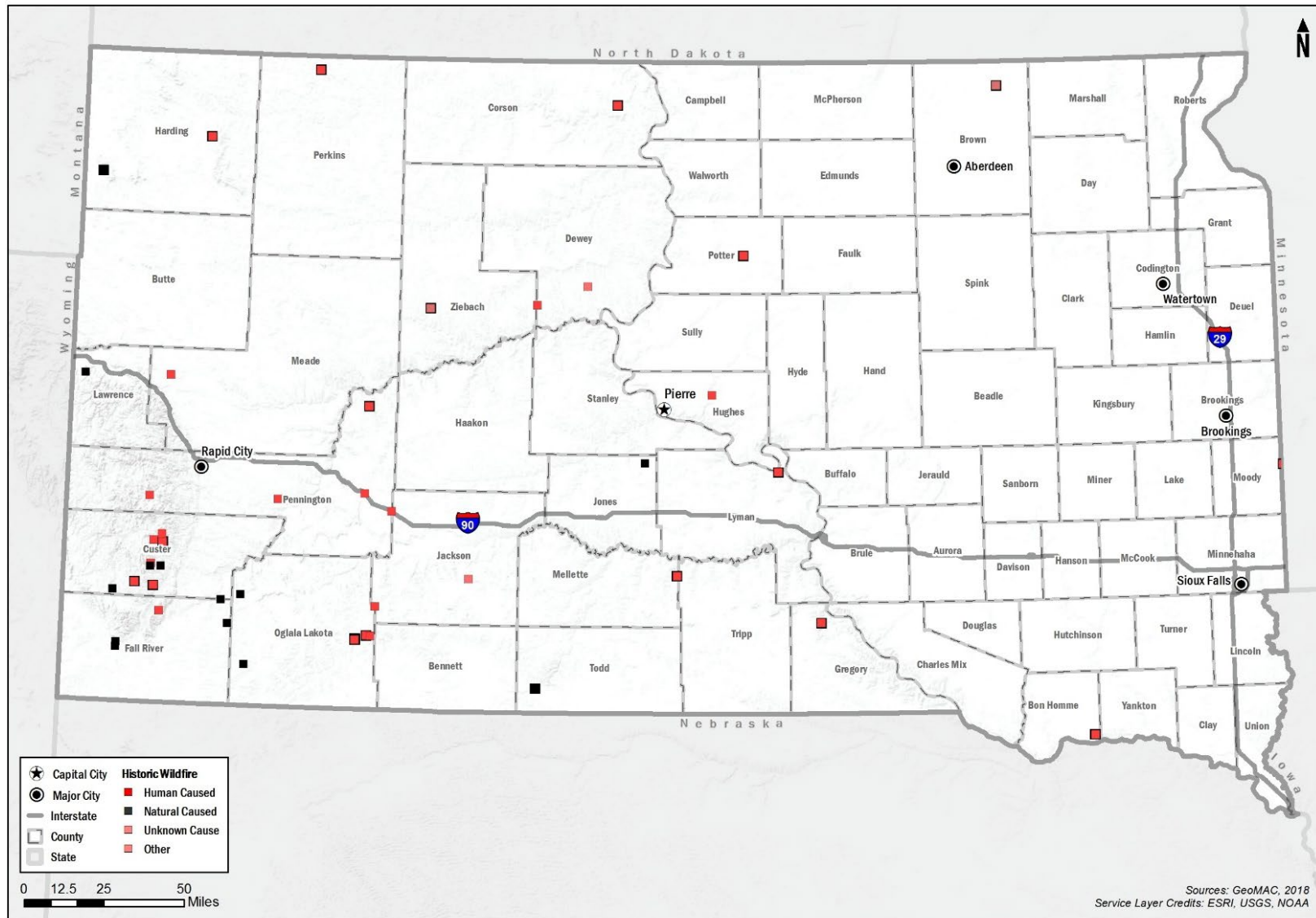


Figure 2-3: Historic Wildfires



## **SECTION 3. ALTERNATIVES**

This section describes the two alternatives evaluated in the PEA: The No Action Alternative and the Proposed Action.

### **3.1 No Action Alternative**

The No Action Alternative is defined as maintaining the status quo without any federal agency involvement. This alternative is used to evaluate the effects of not performing wildfire mitigation projects and provides a benchmark against which other alternatives may be evaluated.

Wildfire mitigation projects could still be completed by local or private landowners and may be approached in an uncoordinated manner that does not appropriately consider environmental impacts. Under the No Action Alternative, the State of South Dakota and individual project proponents would have to rely on savings, insurance, loans, or other forms of assistance to mitigate wildfire threats. Current management activities, including maintenance of existing facilities and methods of suppressing wildfires, would continue. Accumulation of hazardous fuels and the risk of catastrophic wildfires would not be reduced.

### **3.2 Proposed Action**

The Proposed Action includes fire-related mitigation activities that are eligible for FEMA-funding. Actions may be implemented individually or in combination with one another. Generally, HMA programs fund mitigation projects on nonfederal lands that can show risk reduction to the developed environment. There would be no size limit on wildfire mitigation activities eligible for funding through the HMA programs; although, some smaller projects may be eligible for NEPA coverage under a categorical exclusion (CATEX).

Pre-fire activities typically include the creation of defensible space and hazardous fuels reduction and are typically located within 2 miles of at-risk structures. Post-fire activities typically occur within, or adjacent to, a burn scar. Post-fire activities include a variety of activities that may generally be categorized as soil stabilization, erosion control, or reforestation/reseeding projects. FEMA-funded projects must show an increased level of protection for communities or residential areas.

Projects would avoid work in streamside management zones (SMZ). If work must be conducted in an SMZ, then the project would comply with voluntary forestry management best management practices (BMPs) recommended by the state (South Dakota State University et al. 2003). State guidance defines SMZ areas as strips of land at least 50 feet wide on each side of a perennial stream where vegetation should be retained, and activities are limited to protect water quality. SMZ areas also include wetlands and provide additional protection in areas with erosive soils and/or steep slopes. If projects must be conducted in SMZs then a Supplemental Environmental Assessment (SEA) would be prepared.

### **3.2.1 Defensible Space (Greater than 100 Acres)**

Creation of defensible space is a process of vegetation management, which can include removing ladder fuels, reducing flammable vegetative materials, and replacing flammable vegetation with fire-resistant vegetation. Vegetation may include excess fuels or flammable vegetation. Ladder fuels include shrubs, small trees, down wood or brush, and low limbs that may provide a route for a fire to climb from ground fuels up into the forest canopy. The purpose of defensible space is to provide a buffer that limits the spread of wildfire and to establish an area in which firefighters can safely protect structures through fire suppression activities (FEMA 2015).

The required radius of defensible space around a building is related to the degree of the hazard and may vary by topography (specifically slope steepness and direction) and the arrangement, amount, and flammability of the vegetation. Generally, defensible space is considered to extend into three “Ignition Zones” between 30 to 200 feet from a structure’s foundation (National Fire Protection Association [NFPA] 2019). The Immediate Zone extends between 0 and 5 feet from a structure and is the most vulnerable to fire embers. The Intermediate Zone is between 5 and 30 feet, where landscaping or creating breaks can help influence and decrease fire behavior. The Extended Zone is generally between 30 and 100 feet but may extend out to 200 feet where the goal is to interrupt a fire’s path and keep flame lengths shorter and on the ground. Site-specific factors may require extending the perimeter of defensible space.

Typically, defensible space projects include multiple properties and multiple structures. Some of the work may be federally funded, and some may be funded privately. The acreage affected is the sum of the work proposed on all properties with FEMA funding under a particular grant. Projects that total less than 100 acres would likely be covered by CATEX N11 (Federal Assistance for Wildfire Hazard Mitigation Actions) (see Section 3.3.3). If a defensible space project would exceed the 100-acre limit for coverage under CATEX N11, then this PEA may apply.

Defensible space projects for residential structures, commercial buildings, public facilities, and infrastructure must be implemented in conformance with local code requirements for defensible space. FEMA recommends that projects use the design guidelines in the *Homebuilder’s Guide to Construction in Wildfire Zones* (FEMA 2008a) or the *Wildfire Hazard Mitigation Handbook for Public Facilities* (FEMA 2008b), following the guidance that presents a stricter standard.

### **3.2.2 Hazardous Fuels Reduction**

Hazardous fuels reduction is a process of permanently modifying or replacing vegetation in an area strategically located in relation to predicted fire hazard and occurrence so that fires burning into it can be more easily controlled (FEMA 2015). Hazardous fuels reduction includes thinning vegetation, removing ladder fuels, reducing flammable vegetative materials, and replacing flammable vegetation with fire-resistant vegetation. Vegetation may include excess fuels or flammable vegetation. Ladder fuels include shrubs, small trees, down wood or brush, and low limbs that may provide a route for a fire to climb from ground fuels up into the forest canopy.

There are five principles of creating and maintaining fire-resistant forests (Fitzgerald and Bennett 2013):

- Reduce surface fuels.
- Increase the height to the base of tree crowns (remove ladder fuels).
- Increase spacing between tree crowns.
- Keep larger trees of more fire-resistant species.
- Promote fire-resistant forests at the landscape level.

The first four principles are included in hazardous fuels reduction projects. If trees are widely spaced, generally with crowns spaced more than one dominant tree crown width apart, crown fires are much less likely to occur. Factors that tend to increase the required crown spacing include steep slopes, locations with high winds, and the presence of species with dense, compact foliage such as grand fir or juniper. Tree spacing does not have to be even. Small patches of trees can be left at tighter spacing, benefiting some wildlife (Fitzgerald and Bennett 2013). The key is to reduce surface fuels and ladder fuels and to create openings.

Hazardous fuels reduction projects may include a variety of activities, including:

- Cutting of trees that are generally less than 12 inches in diameter breast height to reduce fuel loads and reduce canopy coverage.
- Cutting and clearing of shrubs and brush.
- Pruning and limbing of trees generally up to 15 feet aboveground to reduce ladder fuels.
- Replacing flammable vegetation with fire-resistant vegetation by selective removal of flammable species and/or planting and seeding of fire-resistant species (e.g., selective cutting of non-native juniper trees or removal of annual grass cover and reseeding with native perennial bunchgrass species).
- Removal of down, dead, or dry vegetation.

Hazardous fuels reduction projects may be accomplished through a wide variety of means and methods. Tools may include hand tools (saws, chainsaws, pruners, shovels, seed broadcasters, rakes, etc.) or mechanized equipment such as feller bunchers, chippers, tractors, brush hogs, skid steer loaders, power mowers, and grinders. Access to sites may involve the use of all-terrain vehicles, trucks, trailers, and helicopters. Other techniques that may be used include:

- Herbicide applications to reduce noxious weeds, reduce hazardous fuel volumes, and support the regrowth of desirable vegetation with appropriate safeguards to ensure the protection of human life, the environment, and watersheds. The action does not include aerial application of herbicides.
- Grazing or conversion of vegetation to noncombustible forms (e.g., composting).

- Mechanical treatments, such as disking, mulching, grinding, mowing, chopping, and removal of such material; material left on-site must not exceed appropriate depths in accordance with applicable codes and best practices.
- Biomass removal, including clearing straw, removing dead or dry vegetation, thinning, removal of brush and pine straw, or removing blown-down timber from wind throw, ice, or a combination.
- Other industry-accepted techniques with FEMA's approval.

Vegetation that is cut or gathered up from a project area must be disposed of in some manner. Woody vegetation might be chipped and spread as mulch, might be removed off-site for use as mulch, or might be composted. Dry herbaceous material might be disked into the soil to render it noncombustible. Frequently, woody vegetation is cut into short lengths, hand piled into small piles and burned on-site or used for fuel (biomass). These small piles are typically less than 10 feet high and 10 feet wide. The piles are allowed to dry for at least one season so that they burn quickly and completely when appropriate weather conditions allow, i.e., during the wet season. Burning must be conducted in accordance with State of South Dakota laws for open burning (Administrative Rules of South Dakota [ARSD] 74:27:13:11 and 74:36:06:07) and applicable local regulations. Piles would be ignited by ground crews with typical fire-starting equipment such as drip torches. Piles would be monitored to ensure that fires are completely out. Alternatively, an air curtain burner may be used to burn wood waste in a metal container or trench that minimizes the risk of small fires spreading while also reducing particulate air pollution.

There are a variety of BMPs that would be applied to hazardous fuels reduction projects depending on the project specific details. Projects that do not implement these BMPs may need to undergo a project-specific environmental analysis. BMPs would include:

- Off-road equipment would only be operated when soils are frozen or dry.
- No new roads or access points would be created to access project sites.
- Off-road equipment and vehicles required for activities (tractors, chippers) would be fitted with low ground-pressure tires when possible to reduce or eliminate ground disturbance.
- Stumps and roots of vegetation would be left in place with trees and brush being cut off at ground level.
- Projects would avoid work in SMZ areas. If work must be conducted in an SMZ, then the project would comply with the state's voluntary forestry management BMPs (South Dakota State University et al. 2003).
- Burning of cut material would not be conducted in SMZs. Cut material would be moved to an area outside of the SMZ buffer.

Typical herbicide BMPs include:

- All herbicide applications would occur consistent with label recommendations and herbicides would be applied by trained applicators using equipment that is calibrated on an annual basis.
- Only the quantities of herbicide needed for work in a given day would be transported to the project site.
- Herbicides would not be applied when the wind speed exceeds 10 miles per hour to minimize the potential for drift.
- Herbicides would not be applied if rain is projected within 24 hours.
- Herbicide selection would include consideration of the quantity of herbicide to be used, selectivity for species to be treated, and potential toxicity.
- Application methods would be limited to backpack application, application to cut stumps, or hack and squirt. Only the minimum area necessary for effective control would be treated. Aerial broadcast spraying is not analyzed in this PEA.
- Herbicide use in SMZs would be avoided.

Projects that are not able to conform to the parameters described above or to the BMPs described above would need additional environmental review, and potentially, additional mitigation measures would be needed before federal grant funding could be approved.

A component of a hazardous fuels reduction project may involve noxious weed control. Invasive species may be more flammable due to dense growth habits, the production of large quantities of dead biomass, or some other inherent quality of the species (e.g., flammable oils found in eucalyptus species). The reduction and control of noxious invasive species may be undertaken to reduce flammable biomass and to allow for less flammable native species to become established.

Noxious invasive species may be controlled through mechanical means, herbicide treatments, or biological controls. Mechanical methods such as cutting would involve activities similar to those described above for the removal of hazardous fuels. The use of herbicides would conform to the BMPs described above for the use of herbicides. Biological controls such as insects, diseases, and vertebrates (grazing) would be targeted to the invasive species and would follow the protocols established by the local weed control districts for the use of such controls. In some instances, native vegetation may be planted to help prevent the spread of noxious weeds.

### **3.2.3 Soil Stabilization**

Certain post-fire emergency soil stabilization and flood reduction projects are eligible for funding under Section 1205 of the DRRA and are not limited to the WUI. Eligible activities include reseeding ground cover with quick-growing or native species, mulching, and the implementation of erosion barriers. These short-term mitigation activities are used to mitigate the post-fire effects on physical ecosystem components, such as soil, water, and hydrologic processes. Soil stabilization projects on burn scars or areas damaged during fire suppression

activities may prevent or reduce erosion and flood hazards that can create additional post-fire damage. Section 1205 of the DRRRA includes soil stabilization measures such as:

- **Reseeding ground cover with quick-growing and/or native species.** Seeding reduces hillslope erosion and is beneficial to areas at risk from the spread of invasive and noxious plants. The seed is applied with fixed-wing aircraft or helicopters for large treatment units and with ground-based belly grinders for smaller treatment areas. Since plants take some time to establish from seeds, reseeded is generally included with other treatments such as straw mulching, hydro mulching, or soil scarifying when applied the first year following a fire (USFS 2006). Typically, seed mixes include quick-growing annual and native perennial species and/or sterile cover crops to stabilize the soil and add organic material to the soil that supports the recovery of native species in subsequent years.
- **Mulching with straw or chipped wood.** Sterile straw and chipped wood mulch provide immediate ground cover and protection to soils and seeds from erosion and loss of nutrients. This type of mulch may be applied by helicopter or from the ground using equipment such as strawblowers (USFS 2006).
- **Placing logs and other erosion barriers to catch sediment on hill slopes.** Erosion barriers can consist of straw wattles, straw bales, contour-felled log erosion barriers (LEBs), contour trenching, and scarification to provide a mechanical barrier to slow overland flow, promote infiltration, and trap sediments, thereby reducing sediment movement on burned hillsides (Robichaud and Elliot 2006). LEBs are created using an expert sawyer and a labor crew with hand tools (USFS 2006) and the vehicles needed to transport crews and materials to and from the site.

Soil stabilization activities may include the “chaining” of hydrophobic soils on a burn scar to prepare the soil for seeding or planting (Ott et al. 2003). Chaining generally follows aerial broadcast seeding to create a suitable seedbed. Chaining is often performed with an Ely chain or other similarly modified heavy chain dragged in a loose U-shaped or J-shaped pattern between two crawler tractors. Both ends of the chain are connected to tractors that drag the chain across a burn scar to break up fire-damaged soil. To be covered under the PEA, chaining treatments must be conducted within certain restrictions:

- The subrecipient must identify specific areas to be treated using chaining techniques, and the project boundaries must be clearly defined and mapped.
- The subrecipient would coordinate with the Natural Resources Conservation Service (NRCS) to determine whether soils in the project area are suitable for chaining treatment. Soil suitability can be evaluated using the NRCS Web Soil Survey mapping tool (NRCS 2019).
- Chaining activities that could have an adverse effect on archeological resources listed or eligible for listing on the National Register of Historic Places (NRHP) will require an SEA.
- Projects involving chaining must incorporate erosion and sedimentation control BMPs consistent with the state’s General Permit Authorizing Stormwater Discharges Associated

with Construction Activity under the South Dakota Surface Water Discharge System (Permit Number: SDR100000) (South Dakota Department of Environment and Natural Resources [DENR] 2018a).

- When using chaining techniques, removal of post-fire vegetation, trees, stumps, or root balls would be minimized to the extent possible (Jones 2019).
- Chaining projects would be conducted on flat or gently sloped topography where slopes are typically less than 20 percent.
- Chaining activities in SMZs or wetlands are not covered by this PEA.

Projects under this activity group must be associated with post-fire damage and would be located on or adjacent to burned areas. Activities do not need to be located within a specified distance to structures.

### **3.2.4 Hazard Tree Removal**

Wildfires may leave many acres of standing dead trees. These trees may pose hazards for structures, utility lines, or transportation corridors as they decompose and fall over. They may also pose hazards to people working to restore burned areas or to livestock. Standing dead trees may also fall and damage trees that have been planted to restore burned areas.

Post-fire mitigation for burned trees consists of marking and removing trees in high-risk areas (roads, parking areas, utility corridors, or adjacent to buildings) using chain saws or mechanized equipment such as feller-bunchers. Heavy equipment like backhoes and loaders may be used when hazard trees need to be removed from roads. Generally, hazard trees that are cut would be left on the ground within the project area. They may be felled in a manner that provides contour erosion control. This PEA does not cover salvage logging activities.

Projects under this type of mitigation activity must be associated with post-fire damage and would be located on or adjacent to burned areas.

## **3.3 Alternatives Considered and Eliminated from Evaluation**

This section describes mitigation activities considered but eliminated from evaluation in the PEA because they are either ineligible activities or activities that fall within the parameters of a CATEX. Use of a CATEX for mitigation activities would still require an evaluation of extraordinary circumstances and compliance with environmental and historic preservation requirements. If a specific project is not encompassed by the activities described in the Proposed Action and does not fall within the CATEX parameters, then a separate NEPA evaluation would need to be conducted.

### **3.3.1 Activities Ineligible for HMA Funding**

FEMA policy for the HMGP and PDM programs do not typically allow funding of the following types of projects; therefore, they were not retained as alternatives for consideration under this PEA. These actions may be considered under an SEA.

- Projects on federally owned land and land adjacent to federal lands when the proposed project falls under the primary or specific authority of another federal agency;
- Projects for hazardous fuels reduction in excess of 2 miles from at-risk buildings and structures;
- Projects to address ecological or agricultural issues related to land and forest management (e.g., insects, diseases, infestations, damage from extreme weather events affecting forest-wide health);
- Irrigation of vegetation to avoid disease or drought-related infestation;
- Projects to protect the environment or watersheds where the primary purpose is not related to the restoration of damage from a fire or to prevent further damage as a result of fire;
- Projects for prescribed burning or clear-cutting activities;
- Projects for maintenance activities, deferred or future, without an increase in the level of protection;
- Projects for the creation and maintenance of fire breaks, access roads, and staging areas;
- Purchase of equipment to accomplish eligible work (e.g., chainsaws, chippers);
- Projects for vegetation irrigation systems installed on the ground and designed to moisten the surface; and
- Activities intended solely to remedy a code violation without an increase in the level of protection.

### **3.3.2 Ignition Resistant Construction**

This type of hazard mitigation involves the use of ignition-resistant materials and technologies on new and existing buildings and structures. Ignition-resistant construction is the application of construction standards based on the use of fire-resistant materials, noncombustible materials, and 1-hour fire-rated assemblies. An ignition-resistant construction project may be eligible for FEMA funding only when the property owner has previously created defensible space and agrees to maintain the defensible space in accordance with FEMA HMA guidance or when both defensible space and ignition-resistant construction activities are part of the same project.

An ignition-resistant construction project may include activities that meet or exceed codes currently in effect. For communities without local wildfire codes in place, the materials and technologies proposed may be in accordance with International Code Council, FEMA and its U.S. Fire Administration, and NFPA's Firewise USA recommendations, as appropriate.

Most ignition-resistant construction projects will be eligible for coverage under CATEX N7 (Federal Assistance for Structure and Facility Upgrades). Projects with an external water hydration system component may include some ground disturbance that might not be covered



under CATEX N7. However, ground disturbance for the installation of hydration systems could be covered under CATEX N8 (Federal Assistance for New Construction Activities of Less Than One Acre in Undisturbed or Undeveloped Areas). It is unlikely that a hydration system for a structure would exceed 1 acre of disturbance in previously undisturbed areas. Ignition-resistant construction activities will not be further evaluated in this PEA. If a specific project does not fall within the CATEX parameters, then a separate NEPA evaluation will need to be conducted.

### **3.3.3 Defensible Spaces (Less than 100 Acres)**

CATEX N11 (Federal Assistance for Wildfire Hazard Mitigation) provides coverage for wildfire hazard mitigation actions involving the creation of defensible space or hazardous fuel reduction for up to 100 feet of at-risk structures that includes the selective removal of vegetation less than 12 inches in diameter through thinning, pruning, limbing, sawing, or brush cutting; removal of down, dead, or dry vegetation material as part of the overall action. The actions must be limited to less than 100 acres of vegetation removal either individually or when combined with other reasonably foreseeable private or public actions and follow appropriate best management practices.

### **3.3.4 Flood Reduction Activities**

Post-fire mitigation activities related to flood reduction are eligible for funding under Section 1205 of the DRRRA and are not limited to the WUI. Flood diversion projects may reduce flash flooding because of a burn scar. Eligible activities would include:

- Constructing straw, rock, or log dams in small tributaries to prevent flooding.
- Installing debris traps to modify road and trail drainage mechanisms.
- Modifying or removing culverts to allow drainage to flow freely.
- Adding drainage dips and constructing emergency spillways to keep roads and bridges from washing out during post-fire floods.

Most flood diversion projects would be eligible for coverage under CATEX N4 (Federal Assistance for Actions Involving Stream Work and Modification and Floodways), CATEX N8 (Federal Assistance for New Construction Activities of Less Than One Acre in Undisturbed or Undeveloped Areas), or CATEX N9 (Federal Assistance for Flood Hazard Reduction Actions).

CATEX N4 covers repair and restoration actions, hazard mitigation actions other than flood control, or the new construction of facilities that are functionally dependent or facilitate open space use, when the actions are within or affect regulatory floodways, streams, and stream banks and:

- Involve ground disturbance of less than one-half acre;
- Involve stream bank work or alteration of less than 300 linear feet;
- Do not involve hardening or armoring of the stream banks unless the project uses stream or stream bank bioengineering techniques and improves fish passage or habitat;

- Do not result in adverse flood risk effects on downstream communities;
- Do not result in any increase of flood levels within the community during the occurrence of the base flood discharge if the action takes place within the regulatory floodway;
- Do not increase water surface elevation of the base flood more than 1 foot at any point within the community if the action takes place in a floodplain with no regulatory floodway and when combined with other existing or reasonably foreseeable development.

CATEX N8 covers federal assistance for new construction and associated site preparation activities in undisturbed or undeveloped areas when the activities comprise less than 1 acre and follow BMPs to control noise, water, and air pollution. This category does not apply to new construction in undisturbed or undeveloped floodplains or wetlands. This CATEX covers the range of activities typically necessary for new construction, including field work (e.g., borings and site inspection) and temporary staging and use of construction equipment and vehicles.

CATEX N9 covers minor flood control actions consistent with Sections 1361 and 1366 of the National Flood Insurance Act, such as drainage, berm, water crossing, and detention, retention, or sediment pond projects that have the primary purpose of addressing flood hazards and meet the following conditions:

- Do not affect more than 25 acres.
- Do not result in adverse flood risk effects on downstream communities.
- Do not result in any increase of flood levels within the community during the occurrence of the base flood discharge if the action takes place within the regulatory floodway.
- Do not increase water surface elevation of the base flood more than 1 foot at any point within the community if the action takes place in a floodplain with no regulatory floodway when combined with other existing or reasonably foreseeable development.

CATEX N12 covers federal assistance for the planting of indigenous vegetation.

## **SECTION 4. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

This section describes the affected environment or existing conditions for each resource area and evaluates the environmental consequences of the No Action Alternative and the Proposed Action. Each subsection analyzes a resource area and includes a description of the relevant laws that impact the analysis and a discussion on whether additional consultation and coordination would be required on a project-specific basis when tiering from this PEA. The evaluation of the Proposed Action describes the potential impacts of each eligible activity and provides potential mitigation measures and BMPs that may be employed to avoid, minimize, or mitigate impacts. Post-project implementation of maintenance activities under potentially required operations and maintenance plans is analyzed under each subsection.

### **4.1 Evaluation Criteria and Thresholds**

For each resource area, the context (i.e., geographic extent or setting) and intensity (i.e., magnitude) of potential impacts were evaluated based on the criteria shown in **Table 4-1**. Impacts described throughout this document are direct effects unless otherwise noted as indirect or secondary effects.

**Table 4-1: Evaluation Criteria for Potential Impacts**

<b>Impact Scale</b>	<b>Criteria</b>
None/Negligible	The resource area would not be affected, or changes or benefits would be either nondetectable or, if detected, would have effects that would be slight and local. Impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, although the changes would be small and localized. Impacts or benefits would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have either localized or regional-scale impacts or benefits. Impacts would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary, and the measures would reduce any potential adverse effects.
Major	Changes would be readily measurable and would have substantial consequences on a local or regional level. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, though long-term changes to the resource would be expected.

## Affected Environment and Environmental Consequences

**Table 4-2** establishes the criteria for determining if a Proposed Action may be covered under the FONSI for this PEA, or through a tiered SEA if unmitigated extraordinary circumstances exist. In these situations, an SEA would be prepared, focusing on the resources where the extraordinary circumstances exist. If a project is consistent with the scope and potential impacts described and would apply the mitigation measures proposed in this PEA, then no further NEPA documentation would be required. See Section 5, Best Management Practices and Mitigation Measures and Section 6, Summary of Impacts for a summary of potential effects and mitigation measures that would be required to avoid or minimize adverse effects.

**Table 4-2: Thresholds for Preparing Tiered SEAs**

Area of Evaluation	Action Covered by This PEA	Tiered Supplemental Environmental Assessment Required
<b>Geology, Soils, and Topography</b>	Negligible or minor impacts on geology, soils, or topography.  Or  Mitigation measures are used to reduce potential impacts to a minor level.	Impacts on geology, soils, and topography are moderate or major after the application of mitigation measures.
<b>Air Quality</b>	Emissions in nonattainment and maintenance areas would be less than exceedance levels. Emissions in attainment areas would not cause air quality to go out of attainment for any National Ambient Air Quality Standards (NAAQS).  Or  Mitigation measures are used to reduce potential impacts below the level described above.	Emissions would be greater than the exceedance levels for nonattainment and maintenance areas. Emissions in attainment areas would cause an area to be out of attainment for any NAAQS.
<b>Visual Quality and Aesthetics</b>	Negligible or minor impacts on visual quality and aesthetics.  Or  Mitigation measures are used to reduce potential impacts to a minor level.	Impacts on visual quality and aesthetics may be major.  Or  Historic or scenic resources are present that may be adversely affected.

## Affected Environment and Environmental Consequences

Area of Evaluation	Action Covered by This PEA	Tiered Supplemental Environmental Assessment Required
<b>Water Quality and Water Resources</b>	<p>Negligible or minor impacts on water quality and would not exceed water quality standards or criteria. Localized and short-term alterations in water quality and hydrologic conditions relative to historical baseline may occur.</p> <p>Or</p> <p>Mitigation measures are used to reduce potential impacts to a minor level.</p>	The Proposed Action would cause or contribute to existing exceedances of water quality standards on either a short-term or prolonged basis.
<b>Floodplains</b>	Proposed Action is not located in and does not adversely affect floodplains.	The Proposed Action would adversely affect floodplains.
<b>Wetlands</b>	Proposed Action is not located in or does not adversely affect wetlands.	The Proposed Action would adversely affect wetlands.
<b>Wild and Scenic Rivers</b>	None or minor impact on a wild and scenic river resulting from water quality or water resources impact, visual impacts, vegetation, fish or wildlife habitat impacts.	Moderate or major impact on a wild and scenic river resulting from water quality or water resources impact, visual impacts, vegetation, fish or wildlife habitat impacts.

