

National Park Service

Mississippi National River and Recreation Area



Environmental Assessment for the Fire Management Plan



**Coldwater Spring Unit
and
Mississippi National River and Recreation Area**

**Mississippi National River and Recreation Area
Minnesota
Coldwater Spring / Mississippi National River and
Recreation Area Fire Management Plan
Environmental Assessment**

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CONTENTS

PURPOSE AND NEED	1
Introduction	1
Purpose and Need.....	6
Issues and Impact Topics	7
Impact Topics Considered but Dismissed	8
ALTERNATIVES	10
Introduction	10
Definition of Treatment Methods.....	10
Mechanical Treatments	10
Prescribed Fire	10
Alternative 1: No Action, Continue Current management	11
Alternative 2: Proposed Action, Implement Fire Management Plan	11
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES.....	15
Introduction	15
Analysis of Cumulative Impacts	15
Public Health and Safety	17
Affected Environment.....	17
Environmental Consequences	17
Biological Resources	21
Affected Environment.....	21
Environmental Consequences	26
Air Quality	31
Affected Environment.....	31
Environmental Consequences	31
CONSULTATION AND COORDINATION	34
PREPARERS AND REVIEWERS	37
LITERATURE CITED	38

TABLES

Table 1. Coldwater Spring Vegetation Subunit Characterization.....	24
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FIGURES

Figure 1. Mississippi National River and Recreation Area Vicinity	2
Figure 2. Coldwater Spring Vicinity	3
Figure 3: Properties Comprising Coldwater Spring Unit... ..	4
Figure 4: Fort Snelling Vicinity Property Ownership.....	5
Figure 5: Coldwater Spring Unit & Fire Management Subunits & Features ...	14
Figure.6. Coldwater Spring Vegetation Subunit Communities.....	23

PURPOSE AND NEED

INTRODUCTION

The Mississippi National River and Recreation Area (NRRA), a unit of the National Park System, spans approximately 72 river miles of the Mississippi River corridor as it flows through the Minneapolis-St. Paul metropolitan area (Figure 1). The purpose of Mississippi NRRA is to promote the protection, preservation, enhancement, and enjoyment of the nationally significant resources and values of the Mississippi River through cooperative federal, state, and local comprehensive planning, management, and coordination.

The Mississippi NRRA congressionally authorized park boundary encompasses 54,000 acres. The National Park Service (NPS) has full management authority over land at Coldwater Spring and nine islands in the river corridor, totaling approximately 65 acres. The Coldwater Spring Unit is located near the confluence of the Mississippi and Minnesota Rivers (Figure 2) and within Fort Snelling unincorporated area of Hennepin County.

The Coldwater Spring Unit encompasses approximately 83 acres (Figure 4). The NPS owns approximately 40 acres and has or will have memoranda with the U.S. Veterans Affairs (22 acres) and the Minnesota Historical Society (21 acres) to manage these properties as part of the Coldwater Spring Unit. The Coldwater Spring Unit is characterized by the following plant communities as defined by the Minnesota Department of Natural Resources (2005a, 2005b): southern mesic prairie (UPs23), pin oak – bur oak woodland (FDs37b), southern floodplain forest (FFs68), southern terrace forest (FFs59), southern wet ash swamp (WFs57), southern wet mesic hardwood forest (MHs49), southern mesic savanna (Ups24), and sugar maple – basswood forest (MHs39a). The NPS has re-established by planting approximately 19 acres of prairie and oak savanna communities at the Coldwater Spring Unit since 2011.

Prescribed fire, in addition to other management techniques, is a best management practice used to maintain healthy and resilient fire dependent ecosystems.

The Coldwater Spring complex is within one mile of the northeast corner of Minneapolis-St. Paul (MSP) International Airport (Figure 3). The airport flight patterns are managed by the Metropolitan Airports Commission (MAC). The National Park Service currently has an informal agreement with MAC regarding smoke management and other operations at the Coldwater Spring Unit. NPS fire management staff will notify MAC prior to a burn and inform them of the burn plan.