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Area of Evaluation	Action Covered by This PEA	Tiered Supplemental Environmental Assessment Required
<b>Vegetation</b>	Negligible or minor impacts on native species, their habitats, or the natural processes sustaining them. Population levels of native species would not be affected. Sufficient habitat would remain functional to maintain the viability of all species.	<p>Major impact on native species, their habitats, or the natural processes sustaining them. Population numbers, population structure, genetic variability, and other demographic factors for species might have large short-term declines, with long-term population numbers significantly depressed. Loss of habitat would affect the long-term viability of native species.</p> <p>Or</p> <p>The Proposed Action causes the spread of noxious weeds resulting in major impacts.</p> <p>Or</p> <p>The Proposed Action is in forest stands with old-growth characteristics.</p> <p>Or</p> <p>The Proposed Action involves salvage logging.</p>
<b>Fish and Wildlife Habitat</b>	Negligible or minor impacts on native species, their habitats, or the natural processes sustaining them. Population levels of native species would not be affected. Sufficient habitat would remain functional to maintain the viability of all species.	<p>Major impact on native species, their habitats, or the natural processes sustaining them. Population numbers, population structure, genetic variability, and other demographic factors for species might have large short-term declines, with long-term population numbers significantly depressed. Loss of habitat would affect the long-term viability of native species.</p>

## Affected Environment and Environmental Consequences

Area of Evaluation	Action Covered by This PEA	Tiered Supplemental Environmental Assessment Required
<b>Threatened and Endangered Species</b>	<p>FEMA can make a “No Effect” determination.</p> <p>Or</p> <p>FEMA can make a “Not Likely to Adversely Affect” determination along with concurrence from U.S. Fish and Wildlife Service (USFWS).</p> <p>Or</p> <p>Mitigation measures are used to reduce potential impacts to a minor level or to a “not likely to adversely affect” level.</p>	<p>FEMA determines that the Proposed Action is likely to adversely affect a listed species or will adversely modify critical habitat that cannot be resolved through consultations with the USFWS.</p>
<b>Cultural Resources</b>	<p>No historic properties affected.</p> <p>Or</p> <p>FEMA can make a determination of “No Adverse Effect” with concurrence from the SHPO (State Historic Preservation Office and the THPO (Tribal Historic Preservation Office).</p>	<p>FEMA makes an “Adverse Effect” determination that is not resolved through consultations with the SHPO, THPO or other consulting parties</p> <p>Or</p> <p>Chaining in project areas where an NRHP-eligible or listed archeological sites are located</p>
<b>Environmental Justice</b>	<p>There would be no disproportionately high and adverse environmental or health effects on low-income and/or minority populations.</p> <p>Or</p> <p>Mitigation measures are used to reduce potential impacts to a negligible level.</p>	<p>There would be unmitigated disproportionately high and adverse environmental and health impacts on low-income or minority populations.</p>
<b>Land Use</b>	<p>The Proposed Action causes no impact on existing land uses.</p>	<p>The Proposed Action causes a major impact from the conversion of existing land uses.</p>

## Affected Environment and Environmental Consequences

Area of Evaluation	Action Covered by This PEA	Tiered Supplemental Environmental Assessment Required
<b>Hazardous Materials</b>	<p>Hazardous or toxic materials or wastes would be safely and adequately managed in accordance with all applicable regulations and policies, with limited exposures or risks. There would be no short- or long-term adverse impacts on public safety.</p> <p>Or</p> <p>Mitigation measures are used to reduce potential impacts such that there would be no short- or long-term adverse impacts on public health and safety.</p>	<p>The Proposed Action would result in a net increase in the amount of hazardous or toxic materials or wastes that need to be handled, stored, used, or disposed of, resulting in unacceptable risks, the exceedance of available waste disposal capacity, or probable regulatory violation(s).</p> <p>Or</p> <p>A Phase I or II environmental site assessment indicates that contamination exceeding reporting levels is present and further action is warranted.</p> <p>Or</p> <p>The Proposed Actions involves the release, clean up, or disposal of hazardous materials.</p>
<b>Noise</b>	<p>Noise levels would not exceed typical noise levels expected from equipment or vehicles, would comply with local noise ordinances, and would not adversely affect sensitive receptors. Noise generated by construction would be temporary or short-term in nature.</p> <p>Or</p> <p>Mitigation measures are used to reduce potential impacts below the levels described above.</p>	<p>Noise levels would exceed typical noise levels expected from equipment permanently or for a prolonged period, would not comply with local noise ordinances, or would adversely affect a sensitive receptor.</p>
<b>Traffic and Transportation</b>	<p>The Proposed Action would have only negligible or minor impacts on traffic and transportation.</p> <p>Or</p> <p>Mitigation measures are used to reduce potential impacts to a minor level.</p>	<p>Long-term impacts on traffic and transportation would be moderate or major even with mitigation.</p>



## Affected Environment and Environmental Consequences

Area of Evaluation	Action Covered by This PEA	Tiered Supplemental Environmental Assessment Required
<b>Public Services and Utilities</b>	<p>The Proposed Action would have only negligible or minor impacts on public services and utilities.</p> <p>Or</p> <p>Mitigation measures are used to reduce potential impacts to a minor level.</p>	<p>Long-term impacts on public services and utilities as a result of the Proposed Action may be moderate or major with mitigation.</p>
<b>Public Health and Safety</b>	<p>The Proposed Action would have only negligible or minor impacts on public health and safety.</p> <p>Or</p> <p>Mitigation measures are used to reduce potential impacts to a minor level.</p>	<p>Impacts on public health and safety as a result of the Proposed Action may be moderate or major with mitigation.</p> <p>Projects proposing extensive use of herbicides may need to develop project-specific conditions.</p> <p>Projects proposing the aerial application of herbicides.</p>
<b>Cumulative Impacts</b>	<p>No past, present, or future actions are near the project area.</p> <p>Or</p> <p>The Proposed Action in connection with past, present, or future actions would have only negligible or minor cumulative impacts.</p> <p>Or</p> <p>Mitigation measures are used to reduce the potential cumulative impacts to a minor level.</p>	<p>Cumulative impacts as a result of the Proposed Action in connection with past, present, or future actions may be moderate or major.</p>

### 4.2 Resources Not Affected and Not Considered Further

#### 4.2.1 Prime and Unique Farmland

The Farmland Protection Policy Act of 1981, 7 United States Code (U.S.C.) 4201 et seq., was enacted to minimize conversion of prime and unique farmland and farmland of statewide or local importance to nonagricultural uses and to ensure that federal programs are compatible with local, state, and private programs and policies to protect farmland. This topic was dismissed because the wildfire hazard mitigation activities covered by this PEA would not convert farmland to nonagricultural uses.

#### 4.2.2 Coastal Resources

The State of South Dakota does not include coastal areas and is not subject to the Coastal Zone Management Act. Therefore, coastal resources were dismissed from further analysis.

#### 4.2.3 Sole Source Aquifers

There are no sole source aquifers in the State of South Dakota that would be regulated under the Safe Water Drinking Act of 1974 (42 U.S.C. 300 et seq.). Therefore, sole source aquifers were dismissed from further analysis (U.S. Environmental Protection Agency [EPA] 2019b).

### 4.3 Geology, Soils, and Topography

#### 4.3.1 Affected Environment

Soil types present in a specific project area will vary widely depending on the location of the project. South Dakota contains 17 soil taxonomic suborders as shown in **Figure 4-1** and summarized in **Table 4-3**.

**Table 4-3: Soil Taxonomy Suborders**

Taxonomic Suborder	Area (Acres)	Percent of Total
Ustolls	18,797,712	38.5
Udolls	4,401,415	9.0
Unidentified	4,301,188	8.8
Aquolls	3,885,708	7.9
Usterts	3,875,826	7.9
Orthents	3,439,390	7.0
Albolls	3,044,860	6.2
Fluvents	2,371,261	4.9
Ustepts	1,487,736	3.0
Udalfs	1,060,295	2.2
Ustalfs	846,629	1.7

## Affected Environment and Environmental Consequences

Taxonomic Suborder	Area (Acres)	Percent of Total
Psammets	421,631	0.9
Argids	312,544	0.6
All Other Suborders	635,726	1.3
<b>Total</b>	<b>48,881,920</b>	<b>100.0</b>

Source: NRCS 2019

Seismic conditions are not affected by nor do they impact wildfire hazard mitigation projects. The underlying geology of an area is generally not a concern with respect to wildfire hazard mitigation projects. In some areas of the state, the underlying geology leads to the formation of important aquifers, or the geology may form important habitats for listed species, such as the karst geology critical to cave-obligate species. Water resources, including sole source aquifers, are discussed in Section 4.6, Water Quality and Water Resources. Wildlife habitats and listed species are discussed in Section 4.11, Fish and Wildlife Habitat and Section 4.12, Threatened and Endangered Species and Critical Habitat, respectively.

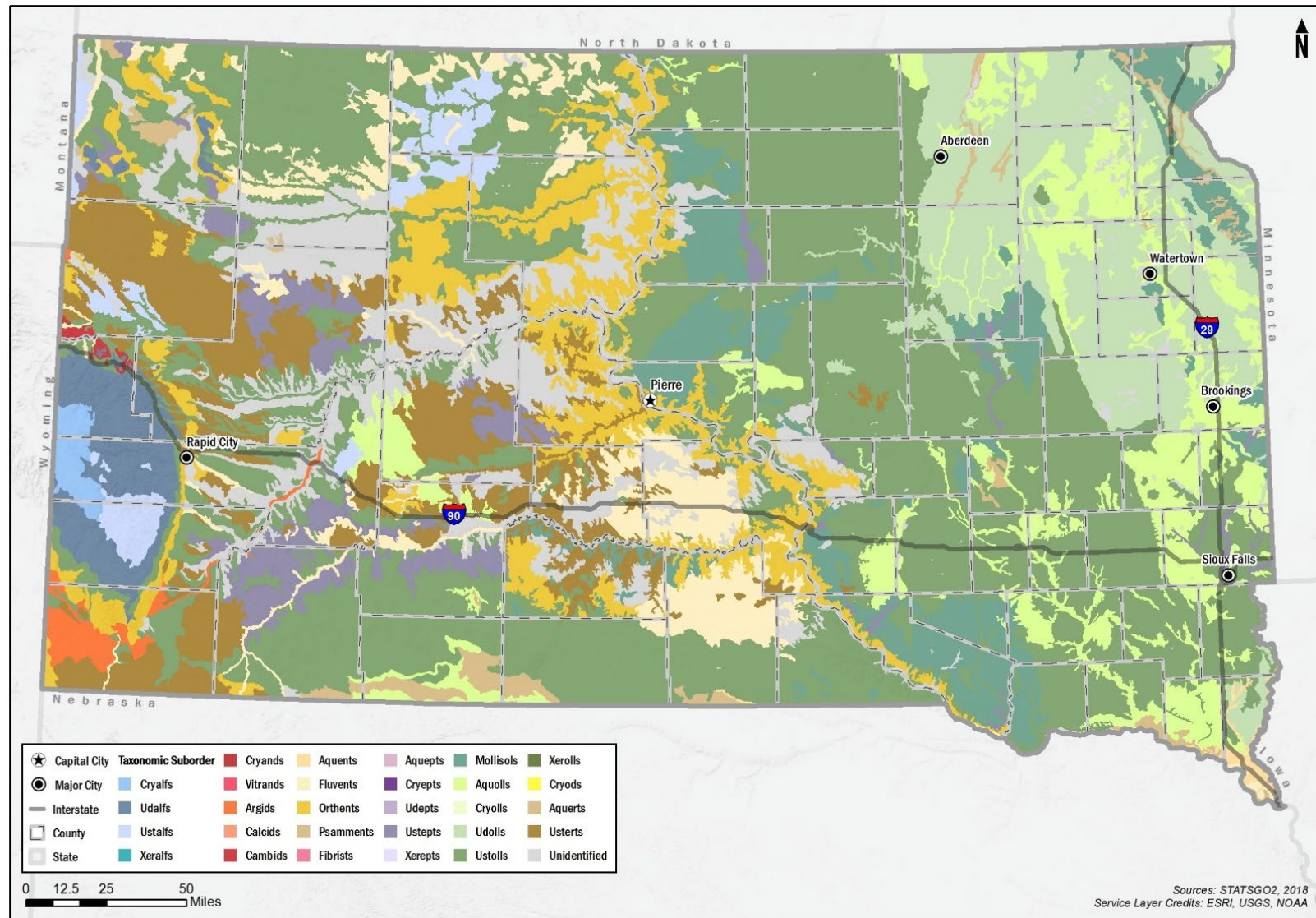
Topography in the state varies substantially and is shown in **Figure 4-2**. Although a project area may cover a relatively small horizontal distance, the topography may still vary widely from essentially level areas to vertical cliffs and rock outcrops. Topography is an important consideration in fire behavior, and wildfire hazard mitigation projects may be located in areas with more extreme topography where the hazards related to wildfires may be greater.

### 4.3.2 Environmental Consequences

#### 4.3.2.1 No Action Alternative

Under the No Action Alternative, a major wildfire would be more likely to occur, which could cause major impact to soils. A wildfire could alter the cycling of nutrients; the physical and chemical properties of soils; and the temperature, moisture, and biotic characteristics of the existing soils.

## Affected Environment and Environmental Consequences



**Figure 4-1: Soil Taxonomy Suborders**



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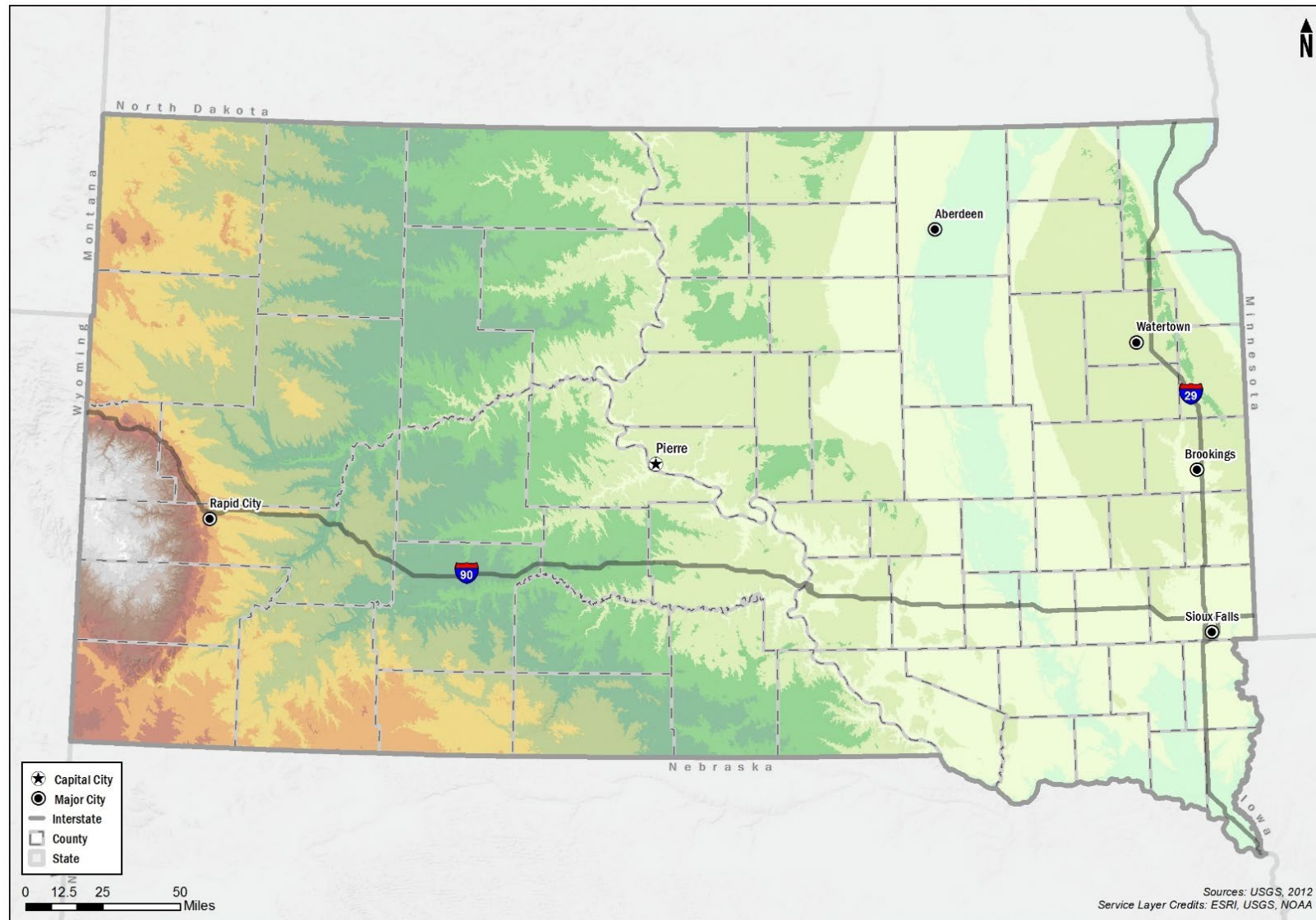


Figure 4-2: Topography

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Wildfires impact hydrological conditions by destroying accumulated forest floor material and vegetation that provide protection to the mineral soil and hold soils on hillslopes. Wildfires can alter infiltration by exposing soils to raindrop impact and creating or enhancing water-repellent soil conditions. In areas with sensitive soils, an intense wildfire can alter the physical and chemical properties of the soils and result in impacts, such as increased hydrophobicity, which results in decreased infiltration and increased runoff. Increased runoff due to increased hydrophobicity may also cause increased erosion.

The amount of erosion and sedimentation that would occur after a wildfire is a function of several variables, including rainfall intensity, soil erodibility, the volume of stored sediment on hillslopes and in channels, and on burn severity (Moody and Martin 2009). In areas where soils are thin, a significant wildfire that removes the vegetation and results in erosion could expose more bedrock to direct rainfall. This could increase the rate of erosion, particularly of certain types of formations such as limestone, karst, or sandstone rock formations. These impacts from a wildfire can result in decreased infiltration and increased runoff, which often causes increased erosion. In the event of a major wildfire, there could be major adverse impacts on soils and geology.

### 4.3.2.2 Proposed Action

**Defensible Space:** The creation of defensible spaces would not affect geology or topography. Defensible space projects would not extend deep enough below the ground surface to disturb geologic resources. There is the potential for defensible space activities to result in minor ground disturbance and soil erosion. The level of potential effect would be minor because of the small areas potentially affected at each site. Although, defensible space activities covered under this PEA are for projects that encompass more than 100 acres, defensible space activities are limited to approximately 200 feet around structures and the equipment used in these small spaces generally only results in negligible effects on erosion.

Ground disturbance and soil erosion may be avoided or minimized by using mulch to prevent erosion (with appropriate safeguards to prevent mulch from reaching surface waters) and avoiding the use of mechanized equipment on slopes or unstable soils to the maximum extent feasible. In areas with steep slopes (typically greater than a 20 percent slope) or sensitive soils (e.g., soils sensitive to compaction such as clay), vegetation reduction should be conducted with the use of hand tools to avoid and minimize potential soil erosion (USFS 2014a, NRCS 2017). BMPs are summarized in Section 5, Best Management Practices and Mitigation Measures.

Ground disturbance and soil erosion may also be avoided or minimized by using rubber-tired mechanical equipment and vehicles on existing roads. Wheeled or tracked vehicles would not be operated in SMZ areas during implementation of this hazard mitigation activity (South Dakota State University et al. 2003).

If soils are disturbed and exposed, they may continue to erode after implementation of the project is complete. If the project area does not experience a wildfire, these effects would be negligible. If a wildfire occurs, the fire in the defensible space area is more likely to have shorter flame

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lengths and to burn at a lower temperature and is less likely to destroy the remaining vegetation and structures resulting in a beneficial effect with respect to soils and erosion.

**Hazardous Fuels Reduction:** Similar to defensible space projects, hazardous fuels reduction projects would not affect geology or topography. Hazardous fuels reduction projects also have the potential to reduce the vegetation that holds soils in place and to result in minor soil erosion. The same measures to avoid and prevent soil erosion that would be applied to defensible space projects would be applied to hazardous fuels reduction projects. Also, hazardous fuels reduction projects that use grazing animals for either implementation or maintenance would manage the number of animals used to control vegetative growth such that the potential for soil erosion is avoided or minimized. Fuels reduction projects may extend over larger areas than defensible space projects; therefore, the potential impacts could be greater. However, with the use of appropriate BMPs and mitigation measures, the impacts related to erosion would be minor.

Disposal of cut vegetation by pile burning would not be likely to result in adverse effects on soils. Small piles that are less than 10 feet by 10 feet and allowed to dry thoroughly before ignition burn quickly. These small piles do not create the intense heat that a large wildfire or a large commercial timber harvest slash pile can create that then results in adverse effects on soil properties. Curtain burning that is contained within a trench may alter soil properties on the bottom and sides of the trench, but when it is filled back in at the end of the project, the top layer of fill material would allow for regrowth of vegetation.

As described in Section 3.2.2, maintenance would be less intense and of shorter duration than the Proposed Action, and the activities that have the potential to result in soil disturbance would be less likely to occur during maintenance. Therefore, potential effects on soils from maintenance would be negligible.

**Soil Stabilization:** Soil stabilization activities would provide moderate benefits to soils by reducing overland flow, erosion, and sedimentation for lower intensity rainfall events. The effectiveness of the treatment depends on actual rainfall amounts and intensities, especially in the first post-fire years. Projects that reseed with ground covers and/or replant trees would result in long-term benefits as the vegetation becomes established and root systems expand to hold soils in place and the vegetation provides greater coverage to intercept rainfall. BMPs to reduce soils disturbance during implementation would include the use of rubber-tired mechanical equipment and accessing project areas through existing roads or utility corridors. Wheeled or tracked vehicles would not be operated in SMZs to implement this hazard mitigation activity (South Dakota State University 2003).

Chaining of soils would cause moderate impacts related to the use of heavy tractors and Ely chains in the short-term by increasing the potential for erosion from stormwater and wind. The activity would break up hydrophobic soils caused by wildfires to create a seedbed and provide soil cover for seeds. In the long-term, the activity would stabilize soils and reduce the potential for erosion as vegetation reestablishes providing moderate benefits. Project activities that involve chaining and disturb more than 1 acre would incorporate erosion and sediment control BMPs consistent with the South Dakota General Permit for Stormwater Discharges Associated with Construction Activities (Permit No. SDR100000) (DENR 2018a). BMPs may include the use of

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silt fencing, inlet protection, straw wattles, sediment traps, or other perimeter control devices (DENR 2018a).

**Hazard Tree Removal:** Moderate impacts on soils would result from compaction from the use of heavy equipment and work crews that could disturb soils. Compacted soils limit water infiltration, which in turn promotes surface water runoff and erosion, and a loss of long-term soil productivity. The amount of compaction would be dependent on soil taxonomy, moisture levels, type of equipment used, type of tires or tracks on the equipment, and number of passes a piece of heavy equipment makes across the same patch. BMPs would be similar to those for soil stabilization activities. In addition, BMPs would include the use of equipment with rubber wheels or allowing workers to access areas on foot with hand tools. Equipment should move around the treatment area in a random pattern and not repeatedly drive over the same areas. With the implementation of BMPs, the impact on soils would not be significant.

### 4.4 Air Quality

Air quality is regulated by EPA under the jurisdiction of the Clean Air Act (CAA) of 1970 and its amendments. EPA has generally applied a two-pronged approach to controlling air pollution: 1) setting National Ambient Air Quality Standards (NAAQS) that define maximum pollution levels in the air that is still protective of human health and welfare and 2) developing emission standards for sources of air pollutants to reduce pollutant emissions to the atmosphere. Pollutants for which NAAQS have been established are called criteria pollutants, which include ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), lead (Pb), and particulate matter (PM). EPA designates locations that do not meet or persistently exceed one or more of the NAAQS as nonattainment areas for each pollutant that does not meet the standards.

The CAA requires that state implementation plans (SIPs) be prepared and implemented by the applicable state or local regulatory agency for each criteria pollutant in nonattainment in an air basin. EPA may develop a federal implementation plan, and Native American tribes may develop their own tribal implementation plans. These plans are intended to achieve air quality standards, typically through the use of rules and agreements. The DENR is the state agency responsible for regulating air quality and developing the SIP for South Dakota. There are currently no approved federal implementation plans or tribal implementation plans for air quality in the state (EPA 2018a).

On November 30, 1993, EPA promulgated a set of regulations known as the “general conformity rule” that included procedures and criteria for determining whether a proposed federal action would conform to the applicable SIPs. The purpose of the general conformity rule is to ensure that federal activities do not cause or contribute to new violations of the NAAQS, ensure that actions do not worsen existing violations of the NAAQS, and ensure that attainment of the NAAQS is not delayed. Before any approval is given for federal action, an applicability analysis must be conducted to determine whether the general conformity rule applies.

The general conformity rule does not apply to any federal action occurring in counties designated as attainment for all criteria pollutants. The general conformity rule does apply in areas the EPA



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has designated “nonattainment” or “maintenance” to ensure that a federal action does not interfere with a state’s plans to meet national standards for air quality.

South Dakota Codified Law (SDCL) 34A-1-18 authorizes the state’s Board of Minerals and Environment to establish emission control requirements and requirements for open burning. Under state law, open burning requirements are generally made at the local level, to account for local conditions, and are tailored to address specific problems. General prohibitions against all open burning are determined at the municipal or county (local) level (DENR 2019a). State air quality regulations prohibit the open burning of any materials that generate hazardous air pollutants such as oils, railroad ties, coated electrical wire, rubber, tires, tarpaper, asphalt shingles, and wood products treated with inorganic chemicals (ARSD 74:36:06:07). SDCL 34-35 is the section of state law relating to range and forest fire prevention including establishment of the Black Hills Forest Fire Protection District. The Black Hills Forest Fire Protection District is an area of unusual fire danger, located in the southwest part of the state, where open burning permits must be obtained from the South Dakota Department of Agriculture (SDCL 34-35-16).

### 4.4.1 Affected Environment

Currently, all counties in South Dakota are in attainment for all criteria pollutants (EPA 2019b).

### 4.4.2 Environmental Consequences

#### 4.4.2.1 No Action

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no impact on air quality related to project implementation. However, a major wildfire would be more likely to spread under the No Action Alternative, which could result in a major short-term impact on air quality. Wildfires would generate high emission rates of air pollutants from smoke; particularly high concentrations of fine PM and heavy metals, which can affect the health of people breathing smoke-laden air (Bladon et al. 2014). Fine particulates are of special concern because of their potential to adversely affect human respiratory systems, especially in young children, the elderly, and people with lung disease or asthma. Wildfires can generate substantial amounts of CO near the fire, which can be of concern for frontline firefighters and individuals with cardiovascular disease (EPA et al. 2016).

The loss of vegetation from a major wildfire could generate fugitive dust in subsequent seasons, especially in windy conditions, which could affect air quality (EPA 1988).

#### 4.4.2.2 Proposed Action

All fire-related mitigation activities covered under the Proposed Action could require equipment or vehicles that burn hydrocarbon fuels. Use of motorized equipment and vehicles would result in the generation of low levels of PM and vehicle exhaust emissions, including hydrocarbons (which result when fuel molecules do not burn or burn partially), nitrogen oxides, CO, and SO<sub>2</sub> (EPA 1994). Emissions would be temporary, short-term, and localized, so only minor impacts on

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air quality in a project area would occur. These projects also may disturb soils, which may result in fugitive dust emissions.

All counties in South Dakota are in an EPA-designated attainment area, and the general conformity rule would not be applicable. The most current attainment status for a particular county can be confirmed with resources such as the EPA Green Book (EPA 2019b). If portions of South Dakota become designated nonattainment or maintenance in the future, then proposed projects would need to evaluate project-specific activities for potential effects on air quality before applying the PEA to the project. For the PEA to apply to a specific project in a nonattainment or maintenance area, the potential effects would need to be less than significant.

For projects in nonattainment and maintenance areas, FEMA must review the proposed activity and determine whether the project qualifies for one of the exemptions provided in the general conformity rule, 40 CFR 93.153(c), prior to approving funding. Most projects covered under the Proposed Action would likely qualify for an exemption because expected emissions from the activity would fall below the emission thresholds established in 40 CFR 93.153(b) at which a conformity analysis would be required. If a project is not found to be exempt, FEMA would require the subrecipient to conduct an air quality analysis in accordance with general conformity rule requirements (40 CFR 93.159).

BMPs to reduce emissions would be followed, such as keeping the vehicle and mechanical equipment running times to a minimum and ensuring engines are properly maintained.

***Defensible Space:*** Creation of defensible space would involve the use of motorized equipment and vehicles needed to remove vegetation. Typical equipment would include chainsaws, chippers, and trucks with trailers to haul equipment and debris. Defensible space projects could involve open burning (pile or curtain burning), which would be conducted in conformance with state law and permitting requirements for open burning. The DENR recommends the following BMPs when conducting open burns:

- Prevailing winds during the burn should be away from any city or any occupied residence likely to be affected by the smoke to the best extent possible.
- The amount of dirt in the material being burned should be minimized to reduce smoldering.
- Open burning should be conducted between 3 hours after sunrise and 3 hours before sunset; this allows for good smoke dispersion. Air inversions that would trap the smoke at breathing level are less likely to occur between these hours. Additionally, fuel should not be added outside the timelines listed above.
- An open burn should be extinguished completely to ensure smoldering of material does not persist.
- Open burning should not obscure visibility or create a traffic hazard on any public road or airport right-of-way.

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- The following entities should be notified of when and where the open burn will occur: local fire department; municipality nearest the burn; county sheriff's department; and any military, commercial, county, municipal, or private airport or landing strip that may be affected by the open burn.
- Having someone watch the fire until it is extinguished and assuring smoke does not impact residences or impair vehicular travel on highways.

The creation of defensible space has the potential to reduce areas burned in a wildfire, which would provide air quality benefits through a reduction in smoke production during a major wildfire.

**Hazardous Fuels Reduction:** Hazardous fuels reduction projects have the potential to impact air quality similar to defensible space projects. Hazardous fuel reduction projects may extend over larger areas than defensible space projects; therefore, the potential impacts from motorized equipment, including the generation of PM and vehicle exhaust, could be greater. Hazardous fuels reduction projects could involve pile burning or curtain burning. Burning of cut vegetative material would follow the procedures specified above under defensible space and state regulations for open burning (ARSD 74:36:06:07). Open pile burning in SMZ areas would be avoided for the project to qualify under this PEA. Hazardous fuels reduction projects are intended to limit the spread of wildfires, which would provide air quality benefits in the event of a wildfire.

**Soil Stabilization:** Sources of air emissions from soil stabilization projects could include fixed-wing aircraft and helicopters, as well as ground equipment such as chainsaws and vehicles used to transport work crews, equipment, seeds, other plants, or mulch material. As plant materials become established, they may reduce sources of air pollutants such as fugitive dust and also remove greenhouse gases from the air resulting in beneficial effects on air quality over the long term.

**Hazard Tree Removal:** Sources of air emissions from hazardous tree removal projects would include motorized equipment such as chainsaws, vehicles used to transport work crews, equipment or debris, and heavy equipment such as feller-bunchers, backhoes, and loaders. The use of heavy equipment could generate fugitive dust that would cause minor short-term air quality impacts in localized areas.

## 4.5 Visual Quality and Aesthetics

### 4.5.1 Affected Environment

While there is no overarching federal law or regulation related to visual resources, several federal statutes address visual resources, including NEPA, the Federal Lands Policy Management Act of 1976, the National Forest Management Act, the Wild and Scenic Rivers Act, the National Trails Act, the Antiquities Act, NHPA of 1966, and the Wilderness Act of 1964. FEMA does not have its own guidance for assessing impacts on visual resources. Visual resource

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study methodologies have been developed by a few federal agencies, and these may be applied to specific projects if the aesthetic quality is a concern. The existing visual quality of a specific project area will vary widely depending on where the project is located and its context.

### 4.5.2 Environmental Consequences

#### 4.5.2.1 No Action Alternative

In the absence of a major wildfire, there would be no impact on visual quality and aesthetics under the No Action Alternative, as current conditions would not change. A major wildfire would be more likely under the No Action Alternative and could have moderate adverse visual effects immediately after the fire for both adjacent landowners and the public that visit parks, preserves, greenbelts, or open spaces that may be in a project area.

#### 4.5.2.2 Proposed Action

The magnitude and type of visual impact from a wildfire hazard mitigation project would depend on the viewshed (the area of land, water, or another environmental extent that is visible from a fixed vantage point) and the magnitude of the work completed for the project. If it is determined that a historic resource would be affected, refer to Section 4.13, Cultural Resources.

**Defensible Space:** Creation of defensible space could create a high contrast between treated and nontreated areas near existing structures. High contrast landscapes often represent an adverse visual impact, which could be minor to moderate depending on the visibility of the area to viewers and the degree of contrast created. However, because more managed landscapes are typically expected closer to structures, an area that has been treated to create defensible space may result in a more harmonious visual effect in association with the built environment. An adverse visual impact could occur if a historic structure, place, or important viewshed were affected. If a historic structure is within the project area, the potential for adverse visual impacts would need to be evaluated by a qualified historical specialist. It is unlikely that a defensible space project would result in a major visual impact even when in association with historic structures.

Additionally, thinning trees would increase visibility in forested areas, which would reduce privacy for residents adjacent to the treated areas. Alternatively, increased visibility may be seen as improving a sense of safety and security. Removing trees and understory vegetation would have a short-term, minor, adverse effect on visual resources associated with the accumulation of downed trees and slash until the downed material can be removed and disposed of properly. Once downed trees and slash are removed, treated areas would be more open and park-like and may appear natural to most observers. Generally, projects remove cut material within a few days, and timing for removal may be specified in grant conditions. Most defensible space projects would result in minor effects on visual quality that may be viewed as adverse or beneficial depending on the viewer's perspective.

**Hazardous Fuels Reduction:** Hazardous fuels reduction projects would have minor effects on visual quality similar to those of defensible space projects. However, hazardous fuels reduction

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projects have the potential to affect much larger areas or areas that are more visible to the general public.

Fuels reduction work could have a beneficial effect by opening some attractive vistas from private property or public viewpoints into parks or open spaces that were previously obscured by vegetation in the foreground. Conversely, minor to moderate negative impacts can result when views from significant public viewpoints, particularly places of historical significance, are noticeably changed by fuels reduction activities. Minor negative visual impacts may result from fuels reduction work along residential greenbelts or forested areas that reduce screening of private residences from public viewpoints along adjacent roads.

Hazardous fuels reduction projects in proximity to historic resources have the potential to alter the visual context of a historic or scenic resource due to the size of the area being treated. Historic places and buildings and public vistas and panoramas provided by turnouts along scenic roads like National Parkways can be adversely affected by fuels reduction projects. Scenic byways often have historical significance that may be impacted by fuels reduction activities. For projects that may affect the visual context of a historic or scenic resource, a project-level assessment would need to be conducted. Following a hazardous fuels reduction project, the potential for major visual alteration due to a major wildfire would also be reduced.

**Soil Stabilization:** Soil stabilization treatments would have a minor short-term impact on visual quality through the installation of LEBs, straw wattles, or bales along contour lines in a landscape. Broadcast mulching and reseeded activities would be visible as ground cover until trees and vegetation reestablish. These treatments would occur in the context of a landscape impacted by a wildfire. The long-term effects would be expected to be beneficial. For projects that may affect the visual context of a historic or scenic resource, a project-level assessment would need to be conducted.

**Hazard Tree Removal:** A stand of burned trees may be seen as a negative view, and removal of burned trees could have a minor beneficial effect on visual quality in a landscape impacted by a wildfire. Once the burned trees and slash are removed, the areas would be more open and devoid of standing trees in the short-term. In the long-term, trees and vegetation would be expected to regenerate.

### 4.6 Water Quality and Water Resources

This section analyzes the impacts of the alternatives on water resources and water quality for both surface water and groundwater resources. Alternatives are evaluated for their potential to degrade existing water quality conditions or impact water resources regulated by the Clean Water Act (CWA) of 1977, 33 U.S.C. 1344 and the state's surface water quality standards (ARSD 74:51:01).

Section 404 of the CWA regulates the placement of dredged or fill material into wetlands, lakes, streams, rivers, and certain other types of waters. The goal of Section 404 is to avoid and minimize losses to wetlands and other waters and to compensate for unavoidable loss through mitigation and restoration. Section 404 is jointly implemented by EPA and the U.S. Army Corps

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of Engineers (USACE). The USACE Omaha District issues Section 404 permits and monitors compliance with issued permits. DENR regulates water quality in the state under Section 401. EPA administers water quality regulations for federally recognized tribes similar to states (EPA 2017).

The CWA requires states to identify waters that do not or are not expected to meet applicable water quality standards with current pollution control technologies alone. On an annual basis, states issue a water quality report under Section 305(b) and 303(d) of the CWA (referred to as the “Integrated Water Quality Report”). Section 303(d) authorizes EPA to assist states, territories, and authorized tribes in listing impaired waters and developing Total Maximum Daily Loads (TMDLs) for impaired waterbodies. A TMDL establishes the maximum amount of a pollutant allowed in a waterbody and serves as the starting point or planning tool for restoring water quality. The 2018 Integrated Report for Surface Water Quality Assessment (DENR 2018b), and the DENR groundwater quality program (DENR 2019c) are the basis for the analysis of water quality.

### 4.6.1 Affected Environment

Surface waters in South Dakota are divided into 14 water basins, such as the Big Sioux, Grand River, and White River basins. South Dakota has approximately 9,726 miles of perennial rivers and 87,780 miles of intermittent streams. Major rivers include the Big Sioux, James, and Cheyenne. The Missouri, Big Sioux, and Bois de Sioux rivers are border rivers shared with neighboring states. In addition to rivers and streams, South Dakota has 575 classified lakes, ponds, and reservoirs totaling approximately 213,265 acres. Major lakes and reservoirs include Lake Oahe, Lake Francis Case, and Lake Sharpe. (DENR 2018b).

About 73.5 percent of all assessed stream miles in the state are considered impaired and do not support one or more beneficial uses (e.g. domestic water supply, fish life propagation waters, and recreation waters) (DENR 2018b). Common sources of impairment include total suspended solids and *E. coli* contamination from livestock and wildlife. Approximately 36 percent of assessed lakes, reservoirs, and ponds are impaired. A common source of impairment in lakes, reservoirs, and ponds is the global atmospheric disposition of mercury, which contributes to mercury buildup in fish tissue.

The majority of South Dakota’s drinking water systems, including 85 percent of public water supply systems, rely on groundwater (DENR 2019c). DENR aims to protect groundwater resources by issuing permits for groundwater discharge and injection wells (DENR 2019c). There are many potential sources of groundwater contamination in South Dakota, including hazardous spills, waste sites, mining and milling operations, agricultural activities such as concentrated animal feeding operations, and land application of wastes (DENR 2019c).

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Figure 4-3: Rivers and Streams

### 4.6.2 Environmental Consequences

#### 4.6.2.1 No Action

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no impact on water quality or surface or groundwater from the implementation of a project. However, a major wildfire would be more likely to spread under the No Action Alternative, which could have a major impact on water resources. If a wildfire were to occur, vegetation and ground cover would be destroyed, and runoff volume and velocity would increase due to the lack of vegetation. Stormwater runoff would cause unstable soils and debris to wash into streams and other water bodies, adversely affecting water quality. Depending on soil conditions and erodibility of streams, the increased volume and velocity of flows resulting from the intensified runoff can erode channels, change hydraulic conditions, and adversely impact the water retention and filtration functions of streams and adjacent wetlands. A significant loss of mature vegetation along steep slopes can increase the risk of landslides into surface waters below, thereby changing local hydrologic and hydraulic conditions.

In areas with sensitive soils, an intense wildfire could alter the physical and chemical properties of soils and result in impacts, such as increased hydrophobicity, which results in decreased infiltration and increased runoff. Increased runoff due to increased hydrophobicity may cause increased erosion. Alteration of soil properties that result in increased stormwater runoff also may affect the ability of water to infiltrate to the groundwater and recharge aquifers.

In the event of a wildfire, impacts on water resources in terms of water quality and sedimentation would range from minor to major, depending on the size and intensity of the fire and on subsequent erosion due to the loss of vegetation. The No Action Alternative has the potential to increase localized sedimentation and flooding and affect groundwater resources.

#### 4.6.2.2 Proposed Action

If Waters of the U.S. could be affected by the Proposed Action, subrecipients must coordinate with USACE to obtain any required permits before initiating work in accordance with the CWA. The PEA is limited to hazard mitigation activities that meet the requirements for a Nationwide Permit (NWP) where the potential for impacts is minor. If vehicles are driven through water, an impact could occur that would need to be evaluated on a project-specific basis. Other short-term impacts could include the potential for fuel spills and lubricants that get in the water from equipment used for the hazard mitigation activities, and the use of herbicides can affect water quality through drift and runoff from application sites.

For projects that impact Waters of the U.S., the subrecipient must develop mitigation measures consistent with USACE policies. These measures may include the restoration or enhancement of surface waters and riparian areas impacted by project activities (40 CFR 230). In order to be covered under this PEA, projects would avoid the operation of wheeled or tracked equipment in SMZs to protect water quality (South Dakota State University et al. 2003).



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***Creation of Defensible Space:*** The creation of defensible spaces would not alter stream flows but could cause temporary minor impacts on surface waters near specific project areas from potential erosion and sedimentation. These effects are unlikely to be significant due to the small areas altered. Operation of motorized vehicles during vegetation removal activities could disturb soils, which could increase erosion potential. The use of equipment near surface waters also has the potential to release pollutants such as fuels and lubricants. Other potential effects on water quality could occur if herbicides are used. Work within or near surface waters would conform to federal, state, and local regulations.

BMPs would be implemented to minimize the transport of sediment to surface waters near any treatment areas. Mulch created from cut vegetation may be used for temporary erosion control to prevent soil from reaching waterways. Appropriate barriers would be required to prevent mulch from being washed into streams. All vehicles and equipment would access project areas using existing roads and would not be driven through water. The use of rubber-tired machinery may reduce potential soil disturbance. Equipment fueling would be required to occur at least 150 feet from wetlands and streams, though local regulations may dictate larger distances. Any herbicide use would follow the BMPs described in Section 3.2.2, Hazardous Fuels Reduction. With the implementation of these BMPs, the effect on both surface water and groundwater would be short-term, minor and adverse. Long-term effects are not anticipated from defensible space projects.

***Hazardous Fuels Reduction:*** Similar to defensible space projects, hazardous fuels reduction projects may reduce vegetation that holds soils in place and can result in erosion and sedimentation into water bodies. The vehicles and equipment used also can result in erosion and sedimentation into water bodies as well as be a source of pollutants such as fuels and lubricants. Hazardous fuels reduction projects may use grazing animals to clear or maintain vegetation. When animals are allowed to graze close to streams and other water bodies, the action of their hooves can result in erosion and sedimentation, and their wastes may wash into surface waters. Projects that use herbicides may result in moderate impacts on water resources. For projects planning to use grazing animals or aerial application of herbicides, a project-level assessment would be needed to evaluate potential impacts.

Hazardous fuels reduction projects may extend over larger areas than defensible space projects; therefore, the potential impacts could be greater and considered moderate depending on the area affected. The same BMPs and mitigation measures described under defensible space would be required to avoid and minimize potential effects on surface waters and groundwater, including sole source aquifers. Hazardous fuels projects are more likely to use herbicides or grazing during implementation and long-term maintenance. If the use of grazing animals is proposed, the number of animals should be the minimum required to control vegetative growth near water resources. Alternative methods of vegetation management such as hand clearing are preferable near water resources.

If herbicides are required for control and maintenance of certain vegetation types within 150 feet of surface waters, then aquatic-safe herbicides and formulations would be used consistent with labeling instructions, by qualified applicators, and precautions would be taken to avoid runoff

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from reaching water bodies. Herbicide precautions might include avoiding application within 24 hours of predicted rain events and direct stump application rather than foliar spraying near water bodies. Any herbicides used near waterbodies would have to be approved by the EPA for use near aquatics. With the use of BMPs described in Section 3.2.2, and compliance with applicable federal, state, and local permits, most projects would likely result in no more than minor impacts on surface and groundwater.

***Soil Stabilization:*** Soil stabilization would provide minor to moderate benefits to water quality because the purpose of the action is to reduce erosion and reduce the potential for negative impacts in post-fire areas. The benefits would be minor to moderate depending on the distance of the proposed site to the surface waters. It is not anticipated that groundwater would be affected by the Proposed Action.

Minor temporary impacts could occur during the implementation of soil stabilization projects if motorized vehicles are operated off-road and/or near surface waters. The use of equipment near surface waters has the potential to release pollutants such as fuels and lubricants. Any work within or near surface waters would conform to federal, state, and local regulations. The operation of heavy equipment in SMZ areas should be minimized or avoided consistent with the state's forestry management BMPs (South Dakota State University 2003).

BMPs would be implemented to minimize the transport of soil to surface waters near any treatment areas from the use of motorized vehicles or ground disturbing activities. Appropriate barriers would be required to prevent mulch from being washed into streams. Vehicles and equipment would access project areas using existing roads. The use of rubber-tired machinery may reduce potential soil disturbance and tracked vehicles would not be allowed. Equipment fueling would be required to occur at least 150 feet from wetlands and streams, though local regulations may dictate greater distances. With the implementation of BMPs, the effect on both surface water and groundwater would be temporary and minor.

As described in Section 4.3.2.2, project activities that involve chaining, and disturb more than 1 acre of land, would incorporate erosion and sedimentation control BMPs consistent with the state's permit requirements for stormwater discharges from construction activities (DENR 2018a). BMPs could include the use of silt fencing, inlet protection, sediment traps, or other perimeter control devices (DENR 2018a).

***Hazard Tree Removal:*** In the short-term, hazard tree removal could provide a minor benefit to water resources and water quality if the cut trees are left on the ground within the project area and felled in a manner that provides contour erosion control. Because tree removal would take place in an environment in which the tree canopy and soil have already been damaged by fire, it is unlikely that this hazard mitigation activity would be the primary source of water quality and water resource impact. To minimize impacts, equipment and work crews would use existing roads and utility corridors to the maximum extent practical to access sites. The creation of new roads to remove the trees would be avoided. New roads have the greatest potential to disturb soils and cause water quality impact through erosion. This PEA does not cover salvage logging (Table 4-2).

### 4.7 Floodplains

Floodplains provide a variety of ecological benefits, including flood storage, reduction in flood velocities, filtration of stormwater, habitat for plants and wildlife, and supporting biodiversity (University of Tennessee 2007). EO 11988, Floodplain Management, requires federal agencies to take actions to minimize occupancy of and modifications to floodplains. FEMA regulations in 44 CFR Part 9, Floodplain Management and Protection of Wetlands, set forth the policy, procedures, and responsibilities to implement and enforce EO 11988 and prohibit FEMA from funding improvements in the 100-year floodplain unless no practicable alternative is available.

Under the National Flood Insurance Act, 42 U.S.C. 4001 et seq., and its implementing regulations, 44 CFR 60, communities must meet certain floodplain development standards to participate in the National Flood Insurance Program (NFIP). Currently, South Dakota has 229 communities that participate in the NFIP and regulate floodplain development activities (FEMA 2019b). At the state level, OEM administers the NFIP in cooperation with FEMA by providing technical assistance and information to local communities that participate in the program (OEM 2019).

#### 4.7.1 Affected Environment

Based on a review of the National Flood Hazard Layer, approximately 1,275,258 acres of land in South Dakota is located in the 100-year floodplain (Zone A, AE, AH, or AO) (FEMA 2019a). Floodplains represent about 3 percent of the total land area in the state (approximately 48,881,920 acres). Floodplain areas are primarily located along major rivers such as the Cheyenne, James, and Big Sioux Rivers.

#### 4.7.2 Environmental Consequences

##### 4.7.2.1 No Action

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no impact on floodplains from project implementation. However, a major wildfire would be more likely to spread under the No Action Alternative, which could have an impact on floodplains. If a wildfire were to occur, vegetation and ground cover would be destroyed by the fire, resulting in a loss of vegetation and ground cover to filter and slow stormwater runoff properly. Consequently, this could lead to decreased infiltration and increased stormwater runoff and erosion following a rain event. The No Action Alternative has the potential to increase localized sedimentation and flooding within floodplains and reduce floodplain functions. Impacts under the No Action Alternative could be moderate, adverse, and long term.

##### 4.7.2.2 Proposed Action

If floodplains are avoided by the activities under the Proposed Action, there would be no effect on floodplains. If floodplains are present in a specific project area, and cannot be avoided or would be impacted, an eight-step decision-making process would be conducted to evaluate whether there would be effects on floodplains. If the action affected floodplains, FEMA would

## Affected Environment and Environmental Consequences

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ensure the action complies with EO 11988 and 44 CFR Part 9. Such action would only be selected if no practicable alternative to the action exists and does not adversely affect floodplains. Under EO 11988 and 44 CFR Part 9, FEMA would notify the public and ensure the subrecipient minimizes potential impacts. Project subrecipients would also coordinate with the local floodplain administrator to obtain any required permits before initiating work. All coordination pertaining to these activities and compliance with any permit conditions would be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files.

BMPs to minimize impacts on floodplains include the storage of equipment, fuel or other regulated materials (such as herbicides) outside of designated floodplain areas. Work in floodplains would also conform to any state regulations and local floodplain ordinances, as well as the state's voluntary forestry management BMPs for SMZ areas (South Dakota State University et al. 2003). The operation of wheeled or tracked vehicles in SMZs would be avoided consistent with state guidance. SMZ and floodplain boundaries frequently overlap due to their proximity to rivers and streams.

***Creation of Defensible Space:*** Defensible space projects would not place any structures or fill within the floodplain that would impede or redirect flood flows, nor would they result in any excavation. Hazard mitigation funding would not result in the construction of structures within the floodplain. Although the activity would reduce risks to adjacent buildings and structures, defensible space projects would not facilitate any development within the floodplain or induce growth.

Vegetation removal would result in minor soil disturbance from the use of vehicles. Mulch created from the cleared vegetation may be placed to help prevent erosion from adjacent disturbed areas from impacting floodplains. Removal of vegetation may affect natural functions of floodplains such as fish and wildlife habitat, which are described in Section 4.11.

Because defensible space projects affect a small area that is linked to existing buildings and structures, it may not be possible to avoid the floodplain and still achieve hazard reduction objectives. Defensible space projects would affect a relatively small area of a floodplain and may not require complete removal of vegetation. With the use of the BMPs described at the beginning of this section, it is expected that the potential effects of defensible space projects would result in no more than minor impacts on floodplains.

***Hazardous Fuels Reduction:*** Similar to defensible space projects, hazardous fuels reduction projects would not include the placement of structures or fill within the floodplain that would impede or redirect flood flows, nor would they result in any excavation. No structures would be constructed within the floodplain, and no major soil disturbance would occur within the floodplain as long as the use of heavy, tracked equipment is avoided. Although the activity would reduce risks to nearby buildings and structures, hazardous fuels projects would not facilitate any development within the floodplain and are not expected to induce growth.

Compared to defensible space projects, hazardous fuels reduction projects generally have more flexibility to avoid work in floodplains. If floodplains are avoided, there would be no effect on

## Affected Environment and Environmental Consequences

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floodplains. With the implementation of BMPs described at the beginning of this section, impacts would be expected to be minor to moderate. In unusual cases, the scope of a project or the proposed methods (such as extensive or aerial use of herbicides) may result in an impact on floodplain function and values, such as fish and wildlife habitat, that would require an SEA. Project-specific mitigation measures would need to be developed and implemented for those unusual cases.

If the Proposed Action is determined to have negligible to minor effects on floodplains, then associated maintenance activities would likely also have negligible to minor effects on floodplains. However, hazardous fuels projects are more likely to use techniques such as herbicides or grazing during implementation and long-term maintenance. These methods have the potential to cause moderate adverse impacts on floodplains. When animals are allowed to graze close to streams and other water bodies, the action of their hooves can result in erosion and sedimentation, and their wastes may wash into surface waters, affecting floodplain function and values such as that for aquatic habitat. Projects that use herbicides may result in impacts on water resources ranging from negligible to moderate.

***Soil Stabilization:*** Soil stabilization projects would not include the placement of structures or fill within the floodplain that would impede or redirect flood flows, nor would they result in any substantial excavation.

Soil stabilization would provide minor to moderate long-term benefits to floodplains as it would reduce the potential for post-fire flooding and assist in the restoration of the natural functions and values of the floodplain, such as the replacement of vegetation lost due to wildfires, that filter stormwater, provide habitat for plants and wildlife, and support biodiversity. The benefits would be minor to moderate depending on the location within the floodplain and the area to be reseeded. If floodplains could be affected by a project, an eight-step decision-making process would be completed to assess any project-specific effects on floodplains and develop project-specific mitigation measures. With the use of the BMPs described at the beginning of this section, it is expected that the potential effects of soil stabilization projects would result in no more than minor impacts on floodplains.

***Hazard Tree Removal:*** Hazard tree removal projects generally have more flexibility to avoid work in floodplains. Removal of hazardous trees would not involve placing structures or fill material in the floodplain that would impede or redirect flood flows, nor would any excavation be required. Hazard tree removal can have minor adverse effects on wildlife habitat functions of floodplains. Hazard tree removal could provide a minor benefit to floodplains if the cut trees are left on the ground within the project area and felled in a manner that provides contour erosion control as the soils recover from the wildfire. With the use of the BMPs described at the beginning of this section, it is expected that the potential effects of hazard tree removal projects would result in no more than minor impacts on floodplains.

### 4.8 Wetlands

Wetlands provide essential environmental benefits, including groundwater recharge, filtration and attenuation of flood waters and stormwater, and habitat for a diversity of species. EO 11990, Protection of Wetlands, requires federal agencies to take action to minimize the loss of wetlands. Activities that disturb wetlands may require a permit from USACE under Section 404 of the CWA.

#### 4.8.1 Affected Environment

The National Wetlands Inventory (NWI) estimates that wetlands encompass approximately 1,967,942 acres in South Dakota, which is about 4 percent of the total land area (USFWS 2019b). As summarized in **Table 4-4** and shown in **Figure 4-4**, the NWI indicates that most wetlands in the state are freshwater emergent wetlands (97 percent) but also include freshwater forested/shrub wetlands (USFWS 2019b).

**Table 4-4: Wetlands by Type**

Wetland Type	Total (Acres)	Percent of Total
Freshwater Emergent	1,901,240	96.6
Freshwater Forested/Shrub	66,703	3.4
<b>TOTAL</b>	<b>1,967,942</b>	<b>100.0</b>

Source: USFWS 2019b

#### 4.8.2 Environmental Consequences

##### 4.8.2.1 No Action

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no impact on wetlands from project implementation activities. However, a major wildfire would be more likely to spread, which could have a major impact on wetlands. If a wildfire were to occur, vegetation and ground cover would be destroyed, which could damage wetland habitat functions and lessen the capacity of wetlands to filter pollutants and maintain water quality.

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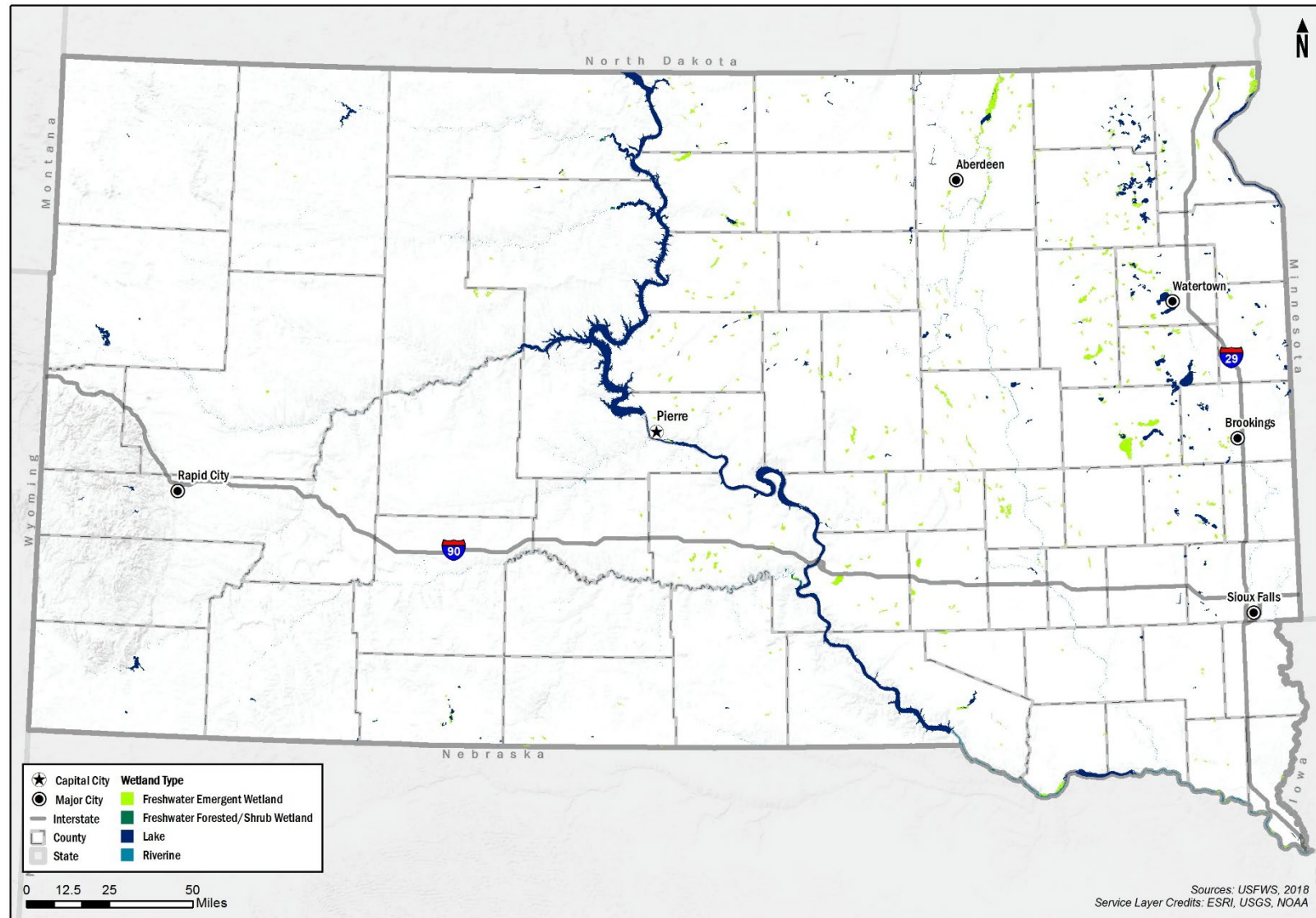


Figure 4-4: Wetlands



### 4.8.2.2 Proposed Action

If wetlands are avoided by the activities under the Proposed Action, there would be no direct effect on wetlands. None of the activities covered by this PEA would need to be conducted in a wetland; therefore, if a specific project is unable to avoid wetlands, then it would require an SEA except as noted below. If wetlands are present in a specific project area, an eight-step decision-making process would be conducted to evaluate whether there would be indirect effects on wetlands from activities conducted outside of the wetland. If the action affected identified wetlands, FEMA would ensure the action complies with EO 11990 and 44 CFR Part 9. Such an action would only be selected if no practicable alternative to the action exists that does not affect wetlands. Under EO 11990 and 44 CFR Part 9, FEMA would notify the public and ensure the subrecipient minimizes potential impacts. If impacts are identified, project subrecipients would need to coordinate with USACE to obtain any required permits before initiating work.

Work in wetlands would also conform to any state regulations and local environmental ordinances. Equipment, fuel, and other regulated materials (such as herbicides) would be stored outside of wetland areas. The operation of wheeled or tracked equipment in wetlands would also be avoided consistent with state guidance (South Dakota State University et al. 2003).