The National Park Service has developed a comprehensive fire management plan (FMP) to comply with revised direction found in the 2009 Guidance for Implementation of Federal Wildland Fire Management Policy (USDA/USDI 2009) and Office of Wildland Management Policy Memorandum 2014-005 Subject: Fire Management Plans (USDI 2015). This environmental assessment (EA) analyzes two fire management alternatives (see the “Alternatives” chapter for detailed information):

Alternative 1: No Action. Continue with current fire management practices.

Alternative 2: Proposed Action. Implement a new fire management plan that would include the use of prescribed burning.

FIGURE 1. MISSISSIPPI NATIONAL RIVER AND RECREATION AREA VICINITY

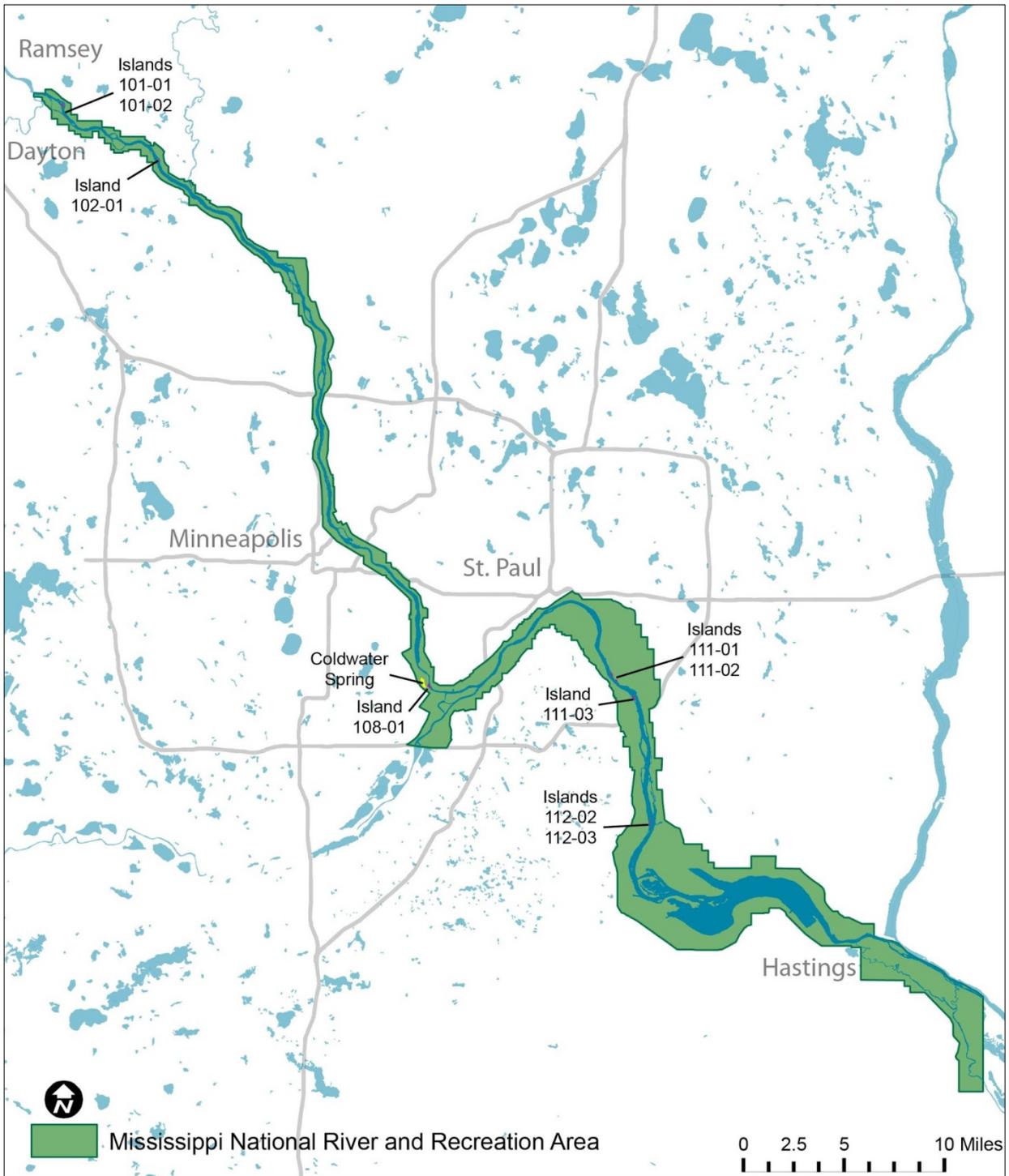


FIGURE 3: FORT SNELLING PROPERTY OWNERSHIP





FIGURE 4: PROPERTIES COMPRISING THE NPS COLDWATER SPRING UNIT

PURPOSE AND NEED

The purpose of the proposed action is to establish a fire management plan for the Mississippi NRRRA and to establish long-term goals and standards regarding human safety, ecosystem management, and management partnerships relating to the use of prescribed fire on the Coldwater Spring Unit and the suppression of wildland (unplanned) fire throughout the Mississippi NRRRA. Due to the proximity of NPS holdings to land maintained by several other agencies, interagency cooperation is also essential to achieve safety and fire management goals.

The National Park Service has a responsibility to protect NPS resources and values and provide for the prevention and management of wildfires. High fuel loads increase the rate of spread, intensity, and flame length of wildfires, thereby making wildfires more difficult to suppress and leading to greater threats to lives, resources, and property. It is therefore beneficial to use prescribed fire to reduce the fuel load.

Areas within the Mississippi NRRRA corridor that are not being actively managed are contributing to the spread of invasive plant and animal species, further necessitating active mechanical and fire-based management activities. Management in the areas surrounding the Coldwater Spring Unit ranges from the maintenance of park-like conditions to areas with no active management.

A variety of treatment methods are needed to restore, protect, and manage native plant communities to ensure that their viability is sustained over time and that they continue to contribute to the natural botanical diversity of the Mississippi NRRRA and Coldwater Spring Unit. Since 2011, the NPS has been re-establishing prairie and oak savanna communities in the Coldwater Spring Unit making the use of prescribed fire as a management tool a necessity.