**Defensible Space:** Defensible space projects would not place any structures or fill within wetlands, nor would the activity result in any excavation. No structures would be constructed within wetlands. Although the activity would reduce risks to adjacent buildings and structures, defensible space projects would not facilitate any development within wetlands or induce growth.

Work in wetlands would be avoided whenever possible. If work within wetlands can be avoided, there would be no impact on wetlands. Because defensible space projects affect a small area that is linked to existing buildings and structures, it may not be possible to avoid the wetland area and still achieve hazard reduction objectives. Crews using hand tools may access wetland areas on foot and reduce vegetative fuels by cutting brush, small trees, and limbing larger trees. Debris may not be dragged out of the wetland but must be hand carried. Mulch or chipped debris may not be placed in a wetland. While this level of activity in a wetland would not trigger a Section 404 permit review, it may still have impacts on the functions of the wetland. Reducing the vegetative cover in a wetland would reduce its habitat functions and its ability to filter stormwater and provide water quality benefits.

Vegetation removal in proximity to wetlands has the potential to result in soil disturbance that could then result in erosion and sedimentation of the wetland. Wetland impacts could also occur if debris or mulch is placed near a wetland and then subsequently washes into the wetland during storm events. Mulch taken to off-site locations for disposal or reuse also must not be placed in wetlands. Projects that propose the placement of mulch or debris in wetlands, or that would disturb wetland soils are not covered by this PEA.

Heavy equipment would not be driven across wetlands. BMPs described in Section 4.6, Water Quality and Water Resources, would also be applied to work in and near wetlands. With the

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implementation of BMPs and required permit conditions, potential impacts on wetlands would be minor to moderate.

**Hazardous Fuels Reduction:** Hazardous fuels reduction projects would not place any structures or fill within wetlands that would affect wetlands, nor would the activity result in any excavation. No structures would be constructed within wetlands. Although the activity would reduce risks to nearby buildings and structures, hazardous fuels projects would not facilitate any development within wetlands or induce growth.

Hazardous fuels reduction projects generally have the flexibility to avoid work within or adjacent to wetlands. If wetlands and a buffer around the wetland are avoided, there would be no effect on wetlands. If wetlands cannot be avoided, the same mitigation measures described under defensible space would apply to hazardous fuels reduction projects. Generally, with the implementation of BMPs, projects would have minor to moderate impacts on wetlands.

Hazardous fuels reduction projects may extend over larger areas than defensible space projects; therefore, the potential impacts could be greater and considered moderate depending on the area affected. The same BMPs and mitigation measures described under defensible space would be required to avoid and minimize potential effects on wetlands. Hazardous fuels projects are more likely to use herbicides or grazing during implementation and long-term maintenance. If the use of grazing animals is proposed, the number of animals should be the minimum required to control vegetative growth near wetlands. Alternative methods of vegetation management such as hand clearing are preferable near wetlands.

If herbicides are required for control and maintenance of certain vegetation types within 150 feet of wetlands, then aquatic-safe herbicides and formulations would be used consistent with labeling instructions, by qualified applicators, and precautions would be taken to avoid runoff from reaching wetlands. Herbicide precautions would include avoiding application within 24 hours of predicted rain events and direct stump application rather than foliar spraying near wetlands. Any herbicides used near wetlands would have to be approved by the EPA for use near aquatics. With the use of BMPs described in Section 3.2.2, and compliance with applicable federal, state, and local permits, most projects would likely result in no more than minor impacts on wetlands.

**Soil Stabilization:** Soil stabilization projects generally have the flexibility to avoid work within or adjacent to wetlands. Reseeding may occur within wetlands provided that appropriate wetland species seed mixes are used, and mulch is not placed in the wetland. Mulch, logs, and other erosion barriers would not be placed in wetlands. A USACE permit may be required for reseeded projects in wetlands.

Soil stabilization projects would not place any structures or fill within wetlands, nor would the activity result in any substantial excavation. Reseeding would provide a minor to moderate long-term benefit to wetlands, as it would replace vegetation lost due to wildfires both within a wetland and in the areas surrounding wetlands. The restored vegetation would improve infiltration of stormwater and habitat for plants and wildlife, supporting biodiversity. Reseeding, mulching, and LEBs placed near wetlands would reduce erosion and sedimentation due to post-

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fire flooding, which would improve water quality within the wetland. The benefits would be minor to moderate depending on the distance between the wetlands and the area where soil stabilization measures are placed.

Minor temporary impacts could occur during the implementation of soil stabilization projects due to the operation of motorized vehicles and equipment. The use of equipment near wetlands has the potential to release pollutants such as fuels and lubricants. Any activities near wetlands would conform to federal, state, and local regulations.

BMPs would be implemented to minimize the transport of sediment and other materials into wetlands near treatment areas. Appropriate barriers would be required to prevent mulch and disturbed soils from being washed into wetland areas. Also, vehicles and equipment would access project areas using existing roads and would not be driven through wetlands. The use of rubber-tired machinery may reduce potential soil disturbance near wetlands. Equipment fueling would be required to occur at least 150 feet from wetlands, though local regulations may dictate larger distances. With the implementation of these BMPs, the adverse effects on wetlands would be temporary and minor and would not be significant.

***Hazard Tree Removal:*** Hazard tree removal projects generally have more flexibility to avoid work within or adjacent to wetlands. Removal of hazard trees from wetland areas could have minor adverse impacts on wildlife habitat functions. Hazard tree removal projects would provide minor long-term benefits to wetlands if the felled trees are used for erosion control near the wetlands. The felled trees would improve infiltration of stormwater and reduce the velocity of runoff thereby reducing erosion as soils recover from a wildfire. The reduction in erosion would reduce sedimentation, which would improve water quality within the wetland. The benefits would be minor to moderate depending on the distance from the treatment areas to the wetlands.

Minor temporary impacts could occur while the trees are being removed due to the operation of motorized equipment. The use of equipment near wetlands has the potential to release pollutants such as fuels and lubricants. BMPs would be similar to those for soil stabilization projects.

### 4.9 Wild and Scenic Rivers

The Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq., was enacted in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the unique character of these designated wild and scenic rivers while recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection.

Federally designated rivers are classified as wild, scenic, or recreational. Wild river areas are rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines that are essentially primitive and unpolluted waters. These represent the vestiges of primitive America. Scenic river areas are rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but which are accessible in places by roads. Recreational river areas are

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rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

### 4.9.1 Affected Environment

The U.S. Congress has designated one portion of the Missouri River in South Dakota as a wild and scenic river (National Wild and Scenic Rivers System 2019). Major rivers and streams in the state, including designated wild and scenic rivers, are shown in **Figure 4-3** (in Section 4.6.1) and summarized in **Table 4-5**.

**Table 4-5: South Dakota Wild and Scenic River**

Name	River Managing Agency	Location	Description	Total Length (Miles)
Missouri River	National Park Service (NPS)	Gregory, Charles Mix, Bon Homme, Yankton, Clay, and Union	From Fort Randall Dam to Lewis and Clark Lake. From Gavins Point Dam, South Dakota, downstream to Ponca State Park, Nebraska.	93

*Source: National Wild and Scenic Rivers System 2019*

### 4.9.2 Environmental Consequences

#### 4.9.2.1 No Action

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no impact on wild and scenic rivers from the implementation of project activities. However, a major to moderate visual and recreational impact on these rivers could occur as result of wildfire. Because wildfire is a feature of the natural landscape, the potential impacts on scenic and recreational values of a wild and scenic river may not be as severe as they could be on other landscapes. Potential impacts of the No Action alternative on wild and scenic rivers would be similar to those described in Section 4.6.2.1, No Action, for surface waters and water quality.

#### 4.9.2.2 Proposed Action

Wildfire mitigation activities would be designed to avoid designated wild and scenic rivers. If a Proposed Action is located near a designated wild and scenic river or a study river, FEMA and the river managing agency would make a formal determination of effect under Section 7 of the Wild and Scenic Rivers Act. The determination would evaluate the effects of the Proposed Action on the values of the river that are the basis for its designation or potential designation. Potential impacts, BMPs and mitigation measures of the Proposed Action on wild and scenic rivers would be similar to those described in Section 4.6.2.2, Proposed Action for surface waters and visual impacts in Section 4.5.2.2, Proposed Action.

### 4.10 Vegetation

Vegetation is the primary fuel in a wildfire. Fires in wildland vegetation display a range of behaviors and characteristics that depend on factors such as the vegetation composition and fuel structure, stage of succession after previous fires or other disturbances, types of past management, climate and weather patterns, terrain, and landscape patterns (Sommers et al. 2011). The concept of “fire regimes” provides an integrated way of classifying the impacts of these diverse spatial and temporal patterns of fire and impacts of fire at an ecosystem or landscape level.

EO 13112, Invasive Species, requires federal agencies to prevent the introduction of invasive species and provide for their control to minimize the economic, ecological, and human health impacts that invasive species cause. EO 13112 defines invasive species as an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health, including noxious weed plant species. Invasive species often outcompete the species that historically occurred in a particular ecosystem, altering the species composition of the plant community and its functions.

Noxious weeds are regulated under the state’s Weed and Pest Control law (SDCL 38-22). The law is enforced by the state’s Weed and Pest Control Commission under the supervision of the South Dakota Department of Agriculture (ARSD 12:62).

Threatened or endangered plant species are evaluated separately in Section 4.12.

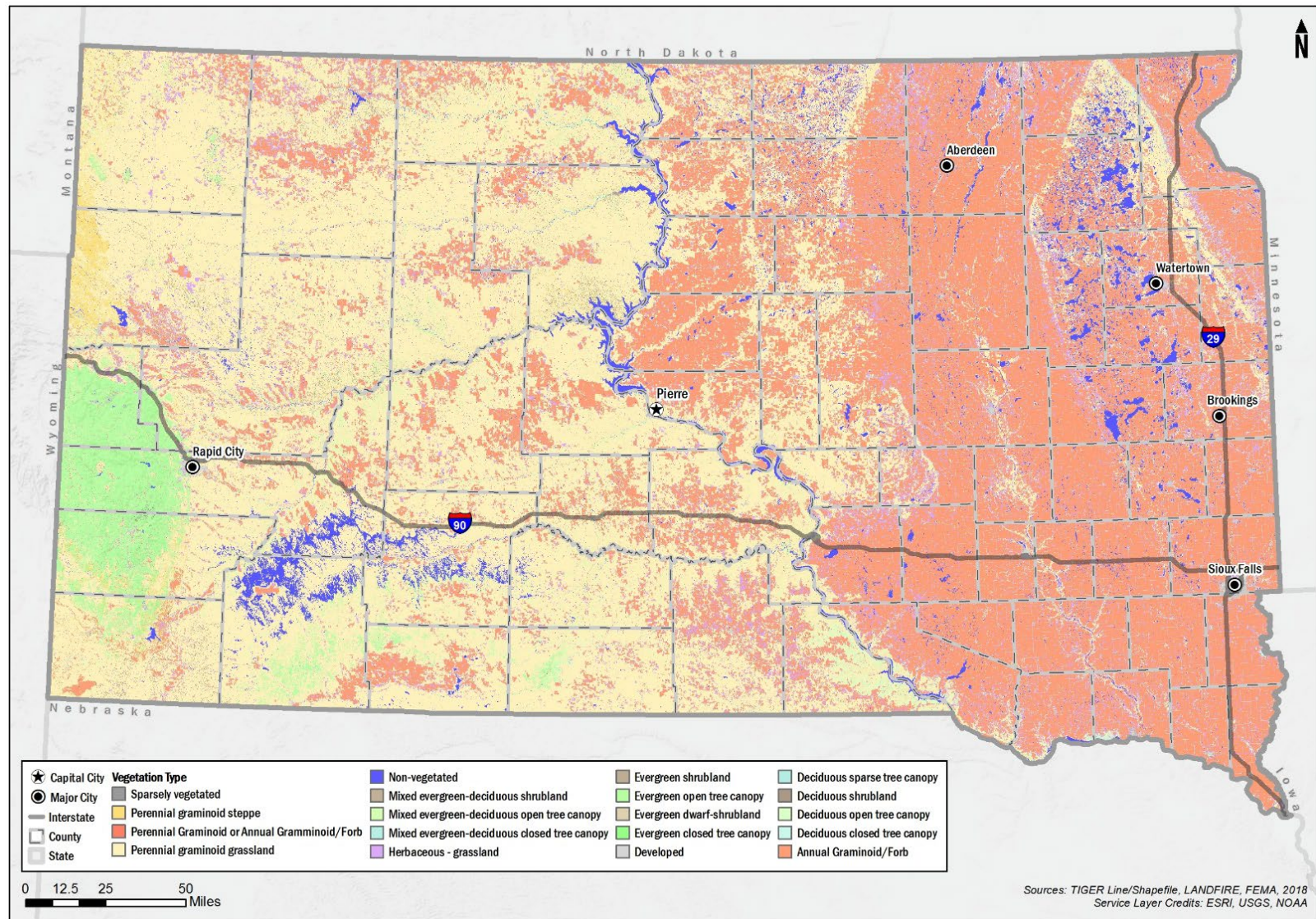
#### 4.10.1 Affected Environment

The Landscape Fire and Resource Management Planning Tools (LANDFIRE) is a vegetation, fire, and fuel characteristics mapping and modeling system sponsored by the USFS (USFS 2014b). The LANDFIRE “Vegetation Type” spatial dataset was used to evaluate existing vegetation cover in the state. Existing vegetation is shown in **Figure 4-5** and summarized in **Table 4-6**.

The Vegetation Type dataset is based on the current distribution of the U.S. National Vegetation Classification (NVC) system circa 2016. The NVC is an 8-level hierarchy that is used to describe vegetation throughout the United States. **Table 4-7** summarizes the subclass category of the NVC. A subclass is the second level of the NVC hierarchy characterized by combinations of general dominant and diagnostic growth forms that vary by latitude and continental position, or that reflect overriding substrate/aquatic conditions. There are 18 vegetation subclasses in the NVC. LANDFIRE data indicate that most of South Dakota is encompassed within 11 of the subclasses.



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**Figure 4-5: Existing Vegetation**

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**Table 4-6: Existing Vegetation Cover (LANDFIRE)**

<b>Vegetation Class</b>	<b>Area (Acres)</b>	<b>Percent of Total</b>
Perennial graminoid grassland	22,390,399	45.8
Annual Graminoid/Forb	17,219,245	35.2
Herbaceous – grassland	3,163,562	6.5
Non-vegetated	1,850,073	3.8
Evergreen open tree canopy	1,482,695	3.0
Developed	974,090	2.0
Deciduous open tree canopy	656,727	1.3
Mixed evergreen-deciduous shrubland	456,230	0.9
Perennial graminoid steppe	307,689	0.6
Mixed evergreen-deciduous open tree canopy	218,887	0.4
Deciduous closed tree canopy	68,680	0.1
All other classes	93,647	0.2
<b>TOTAL</b>	<b>48,881,920</b>	<b>100.0</b>

Source: USFS 2014b

Eight vegetation classes represent over 98 percent of all vegetation in the state. These include:

- Perennial graminoid grassland
- Annual Graminoid/Forb
- Herbaceous - grassland
- Non-vegetated
- Evergreen open tree canopy
- Developed
- Deciduous open tree canopy
- Mixed evergreen-deciduous shrubland

“Perennial graminoid grassland” represents the largest vegetation subclass in the state at 45.81 percent of total land area. This subclass is made up of perennial grasslands that include both native and non-native species. The subclass also may contain some forb vegetation such as flowering plants and spore-bearing ferns, horsetails, lycopods, and whisk-ferns (Bureau of Land Management [BLM] 2013).

“Annual Graminoid/Forb” is the second largest subclass, making up 35.23 percent of the total land area. Annual grasslands are a class of herbaceous vegetation dominated by annual grasses.



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Annual grasses generally contribute to greater than 60 percent of total herbaceous canopy cover, exclusive of drought years when annual vegetation growth is greatly diminished (BLM 2013).

The “herbaceous-grassland” subclass includes lands where herbs (mostly graminoids, forbs, and ferns) form at least 25 percent cover, and woody vegetation has less than 25 percent cover, or areas dominated by graminoid vegetation form greater than 50 percent of total herbaceous canopy cover (BLM 2013).

“Non-vegetated” is a vegetation subclass where there is typically less than one percent vegetative cover. These lands have limited capacity to support life and include urban, industrial areas, extraction areas, and transportation/energy features (BLM 2013).

“Evergreen open tree canopy” is a vegetation subclass where there are open tree canopy conditions dominated by evergreen species contributing to more than 75 percent of the total tree cover. The “open tree canopy” subclass is characterized by 25 and 60 percent crown cover (USFS Undated).

“Developed” is a vegetation subclass where the lands have been altered to support urban or industrial development, excavation areas, or transportation, communication, or energy linear features (BLM 2013).

“Deciduous open tree canopy” is a subclass of vegetation where there is an open tree canopy condition dominated by deciduous tree species. Seventy-five percent of the total tree cover is comprised of deciduous tree species (USFS Undated).

“Mixed evergreen-deciduous shrubland” is a subclass of vegetation defined by areas dominated by shrubs with individuals or clumps not touching to interlocking. This subclass includes vegetation types where trees (for forests and woodlands) or shrubs (for shrublands) are the dominant life form, and neither deciduous nor evergreen species represent more than 75 percent of the cover present (BLM 2013).

### 4.10.1.1 Fire Regime Groups

LANDFIRE data were also used to evaluate fire regime groups in the state and are presented in **Figure 4-6**. LANDFIRE divides vegetation into five fire regime groups (FRG) based on a frequency and severity scale for wildfires. The scale was established by the National Interagency Fuels, Fire & Vegetation Technology Transfer (NIFTT) (2010) and is summarized in **Table 4-7**.

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**Table 4-7: Fire Regime Groups**

Group	Frequency	Severity	Description
I	0 – 35 years	Low or Mixed	Generally, low-severity fires replacing less than 25% of the dominant overstory vegetation; can include mixed-severity fires that replace up to 75% of the overstory.
II	0 – 35 years	Replacement	High-severity fires replacing greater than 75% of the dominant overstory vegetation.
III	35 – 200 years	Mixed or Low	Generally mixed-severity; can also include low-severity fires.
IV	35 – 200 years	Replacement	High-severity fires.
V	200+ years	Replacement or Any Severity	Generally, replacement-severity; can include any severity type in this frequency range.

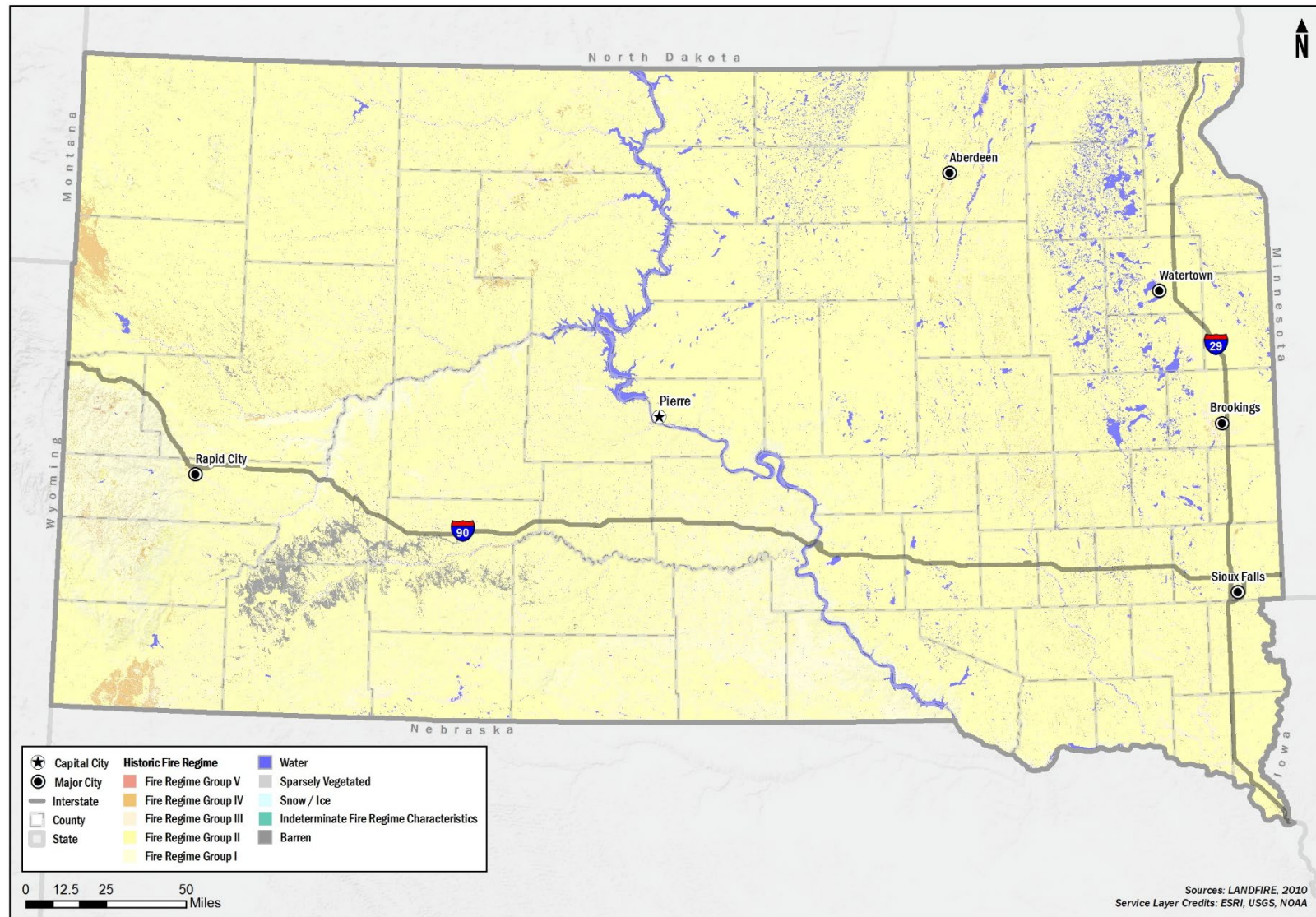
Source: NIFTT 2010

NIFTT defines fire severity as the effect of fire on upper layer canopy replacement.

- **Low-severity fire:** Any surface fire replacing less than 25 percent of the dominant upper canopy layer in a succession class. Low severity fires can open or maintain a given succession class.
- **Mixed-severity fire:** A generally broad fire severity classification that refers to fire effects intermediate between the low severity and replacement severity. Mixed-severity fires produce between 25 and 75 percent upper-layer canopy replacement during a given event. Mixed-severity fires can open or maintain a succession class.
- **Replacement-severity fire:** Any fire that causes greater than 75 percent removal of the dominant upper canopy layer, reverting that succession class to an early-seral class. Replacement severity fires may or may not kill the dominant plants.

Replacement may or may not cause a lethal effect on vegetation. For example, a replacement fire in grassland simply removes the leaves, which usually re-sprout from the basal crown, whereas a replacement fire with conifers as the fuel causes total tree mortality. A summary of FRGs in South Dakota is provided in **Table 4-8**.

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**Figure 4-6: Historic Fire Regime Groups**

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**Table 4-8: Distribution of Fire Regime Groups in South Dakota**

Fire Regime Group	Area (Acres)	Percent of Total
Fire Regime Group II	39,752,398	81.3
Fire Regime Group I	3,491,141	7.1
Fire Regime Group III	3,055,333	6.3
Water	1,440,177	2.9
Fire Regime Group IV	688,921	1.4
Barren	409,609	0.8
Fire Regime Group V	30,287	0.1
Sparsely Vegetated	14,053	0.0
<b>TOTAL</b>	<b>48,881,920</b>	<b>100.0</b>

Source: USFS 2014b

Just over 81 percent of the state’s vegetation is classified in Fire Region Group II. Wildfires in this group occur with a frequency of 0 to 35 years and are generally replacement-severity fires replacing greater than 75 percent of the dominant overstory vegetation. Stand replacement fires can occur in forests, woodlands and savannas, annual grasslands, and shrublands. Fires may be crown fires, high-severity surface fires, or ground fires (Sommers et al. 2011).

### 4.10.1.2 Noxious Weeds

The state has declared seven statewide noxious weeds and allows each county to list up to six additional “locally noxious weeds” on a countywide basis. **Table 4-9** summarizes noxious weeds in South Dakota as identified by ARSD 12:62:03.

**Table 4-9: South Dakota Noxious Weed List**

Common Name	Scientific Name	Class
Leafy Spurge	<i>Euphorbia esula</i>	State
Canada thistle	<i>Cirsium arvense</i>	State
Perennial sow thistle	<i>Sonchus arvensis</i>	State
Hoary cress	<i>Cardaria draba</i>	State
Russian knapweed	<i>Centaurea repens</i>	State
Purple loosestrife	<i>Lythrum salicaria</i>	State
Salt cedar	<i>Tamarix sp.</i>	State
Absinth wormwood	<i>Artemisia absinthium</i>	County
Black henbane	<i>Hyoscyamus niger</i>	County
Bull thistle	<i>Cirsium vulgare</i>	County
Chicory	<i>Cichorium intybus</i>	County
Common Burdock	<i>Arctium minus</i>	County
Common mullein	<i>Verbascum thapsus</i>	County

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Common Name	Scientific Name	Class
Common tansy	<i>Tanacetum vulgare</i>	County
Dalmation toadflax	<i>Linaria dalmatica</i>	County
Diffuse knapweed	<i>Centaurea diffusa</i>	County
Field bindweed	<i>Convolvulus arvensis</i>	County
Giant knotweed	<i>Polygonum sachaliense</i>	County
Houndstongue	<i>Cynoglossum officinale</i>	County
Musk thistle	<i>Carduus nutans</i>	County
Ox eye daisy	<i>Leucanthemum vulgare</i>	County
Phragmites	<i>Phragmites australis</i>	County
Plumeless thistle	<i>Carduus acanthoides</i>	County
Poison hemlock	<i>Conium Maculatum</i>	County
Puncturevine	<i>Tribulus terrestris</i>	County
Scotch thistle	<i>Onopordum acanthium</i>	County
Spotted knapweed	<i>Centaurea maculosa</i>	County
Sulfur cinquefoil	<i>Potentilla</i>	County
St. Johnswort	<i>Hypericum perforatum</i>	County
White Horehound	<i>Marrubium vulgare</i>	County
Yellow toadflax	<i>Linaria vulgaris</i>	County

Source: ARSD 12:62:03

### 4.10.2 Environmental Consequences

#### 4.10.2.1 No Action

Under the No Action Alternative, there would be no direct impacts on vegetation from the implementation of project activities. Current natural and man-made disturbances would continue. Fire suppression has led to a buildup of fuel that can contribute to more intense and destructive fires and disrupts natural fire regimes. In some cases, the lack of moisture from droughts makes the vegetation more flammable. However, with extreme droughts of long duration, vegetation either does not grow or grows more slowly, which could reduce fire hazards because fuels would not accumulate as quickly. The introduction of non-native species has also changed the landscape in many regions. In some cases, non-native species can be more flammable, and fires in stands composed of non-native species may be more difficult to manage.

Eligible fire hazard mitigation activities of the Proposed Action would not be implemented, and there would be no effect on vegetation. However, it is possible that without guidance toward hazardous fuels management, which emphasizes ladder fuel reduction and thinning, some areas may engage in activities such as clear-cutting, which is not eligible for grant funding, to a greater

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degree. Clear-cutting could result in major impacts on vegetation through direct removal from large areas.

A major wildfire (one that is severe and threatens at-risk buildings and structures) would be more likely and could result in partial or complete loss of vegetation. While fire is a natural component of many ecosystems and has beneficial effects on vegetation, years of fire suppression have increased fuel density in many places, which has increased the extent and intensity of future wildfires. In the event of a major wildfire, the potential for noxious weeds to become established over larger areas could increase because of the disturbance to established vegetation communities that results from a major wildfire. The spread of noxious weeds and the creation of hydrophobic soils that can result from a major wildfire can both prevent the re-establishment of native plant communities resulting in long-term adverse impacts on vegetation.

### 4.10.2.2 Proposed Action

Impacts on vegetation include direct removal of vegetation, such as trees and understory vegetation as well as dead down and standing material. Post-fire mitigation would consist of reseeding and other soil stabilization measures. While there are no regulatory thresholds for the significance of impacts on vegetation, considerations would include the size of the area affected, the rarity of the plant community, and whether the activity would be likely to affect the soil stabilization and habitat functions of the plant community.

**Defensible Space:** Creation of defensible space would typically have only a minor impact on vegetation. The area of impact is limited to the area needed to defend a specific existing building, structure, or facility from a wildfire. There is generally already a disturbed zone associated with the built environment where naturally occurring vegetation has been removed or modified; therefore, the area over which naturally occurring vegetation might be disturbed by a project would be less than the total area within the defensible space radius around a structure. Even though this activity would cumulatively total more than 100 acres, the areas affected would all be in close association with existing structures and largely include the existing disturbance zone around the structures. The creation of defensible space would not have more than a minor adverse effect on vegetation and vegetation communities.

If it is determined that the treatment proposed by a specific project may impact an area of special significance that has been designated, mapped, or officially adopted pursuant to law by federal, state, or local agencies, then it should be further analyzed as the effects may be greater than minor. This may include habitat for threatened and endangered plant species evaluated in Section 4.12.

Vegetative material that is removed would be mulched and spread on-site, or it may be hauled off-site for disposal or reuse. If the use or disposal of chips or mulch would be located in a place or at a depth that could negatively impact vegetation or other resources, further analysis of the project would be necessary. Generally, the use of mulched vegetation is considered to be a benefit because it holds moisture in and adds organic material to the soil and helps control erosion. However, if mulch is placed in thick layers, it can inhibit the regrowth of beneficial



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plant species or affect the use of an area by beneficial invertebrates. In these cases, it may be necessary to place less mulch to avoid impacts.

Because defensible space activities remove or reduce the vegetation near buildings and structures, there would be the potential for invasive species to spread into treated areas. Maintenance of treated areas would be required to reduce the potential for invasive species to become established. Because the treated areas are small, maintenance would be required, and defensible space areas are near other maintained landscapes where active management of invasive species may be expected, the impact of this activity on the spread of invasive species would be minor.

***Hazardous Fuels Reduction:*** Hazardous fuels reduction covers a broad category of treatments that can impact vegetation. The treatments are designed to change the character of the vegetation to reduce fire intensity and severity. Hazardous fuels reduction projects would result in effects on vegetation that may range from minor to moderate through the removal of smaller canopy trees (generally less than 12 inches in diameter breast height) and understory trees and shrubs to increase crown spacing or other related activities such as removal of limbs or dead fallen or standing material.

Factors that can contribute to vegetative impacts include the size of the treatment area, the amount of vegetation removed, the location on the landscape, distance to roads, presence of wetlands or streams, time of year, degree of prior disturbance or forest fragmentation, and the general health and stress level of the vegetation to be modified. It is expected that most hazardous fuels reduction projects will be located in managed forests or rangelands. Forest stands with old-growth characteristics would be avoided (defined as remnant natural areas that have not been subject to significant disturbance by mankind, have not been subjected to logging, and have inherently progressed per natural tendencies).

Vegetative material that is chipped and spread as mulch would be placed in a location or at a depth that would not negatively impact vegetation or other resources. If the depth of mulch is proposed to be greater than 2 to 4 inches, further analysis of the project would be necessary. Vegetative material may also be piled into small piles and burned. Piles must be placed to avoid impacting vegetation and trees that to remain. Piles would be sized and located in small areas, generally 10 feet by 10 feet, to limit damage to remaining vegetation.

To maintain appropriate vegetation densities and species composition, it is necessary to monitor and maintain fuel management zones and to continue to treat these areas as necessary or as required by states, or organizations such as the NFPA Firewise Program (NFPA 2019). In some instances, without proper maintenance, these areas could create an increased fire risk compared to pre-action conditions if cut stumps re-sprout into multiple small stems, for example. Maintenance activities would result in minor to moderate impacts on vegetation following the initial hazardous fuels reduction.

Much like the creation of defensible space, invasive species may move into treated areas when underbrush and ground fuels are removed. Maintenance of treated areas would be required to



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reduce the potential for invasive species to become established that results in minor to moderate impact from the use of herbicides.

**Soil Stabilization:** Soil stabilization would provide minor to moderate long-term benefits as it may replace vegetation lost due to wildfires, provide immediate ground cover such as sterile straw and chipped wood mulch to protect soils from erosion and loss of nutrients, or place erosion barriers to catch sediment on hill slopes. Reseeding would be beneficial to areas at risk from the spread of invasive and noxious weeds by quickly establishing ground cover that would prevent the spread of invasive species. Chaining would impact burned vegetation and soil in the short-term, following reseeded activities, but would provide long-term benefits by supporting revegetation and reducing in the spread of noxious weeds following a wildfire.

The benefits would be minor to moderate depending on the size and location of the area to be reseeded. If the seed mix consists of local native species appropriate for the surrounding ecosystem, then the potential benefits would be greater than if the seed mix is composed of quick growing, but non-native species intended to rapidly stabilize the soil. Seed mixes of quick growing species are typically composed of sterile seed mixes that only persist for a season or two. If follow up treatment with native or woody species is not completed in a timely manner, then invasive species can rapidly take over an area and the treatment would only delay them a year or two.

BMPs would be implemented to minimize the impacts on vegetation due to the potential use of motorized vehicles during implementation. Vehicles and equipment would access project areas using existing roads. The use of rubber-tired machinery would reduce potential soil disturbance. With the implementation of these BMPs, the effect on vegetation due to implementation would be temporary and minor and would not be significant.

**Hazard Tree Removal:** Hazard tree removal would provide minor long-term benefits for the reestablishment of vegetation after a wildfire. Removal of burned trees can affect the characteristics of the vegetation that reestablish after a fire (USFS 2009). Complete removal of burned trees from a project area would remove perches for seed-dispersing birds, and their removal may change the composition of the seed rain and plant community post-fire. Besides a means of post-fire erosion control, felled trees that remain in place can provide protected “safe sites” for germination and establishment of some species, especially in the post-fire environment, and their eventual decay can facilitate recruitment of understory species long after the initial disturbance. The proposed action does not include salvage logging.

BMPs would be implemented to minimize the impacts on vegetation due to the potential use of motorized vehicles during tree removal. Generally, hazard trees that are cut would be left on the ground within the project area and would be felled in a manner that enhances the long-term reestablishment of vegetation. Removal and handling of felled trees in SMZs would be conducted in accordance with state’s voluntary forestry management BMPs. State guidance recommends the retention of felled trees for bank stabilization and as a future source of large woody debris for the stream channel. Large woody debris in a channel can help dissipate stream energy, stabilize banks, and form pools that trap sediment and provide fish habitat (South Dakota

State University et al. 2003). With the implementation of these BMPs, the effect on vegetation would be temporary and minor and not significant.

### 4.11 Fish and Wildlife

Fish and wildlife include the species that occupy, breed, forage, rear, rest, hibernate, or migrate through the project areas. Regulations relevant to fish and wildlife include the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). Threatened and endangered wildlife species are evaluated separately in Section 4.12.

The BGEPA as amended, 16 U.S.C. 5A-II 668 et seq., provides for the protection of bald and golden eagles by prohibiting the take, possession, sale, purchase, barter, transport, export, or import of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. This Act requires consultation with the USFWS to ensure that proposed federal actions do not adversely affect bald or golden eagles.

The MBTA, 16 U.S.C. 701-719c, decrees that all migratory birds and their parts (including eggs, nests, and feathers) are protected. A recent legal memorandum by the U.S. Department of the Interior (DOI) (DOI 2017) states that the law only prohibits “pursuing, hunting, taking, capturing, killing, or attempting to do the same applies only to direct and affirmative purposeful actions that reduce migratory birds, their eggs, or their nests, by killing or capturing, to human control.” Situations where an “incidental take” occurs, defined as “both takings and/or killings that directly and foreseeably result from, but are not the purpose of, an activity,” are no longer subject to penalties under the MBTA. All fire-related mitigation activities being evaluated could result in a potential incidental take and none would involve a purposeful take of migratory birds. For this reason, the recommendations provided in the following sections are considered BMPs.

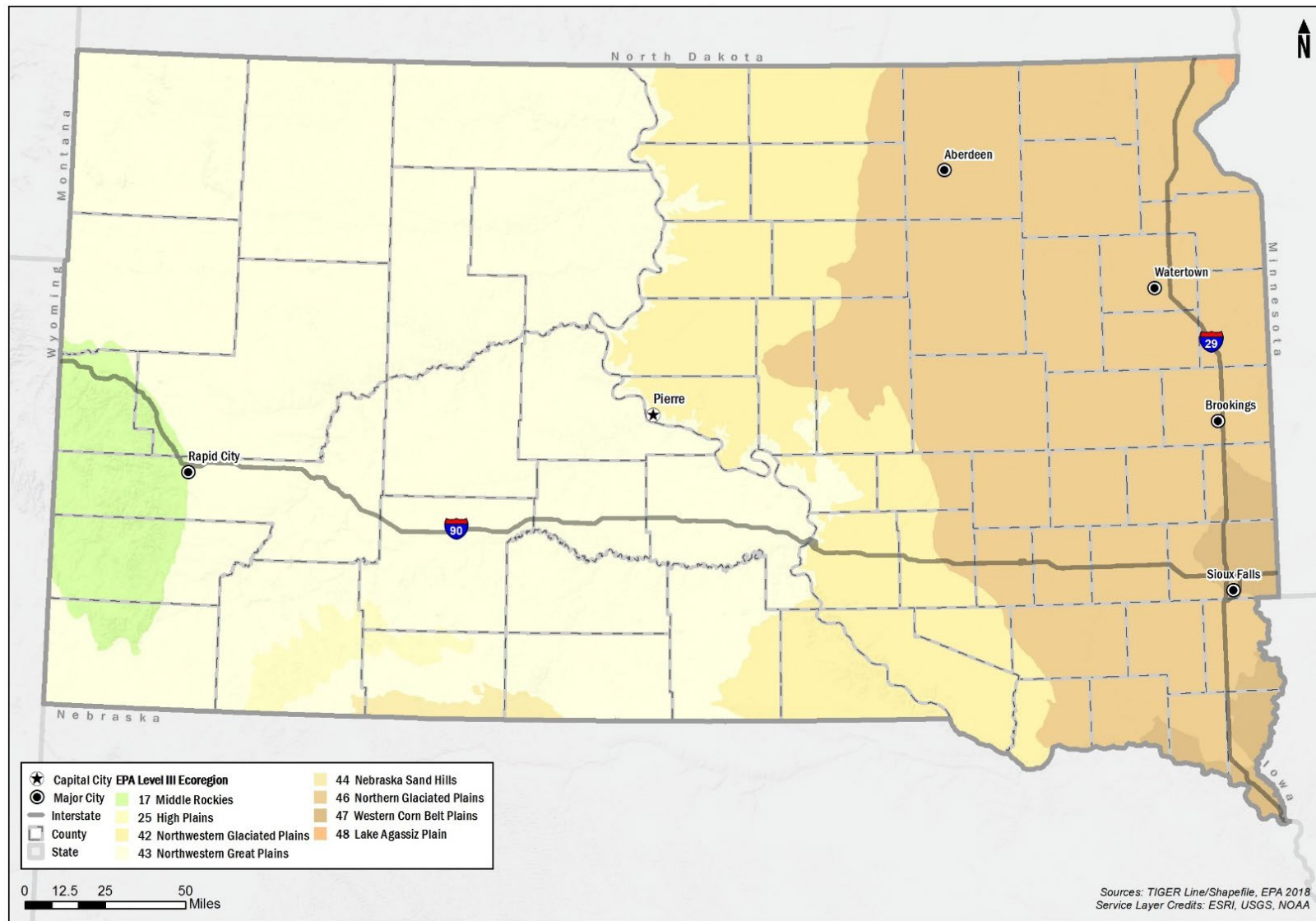
Nearly all native North American bird species are protected by the MBTA. Under the MBTA, the purposeful taking, killing, or possessing migratory birds is unlawful. Projects that are likely to result in the purposeful taking of birds protected under the MBTA would require the issuance of taking permits from the USFWS.

#### 4.11.1 Affected Environment

##### 4.11.1.1 Fish and Wildlife Habitat

EPA has developed a system to evaluate “ecoregions” to structure and implement ecosystem management strategies across federal agencies, state agencies, and nongovernmental organizations (EPA 2003). Ecoregions are ecosystems that have similar characteristics, environmental conditions, ecosystem types, functions, and qualities. EPA characterizes ecoregions using geology, landforms, soils, vegetation, climate, land use, wildlife, and hydrology. Each ecoregion would support a characteristic diversity of fish and wildlife species and thus are a useful tool for describing the diversity that may occur within a large area such as a state. South Dakota contains eight EPA-designated “Level III” ecoregions, which are shown in **Figure 4-7** and summarized in **Table 4-10**.

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**Figure 4-7: Level III Ecoregions**

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**Table 4-10: Level III Ecoregions**

Ecoregion	EPA ID	Size (Acres)	Percent of Total
Northwestern Great Plains	43	23,329,465	47.7
Northern Glaciated Plains	46	13,957,946	28.6
Northwestern Glaciated Plains	42	7,786,598	15.9
Middle Rockies	17	1,953,221	4.0
Western Corn Belt Plains	47	928,738	1.9
High Plains	25	606,498	1.2
Nebraska Sand Hills	44	280,489	0.6
Lake Agassiz Plain	48	38,966	0.1
<b>Total</b>	---	<b>48,881,920</b>	<b>100.0</b>

Source: EPA 2003

The Northwestern Great Plains ecoregion is comprised of semiarid rolling plains of shale, siltstone, and sandstone interrupted by occasional buttes and badlands. Spring wheat and alfalfa have replaced most of the native grasslands, but some persist in areas of steep or broken topography. Erratic precipitation patterns and limited irrigation opportunities limit agriculture production in this region (EPA 2003). This ecoregion supports common wildlife species such as white-tailed deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*), sharp-tailed grouse (*Tympanuchus phasianellus*), and greater prairie grouse (*Tympanuchus cupido*), as well as federally listed species such as the black-footed ferret (*Mustela nigripes*) and pallid sturgeon (*Scaphirhynchus albus*) (South Dakota Game and Fish Department [SDGFP] 2019a).

The Northern Glaciated Plains ecoregion consists of a gently rolling to flat landscape composed of glacial drift, which fosters a grassland transition between shortgrass and tallgrass prairies. Annual climatic fluctuations limit agriculture success, and a high concentration of temporary and seasonal wetlands produce advantageous conditions for duck nesting and migration (EPA 2003). Wildlife species such as American beavers (*Castor canadensis*), muskrats (*Ondatra zibethicus*), and mink (*Neovison vison*) inhabit the wetland areas of this ecoregion, while badgers (*Taxidea taxus*), mule deer, white-tailed deer, and ring-necked pheasants (*Phasianus colchicus*) can be found in the uplands. The federally listed Topeka shiner (*Notropis topeka*) can also be found in the waters of this ecoregion (SDGFP 2019a).

The Northwestern Glaciated Plains ecoregion is characterized by a semiarid climate, mixed-grass prairies, and a high concentration of wetlands. Land use in the eastern part of this ecoregion is dominated by dryland farming while cattle ranching and farming dominate the western portion (EPA 2003). Common wildlife species of the ecoregion include mule deer, white-tailed deer, red fox (*Vulpes vulpes*), coyotes (*Canis latrans*), and sharp-tailed grouse. Federally listed threatened or endangered species that reside within this ecoregion include the pallid sturgeon and the piping plover (*Charadrius melodus*) (SDGFP 2019a).

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The Middle Rockies ecoregion is characterized by the black hills in the southwestern part of the state and includes foothills, plateaus, and highlands. The foothills form a lower elevation concentric circle around the plateaus and highlands. The plateaus are a relatively flat, elevated expanse covering mid-elevation slopes and grasslands. The higher elevation highlands see cooler temperatures and increased rainfall while supporting boreal tree species such as white spruce (*Picea glauca*), quaking aspen (*Populus tremuloides*), and paper birch (*Betula papyrifera*). This ecoregion supports activities such as ranching, grazing, logging, recreation, and mining (EPA 2003). Common wildlife species include elk (*Cervus canadensis*), mountain lion (*Puma concolor*), porcupine (*Erethizon dorsatum*), and red squirrel (*Tamiasciurus hudsonicus*), while federally listed species that reside in this ecoregion include the northern long-eared bat (*Myotis septentrionalis*) and least tern (*Sternula antillarum athalassos*) (SDGFP 2019a).

The Western Corn Belt Plains ecoregion consists of fertile soil, temperate climate, and adequate precipitation during the growing season, which leads to high agricultural productivity in the region. The topography consists of level to gently rolling glacial till plains with areas of morainal hills and loess deposits. Intensive rowcrop agriculture of corn, soybeans, and feed grains has replaced almost all the original tallgrass prairie that dominated this ecoregion (EPA 2003). Common wildlife species of the Western Corn Belt Plains ecoregion are mule deer, white-tailed deer, coyotes, ring-necked pheasants and the federally endangered Topeka shiner (SDGFP 2019a).

The High Plains ecoregion consists of tablelands and rolling plains created by erosion of the Rocky Mountains. Low rainfall results in drought-resistant shortgrass prairie dominating the ecoregion, while a mixed-grass prairie dominates the northern extremity of the high plains (EPA 2003). This ecoregion supports a variety of wildlife species including mule deer, wild turkey (*Meleagris gallopavo*), and black-tailed prairie dogs (*Cynomys ludovicianus*) (SDGFP 2019a).

The Nebraska Sandhills ecoregion is characterized by a large grass-stabilized dune. The region lacks tilled agriculture and is relatively treeless. The prairie grass associations are specific to the sandy environment, but the delicate vegetative cover is vulnerable to blowouts. The predominant land use in the region is cattle ranching (EPA 2003). Some wildlife species that reside in this ecoregion include black-tailed jackrabbits (*Lepus californicus*), upland sandpipers (*Bartramia longicauda*), and greater prairie grouse (SDGFP 2019a).

The Lake Agassiz Plain ecoregion has an extremely flat landscape with fewer lakes and pothole wetlands than other ecoregions in the area. Intensive agriculture has replaced the historic tallgrass prairie that utilized the thick lacustrine sediments underlain by glacial till that make up this ecoregion (EPA 2003). Common wildlife species that can be seen in this ecoregion include white-tailed deer, raccoons (*Procyon lotor*), and red fox (SDGFP 2019a).

### 4.11.1.2 Bald and Golden Eagles

Bald eagles and golden eagles are found throughout South Dakota. Breeding and wintering habitats may be different, and activities that would affect nesting areas or winter roosts could result in significant impacts.

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Bald eagles live near rivers, lakes, and marshes where they can find fish, their staple food. Bald eagles also feed on waterfowl, turtles, rabbits, snakes, and other small animals and carrion. Bald eagles require a good food base, perching areas, and nesting sites. Their habitat includes large lakes, reservoirs, and rivers. In winter, the birds congregate near open water in tall trees for spotting prey and night roosts for sheltering (USFWS 2017).

Golden eagles build nests on cliffs or in the largest trees of forested stands that often afford an unobstructed view of the surrounding habitat. Their nests are usually made of sticks and soft material added to existing nests or new nests that are constructed to create strong, flat or bowl-shaped platforms. Golden eagles avoid nesting near urban habitat and do not generally nest in densely forested habitat. Individuals will occasionally nest near semi-urban areas where housing density is low and in farmland habitat; however, golden eagles have been noted to be sensitive to some forms of human presence (USFWS 2017).

### 4.11.1.3 Migratory Birds

Over 1,000 native bird species, including common species such as American robin (*Turdus migratorius*) and American crow (*Corvus brachyrhynchos*) are protected by the MBTA. South Dakota is located in the internationally designated Central Flyway, used to manage migratory birds (USFWS 2019c). USFWS and its partners establish the flyway areas based on the routes different bird species follow as they migrate between nesting and wintering areas in North America (USFWS 2019c).

## 4.11.2 Environmental Consequences

### 4.11.2.1 No Action

The No Action Alternative would not affect common wildlife species, bald or golden eagles, or migratory birds because there would be no alteration of habitats and no construction-related effects. However, a major wildfire would be more likely under the No Action Alternative that could destroy wildlife habitat, which may include nesting, foraging, roosting, or wintering habitats. Furthermore, major impacts would occur to aquatic habitats affecting fish and other aquatic life because streams would be subject to heavy flow volumes and resulting erosion from increased runoff following a major wildfire. These impacts associated with the loss of existing vegetation would continue until adequate vegetation is reestablished within the burnt area.

In the event of a major wildfire, invasive species might be expected to become established over larger areas because of the loss of existing vegetation, which could affect indigenous species of wildlife.

### 4.11.2.2 Proposed Action

All fire-related mitigation activities covered under the Proposed Action have the potential to temporarily alter wildlife behavior from equipment-generated noise and project-related activity (human presence and use of equipment). These impacts can result in altered behavior, disruption of foraging, breeding, or resting behaviors affecting the health of species and populations.

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However, because the duration of the activity in any one location would be limited to a few weeks, impacts are unlikely to be greater than minor.

The use of motorized vehicles and equipment for the activities could have minor impacts on nesting birds protected by the MBTA. To minimize impact, vehicles and equipment should access project areas using existing roads. Impacts may be avoided by timing project activities for the non-breeding season. Nesting seasons vary slightly by region, but generally, if project activities that remove vegetation are avoided between March and August, a project would minimize impacts on migratory birds and other wildlife. As a recommended BMP, cutting of vegetation should be limited to outside of the nesting season.

If the activity must occur during the breeding season, surveys are recommended to determine whether nests are present and, if so, a buffer area with a specified radius around the nest would be established so that no disturbance or intrusion would be allowed until the young had fledged and left the nest. The size of the buffer area would vary depending on species and local conditions (e.g., the presence of busy roads) and would be based on the professional judgment of a monitoring biologist.

If bald and golden eagle nests are identified in a project area, consultation with USFWS would be required to establish appropriate buffers and actions to protect nest sites. Typical mitigation measures include seasonal limits on clearing activities, retention of nest trees, and the establishment of buffers around nest trees.

With the implementation of these mitigation measures, potential impacts on fish and wildlife habitat, migratory birds, and bald and golden eagles would be minor.

***Defensible Space:*** Wildlife species that typically occur near existing structures would be species commonly found within and at the edges of natural habitats and would be adapted to habitats that are influenced by human activities. Because each area disturbed would be relatively small and associated with existing disturbed areas and human activity centers around structures, potential impacts would be minor and unlikely to affect local populations of wildlife species.

Defensible space is created by removing or reducing the vegetation proximate to a building or structure, and this could have a minor impact on nesting birds protected by the MBTA. Maintenance activities, such as mowing or removing dead limbs could have a minor impact on nesting birds protected by the MBTA or BGEPA.

***Hazardous Fuels Reduction:*** Because hazardous fuels reduction projects have the potential to affect relatively large areas or be located in more sensitive habitats, there is the potential for moderate impacts on wildlife and habitats from these types of projects. Forested stands with old-growth characteristics, areas with vernal pools, or other unique habitat features such as caves or cliffs would be avoided. It is expected that most hazardous fuels reduction projects would be located in managed forests and rangelands. Most projects would be located within the WUI, where common wildlife species are likely to be adapted to a low level of disturbance and human presence.



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Effects related to disturbances would be temporary and only occur when project activities are underway or during short periods related to maintenance activities. In areas where sensitive species occur, projects would restrict work methods to the use of hand tools to reduce and minimize impacts. The applicability of this measure would be determined on a project-specific basis. Hazardous fuels reduction projects also create slash (course and fine woody debris). Slash would not be allowed to deposit in streams and water bodies because it can deplete oxygen levels and harm aquatic life. The use of herbicides must conform to the BMPs outlined in the project description in Section 3.2.2. Mitigation measures described for migratory birds and bald and golden eagles would reduce potential impacts on nesting birds to a negligible or minor level.

**Soil Stabilization:** Soil stabilization would provide minor to moderate long-term benefits to fish and wildlife, as it would replace vegetation lost to wildfires, provide immediate ground cover to protect soils from erosion and loss of nutrients, or reduce erosion that impacts aquatic habitats and limits regrowth of upland habitats. Benefits would be dependent on the size and location of the area to be treated. Revegetation would benefit fish habitat, as it would provide filtration of stormwater and improve water quality due to reduced sedimentation. It would benefit terrestrial wildlife and birds by providing vegetation and plants that provide food resources and habitat.

**Hazard Tree Removal:** Hazard tree removal could have minor to moderate impacts on wildlife habitat depending on the species habitat requirements and the type of tree species being removed. The removal of certain tree species and smaller trees would have less wildlife habitat impact. This includes tree species that create “hard” snags, such as lodgepole pine (*Pinus contorta*) and subalpine fir (*Abies lasiocarpa*), that are less likely to be used for habitat, nesting, or as a food source by birds and mammals due to the density of the wood (USFS 2009). Burned tree removal could impact multiple bird and mammal species that nest or den in cavities and that use less dense snags as habitat. Leaving felled trees in place may benefit a variety of wildlife species that rely on large woody debris as habitat that may have been lost due to the fire. Felled trees used for contour erosion control would provide minor aquatic benefits as they would improve water quality due to reduced sedimentation. While the trees are removed or felled, the activity would create minor temporary impacts due to noise from the use of chain saws, mechanized equipment, backhoes, or loaders.

### 4.12 Threatened and Endangered Species and Critical Habitat

The ESA of 1973, 16 U.S.C. 1531–1544, directs federal agencies to protect threatened and endangered species in consultation with the USFWS. This protection includes a prohibition against direct take (e.g., killing, harassing) and indirect take (e.g., destruction of habitat). Section 7 of the ESA requires federal agencies to aid in the conservation of listed species and to ensure the activities of federal agencies will not jeopardize the continued existence of listed species or adversely modify designated critical habitat.

#### 4.12.1 Affected Environment

As of May 2019, USFWS has listed 15 plant and animal species as threatened, endangered, or experimental in the State of South Dakota, as summarized in **Table 4-11** (USFWS 2019a).

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**Table 4-11: Federally Listed Species**

Common Name	Scientific Name	Federal Status	Critical Habitat	Habitat Requirements/Notes
Black-footed ferret	<i>Mustela nigripes</i>	EXPN, E	No	Habitat consists of grasslands, steppe, and shrub steppe. Requires prairie dog colonies for prey and shelter, utilizes prairie dog burrows for resting and birthing sites. Range includes Western South Dakota.
Northern long-eared bat	<i>Myotis septentrionalis</i>	T	No	Hibernates in caves and abandoned mines in winter. During summer, roosts singly or in colonies underneath bark, in cavities, or in crevices of live trees and snags. Typically associated with late-successional forests with a high number of old trees. Black Hills and along the Missouri River.
Least tern	<i>Sterna antillarum</i>	E	No	Interior populations nest mainly on large riverine sandbars or salt flats that become exposed during periods of low water. Mainly along the Missouri River.
Piping plover	<i>Charadrius melodus</i>	T	Yes	Sparsely vegetated shores and islands of shallow lakes, reservoirs, industrial ponds, and river islands. Requires wide sandy beaches with highly clumped vegetation, having less than 5 percent overall vegetation cover and/or with extensive gravel. Missouri River at Lake Oahe and below Fort Randall and Gavin's Point dams.
Red Knot	<i>Calidris canutus rufa</i>	T	No	Sandy shorelines and marshes along large lakes in South Dakota may be used as a stopover locations during migration; does not nest in the state (USFWS 2014)
Whooping Crane	<i>Grus Americana</i>	E	Yes-Not in South Dakota	During migration, requires large, shallow (less than 1 foot) lakes, emergent wetlands, and grain and stubble fields with good horizontal visibility. May occur in suitable habitat throughout the state during migration.
Pallid sturgeon	<i>Scaphirhynchus albus</i>	E	No	Occupies the bottom of large, silty rivers with a natural hydrograph. Can utilize a diversity of depths and velocities formed by braided channels, sand bars, sand flats and gravel bars. Missouri River basin.
Topeka shiner	<i>Notropis topeka</i>	E	Yes	Quiet, open, permanent pools of small, clear, high-quality headwaters and creeks that drain upland prairie areas, including tiny spring-fed pools in headwater streams and larger streams. Eastern South Dakota tributaries
Higgins eye (pearlymussel)	<i>Lampsilis higginsii</i>	E	No	Medium to large rivers with stable substrates that vary from sand to boulders, but not firmly packed clay, flocculent silt, organic material, bedrock, concrete, or unstable sand. Missouri River basin in southern South Dakota.

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Common Name	Scientific Name	Federal Status	Critical Habitat	Habitat Requirements/Notes
Scaleshell mussel	<i>Leptodea leptodon</i>	E	No	Medium to large rivers with low to moderate gradients in a variety of stream habitats including gravel, cobble, boulders, and occasionally mud or sand substrates. Tributaries to the Missouri River basin.
American burying beetle	<i>Nicrophorus americanus</i>	E	No	Various habitats from grassland, old field shrubland, and hardwood forests. Requires suitable soils for burying and available carrion such as small birds and rodents. South-central South Dakota in Gregory, Tripp, and Todd counties.
Dakota skipper	<i>Hesperia dacotae</i>	T	Yes	Restricted to unplowed native prairie on dry to mesic calcareous gravelly soils. Can occur in moderately grazed prairie pastures. Northeastern South Dakota.
Poweshiek skipperling	<i>Oarisma poweshiek</i>	E	Yes	Primarily found in virgin tallgrass prairie but can also occurs in fens and grassy lakeshores. Northeastern South Dakota.
Leedy's roseroot	<i>Rhodiola integrifolia</i> ssp. <i>leedyi</i>	T	No	North or east-facing talus slopes or cliff ledges where groundwater or cool air constantly seep through the strata or between the rocks, maintaining a cool, wet environment throughout the summer. Single occurrence on granite in the central Black Hills (South Dakota Natural Heritage Program 2018).
Western prairie fringed orchid	<i>Platanthera praeclara</i>	T	No	Tallgrass prairies and sedge meadows. Eastern and southern South Dakota. (USFWS 2013)

Source: USFWS 2019a and SDGFP 2019a

Endangered (E) – Any species that is in danger of extinction throughout all or a significant portion of its range.

Threatened (T) – Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Non-Essential Experimental Population (EXPN) - A population of a listed species reintroduced into a specific area that receives more flexible management under the ESA.

Four listed species have designated critical habitat in the South Dakota: piping plover, Topeka shiner, Dakota skipper (*Hesperia dacotae*), and Poweshiek skipperling (*Oarisma poweshiek*) as shown in Error! Reference source not found... Their designated critical habitat is described below.

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Figure 4-8: Federally Designated Critical Habitat

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**Piping plover:** Designated critical habitat for the piping plover occurs along the Missouri River. For the northern Great Plains breeding population, designated critical habitat includes the following physical primary constituent elements:

- On prairie alkali lakes and wetlands, shallow, seasonally to permanently flooded, mixosaline to hypersaline wetlands with sandy to gravelly, sparsely vegetated beaches, salt-encrusted mud flats, and/or gravelly salt flats; springs and fens along edges of alkali lakes and wetlands; and adjacent uplands 200 feet above the high-water mark of the alkali lake or wetland.
- On rivers, sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river.
- On reservoirs, sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel, or shale, and their interface with the water bodies.
- On inland lakes (Lake of the Woods), sparsely vegetated and windswept sandy to gravelly islands, beaches, and peninsulas, and their interface with the water body.