According to the Mississippi NRRRA's natural resource condition assessment (Kraft 2014), the distribution of vegetation types are outside of their natural historic ranges, and the Mississippi NRRRA is at high risk for invasion by non-native species. Eradication efforts in several areas are underway, but without a systematic approach to both controlling the invasive species and surveying their spread, it is unknown what effects efforts to control are having. Along with other control methods that are not evaluated in this EA (e.g. chemical or biological invasive controls), control of invasive plant species could be affected through the use of prescribed fire and mechanical fuels reduction.

A fire management plan is needed to provide a detailed reference and doctrine for the implementation of fire management policy and objectives. This plan would address how to apply prescribed fire for land management in safe, efficient ways, and how to suppress unplanned fire in instances of wildfire or escape.

The specific fire management goals include:

- 1) Protect human life, communities, and resources from the adverse effects of unplanned fire, without compromising safety.
- 2) Maintain and restore fire adapted tallgrass prairie and oak savanna, using appropriate tools and techniques, in a manner that will provide sustainable, ecological, and social benefits.
- 3) Integrate knowledge generated through fire and natural resource research into fire management priorities, decisions, and actions.
- 4) Communicate and coordinate with other agencies and stakeholders to pursue common fire-use and suppression goals, programs, and projects.
- 5) Build and promote organizational effectiveness by building program capacity, leadership, and effective management practices.

- 6) Manage planned and unplanned ignitions according to federal, state, and local regulations.
- 7) Promote public understanding of fire management programs and objectives.

Prescribed burns at the Coldwater Spring Unit to manage fire dependent communities include:

- 1) Prairie subunits:
 - a. Encourage native grass and forbs species' and native animal species' dominance and persistence.
 - b. Control invasive and woody plant species.
- 2) Oak savanna subunits:
 - a. Encourage native grass, forbs, tree, and shrub species' and native animal species' dominance and persistence.
 - b. Control invasive and woody plant species.
- 3) Forest subunits:
 - a. Reduce and control fuel loads and control invasive species.

ISSUES AND IMPACT TOPICS

Impact topics are resources of concern that could be affected, either beneficially or adversely, by the alternatives presented in this EA. The impact topics were identified based on internal scoping, current site conditions, federal laws, regulations, executive orders, and NPS *Management Policies* (NPS 2006a).

The “Affected Environment and Environmental Consequences” chapter presents the resources and conditions associated with each topic, and the potential impacts that could result from implementing either the proposed action or no-action alternative.