**Topeka shiner:** Designated critical habitat for the Topeka shiner occurs in southeastern South Dakota. Primary constituents include:

- Streams with mostly permanent flow but that can become intermittent during dry periods; side-channel pools and oxbows either seasonally connected to a stream or maintained by groundwater inputs, at a surface elevation equal to or lower than the bankfull discharge stream elevation; and streams and side-channel pools with water quality necessary for unimpaired behavior, growth, and viability of all life stages.
- Streams with mostly permanent flow but that can become intermittent during dry periods; side-channel pools and oxbows either seasonally connected to a stream or maintained by groundwater inputs, at a surface elevation equal to or lower than the bankfull discharge stream elevation; and streams and side-channel pools with water quality necessary for unimpaired behavior, growth, and viability of all life stages.
- Living and spawning areas for adult species include pools or runs with water velocities less than 20 inches/second and depths ranging from 4 to 80 inches; living areas for juvenile Topeka shiners are characterized by water velocities less than 20 inches/second with depths less than 10 inches and moderate amounts of instream aquatic cover, such as woody debris, overhanging terrestrial vegetation, and aquatic plants.
- Sand, gravel, cobble, and silt substrates with amounts of fine sediment and substrate embeddedness that allows for nest building and maintenance of nests and eggs by native Lepomis sunfishes and Topeka shiner as necessary for reproduction, unimpaired behavior, growth, and viability of all life stages.
- Adequate terrestrial, semiaquatic, and aquatic invertebrate food base that allows for unimpaired growth, reproduction, and survival of all life stages; a hydrologic regime capable of forming, maintaining, or restoring the flow periodicity, channel morphology, fish community composition, off-channel habitats, and habitat components described in

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the other primary constituent elements; and few or no nonnative predatory or nonnative competitive species present.

**Dakota skipper:** Designated critical habitat for the Dakota skipper is located in eastern South Dakota. Primary constituent elements are outlined below.

- Wet-mesic tallgrass or mixed-grass remnant untilled prairie that occurs on near-shore glacial lake soil deposits or high-quality dry-mesic remnant untilled prairie on rolling terrain consisting of gravelly glacial moraine soil deposits. Specifically, these prairie environments contain a predominance of native grasses and native flowering forbs and glacial soils that provide the soil surface or near surface (between soil surface and 0.8 inches in depth) micro-climate conditions conducive to Dakota skipper larval survival and native-prairie vegetation. If present, trees or large shrub cover is less 5 percent in dry prairies and less than 25 percent in wet-mesic prairies and, if present, nonnative invasive plant species occur in less than 5 percent of area.
- At least one of the following native grasses can provide food and shelter sources during Dakota skipper larval stages: prairie dropseed (*Sporobolus heterolepis*) or little bluestem (*Schizachyrium scoparium*). One or more of the following forbs in bloom can provide nectar and water sources during the Dakota skipper flight period: purple coneflower (*Echinacea angustifolia*), bluebell bellflower (*Campanula rotundifolia*), white prairie clover (*Dalea candida*), upright prairie coneflower (*Ratibida columnifera*), fleabane (*Erigeron spp.*), blanketflower (*Gaillardia spp.*), black-eyed Susan (*Rudbeckia hirta*), yellow sundrops (*Calylophus serrulatus*), prairie milkvetch (*Astragalus adsurgens*), or common gaillardia (*Gaillardia aristata*).
- Dispersal grassland habitat within 0.6 miles of native high-quality remnant prairie (as defined in Primary Constituent Element 1) that connects high-quality wet-mesic to dry tallgrass prairies or moist meadow habitats. Dispersal grassland habitat consists of undeveloped open areas dominated by perennial grassland with limited or no barriers to dispersal including tree or shrub cover less than 25 percent of the area and no row crops such as corn, beans, potatoes, or sunflowers.

**Poweshiek skipperling:** Designated critical habitat is located in eastern South Dakota and includes the following primary constituent elements:

- Wet-mesic to dry tallgrass remnant untilled prairies or remnant moist meadows containing a predominance of native grasses and native flowering forbs and undisturbed (untilled) glacial soil types including, but not limited to, loam, sandy loam, loamy sand, gravel, organic soils (peat), or marl that provide the edaphic features conducive to larval survival and native-prairie vegetation. If present, depressional wetlands or low wet areas within or adjacent to prairies that provide shelter from high summer temperatures and fire; trees or large shrubs that cover less than 5 percent of area in dry prairies and less than 25 percent in wet- mesic prairies and prairie fens; and nonnative invasive plant species occurring in less than 5 percent of area can be constituent elements for critical habitat.

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- Prairie fen habitats that contain a predominance of native grasses and native flowering forbs; undisturbed (untilled) glacial soil types including, but not limited to, organic soils (peat), or marl that provide the edaphic features conducive to larval survival and native-prairie vegetation; depressional wetlands or low wet areas, within or adjacent to prairies that provide shelter from high summer temperatures and fire; and hydraulic features necessary to maintain prairie fen groundwater flow and prairie fen plant communities. If present, trees or large shrubs cover less than 25 percent of the unit; and nonnative invasive plant species occur in less than 5 percent of area.
- Native grasses and native flowering forbs provide larval and adult food and shelter. For native grasses, at least one of the following species must be available to provide food and shelter sources during larval stages: Prairie dropseed, little bluestem, sideoats grama (*Bouteloua curtipendula*), or mat muhly (*Muhlenbergia richardsonis*). For flowering forbs, at least one of the following forbs in bloom must be available to provide nectar and water sources during the flight period: Purple coneflower, black-eyed Susan, smooth ox-eye (*Heliopsis helianthoides*), stiff tickseed (*Coreopsis palmata*), palespike lobelia (*Lobelia spicata*), sticky tofieldia (*Triantha glutinosa*), or shrubby cinquefoil (*Dasiphora fruticosa* ssp. *floribunda*).
- Dispersal grassland habitat that is within 0.6 miles of native high-quality remnant prairie (as defined in Primary Constituent Element 1) that connects high-quality wet-mesic to dry tallgrass prairies, moist meadows, or prairie fen habitats. Dispersal grassland habitat consists of the following physical characteristics appropriate for supporting Poweshiek skipperling dispersal: Undeveloped open areas dominated by perennial grassland with limited or no barriers to dispersal including tree or shrub cover less than 25 percent of the area and no row crops such as corn, beans, potatoes, or sunflowers.

### 4.12.2 Environmental Consequences

#### 4.12.2.1 No Action

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no effect on listed species or critical habitat from FEMA's actions. However, a major wildfire would be more likely to spread under the No Action Alternative and to damage existing habitats for federally listed species. Although the loss of existing habitat would only continue until adequate vegetation is reestablished within the burnt area, the impact could be irreversible for some listed species. The populations of listed species are, by definition, small or isolated. If a wildfire eliminates all of the habitat for a particular species, there may not be any unaffected areas that contain that particular species close enough for the species to recolonize the burnt area following vegetative recovery. Therefore, even though the effect on vegetation and habitats may be temporary, the impact could be major and irreversible for some listed species.

#### 4.12.2.2 Proposed Action

Potential effects on listed species may range from no effect to a likely to adversely affect determination. If FEMA determines that federally listed species or species proposed for federal



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listing, their habitat, or designated critical habitat would potentially be affected by an action, FEMA will conduct ESA consultation under ESA Section 7(a)(2). This review would be conducted on a project-specific basis.

Fire-related hazard mitigation activities covered by the Proposed Action have the potential to result in no effect to moderate effects on listed species. As needed, FEMA would seek concurrence with findings of “may affect, not likely to adversely affect” and would conduct formal consultation with USFWS for findings of “likely to adversely affect.”

Fire-related mitigation activities would primarily be conducted in terrestrial habitat, i.e. forested areas. Projects activities in streams and wetlands would be avoided. Potential effects on listed animal species include short-term noise impacts from equipment and vehicles while the projects are being implemented. Both plant and animal habitat of listed species could be affected by ground disturbance caused by equipment and vehicles. To minimize or avoid potential effects, vehicles and equipment would access project areas using existing roads to the extent practicable. The use of rubber-tired machinery may also reduce the potential for sedimentation into streams.

***Defensible Space:*** Because defensible space projects remove vegetation, they have the potential to affect listed species and critical habitat. Noise from equipment and vehicles used to implement defensible space projects could disturb listed animal species. Both plant and animal habitat of listed species could be affected by ground disturbance caused by equipment and vehicles. Other potential effects could occur if there are impacts on water quality through soil erosion or the use of herbicides, or impacts resulting from the introduction of invasive species. The potential for defensible space projects to affect listed species would typically be expected to be minor because the area affected is generally small and near previously disturbed areas; however, each project area would need to be reviewed for the potential presence of listed species or their habitats.

***Hazardous Fuels Reduction:*** Potential impacts on threatened and endangered species are more likely to occur with hazardous fuels projects that extend over larger areas and involve a wider variety of vegetation treatments, including the use of herbicides or heavy equipment. Noise from equipment and vehicles may disturb listed animal species. Both plant and animal habitat of listed species could be affected by ground disturbance caused by equipment and vehicles. Hazardous fuels projects are more likely than defensible projects to use widespread application of herbicides during implementation and maintenance activities that may have a broader range of impacts or affect areas further from the project boundaries. Aerial application of herbicides would require an SEA.

Hazardous fuels reduction projects and maintenance activities could have a wide range of potential effects on listed species and their habitats from no effect to a major effect. A major effect would be a jeopardy determination and would preclude a project from proceeding. It is anticipated that most hazardous fuels projects would result in minor (not likely to adversely affect) or moderate (likely to adversely affect) impacts that would be resolved through consultation and the development of project-specific conservation measures. Common conservation measures may include seasonal restrictions to avoid working when listed species are present or active in an area or measures to protect water quality to avoid impacts on aquatic species.

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**Soil Stabilization:** Soil stabilization activities would provide a long-term benefit to threatened and endangered species as it would start the revegetation process and reduce erosion that limits regrowth in burned areas and impacts aquatic systems. The benefits would be minor to moderate depending on the habitat requirements of the species.

Potential impacts on threatened and endangered species and designated critical habitats would be short term and relate to the use of equipment. Noise from equipment and vehicles may disturb listed animal species. Both plant and animal habitat of listed species could be impacted by ground disturbance caused by equipment and vehicles. To minimize potential impacts, vehicles and equipment would access project areas using existing roads to the extent practicable. The use of rubber-tired machinery may reduce the potential for sedimentation into streams.

**Hazard Tree Removal:** Leaving felled trees in place would benefit threatened and endangered species that rely on large woody debris as habitat that is lost due to a wildfire. The benefits would be minor to moderate depending on the habitat requirements of the species. Felled trees used for contour erosion control would provide minor benefits for aquatic species, as they would improve water quality due to reduced sedimentation. The activity would create minor temporary impacts on listed animal species due to noise from the use of chain saws, mechanized equipment, backhoes, or loaders. Both plant and animal habitat of listed species could be affected by ground disturbance caused by equipment and vehicles. Removal of dead trees could adversely affect the northern long-eared bat that uses dead trees for roosting sites.

### 4.13 Cultural Resources

Cultural resources include the physical evidence or place of past human activity: site, object, landscape, and structure or a site, structure, landscape, object, or natural feature of significance to a group of people traditionally associated with it.

Section 106 of the NHPA, 54 U.S.C. 300101 et seq., and its implementing regulations, 36 CFR 800, require federal agencies to consider the effects of their undertakings on historic properties and give the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), Native American tribes, and other interested parties an opportunity to comment on such undertakings. A historic property (or historic resource) is defined in the NHPA as any “prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places (NRHP), including artifacts, records, and material remains related to such a property or resource.”

The NRHP is the nation’s official list of cultural resources worthy of preservation and is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our cultural resources. For a historic property to be listed in the NRHP, it must meet one of four criteria and have sufficient integrity. Integrity is the ability of the property to convey this significance through physical features and context. Significant historic properties include districts, structures, objects, or sites that are at least 50 years of age and meet at least one National Register criterion. Criteria used in the evaluation process are specified in the NRHP (36 CFR 60.4). National Historic Landmarks are historic places that hold national significance. The

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Secretary of the Interior designates these places as exceptional because of their abilities to illustrate U.S. heritage. National Historic Landmarks are also listed in the NRHP.

Under Section 101(d)(6)(A) of the NHPA, properties of traditional religious and cultural significance to an Indian tribe or Native Hawaiian Organization may be deemed eligible for listing on the NRHP. FEMA treats resources that are eligible for or listed on the NRHP equally. In addition to the NHPA, the Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001–3013, establishes the rights of Native American lineal descendants, Indian tribes, and Native Hawaiian Organizations for the treatment, repatriation, and disposition of Native American human remains funerary objects, sacred objects, and other Traditional Cultural Property. A Traditional Cultural Property is a historic property that is eligible for inclusion in the NRHP based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community.

The ACHP is an independent federal agency established by the NHPA. The ACHP mission focuses on the preservation of cultural resources and the development of federal policy related to historic preservation. The NHPA established SHPOs in each state and territory and Tribal Historic Preservation Offices (THPOs) for federally recognized Native American tribes. The SHPOs reflect the interests of the state and its citizens in the preservation of their cultural heritage. The SHPO is a program of the South Dakota Historical Society (SDHS) under the Department of Education (SDHS 2019). The SDHS manages five programs related to cultural resources, including the state archives. The state archive is located at the Cultural Heritage Center in Pierre and contains over 12,000 cubic feet of historic records (SDHS 2019).

Native American tribes can participate in this process if they chose. For a tribe that has assumed the responsibilities of the SHPO for activities on tribal land, the THPO is the official representative to ensure a project complies with Section 106 of the NHPA (36 CFR 800.2(c)(2)). In these situations, FEMA consults with the THPO instead of the SHPO regarding undertakings occurring on or affecting historic properties on tribal lands. Non federally recognized tribes can participate in the Section 106 processes as interested parties.

The National Park Service (NPS) administers a Tribal Historic Preservation Program pursuant to the NHPA. As part of the program, NPS maintains a directory of THPOs throughout the country (NPS 2019b). Because the term of office for the THPO position varies depending on the tribal government, FEMA should consult the NPS directory, as well as the SHPO, to identify any THPOs that could be involved in the Section 106 process for a particular project. There are currently seven federally recognized Native American tribes in the state with established THPO programs: Oglala Sioux Tribe, Sisseton-Wahpeton Oyate, Rosebud Sioux Tribe of Indians, Flandreau Santee Sioux Tribe, Crow Creek Sioux Tribe, Yankton Sioux Tribe, and Cheyenne River Sioux Tribe.

SHPO and THPO activities can include identifying, nominating, or administering applications for historic properties deemed eligible for listing on the NRHP, maintaining data on historic properties that have been identified but not yet nominated, and providing technical information. Federal agencies consult with the SHPO about federal actions, and the SHPO either concurs or does not concur with the federal agency's findings.

### 4.13.1 Affected Environment

As of June 2019, South Dakota had 16 National Historic Landmarks; 1,349 properties listed in the NRHP, and 45 properties listed in the South Dakota Register of Historic Places (NPS 2019a, Sundstrum 2018). Among the National Historic Landmarks are numerous fortified Native American villages, as well as a Native American burial mound complex, the Wounded Knee Battlefield, an historic gold mining town, and a nineteenth century cattle ranch. Ten of the 16 National Historic Landmarks are located along the Missouri, James, or Big Sioux Rivers. Most NRHP-listed historic properties are aboveground buildings (842), districts (148), or structures (127). There are also 220 archaeological sites and twelve objects listed on the NRHP (NPS 2019a). NRHP-listed archeological resources include a wide range of Native American and Euro-american property types distributed throughout the state.

To guide the management of cultural resources, the SHPO published a 2016 Historic Preservation Plan, and in 2018, an update to the State Plan for Archaeological Resources (Sundstrum 2018). The State Plan for Archaeological Resources describes the known sites and districts in terms of particular periods, regions, and site types throughout the state, and is intended to help cultural resource managers identify, analyze, and determine the historic significance of groups of related archaeological resources. The document includes detailed site distribution maps and identified priority site types for preservation.

#### 4.13.1.1 Archeological Sites

##### *Prehistoric (ca. 13,500 Before Present – 1861)*

Prehistoric Native American culture history in the state extends from the period of early Holocene Paleoindian exploration circa 13,500 years before present to the Protohistoric period. The Protohistoric period (ca. 1700 – 1861) corresponds with the introduction of European trade goods to Native American groups, including horses, but before permanent settlement of the region by non-Indians. Prehistoric sites in South Dakota are associated with 24 physiographic zones defined by a combination of major drainage basins and landform types, such as the White River Badlands, Black Hills, Missouri River Trench, and Missouri Coteau. The northern Great Plains prehistoric cultural chronology is divided into seven major overlapping subdivisions from the Paleoindian period to the Protohistoric period, including Early, Middle, and Late Archaic, Woodland, Late Prehistoric, and Plains Village periods. The Protohistoric period falls within the Plains Village period, which spans the last approximately 1,000 years.

Prehistoric site types in the state commonly include artifact scatters, hearths, villages, fortifications, burials, bison or antelope kill sites, eagle-trapping pits, tool-stone procurement and tool manufacture sites, rock cairns, shelters, circles and alignments, rock art, vision quest locales, timber lodges, and Traditional Cultural Properties. Some prehistoric site types are ubiquitous and widespread across the state, some are associated with specific time periods or culture groups, and some are associated with the locations of specific natural resources or landscape features. Examples of natural resources where prehistoric sites may be found nearby include rock outcrops used in stone tool making, and major and minor river drainages that served as transportation corridors through Great Plains agricultural land. Prehistoric archaeological sites may also be

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found in proximity to springs and lakes, specific forest and plant communities, trail networks, and prominent landscape features.

The distribution of Woodland and Plains Village sites, including mounds, is largely confined to the major rivers of eastern and central South Dakota. Stone circles (also known as tipi rings) and artifact scatters represent campsites and food processing areas that occurred in valleys, on toe slopes, and on mesa tops. Deposits of animal bones (bone beds) resulting from game drives occur in deep soils of draws, alluvial fans, and toe slopes, whereas vision quest markers, cairns, and eagle-trapping pits occur on the rimrocks. Rock art sites (petroglyphs and pictographs) are commonly found in the rock overhangs below the rim and on sandstone outcroppings (Sundstrom 2018).

### *Historic (Post 1861)*

Prior to the Euro-american settlement of South Dakota, various groups traversed the land beginning in the mid-1700s. Notable historic events include the Lewis and Clark Expedition of 1804, the establishment of French and Spanish trading posts along the Missouri River, and the European exchange of horses and guns for buffalo robes and pelts. The fur trade ended in the late 1850's and, as the federal government began to negotiate Native American tribal reservations, the first white settlements reached eastern South Dakota. The Dakota War of 1862 was a failed revolt by a band of Dakota Indians who resisted confinement to reservations.

White settlement in the western part of the state was largely confined to the Oregon Trail by Lakota Indians until a gold rush in 1875-1876 prompted the federal government to take control of the Black Hills, opening the region up for exploration and settlement. Open-range cattle and sheep ranching was a primary historic development in South Dakota during the 1880's, however severe winters proved devastating to herds. South Dakota became a state in 1889. Through the turn of the century it remained largely agricultural in the east with expansive public land in the west, including Indian reservations, National and State parks, forests, and monuments. During this time, Scandinavian, Russian, German, Dutch, Czech, and Bohemian emigrants settled in various parts of South Dakota.

The SHPO identifies 17 historic contexts, 11 historic property nomination forms, and 14 multiple-property documentation forms associated with broad or specific topics in the state's historic development. The contexts describe historic themes in the state's development over time and identify historic archaeological sites as well as above-ground architectural resources (SHPO 2019).

Historic archaeological property types are listed and described in the State Plan for Archaeological Resources (Sundstrom 2018). They include farmsteads, roads, railroads, foundations, depressions, alignments, burials, cairns, cabins, trading posts, school foundations, town sites, dams, dumps, earthworks, fence-lines, forts, mines, quarries, industrial sites, monuments, and wells or cisterns. Generally mining sites are concentrated in the Black Hills, farming sites in the east, and ranching sites in the west.

### 4.13.1.2 Historic Architectural Sites

NRHP-listed historic architectural properties in South Dakota are predominantly buildings and districts that had a range of historic functions. For example, ranches, residences, rural institutional buildings, public community buildings, ethnic enclaves, bridges, barns, schools, churches, libraries, recreational facilities, as well as other above-ground property types are included (NPS 2019a). The South Dakota Statewide Preservation Plan provides a list of threatened historic property types the State is interested in preserving and considers important historic resources. These include historic downtown commercial buildings that make up the central business district of many small towns. Other property types include homesteading and agricultural buildings such as farms and ranches, rural institutional building, public buildings, and rural buildings associated with ethnic enclaves. Historic architectural building types in South Dakota are described by Rogers and Schwan (2000) in a technical brief (<https://history.sd.gov/preservation/SHPOdocs.aspx>).

The SHPO has developed additional historic contexts for historic architectural resources that are dependent on the structure's (historical) function and location. Some resources are present throughout the state and some are location dependent. Examples of contexts found in South Dakota include Indian Housing, Steel Water Towers from 1894 – 1967, Ranches, German Russian Folk Architecture, Historic Hutterite Colonies, and Federal Relief Construction from 1929-1941.

### 4.13.2 Environmental Consequences

#### 4.13.2.1 No Action Alternative

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no effect on cultural resources from FEMA-funded grant activities. However, a major wildfire would be more likely to spread under the No Action Alternative, which could have a major impact on cultural resources.

The probability of a wildfire spreading to and destroying aboveground historic buildings, structures, and districts would increase. Historic and prehistoric archaeological sites that include aboveground or surface to near-surface flammable remains such as timbers or bones would be at risk. These include many of the emigrant and ranch site types that include timber structural remains or remnant plantings and trees. Prehistoric caves with pictographs and both prehistoric and historic Native American archaeological sites are less likely to be affected by a wildfire. However, these sites may also include above- and belowground stone elements such as tipi rings, cairns, forts, and hunting blinds, and fire suppression methods or post-fire cleanup activities could destroy most of the site types through the use of heavy equipment. Rock shelter sites are unlikely to be affected by the spread of wildfire; however, rock art sites could be affected. All types of prehistoric and historic archaeological sites near the surface or buried could be adversely affected by wildfire suppression techniques or post-fire cleanup activities.

Sloping landforms such as stream banks and hillsides would be subject to short- and long-term natural erosional processes (alluvial, aeolian) following a wildfire event that results in a loss of

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vegetation. Aboveground historic properties could potentially be affected if situated near the edge of an eroding bluff or terrace that is undermined. Similarly, belowground archaeological sites on these same landforms could be exposed and degraded during natural erosional processes, resulting in loss of integrity.

Post-fire hazard mitigation involving the removal of burned trees and debris would not take place. Certain historic property types affected by fire would not be subject to further salvage or preservation efforts because of the presence of hazards creating an unsafe setting. Other types of historic properties, particularly buried prehistoric lithic scatters, or surface features composed of rocks, may be better preserved under this alternative because activities that use heavy machinery that could compromise archaeological integrity would not occur.

### 4.13.2.2 Proposed Action

Project-specific consultation with the SHPO or THPO would be necessary for all hazard mitigation activities covered by the Proposed Action. FEMA would conduct an individual Section 106 consultation for each project application in accordance with the NHPA before the grant award. FEMA would identify the Area of Potential Effect (APE) for each project and whether there were any historic or cultural resources potentially present in the APE, in consultation with the SHPO and the THPO, as appropriate. Pedestrian surveys may be needed to determine if resources are present. If resources are potentially present, then FEMA would determine whether the resource could be affected and consult with the SHPO or THPO, as appropriate, and other potentially interested parties (including Native American tribes) on potential effects and avoidance or mitigation measures. If any adverse effects are identified, FEMA would consult on mitigation measures and a Memorandum of Agreement (MOA) would be prepared as appropriate.

Additional archaeological surveys may be required before ground-disturbing activities occur, depending on the results of consultation with the SHPO or THPO. Inadvertent discovery protocols would be applied as a mitigation measure to any projects that propose ground-disturbing activities regardless of how minor the disturbance may appear. Inadvertent discovery protocols specify that if archeological deposits, including any Native American property, stone tools, bones, or human remains, are uncovered, all work in the vicinity of the discovery must be halted immediately, and all reasonable measures must be taken to avoid or minimize harm to the finds. All archeological findings would be secured, and the subrecipient would restrict access to the sensitive area. The subrecipient would inform FEMA immediately of such findings, and FEMA would consult with the SHPO or THPO, as appropriate. Work in sensitive areas would not resume until the consultation is completed and until FEMA determines that the appropriate measures have been taken to ensure complete project compliance with the NHPA.

Through Section 106 consultation with the SHPO and THPO and the application of project-specific mitigation measures developed through the consultation process, potential effects to above- and belowground historic properties would be reduced to none or minor impacts.

***Defensible Space:*** Creation of defensible space surrounding individual structures or residential communities could have a measurable effect on aboveground historic buildings, structures, or



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districts when the integrity of setting is a key factor in the significance of the property and the property is listed or eligible for listing on the NRHP. Per NPS guidelines, the integrity of setting refers to the physical environment of a historic property. Setting refers to the character of the place in which the property played its historical role. Clearing vegetation could affect the historic viewshed of a given property. The use of heavy machinery to clear vegetation near one or more historic structures also has the potential to create damage from vibrations.

Most historic and prehistoric archaeological site types in areas identified for defensible space projects may be exposed and vulnerable to disturbance or looting as a result of the activity. Prehistoric caves with pictographs and both prehistoric and historic Native American archaeological sites would be subject to minor impacts or may be preserved and protected as a result of the activity triggering identification and evaluation level surveys. Because defensible space projects are located close to existing structures, the potential for impacts on prehistoric and historic Native American archaeological sites is likely low because the project areas would have been previously disturbed.

The following avoidance and mitigation measures would be used to limit impacts from defensible space projects:

- Hand clearing methods will be used within 500 feet of known historic structures and archaeological sites.
- Staging will be located in previously disturbed areas.
- Existing roads and access points will be used to the maximum extent possible, and the creation of new access roads will be minimized. If new access roads or staging areas are required, those areas would be surveyed for the presence of cultural resources before construction begins.
- Low-impact equipment will be used for clearing and hauling to the extent practicable (e.g., rubber-tired vehicles and equipment).
- If appropriate, a resource-enhancing planting plan or other design improvements will be implemented in keeping with the historic context.
- Inadvertent discovery protocols will be implemented.

**Hazardous Fuels Reduction:** Hazardous fuels reduction projects would be less likely to affect historic structures but may be more likely to affect archeological resources. Effects on cultural resources could range from no effect to a moderate effect. The avoidance and mitigation measures described under defensible space projects would reduce potential effects in most cases to a negligible or minor level. Avoiding ground disturbing activities would be the most effective method of avoiding adverse impacts on archeological resources.

**Soil Stabilization:** Soil stabilization activities would result in the preservation of certain types of archaeological sites exposed after a wildfire event, and potentially the stabilization of landscape features where historic structures are situated. The equipment used to spread seed and mulch,

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scarify hydrophobic soils, and/or place logs and erosion barriers may disturb soils and potentially affect cultural resources. These activities would have minor effects on historic properties. Chaining in project areas where NRHP-eligible or listed archeological sites are located would require an SEA.

**Hazard Tree Removal:** Post-fire hazard mitigation involving the removal of burned trees and resulting debris could involve the use of heavy machinery, in which case above- and belowground archaeological sites could be affected. By the nature of the activity, which is designed to clear unsafe areas after a wildfire, any historic structures within the project area could be either damaged or destroyed, and cultural resource surveys would not be possible until the activity is completed. Minimizing impacts on historic properties within these zones can be achieved through the development of an Inadvertent Discovery Plan tailored to specific anticipated site types, as needed before project implementation and in consultation with the SHPO and THPO. This would result in the activity having little or no potential to affect historic properties.

### 4.14 Environmental Justice

Environmental justice compliance is guided by EO 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, which requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects that its activities may have on minority or low-income populations. CEQ defines the term “minority” as persons from any of the following groups: Black, Asian or Pacific Islander, American Indian or Alaskan Native, and Hispanic (CEQ 1997). Low-income or poverty areas are defined using the statistical poverty threshold from the U.S. Census Bureau (USCB), which is based on income and family size. CEQ considers a census tract to be minority or low-income when at least 50 percent or more of its residents are minority or low-income or when the population in the census tract has a “meaningfully greater” number of minority and low-income persons when compared to larger geographic areas such as a county or state (CEQ 1997). The 2017 poverty threshold for a family of four with two children under the age of 18 was \$24,858 (USCB 2017).

#### 4.14.1 Affected Environment

South Dakota had an estimated population of the state of 855,444 persons in 2017 (USCB 2017). A summary of the racial composition in the state is provided in based on the 2013–2017 American Community Survey 5-year estimates.

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**Table 4-12: Racial Composition**

Race or Ethnicity	Number of Persons	Percent of Total
White (Not Hispanic or Latino)	707,282	82.7
American Indian and Alaska Native	71,127	8.3
Hispanic or Latino	29,901	3.5
Two or more races	20,320	2.4
Black or African American	14,292	1.7
Asian Alone	11,639	1.4
Some other race	554	0.1
Native Hawaiian and Other Pacific Islander	329	0.04
<b>TOTAL</b>	<b>855,444</b>	<b>100.0</b>

Source: USCB 2017

In 2017, the poverty rate in South Dakota was 13 percent, which is lower than the national rate of 14.7 percent (USCB 2017).

### 4.14.2 Environmental Consequences

#### 4.14.2.1 No Action

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no disproportionately high and adverse human health or environmental effect on minority or low-income populations resulting from a federal action. However, a major wildfire would be more likely to spread depending on risk factors such as vegetation and post-fire impacts would not be mitigated. All populations within a project area would continue to be at risk of a catastrophic wildfire regardless of their race, nationality, or income level.

#### 4.14.2.2 Proposed Action

The Proposed Action would not have a disproportionately high and adverse human health or environmental effect on minority or low-income populations. All populations within a project area would see a reduction in risk of catastrophic wildfire or post-fire impacts, regardless of their race, nationality, or income level. None of the hazard mitigation activities would result in land acquisition or displacement of residents or businesses, including those owned by minority and low-income persons. There would be no long-term adverse effects related to traffic, noise, or air quality from any of the hazard mitigation activities. There would be short-term adverse effects related to the implementation of the hazard mitigation activities (as described in other resource sections); however, they are not expected to be disproportionate on environmental justice communities. Project locations would be selected based on wildfire risk or in areas where wildfires have occurred (burn scars) rather than on demographic characteristics.

### 4.15 Land Use

#### 4.15.1 Affected Environment

South Dakota has a total area of approximately 75,811 square miles with a population density of 10.7 people per square mile, which is lower than the national average of 87.4 persons per square mile (USCB 2018). Major cities in the state include Sioux Falls, Rapid City, and Aberdeen. Common land uses were evaluated using EPA ecoregion data, and are summarized in **Table 4-13** (EPA 2003). In general, land uses in South Dakota include cattle grazing and ranching, farming, and wildlife habitat. South Dakota has two national parks – Badlands and Wind Cave (NPS 2019b).

**Table 4-13: Common Land Uses by EPA Ecoregion**

Ecoregion	Common Land Uses
Northwestern Great Plains	Cattle grazing and ranching, farming, and some wildlife habitat
Northern Glaciated Plains	Extensive farming, grazing; some wildlife habitat
Northwestern Glaciated Plains	Cattle grazing and farming; some wildlife habitat
Middle Rockies	Grazing, recreation, hunting, timber production, some suburban development
Western Corn Belt Plains	Farming and grazing; transportation corridor
High Plains	Cattle grazing; some farming and timber production
Nebraska Sand Hills	Cattle ranching and some hayland
Lake Agassiz Plain	Farming, grazing, and some wildlife habitat

Source: EPA 2003

#### 4.15.2 Environmental Consequences

##### 4.15.2.1 No Action

The No Action Alternative would have no impact on land use as existing conditions would remain unchanged. However, under the No Action Alternative, wildfire spread, floods, erosion, or mudslides would be more likely to occur. These hazards have the potential to damage the built and natural environment and alter the existing use of land. Major wildfires would degrade soils and destroy vegetation, which would affect grazing, farming, and wildlife habitat, activities that make up much of South Dakota's land uses.

##### 4.15.2.2 Proposed Action

None of the fire-related hazard mitigation activities would convert existing land uses. Therefore, no impacts would be anticipated from defensible space, hazardous fuel reduction, soil stabilization, or hazard tree removal projects. In the long-term, these projects could benefit land uses by reducing the risk of wildfire and mitigating post-fire damage.

### 4.16 Public Health and Safety

#### 4.16.1 Affected Environment

Wildfires pose a threat to public health and safety not only from the immediate danger that occurs while a wildfire burns but also after the fire. During a wildfire, health and safety concerns include smoke inhalation, injury, and death. Both residents of an area and emergency responders are at risk of injury and death during a wildfire. Flash flooding, mudslides, and erosion following wildfires can contribute to sediment and debris in nearby waterways, which can affect downstream water quality and damage structures, roads, and utilities critical to the safety and well-being of citizens in and downstream from the impacted area.

Population density varies throughout the state. In 2011, the counties of Minnehaha, Lincoln, Davison, and Yankton had the highest population density. From 2000-2011, the largest increase in population density (91 percent) occurred in Lincoln County. Generally, counties with increasing population growth, especially in the WUI, also experience an increase in vulnerability to wildfire hazards (OEM 2014).

The Social Vulnerability Index uses 30 socioeconomic variables, such as race and class, ethnicity, age (elderly residents), and wealth, that may contribute to a reduction in a community's resilience to natural hazards (OEM 2014). Children and seniors are especially vulnerable to wildfire smoke exposure (EPA et al. 2016) and are generally less mobile and able to evacuate in the face of a natural disaster. From 2006-2010, the counties with the highest social vulnerability scores included Buffalo, Todd, Shannon, Jackson, Mellette, McPherson, Bennett, Ziebach, Corson, Fall River, Dewey, Charles Mix, Bon Homme, and Roberts (OEM 2014).

#### 4.16.2 Environmental Consequences

##### 4.16.2.1 No Action

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no impact on public health and safety from FEMA-funded grant activities. However, wildfires, flooding, erosion, or mudslides would be more likely to occur. People and structures in areas that are at risk from wildfires would remain at risk. Structures at risk would include houses, roads, bridges, railroads, water intakes, and water treatment facilities. If these facilities are damaged or destroyed, there could be major impacts on public health and safety. In areas that recently experienced a wildfire, structures would be at risk of post-fire hazards, including flooding, erosion, and mudslides. Post-fire erosion can severely impact the capacity of water supplies and water treatment facilities.

Wildfires can generate substantial amounts of fine particulate matter, which can affect the health of people breathing smoke-laden air. Therefore, there could be a major impact on the health of people downwind from a wildfire, especially seniors, young children, and people with lung disease or asthma. At close range, wildfires can generate substantial amounts of CO, which can pose a health concern for frontline firefighters.

### 4.16.2.2 Proposed Action

**Defensible Space:** Creation of defensible space is intended to reduce the rate of spread and intensity of a wildfire near buildings and structures, which would improve the health and safety of occupants and firefighters and make it easier to bring a wildfire under control. This activity would help to protect specific structures, which may have beneficial effects on the ability of firefighters to control fires and the occupants of those structures.

**Hazardous Fuels Reduction:** Hazardous fuels reduction projects would result in benefits similar to those described under defensible space. Hazardous fuels reduction projects may reduce the intensity and frequency of wildfires in the WUI. Overall, this activity would lower risks for people living and working in the WUI because wildfires would threaten fewer houses and critical facilities would be less likely to be damaged. Wildfires may be more easily contained reducing the acreage and duration of a fire and its ability to produce harmful smoke.

Hazardous fuels reduction projects are more likely to use herbicides during project implementation or for maintenance activities that may affect workers or people who use the treated areas for recreation or occupational reasons (e.g., forest or agricultural workers). The BMPs described in Section 3.2.2 would be required to minimize the potential impacts of herbicide use.

**Soil Stabilization:** Soil stabilization projects would reduce the risk of erosion, flash flooding, and utility or emergency response disruptions in a project area where there is a burn scar. This would provide minor to moderate benefits to populations in or near the project area. Soil stabilization projects may benefit water supply and treatment utilities that serve surrounding populations by reducing sediments in the water supply chain.

**Hazard Tree Removal:** Hazard tree removal projects would improve safety for people using the project area for recreation or occupational reasons. If cut burned trees are laid on the ground to provide erosion control, then the benefits would be similar to those from soil stabilization projects that involve LEBs.

## 4.17 Noise

### 4.17.1 Affected Environment

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are considered noise. Noise events that occur during the night (10 p.m. to 7 a.m.) are more annoying than those that occur during regular waking hours (7 a.m. to 10 p.m.). Assessment of noise impacts includes consideration of the proximity of the noise sources to sensitive receptors. A sensitive receptor is defined as an area of frequent human use that would benefit from a lowered noise level. Typical sensitive receptors in developed areas include residences, schools, churches, hospitals, and libraries. In more sparsely developed areas, noise-sensitive receptors would include recreational development such as parks, campgrounds, water access sites, and trails. Recreational areas are areas, such as parks, campsites, water access sites, and trails, that rely on quiet settings as an essential part of their character. Typical noise sources in residential or

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recreational areas are associated with climatic conditions (wind, rain), transportation (traffic on roads, airplanes), and “life sounds” (people talking, children playing, yard maintenance).

Sources of noise can include construction equipment including motorized tools, equipment, and vehicles. Wildfire hazard mitigation projects may include the use of aircraft for some activities as well as ground-based equipment and vehicles.

**Urban environments** are likely to have high noise levels from vehicular traffic and construction. Typical highways produce noise levels that range from 80 to 100 A-weighted decibels (dBA), and construction produces noise levels between 93 and 108 dBA (DOI 2008). .

**Airports** generate high levels of noise from aircraft activities that increase ambient noise levels in nearby communities. Commercial aircraft generally emit between 70 to 100 dBA (Federal Aviation Administration 2012). Jet airplanes can produce sounds up to 120 dBA (Federal Railroad Administration 2016). South Dakota has 6 commercial airports and 6 large general aviation airports.

**Highways** produce noise levels ranging from 80 to 100 dBA (DOI 2008) even outside of urban areas. Major highways in South Dakota include I-29 and I-90.

**Railways** can produce higher noise levels that range from 70 to 115 dBA (Federal Railroad Administration 2016). There are 1,977 miles of rail in South Dakota.

**National and state parks** generally have lower average noise levels due to their location in wilderness areas away from human infrastructure. Typical noise levels for national and state parks are as low as 10 dBA (NPS 2016).

### 4.17.2 Environmental Consequences

#### 4.17.2.1 No Action

Under the No Action Alternative, no FEMA action would occur; thus, there would be no change in existing noise levels that could impact sensitive receptors.

#### 4.17.2.2 Proposed Action

All mitigation activities under the Proposed Action would increase noise levels in the short-term from the operation of equipment or vehicles. The impact would be temporary and of relatively short duration at any one location and impacts would be minor. To minimize noise impacts, the following BMPs would be implemented:

- Limiting mitigation activities to regular business hours consistent with the local noise ordinances.
- Using equipment and machinery that meets applicable local, state, and federal noise control regulations.



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In park areas, BMPs can include the selection of contractors who have implemented a “Buy Quiet” program for their operation. Buy Quiet is a voluntary program that contractors can implement to protect the hearing of workers and soundscape environment in a park by:

- Purchasing replacement machinery that produces less noise than the original machinery.
- Purchasing the most cost-beneficial piece of machinery available that produces less noise than the original machinery.
- Purchasing the quietest piece of machinery available regardless of price.

Additional guidance on Buy Quiet programs is provided by the National Institute for Occupational Safety and Health (CDC 2014). Other BMPs include the development of soundscape management plans and contractor noise control plans (National Academy of Engineering 2013).

**Defensible Space:** Defensible space projects typically occur in the WUI in primarily residential or less densely populated areas. Creation of defensible spaces would generate noise from the operation of equipment such as chainsaws, chippers, trucks and trailers, construction and maintenance vehicles, and other required equipment. Impacts would be localized and of short duration at any one location; therefore, noise impacts would be minor.

**Hazardous Fuels Reduction:** Hazardous fuels reduction projects typically occur in the WUI in primarily residential or less densely populated areas. Noise impacts would be similar to those described for defensible space projects. However, because hazardous fuels reduction projects are generally larger in scale, they would be more likely to use mechanized equipment rather than hand tools, which would increase the potential to generate noises that can be heard over larger distances. Offsetting the louder noise generated from mechanized equipment is the potentially longer distances between noise source and areas of concentrated development. Much of the noise generated for these types of projects would be similar to the noise from normal forest practices and would not be out of context for the setting. Therefore, noise impacts from hazardous fuels reductions would be minor. If there are sensitive receptors near a proposed project, project-specific assessments should be conducted and appropriate mitigation measures developed, such as adjustments in the equipment proposed for use.

**Soil Stabilization:** Soil stabilization projects may occur in undeveloped areas, parks, or recreational areas in proximity to burn scars. Sources of noise could include fixed-wing aircraft and helicopters, as well as ground equipment such as chainsaws and vehicles used to transport work crews, equipment, seeds or mulch material. Low-flying aircraft may be disruptive to sensitive receptors such as parks and consideration should be given to equipment selection in developing mitigation measures for specific projects. Noise generation would be short-term and impacts likely would be minor to moderate.

**Hazard Tree Removal:** Hazard tree removal may occur in undeveloped areas, parks, or recreational areas in proximity to burn scars. Sources of noise could include hand equipment such as chainsaws, vehicles used to transport work crews, equipment, or debris, and heavy equipment such as feller bunchers, backhoes, and loaders. Equipment noise may be disruptive to

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sensitive receptors such as parks and consideration should be given to equipment selection in developing mitigation measures for specific projects. Noise generation would be short-term and impacts likely would be minor to moderate.

### 4.18 Traffic and Transportation

#### 4.18.1 Affected Environment

South Dakota has a diverse transportation network composed of roadways, railways, and airports. South Dakota's road network comprises 82,558 miles of public roadways, of which 2,431 miles are federally owned (Federal Highway Administration 2014). South Dakota has two major interstates that provide connections for intercity and interstate travel (**Table 4-14**). Additionally, 10 U.S. highways provide access throughout South Dakota (**Figure 4-9**).

**Table 4-14: Major Interstates and Cities Served in South Dakota**

Interstate	Major Cities Served (Population larger than 5,000)
I-29	Brookings, Sioux City, Sioux Falls, Watertown
I-90	Brandon, Mitchell, Rapid City, Sioux Falls, Spearfish

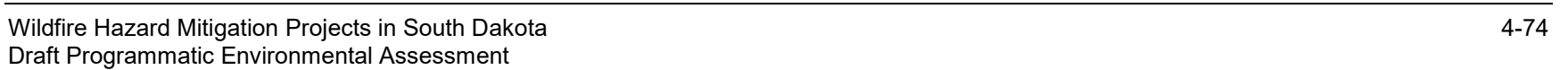
Source: Federal Highway Administration 2018

The Burlington Northern Santa Fe (BNSF) Railway owns approximately 900 miles of track in South Dakota and the Rapid City, Pierre & Eastern Railroad owns nearly 600 miles. Combined, these two railroads encompass nearly 80 percent of the rail system in South Dakota (South Dakota Department of Transportation [SDDOT] 2014). There are no Amtrak lines or stations within South Dakota (Amtrak 2019). Six commercial service airports in South Dakota serve the cities of Sioux Falls, Watertown, Huron, Aberdeen, Pierre, and Rapid City (SDDOT 2016). The remaining airports in the state provide services for general aviation, which includes all aviation activity not related to military or scheduled airline operations (SDDOT 2016).

#### 4.18.2 Environmental Consequences

##### 4.18.2.1 No Action

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no impacts on traffic or the transportation network from FEMA-funded grant activities. However, wildfires, floods, erosion, or mudslides would be more likely under the No Action Alternative. Roads, rail lines, and/or trail systems could be blocked, damaged, or destroyed if a wildfire approached or encompassed the local area, or if the area was flooded or experienced a mudslide. Emergency access roads could be impacted, which would be detrimental for single ingress/egress roadways or narrow through routes lined with large trees and could prevent evacuations or prevent firefighters from entering an area.



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Depending on location and wind direction, smoke from a wildfire could close sections of bordering roadways or rail lines. Minor short-term traffic congestion could occur during closures caused by a wildfire, flood, or mudslide. Smaller roads may not be cleared as quickly as larger routes, but the number of travelers potentially impacted would also be less. If roadways or rail lines are damaged, longer term, minor adverse impacts could occur because of increased travel times and increased traffic volumes on alternate routes if travel patterns change.

### 4.18.2.2 Proposed Action

Few of the fire-related mitigation activities covered under the Proposed Action have the potential to cause temporary impacts on traffic and transportation networks while the projects are being implemented. Most of the work would occur off public roads and ground-based equipment and crews would not block travel lanes while conducting the work. Some activities may be conducted along roadways and appropriate traffic controls would be put in place to avoid and minimize potential delays to travelers and freight movement. In the long-term, all mitigation activities covered under the Proposed Action would reduce the risk of roadway or rail facility closures from wildfires or post-fire related impacts such as flash floods. If an activity resulted in traffic detours or temporary road lane closures, the subrecipient would develop a maintenance of traffic plan and establish alternate routes that do not affect the provision of emergency services.

**Defensible Space:** The creation of defensible space would require the movement of some equipment and work crews to project sites; however, the impact would be minor due to the size of the work crews and the limited amount of equipment needed to implement a project. There would be no measurable effect on traffic or roads.

**Hazardous Fuels Reduction:** The impact of hazardous fuels reduction project is similar to that described for defensible space projects. However, because hazardous fuels reduction projects are generally larger in scale, they would be more likely to use larger equipment and possibly larger crews. However, even on large relatively complex hazardous fuels reduction projects, effects on local transportation networks would generally be negligible because most of the work would be conducted off of the transportation network. In cases where some work is conducted along public routes, traffic would be routed around equipment and appropriate traffic control measures would be employed. In unusual cases, it is possible that a single ingress/egress roadway, a narrow through road, or a trail could be partially blocked or closed during the work. Any potential closures would be short-term and temporary, and in most cases other existing roads and trails would still be available for access or recreational use during implementation of the project, resulting in minor to moderate effects.

Work along the edge of public roads during both implementation and maintenance could have minor effects on traffic by causing temporary closures of a road lane. Vehicles could be forced to take alternate routes or experience delays; however, these impacts are expected to be rare, and if they occur, effects would be minor and temporary.

**Soil Stabilization:** Soil stabilization activities would require the movement of ground-based work crews and equipment to project sites with burn scars. Traffic impacts would be minor.

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Larger-scale reseeding and mulching activities would be implemented with fixed-wing aircraft or helicopter, which would reduce impacts on surface roadways and traffic.

**Hazard Tree Removal:** The impact of hazard tree removal projects would be similar to soil stabilization projects; however, it would not involve the use of fixed-wing aircraft or helicopters.

### 4.19 Public Services and Utilities

This section evaluates the potential impacts of the proposed fire mitigation program on public utilities such as sewer, water, gas, and electricity; emergency services such as fire and police; and public facilities such as schools, hospitals, parks, and recreational facilities.

#### 4.19.1 Affected Environment

##### 4.19.1.1 Utilities

**Natural Gas and Electricity:** Major gas and electric utility providers in South Dakota include six investor-owned electric utilities, several electric cooperatives, several municipal electric utilities, three investor-owned natural gas utilities, and three municipal gas utilities (South Dakota Public Utilities Commission undated). A majority of South Dakota's electricity is generated by hydroelectric power, coal, and nonhydroelectric renewables (U.S. Energy Information Administration [EIA] 2019). In 2016, South Dakota's two largest energy producers were biofuels and renewable energy sources, and the industrial and transportation end-use sectors used the most energy (40.1 percent and 26.3 percent respectively) (EIA 2019). The highest energy consumption in South Dakota was natural gas (85 trillion Btu) and biomass (62 trillion Btu) in 2016 (EIA 2019).

**Water and Wastewater:** Potable water and wastewater facilities in South Dakota are managed, owned, and operated at the local level. There are 645 active public drinking water systems in South Dakota, including community, non-transient non-community, and transient non-community water systems (EPA 2019c). Most of the systems (74 percent) serve populations of less than 500; fifteen systems serve populations of 10,000 or more (EPA 2019c). DENR is responsible for the enforcement of the federal Safe Drinking Water Act, which establishes drinking water standards, source water protection, water and wastewater operator system certifications (DENR 2019b). DENR issues permits to construct, modify, or upgrade water systems.

**Solid Waste:** DENR's Solid Waste Management Program regulates storage, treatment, and disposal of solid waste in South Dakota. Currently, the program permits 15 landfills in the state (DENR 2019d).

##### 4.19.1.2 Public Safety Services

South Dakota has 155 state and local law enforcement agencies with 2,669 full-time employees (U.S. Department of Justice 2011). Across South Dakota, there are 293 registered fire departments (U.S. Fire Administration 2019) and approximately 480 firefighters (U.S. Bureau of

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Labor Statistics 2017). Registered fire department staff may include career, volunteer, paid-per-call firefighters, civilian staff, or non-firefighting employees (U.S. Fire Administration 2019).

Emergency response time standards frequently exist in contractual obligations between communities and emergency service organizations. As a result, there is typically considerable variation between standards in one community and another.

### **4.19.1.3 Other Public Facilities**

Public facilities such as schools, hospitals, and parks exist across the state and may be in the vicinity of some project areas. Schools and hospitals are more likely to be located within built areas rather than on the fringes where fuels reduction work would be likely to occur.

SDGFP manages over 60 parks, recreation areas, and nature areas throughout the state (SDGFP 2019b). NPS manages the Badlands National Park, Wind Cave National Park, Mount Rushmore National Memorial, Jewel Cave National Monument, Minuteman Missile National Historic Site, Lewis & Clark National Historic Trail, and the Missouri National Recreational River (NPS 2019b).

## **4.19.2 Environmental Consequences**

### **4.19.2.1 No Action Alternative**

Under the No Action Alternative, there would be no FEMA action; therefore, there would be no impact on utilities, public services, and facilities related to FEMA-funded grant activities. However, a major wildfire would be more likely under the No Action Alternative, which could damage infrastructure and have a moderate to a major adverse impact on the ability of service providers to operate. During a major wildfire, emergency personnel would be focused on responding to needs related directly to the wildfire and would not be as available to respond to other emergencies in their service area. Electrical services provided via overhead power lines have the potential to spark catastrophic fires if vegetation is allowed to grow up into the lines. A wildfire also can destroy aboveground utilities such as electrical lines, resulting in moderate to major effects on service. Other public facilities may be damaged or destroyed during a wildfire, and it may take considerable time to replace their functions.

### **4.19.2.2 Proposed Action**

None of the mitigation activities covered by the Proposed Action would adversely affect or require additional utilities in project areas. All activities could result in temporary traffic detours or short-term lane closures while the project is being implemented. If detours or closures are necessary, the subrecipient would develop a maintenance of traffic plan to ensure that the work does not affect the provision of emergency services.

In the long-term, the hazard mitigation activities would reduce the potential for damage to existing overhead utilities, maintaining service for customers and other public functions. The hazard mitigation activities would also reduce the risk of damage to water and wastewater infrastructure, such as water treatment plans or solid waste disposal facilities. Fire-related hazard

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mitigation activities would reduce the potential for lane closures and impacts on the emergency response as a result of wildfires. Hazard mitigation activities would also reduce the risk of wildfires and the potential for damage to public facilities in the long term.

***Defensible Space:*** The creation of defensible space around buildings and utilities would reduce the potential for damage during a wildfire. When defensible space is created around utilities, and public facilities, the services provided would directly benefit. Defensible space may also make conditions safer for firefighters attempting to protect structures from a wildfire. The creation of defensible space may have moderate benefits on public utilities and services.

***Hazardous Fuels Reduction:*** Hazardous fuels reduction projects may involve work along public roads and could have minor effects on public services because of the temporary closure of a lane. School buses and police and fire vehicles may experience delays. Hazardous fuels reduction projects would not be expected to affect public services or the response times of emergency responders in the long-term. If work in a public park is extensive, the park or portions of a park may be closed to public access for the duration of the work. It is unlikely that such closures would extend beyond 2 weeks for any one location. Multiple closures may be required at a location to protect the public from hazards related to the cutting of vegetation, application of herbicides, and burning, chipping, or removal of cut material.

Hazardous fuels reduction projects and the continued maintenance of the project area would reduce hazards associated with a major wildfire in and near project areas and would contribute to the containment of wildfires. Hazardous fuels reduction activities may improve conditions for firefighters within project areas by reducing the potential for crown fires or torching to occur. This reduction in risk could reduce the level of need for emergency services within a project area and allow emergency responders to remain available to respond to other emergencies throughout an area rather than dedicating all available forces to firefighting. This would result in a beneficial effect on public services.

***Soil Stabilization:*** Soil stabilization projects would benefit public utilities by reducing erosion and sedimentation of surface waters that may be used for drinking water. These benefits could be substantial if the project protects a regional water supply and treatment plant. Projects that reduce the risk of landslides or flooding would also benefit service providers and utilities because access routes and utility lines would be less likely to be damaged in the post-fire environment.

***Hazard Tree Removal:*** Hazard tree removal projects could benefit utilities and public service providers by removing hazardous trees that could topple onto powerlines or across roadways. These benefits would be localized and minor.

### 4.20 Hazardous Materials

Hazardous materials and hazardous wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present a substantial danger to public health or the environment when released or otherwise improperly managed. Hazardous materials are regulated by state and federal law including the following:



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- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly referred to as the Superfund Program. Superfund sites are contaminated because of hazardous waste being dumped, left out in the open, or otherwise improperly managed. These sites include manufacturing facilities, processing plants, landfills, and mining sites.
- Brownfields Utilization, Investment, and Local Development (BUILD) Act (EPA Brownfields Program). The EPA Brownfields Program provides grants and technical assistance to communities, states, tribes, and others to assess, safely clean up, and sustainably reuse contaminated properties.
- Toxics Release Inventory (TRI) Program established by the Emergency Planning and Community Right-to-Know Act. The TRI maintains data on industrial facilities that use, manage, and store potentially toxic chemicals into the environment, including Pb, polycyclic aromatic, and zinc compounds.
- The Resource Conservation and Recovery Act (RCRA) regulates hazardous and nonhazardous wastes and provides a system for managing hazardous waste from the time it is generated until its disposal. Sites designated “RCRA Corrective Action” are involved with the cleanup of current environmental problems caused by the mismanagement of waste.

### 4.20.1 Affected Environment

Based on the June 2019 search of EPA’s *Cleanups in My Community* database, South Dakota has one RCRA Corrective Action site, 281 brownfield sites, and two proposed and final National Priorities List sites regulated through the Superfund Program (EPA 2019a).

### 4.20.2 Environmental Consequences

#### 4.20.2.1 No Action

Under the No Action Alternative, existing conditions for hazardous materials would not change. The risk of wildfire spread, flooding, and mudslides would not be reduced. These hazards could damage hazardous material storage facilities, which could lead to hazardous materials leaks and spills. Wildfires may involve sites with historical contamination, such as Superfund or brownfield sites. This could cause major, long-term contamination of environmental resources in the surrounding area. Additionally, there is a risk that hazardous materials could ignite and explode during a wildfire.

In the event of a major wildfire, chemical fire retardants may be applied to wildland vegetation, and the impacts could be moderate depending on the amount, chemical composition, and locations where fire retardants are applied. While most wildfire retardants are generally considered to be nontoxic, there have been some documented fish kills when large amounts have been dropped directly into water bodies. Also, during a major wildfire, buildings and structures

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that contain hazardous materials may burn, allowing those materials to be released into the environment.

### 4.20.2.2 Proposed Action

All fire-related mitigation activities covered under the Proposed Action could involve the use of mechanical equipment and vehicles. There is always a minor threat of leaks of oils, fuels, and lubricants from the use of equipment and vehicles. The short-term duration of project activities and implementation of BMPs would reduce this potential effect to a minor level. The following BMPs would be implemented to avoid or minimize impacts:

- Work equipment would be kept in good working order.
- Equipment staging, refueling, and storage of gasoline must occur outside of sensitive areas and areas where hazardous materials could reach surface waters.
- Any equipment to be used over, in, or within 100 feet of water would be inspected daily for fuel and fluid leaks. Any leaks would be promptly contained and cleaned up, and equipment would be repaired.

If site contamination or evidence of contamination is discovered before or during implementation, the subrecipient would manage the contamination in accordance with the requirements of the governing local, state, and federal regulations and guidelines. Before beginning work, the subrecipient would evaluate whether there are any regulated sites in a project area and the work would be adjusted to avoid disturbing contaminated materials.

Hazardous or toxic materials, including herbicides or pesticides, would be handled, stored, applied, or disposed of in accordance with state water quality laws (SDCL 38-21-15) and voluntary BMPs for work in SMZ areas.

**Defensible Space:** Due to the proximity to existing structures, defensible space projects are more likely to encounter small amounts of household hazardous materials than other activities. These materials would be easily avoided, and the potential for a release of hazardous materials would be negligible.

**Hazardous Fuels Reduction:** The potential to encounter or create hazardous materials during a hazardous fuels reduction project is similar to that described for defensible space projects. However, because hazardous fuels reduction projects are generally larger in scale, they would be more likely to use mechanized equipment rather than hand tools, which would increase the risk of generating accidental leaks or spills from the equipment.

Also, hazardous fuels reduction projects generally encompass much larger areas and the potential to encounter hazardous materials or larger quantities of hazardous materials would be greater. Projects would identify and avoid known and new sources of hazardous materials when encountered in the field. If a new source of hazardous materials is encountered during implementation, the area would be reported to the appropriate state and federal authorities and the fuels reduction work would be redirected to avoid disturbing and potentially releasing

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contaminants into the environment or exposing workers. This PEA does not cover the release, clean up, or disposal of hazardous materials.

Hazardous fuels reduction projects may employ herbicides during project implementation. If used and stored in accordance with local, state, and federal regulations, herbicides and other chemical treatments would not be expected to result in adverse impacts on human health or the natural environment; however, there may be minor short-term effects. Herbicide use would conform to the BMPs for herbicide use (Section 3.2.2) or a project-specific evaluation to identify potential impacts and avoidance or minimization measures would be required. Personnel involved with the application of herbicides must comply with state regulations for private and commercial pesticide applicators and operators (ARSD 12:56).

**Soil Stabilization:** Soil stabilization projects would require the use of mechanical equipment, vehicles, and possibly fixed-wing aircraft or helicopters, with the potential for leaks or spills of oils, fuels, and lubricants. Any ground disturbing activities would have the same potential for encountering hazardous materials as described for fuels reduction activities and similar avoidance measures would be implemented for soils stabilization projects.

**Hazard Tree Removal:** Equipment used for hazardous tree removal would have the same potential for small leaks and spills as defensible space projects, and the same BMPs would be applied to these projects. Because hazardous tree removal is less likely to result in ground disturbance than other fire hazard reduction activities, there would be less potential for impacts from encountering hazardous materials. Avoidance measures would be implemented if hazardous materials are encountered.

### 4.21 Cumulative Impacts

Cumulative impacts are defined as impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or nonfederal) or person undertakes the other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). CEQ regulations state that cumulative impacts must be evaluated along with the direct and indirect effects of each alternative (40 CFR 1508.7).

Through this PEA, FEMA evaluates the potential environmental consequences of providing grant funding for future wildfire hazard mitigation activities in South Dakota. These activities are described in Section 3, Alternatives and include the creation of defensible space, hazardous fuels reduction projects, and post-wildfire mitigation measures to stabilize soils, reduce risks from post-fire flooding, and remove hazard (burned) trees.

Because the Proposed Action would result from future grant assistance, the specific locations of the actions are unknown at the time of this assessment. Individual projects resulting from the Proposed Action could result in cumulative impacts depending on what other past, present, or future actions have been undertaken near the individual project area. Individual projects proposed for coverage under this PEA are not anticipated to cause significant impacts, even when combined with other actions. Projects that could result in significant impacts can generally

## Affected Environment and Environmental Consequences

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be reduced below the level of significance by implementing the BMPs and mitigation measures described in Section 5. An SEA will be completed for any project that is anticipated to result in impacts that cannot be addressed by mitigation measures discussed in Section 5, Best Management Practices. **Table 4-2** provides the specific thresholds for determining whether a project may be covered under this PEA or would require an SEA.

Defensible space activities are generally associated with existing buildings and structures and areas that have been previously disturbed. There are situations where they may be associated with new construction or encompass larger areas because of the number of properties involved in a single grant application. For example, the creation of defensible space could have a negative cumulative impact on native vegetation if numerous properties in an area are undergoing treatment. However, this potential cumulative effect is unlikely to be significant because the vegetation around existing structures tends to already be impacted by human activities and management.

Hazardous fuels reduction projects may have the greatest potential for cumulative impacts because they tend to include more area. In particular, hazardous fuels reduction activities are more likely to result in cumulative impacts on vegetation, wildlife, and threatened and endangered species than other wildfire hazard mitigation activities. If a specific project would result in significant adverse impacts or may be cumulatively significant, then a project-specific evaluation would need to be conducted (see Section 1.4).

Wildfire hazard mitigation projects could result in beneficial cumulative impacts if combined with other wildfire hazard mitigation projects or in combination with other state and local efforts to decrease development in the WUI. These beneficial effects may occur by reducing vulnerabilities to wildfire or by preventing the spread of a high-intensity wildfire.

Hazard tree removal and soil stabilization projects implemented on post-fire burn scars have the potential to cumulatively benefit water resources, vegetation, aquatic, and terrestrial habitat. These projects would be implemented in an environment that was significantly impacted by wildfire. Benefits would result from the cumulative reduction in erosion and sedimentation and the reestablishment of vegetation in multiple project areas within the same watershed.

## SECTION 5. BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

Section 4 describes the affected environment and potential environmental consequences (beneficial or adverse) resulting from the No Action Alternative and the Proposed Action. With the implementation of the BMPs and mitigation measures described under each resource category, none of the potential impacts of the Proposed Action would be significant based on the significance criteria defined in Section 4. **Table 5-1** summarizes BMPs and mitigation measures that are required by regulation, law, or statute or that are generally applied in compliance with federal, state, and local regulations.

**Table 5-1: BMPs and Mitigation Measures**

Resource Area	Required BMPs or Mitigation Measures
<b>Geology, Soils, and Topography</b>	<ul style="list-style-type: none"> <li>• Leave root balls in place.</li> <li>• Use rubber-tired mechanical equipment and vehicles.</li> <li>• Use existing roads for access.</li> <li>• Use mulch to prevent soil erosion.</li> <li>• Avoid the use of mechanized equipment on steep slopes or unstable soils.</li> <li>• In areas with steep slopes or sensitive soils, use hand tools to avoid and minimize potential soil erosion.</li> <li>• Drive heavy equipment around the treatment area in a random pattern and avoid repeatedly passing across the same spots.</li> <li>• Project activities that involve chaining would incorporate erosion and sediment control BMPs consistent with the state's General Permit for Stormwater Discharges Associated with Construction Activities (DENR 2018a).</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>• Vehicle and mechanical equipment running times would be kept to a minimum.</li> <li>• Ensure that engines are properly maintained.</li> </ul>
<b>Visual Quality and Aesthetics</b>	<ul style="list-style-type: none"> <li>• Consult with the SHPO or THPOs to resolve adverse visual effects on any NRHP-listed or eligible historic properties (36 CFR 800.2).</li> <li>• Consult with the appropriate river management agency to develop mitigation measures for visual impacts on federally designated wild and scenic rivers (16 U.S.C 1283).</li> </ul>

## Best Management Practices and Mitigation Measures

Resource Area	Required BMPs or Mitigation Measures
<b>Water Quality and Water Resources</b>	<ul style="list-style-type: none"> <li>• Mulch cut vegetation for temporary erosion control to prevent soil from reaching waterways.</li> <li>• Use rubber-tired machinery to reduce potential erosion and sedimentation into surface waters.</li> <li>• For projects that impact Waters of the U.S., follow implementing regulations for the Clean Water Act (40 CFR 230 Subpart H).</li> <li>• Follow state-recommended BMPs for work in SMZs: <ul style="list-style-type: none"> <li>○ Retaining trees, shrubs, and stumps.</li> <li>○ Avoiding the operation of wheeled and tracked vehicles.</li> <li>○ Keeping slash out of streams and water bodies.</li> </ul> </li> <li>• Fuel equipment and vehicles at least 150 feet from streams, or in compliance with local regulations that dictate larger distances.</li> </ul>
<b>Floodplains</b>	<ul style="list-style-type: none"> <li>• Avoid project activities in floodplains in accordance with EO 11988 and 44 CFR 9.2.</li> </ul>
<b>Wetlands</b>	<ul style="list-style-type: none"> <li>• Avoid project activities in wetlands in accordance with EO 11990 and 44 CFR 9.2.</li> <li>• Avoid driving heavy equipment across wetlands (40 CFR 230 Subpart H).</li> <li>• Leave root balls in place in wetlands and adjacent areas.</li> <li>• Fuel equipment and vehicles at least 150 feet from streams, or in compliance with local regulations that dictate larger distances.</li> </ul>
<b>Wild and Scenic Rivers</b>	<ul style="list-style-type: none"> <li>• Consult with the appropriate river management agency to develop mitigation for impacts on federally designated wild and scenic rivers (16 U.S.C 1283).</li> <li>• <i>See Water Quality and Water Resources and Visual Quality and Aesthetics.</i></li> </ul>
<b>Vegetation</b>	<ul style="list-style-type: none"> <li>• Ensure vehicles and equipment access project areas via existing roads.</li> <li>• Use rubber-tired machinery to reduce potential soil disturbance.</li> </ul>
<b>Fish and Wildlife Habitat</b>	<ul style="list-style-type: none"> <li>• Vehicles and equipment would access project areas using existing roads (40 CFR 230 Subpart H).</li> <li>• When possible, avoid clearing of vegetation from March through August to avoid impacts on nesting migratory birds.</li> <li>• Leave felled trees in place to provide habitat benefits.</li> <li>• As appropriate, if bald or golden eagles are present in the project areas, consult with USFWS to develop mitigation measures (16 U.S.C 668).</li> <li>• Establish buffers for eagle nesting sites.</li> </ul>
<b>Threatened and Endangered Species</b>	<ul style="list-style-type: none"> <li>• As needed, develop avoidance and mitigation measures in consultation with USFWS in accordance with Section 7 of the ESA (50 CFR 402).</li> </ul>

## Best Management Practices and Mitigation Measures

Resource Area	Required BMPs or Mitigation Measures
<b>Cultural Resources</b>	<ul style="list-style-type: none"> <li>• Use existing roads and access points and avoid the creation of new access roads.</li> <li>• Use hand-clearing methods within 500 feet of known historic structures and archaeological sites.</li> <li>• Locate staging in previously disturbed areas.</li> <li>• Use low impact equipment such as rubber-tired vehicles.</li> <li>• Consult with the SHPO or THPO to resolve adverse effects to any NRHP-listed or eligible historic properties (36 CFR 800.2).</li> <li>• Implement post-review discovery protocols for projects that propose ground-disturbing activities (36 CFR 800.13).</li> <li>• Chaining in project areas with NRHP-listed or eligible archeological sites would require an SEA.</li> </ul>
<b>Environmental Justice</b>	<ul style="list-style-type: none"> <li>• None.</li> </ul>
<b>Land Use</b>	<ul style="list-style-type: none"> <li>• None.</li> </ul>
<b>Noise</b>	<ul style="list-style-type: none"> <li>• Select contractors who have implemented “Buy Quiet” programs for their operations where possible.</li> <li>• Develop soundscape management plans and contractor noise control plans for projects in park areas.</li> <li>• Limit project activities to regular business hours in accordance with any local noise ordinances.</li> <li>• Use equipment and machinery that meet applicable local, state, and federal noise control regulations.</li> </ul>
<b>Traffic and Transportation</b>	<ul style="list-style-type: none"> <li>• Develop a maintenance of traffic plan to minimize the impact of temporary lane closures or detours.</li> </ul>
<b>Public Services and Utilities</b>	<ul style="list-style-type: none"> <li>• Develop a maintenance of traffic plan to minimize temporary lane closures or detours.</li> </ul>



## Best Management Practices and Mitigation Measures

Resource Area	Required BMPs or Mitigation Measures
<b>Public Health and Safety</b>	<ul style="list-style-type: none"> <li>• Herbicide BMPs:               <ul style="list-style-type: none"> <li>○ All herbicides must be used consistent with label recommendations.</li> <li>○ Herbicides would be applied by trained applicators using equipment that is calibrated annually.</li> <li>○ Only the quantity of herbicide needed in a given work day would be transported to the project site.</li> <li>○ Herbicides would not be applied when the wind speed exceeds 10 miles per hour to minimize the potential for drift.</li> <li>○ Herbicides would not be applied if rain is projected within 24 hours.</li> <li>○ Herbicides would be selected by considering the quantity of herbicide to be used, selectivity for species to be treated, and potential toxicity.</li> <li>○ Limit application methods to backpack application, application to cut stumps, or hack and squirt.</li> <li>○ Confirm any herbicide use conforms to ARSD 12:56.</li> </ul> </li> <li>• Develop a maintenance of traffic plan to ensure that temporary lane closures or detours do not affect the provision of emergency services.</li> </ul>
<b>Hazardous Materials</b>	<ul style="list-style-type: none"> <li>• Before beginning work, the subrecipient would evaluate whether there are any regulated sites in a project area and the work would be adjusted to avoid sources of hazardous materials and avoid disturbing the ground over or near hazardous materials.</li> <li>• Conduct daily inspections of equipment to be used over, in, or within 100 feet of water for fuel and fluid leaks.</li> <li>• Any spills would be promptly contained and cleaned up and the equipment would be repaired.</li> <li>• Storage and handling of hazardous and toxic materials in SMZs, including fuels, should be avoided (South Dakota State University et al. 2003).</li> <li>• Personnel involved with the application of herbicides must comply with state regulations for pesticide applicators and operators (ARSD 12:56).</li> <li>• If site contamination or evidence of contamination is discovered before or during implementation, the subrecipient must manage the contamination in accordance with the requirements of the governing local, state, and federal regulations and guidelines including RCRA.</li> </ul>

Additional BMPs or mitigation measures may be developed through consultation with other federal and state agencies, and through state and local permit reviews. These additional measures may further reduce any potential impacts of specific projects.

## Best Management Practices and Mitigation Measures

Consultations and permitting processes common to wildfire hazard mitigation projects are outlined in **Table 5-2**. Not all projects would require all of these reviews; moreover, each project would require compliance with local laws, and additional processes may apply.

**Table 5-2: Consultations and Permits that May Be Required or Applicable**

Resource Area	Permits/Approvals/ Consultation	Description
<b>Geology, Soils, and Topography</b>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>Local approvals for open burning (SDCL 34A-1-18)</li> <li>Burn permit in the Black Hills Forest Protection District (SDCL 34-35-16)</li> <li>State restrictions on open burning (ARSD 74:27:13:11 and 74:36:06:07; SDCL 34-35)</li> </ul>	<ul style="list-style-type: none"> <li>Open burning of trees and vegetation</li> </ul>
<b>Visual Quality and Aesthetics</b>	<ul style="list-style-type: none"> <li>Section 106 consultation under the NHPA</li> <li>Consultation under Section 7 of the Wild and Scenic Rivers Act</li> </ul>	<ul style="list-style-type: none"> <li>Visual impacts on cultural resources or federally designated wild and scenic rivers resolved through the consultation process</li> </ul>
<b>Water Quality and Water Resources</b>	<ul style="list-style-type: none"> <li>401/404 Permit (CWA)</li> </ul>	<ul style="list-style-type: none"> <li>Minor impacts on Waters of the U.S. that would meet the requirements for an NWP</li> </ul>
<b>Floodplains</b>	<ul style="list-style-type: none"> <li>Local Floodplain Development Permit</li> <li>Eight-Step Analysis (EO 11988 and 44 CFR 9)</li> </ul>	<ul style="list-style-type: none"> <li>Minor impact on designated floodplains that meet the requirements of a local jurisdiction's floodplain ordinance</li> </ul>
<b>Wetlands</b>	<ul style="list-style-type: none"> <li>401/404 Permit (CWA)</li> <li>Eight-Step Analysis (EO 11990 and 44 CFR 9)</li> </ul>	<ul style="list-style-type: none"> <li>Minor impact on wetlands that meet the requirements for an NWP</li> </ul>
<b>Wild and Scenic Rivers</b>	<ul style="list-style-type: none"> <li>Consultation under Section 7 of the Wild and Scenic Rivers Act</li> </ul>	<ul style="list-style-type: none"> <li>Consultation process with the river management agency to address impacts on federally designated wild and scenic rivers</li> <li>See Water Quality and Water Resources</li> </ul>

## Best Management Practices and Mitigation Measures

Resource Area	Permits/Approvals/ Consultation	Description
<b>Vegetation</b>	<ul style="list-style-type: none"> <li>County Weed and Pest Boards requirements (ARSD 12:62:09)</li> </ul>	<ul style="list-style-type: none"> <li>Cooperation with requirements of County Weed and Pest Boards</li> <li>If voluntary cooperation is not obtained, the Board may refer the matter to the Secretary (ARSD 12:62:11:04)</li> </ul>
<b>Fish and Wildlife Habitat</b>	<ul style="list-style-type: none"> <li>Consultation with USFWS under the BGEPA</li> </ul>	<ul style="list-style-type: none"> <li>Consultation to address project impacts on any bald or golden eagles present in the project area</li> </ul>
<b>Threatened and Endangered Species</b>	<ul style="list-style-type: none"> <li>USFWS Consultation under Section 7 of the ESA</li> </ul>	<ul style="list-style-type: none"> <li>Consultation to assess effects to species, and to develop avoidance and minimization measures as appropriate</li> </ul>
<b>Cultural Resources</b>	<ul style="list-style-type: none"> <li>Section 106 consultation under the NHPA with tribes and SHPO/THPOs</li> <li>Development of a Section 106 MOA, if needed</li> </ul>	<ul style="list-style-type: none"> <li>Consultation to evaluate and resolve adverse effects to historic properties, and preparation of an MOA as appropriate</li> </ul>
<b>Environmental Justice</b>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Land Use</b>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Public Health and Safety</b>	<ul style="list-style-type: none"> <li>Compliance with ARSD 12:56</li> </ul>	<ul style="list-style-type: none"> <li>State law related to herbicide application and operators</li> </ul>
<b>Noise</b>	<ul style="list-style-type: none"> <li>Local noise ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Project activities that exceed noise levels outside of regular construction hours may need to obtain a local variance</li> </ul>
<b>Traffic and Transportation</b>	<ul style="list-style-type: none"> <li>Local or state approval of a Maintenance of Traffic Plan</li> </ul>	<ul style="list-style-type: none"> <li>Projects that have the potential to impact emergency services because of temporary road closures or detours</li> </ul>
<b>Public Services and Utilities</b>	<ul style="list-style-type: none"> <li>Local or state approval of a Maintenance of Traffic Plan</li> </ul>	<ul style="list-style-type: none"> <li>Projects that have the potential to impact emergency services because of temporary road closures or detours</li> </ul>
<b>Hazardous Materials</b>	<ul style="list-style-type: none"> <li>Compliance with ARSD 12:56</li> </ul>	<ul style="list-style-type: none"> <li>State law related to the qualifications of herbicide application and operators</li> </ul>

## SECTION 6. SUMMARY OF IMPACTS

**Table 6-1:** summarizes the potential impacts of each alternative on the resource areas based on the analysis in Section 4. The table is organized by resource area for each alternative.

**Table 6-1: Summary of Impacts**

Resource Area	No Action	Proposed Action
<b>Geology, Soils, and Topography</b>	Major impact on soils as a result of wildfire.	<p>Negligible to minor short-term impact on soils from implementation of defensible space and hazardous fuels reduction projects.</p> <p>Moderate short-term impacts from the chaining of soils or other use of heavy equipment.</p> <p>Minor to moderate long-term benefits from the reduction in erosion and sedimentation with soil stabilization projects.</p>
<b>Air Quality</b>	Major short-term impact on air quality from a wildfire.	<p>Minor short-term impact on air quality from equipment and vehicles used to implement projects.</p> <p>No new emission sources and no long-term air quality impacts.</p> <p>Long-term benefit from the reduction in wildfire hazards and associated air quality impacts.</p>
<b>Visual Quality and Aesthetics</b>	Moderate short-term impact on visual quality as a result of a wildfire.	Impact dependent on project and proximity to sensitive sites such as NRHP-listed historic sites or federally designated wild and scenic rivers.

## Summary of Impacts

Resource Area	No Action	Proposed Action
<b>Water Quality and Water Resources</b>	Minor to major impacts on water quality and sedimentation depending on the size and intensity of the wildfire and subsequent erosion due to the loss of vegetation.	<p>Minor to moderate short-term impact from erosion and sedimentation related to mitigation activities.</p> <p>Minor short-term impacts from the chaining of soils.</p> <p>Minor to moderate long-term benefits from the reduction in erosion and sedimentation from soil stabilization and hazard tree removal projects (used for contour erosion control).</p>
<b>Floodplains</b>	Moderate long-term impact on floodplain functions from the loss of vegetation/groundcover; erosion and sedimentation as a result of wildfire.	<p>Minor short-term impact from erosion and sedimentation related to mitigation activities that remove vegetation.</p> <p>Minor to moderate long-term benefits to floodplain functions from soil stabilization projects.</p>
<b>Wetlands</b>	Major long-term impact from the loss of vegetation/groundcover and erosion and sedimentation into wetlands as a result of a wildfire.	<p>Minor to moderate short-term impact from erosion and sedimentation related to hazard mitigation activities that remove vegetation.</p> <p>Minor to moderate long-term benefits from the increase in stormwater infiltration, and reduction in erosion and sedimentation from soil stabilization projects.</p>
<b>Wild and Scenic Rivers</b>	Minor to major impacts on water quality and sedimentation depending on the size and intensity of the wildfire and subsequent erosion due to the loss of vegetation.	Impact dependent on project and proximity to federally designated wild and scenic rivers.

## Summary of Impacts

Resource Area	No Action	Proposed Action
<b>Vegetation</b>	<p>Major long-term impact on trees and vegetation as a result of wildfire.</p> <p>Some plant species would benefit from fires that reset the successional stage of the vegetation.</p>	<p>Minor to moderate short-term impact from the removal of vegetation.</p> <p>Minor to moderate long-term benefits from the reduction in wildfire hazards and reseeding.</p>
<b>Fish and Wildlife</b>	<p>Major long-term impact on fish and wildlife habitat as a result of wildfire.</p>	<p>Minor short-term impact from altered wildlife behavior, disruption of foraging, breeding, or resting behaviors affecting the health of species and populations.</p> <p>Minor to moderate long-term benefits from the replacement of vegetation lost to wildfire through reseeding.</p> <p>Minor to moderate impact on certain woodpecker bird species that use burned trees as habitat.</p>
<b>Threatened and Endangered Species</b>	<p>Moderate to major long-term impact on threatened and endangered species as a result of wildfire.</p>	<p>No effect to moderate effect to threatened and endangered species and critical habitat depending on the project and location.</p>
<b>Cultural Resources</b>	<p>Major impact on cultural resources as a result of the damage or destruction of historic properties as a result of wildfire.</p>	<p>None or minor impacts on historic properties.</p>
<b>Environmental Justice</b>	<p>No disproportionate and adverse effects.</p>	<p>No disproportionate and adverse effects.</p>
<b>Land Use</b>	<p>Major, short-term impact on land use from the effects of wildfires, including floods, erosion, and mudslides as a result of wildfire.</p>	<p>Long-term benefits to existing land use by reducing the potential for wildfire hazards or post-fire impacts.</p>

## Summary of Impacts

Resource Area	No Action	Proposed Action
<b>Public Health and Safety</b>	<p>Long-term risk of wildfire would remain.</p> <p>Short term post-fire effects, such as flooding, erosion, mudslides, and air quality impacts as a result of wildfire.</p>	<p>Long-term benefits from the reduction in wildfire hazards and post-fire impacts such as flooding, erosion, mudslides, water and air quality impacts.</p> <p>Long-term benefits to emergency response.</p> <p>Minor short-term impacts from the use of herbicides.</p>
<b>Noise</b>	No impact.	<p>Minor short-term impact from the use of vehicles and equipment for the hazard mitigation activities.</p> <p>No new sources of noise and no long-term impact from any hazard mitigation activity.</p>
<b>Traffic and Transportation</b>	Minor short-term impact on transportation facilities as a result of closures.	<p>Minor short-term impact from the mitigation activities that cause temporary road closures or detours.</p> <p>Long-term reduction in risk of road closures or damage because of wildfires.</p>
<b>Public Services and Utilities</b>	Moderate to major impact on public services and utilities or to the function of emergency services from damaged infrastructure as a result of wildfire.	<p>Minor short-term impact from temporary road closures or detours.</p> <p>Long-term benefits from the reduction in wildfire risks and post-fire impacts that cause flash flooding, mudslides, erosion, road closures, or emergency response delays.</p>

## Summary of Impacts

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Resource Area	No Action	Proposed Action
<b>Hazardous Materials</b>	Major long-term impact from wildfires causing damage to hazardous material storage facilities, major environmental contamination, or explosions.	<p>Minor short-term impact from leaks and spills caused by vehicles and equipment used to implement the mitigation activity.</p> <p>Minor impact from the use of herbicides.</p> <p>Potential for exposure to contaminated materials that had not been previously identified in the course of project implementation.</p> <p>Long-term reduction in wildfire hazards or post-fire impacts on facilities that store hazardous materials.</p>



## **SECTION 7. PUBLIC INVOLVEMENT**

### **NOTICE OF INTENT TO PREPARE A PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (PEA) FOR WILDFIRE MITIGATION**

The Federal Emergency Management Agency (FEMA) announces its intent to prepare a Programmatic Environmental Assessment (PEA) for wildfire mitigation projects throughout the State of South Dakota.

Due to the increase in the quantity of vegetative ground and ladder fuels, surface fires today move easily into the tree canopy and fuel destructive crown fires. The purpose of this action is to reduce the wildfire hazard in urban interface communities and reduce hazards that may occur in areas that have experienced a wildfire. Wildfire hazard mitigation activities are funded under FEMA's Hazard Mitigation Assistance (HMA) programs, as authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (Stafford Act). Currently, requirements for hazard mitigation activities are found in the FEMA Hazard Mitigation Assistance Guidance, or as amended.

In 2018, Section 1204 of the Disaster Recovery Reform Act (DRRA) amended the Stafford Act, authorizing FEMA to provide Hazard Mitigation Grant Program funding in areas that received Fire Management Assistance Grants (FMAG) to include areas that have experienced a major fire since January 1, 2016. Historically, the FMAG program has provided funding for the mitigation, management, and control of fires on non-federal lands that threaten such destruction as would constitute a major disaster. Section 1205 of the DRRA explicitly expanded eligible wildfire mitigation activities under the HMA programs to include certain post-fire mitigation activities.

FEMA hereby publishes this notice of intent to prepare a PEA for these actions, pursuant to the National Environmental Policy Act (PL 91-190) and associated environmental statutes, as implemented in FEMA's regulations 44 CFR Part 10. Notice is also published in accordance with the National Historic Preservation Act, as implemented in 36 CFR Part 800; and Executive Order 11988, Floodplain Management and Executive Order 11990, Wetlands Protection, as implemented in 44 CFR Part 9, since these actions may have the potential to affect historic, cultural, and archaeological resources, floodplains, and wetlands.

This statewide PEA will address the purpose and need of the proposed projects, project alternatives considered (including the "No Action" alternative), affected environment, environmental consequences, and impact mitigation measures. The proposed action(s) being considered for funding are fire-related mitigation activities, such as maintenance of defensible space and hazardous fuels reduction, and activities that reduce hazards associated with burned landscapes, such as erosion and flooding, noxious weeds, and hazardous burned trees. No open burning will occur as a result of the proposed projects. Appropriate Best Management Practices will be implemented, and all actions must comply with applicable federal, tribal, state, and local regulations and requirements. Once completed, the draft PEA will be available for public review and comment.

A public comment period related to the alternatives, as outlined in this 'Notice of Intent,' or other possible alternatives will remain open for 15 days following publication of this notice. In

addition to this initial comment period, a final comment period will be opened for notice of availability of the Draft PEA.

Interested persons may provide comments or obtain more detailed information about the alternatives by contacting Daniel Jones, FEMA Region VIII, Environmental Specialist, Denver Federal Center, PO Box 25267 Denver, CO 80225, [daniel.jones5@fema.dhs.gov](mailto:daniel.jones5@fema.dhs.gov). Comments will be accepted from the affected public; local, state, tribal and federal agencies; and other interested parties in order to consider and evaluate environmental impacts of the proposed projects.

## SECTION 8. LIST OF PREPARERS

The following is a list of preparers who contributed to the development of the Wildfire Hazard Mitigation Projects in South Dakota Programmatic Environmental Assessment for FEMA. The individuals listed below had principal roles in the preparation of this document.

### CDM Smith

Preparers	Degree	Experience and Expertise	Role in Preparation
Emma Argiroff	Master of Urban Planning	Environmental Planning	Air Quality, Water Resources, Floodplains, Wetlands, Wild and Scenic Rivers, Land Use, Public Health and Safety, Noise, Hazardous Materials
Kacey Bates	Master of Geospatial Information Science and Technology	GIS	Figures and Mapping
Mandi Caudill	PhD, Environmental Science	Environmental Science	Technical Review for Water Resources, Vegetation, and Fish and Wildlife
Wilson Fogler	Bachelor of Science, Forestry (Wildlife Habitat Management and Conservation)	Environmental Science	Geology and Soils, Vegetation, Fish and Wildlife, Threatened and Endangered Species
Alan Hachey, AICP	Master of Regional Planning	NEPA Compliance	Technical Lead, Soils and Geology
Jennifer Jones	Master of Science, Environmental Science	Environmental Science	Threatened and Endangered Species
Desiree Joseph	Master of Environmental Pollution Control	Project Manager	Project Manager
Drew Poulter	Bachelor of Science, City and Regional Planning	Environmental Planning	Socioeconomics, Environmental Justice, Public Services, and Utilities
Mary Lynne Rainey	Master of Arts, Anthropology	Section 106 Compliance	Cultural Resources

## List of Preparers

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Preparers	Degree	Experience and Expertise	Role in Preparation
Kate Stenberg	PhD, Wildlife and Fisheries Science and Regional Planning; Master of Environmental Administration	NEPA Compliance	Quality Control
Melissa Vagi	Master of Journalism	Technical Editor	Editorial Review
John Wondolleck	Master of Zoology	Senior Planner	NEPA Documentation/Review

### Federal Emergency Management Agency

Reviewers	Role in Preparation
Daniel Jones	Project Monitor
Richard Myers	Technical Monitor
Richard Hansen	Region 8 Mitigation Staff
Steve Hardegen	Regional Environmental Officer

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## **Appendix A    Compliance Checklist**

## ***Part I***

<b>Wildfire Mitigation Projects in the State of South Dakota</b>	Date:	Project Code:
<b>Assessment under the Wildfire Mitigation Projects in the State of South Dakota Programmatic Environmental Assessment (PEA) and Finding of No Significant Impact (FONSI)</b>		
Disaster Description and Date:		
Project Name and Location: Include address and coordinates.		
Name and Contact Information of Project Primary Point of Contact:		
Comprehensive Project Description:		

### **PEA Alternative Used** (Check all that apply)

- ☐ Alternative 1 – No Alternative
- ☐ Alternative 2 – Defensible Space
- ☐ Alternative 3 – Hazardous Fuel Reduction
- ☐ Alternative 4 – Post-fire Soil Stabilization

## I. Evaluation

### ENVIRONMENTAL IMPACT ASSESSMENT:

Document impacts on human, socio economic, or natural environment for environmental setting or circumstances.

Setting/Resource/Circumstance	Are Impacts Consistent with Descriptions in PEA? (Yes/No)	Are There Additional Impacts? (Yes/No)	Date Reviewed	Are Site Specific Study Documents Attached? (Yes/No)
Geology, Soils and Land Use				
Transportation Facilities				
Safety and Occupational Health				
Socioeconomics and Environmental Justice				
Air Quality				
Noise				
Public Services and Utilities				
Water Resources				
Biological Resources				
Cultural Resources				
<b>REGULATORY CHANGES:</b> Document changes to laws, regulations, and/or guidelines since signature of PEA/FONSI:				
<b>IMPACTS ASSESSMENT:</b> For items checked as having additional impacts: assess the affected natural and socio-economic environment, impacts and new issues/concerns which may now exist:				
<b>MITIGATION:</b> List specific mitigation measures for each resource impacted (both impacts from PEA or additional impacts):				

**II. Public/Agency Involvement (if any)**

Has there been opportunity for public involvement? Document any public meetings, notices, & websites, and/or document agency coordination. For each provide dates, and coordination. What agencies are involved?
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**III. Permits**

List required permits and status of permit:
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**IV. Attachments Listed**

List maps, studies, background data, permits, etc.

## V. Conclusion and Recommendation

- ☐ The project is consistent with the alternatives and impacts as described in the PEA.
- ☐ The project generally is consistent with the alternatives and impacts as described in the PEA, but includes some minor impacts not described in the PEA which are documented in this checklist.
- ☐ The project requires a Supplemental Environmental Assessment or Environmental Impact Statement because (1) creates impacts not described in the PEA; (2) creates impacts greater in magnitude, extent, or duration than those described in the PEA; or (3) requires additional mitigation measures that are not described in the PEA to keep impacts below significant levels.

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Applicant or Responsible Entity Signature

Date

---

Funding Agency

Date

Upon completion please submit this checklist and all attachments to Rick Myers  
(Richard.Myers2@fema.dhs.gov), FEMA Region VIII, Deputy Regional Environmental  
Officer, for the purpose of tracking cumulative impacts.