Public Health and Safety. At the forefront of NPS plans and actions is providing a safe and healthy environment for NPS visitors, staff, and neighbors. Smoke from prescribed fires could affect air quality, thus park visitors, adjacent landowners, and local communities could be adversely impacted. Air quality, especially smoke from fires, can impact visibility in adjacent areas, including the MSP airport, and might cause safety concerns for vehicles traveling on highways and aircraft. Adjacent freeways and urban arterials have high daily traffic volumes. Dense smoke could slow or impede traffic flow. Smoke could cause visibility problems for the airport. The Coldwater Spring Unit is under an airport flight path (however this flight path is rarely used).

Biological Resources (Vegetation and Wildlife). A prolonged lack of active native land management at the Coldwater Spring Unit, in combination with disturbance from the removal of structures on the property, resulted in the inundation of the prairie area with invasive grasses and forbs. The native grasses and forbs that have been broadcast, frost seeded and seedlings planted on the Coldwater Spring Unit prairie and oak savanna have begun to spread and mature. Without fire and the active clearing of invasive species, however, the native grasses and forbs are less likely to persist and reproduce, as they will be outcompeted by the faster-growing, non-native pioneer species. The use of prescribed burning would promote native species regeneration and restoration success. Controlling invasive/exotic plants and maintaining biodiversity in fire dependent habitats would improve habitat quality and quantity for terrestrial and aquatic wildlife species.

Initially after a burn, the potential would exist for invasive/exotic species to be re-introduced from adjacent lands that have not been burned or managed for removal. This re-introduction would generally be limited in scope, but none-the-less likely. The NPS is coordinating and currently working with those landowners to remove invasive species and restore native habitat to prevent reinvasion onto Coldwater. Continued future prescribed burns, as well as other methods of exotic species management that are not addressed in this EA,

would control any introduction. Healthy, fire dependent ecosystems/communities are naturally resistant to invasive/exotic species re-introduction if managed properly.

Air Quality. The 1963 Clean Air Act (42 USC 7401 et seq., as amended) stipulates that federal land managers have an affirmative responsibility to protect a park's air quality from adverse air pollution impacts. Prescribed burns release carbon and particulates that would affect air quality. Air quality could be affected to varying degrees by prescribed fire activities. Emissions from smoke could impact downwind communities. The Coldwater Spring unit is located in an urban setting in which air quality is moderate to begin with, meaning that the addition of natural fire particulates may lead to poor air quality conditions when burn conditions are not appropriate.

Impact Topics Considered but Dismissed

The following topics were initially considered but dismissed from detailed analysis.

Cultural Resources. The National Historic Preservation Act, as amended in 2000 (16 USC 470 et. seq.), and the NPS Director's Order #28: Cultural Resource Management and NPS Management Policies (2006) require consideration of impacts on cultural resources listed on or eligible for listing on the National Register of Historic Places.

Historic Structures - Coldwater Spring historic resources are comprised of the stone spring house, spring, and associated reservoir. The spring, springhouse, and reservoir are contributing elements to the Fort Snelling National Historic Landmark (NHL) and National Register Historic District and are the remaining elements of a waterworks facility that supplied water for the fort. Actions that could adversely affect the flow of water and structures would constitute an adverse effect on the quality that makes the spring a contributing element to the NHL and National Register District (NPS 2006b). Prescribed fire operations would control the location and conditions of burn operations and fire breaks would be maintained around the spring house and reservoir through mechanical methods. The likelihood of fire reaching historic structures would be low and the resistance of stone spring house, spring, and reservoir to fire effects would be high. The adverse effects on structures or water quality would be negligible, and historic structures are therefore dismissed from analysis.

Ethnographic Resources -- Five federally recognized tribes, (four Dakota and one Iowa) have indicated the Coldwater Spring site is sacred under Executive Order 13007, and other tribes, while not declaring it sacred, have stated that it is a site of historic and cultural importance.

Under Executive Order 13007, federal agencies are to accommodate access to and ceremonial use of sacred sites and work to avoid adversely affecting the physical integrity of sacred sites. Ethnographic resources could be exposed to prescribed fire and, without fire breaks and operations planning, could be adversely affected. NPS would work with tribes and work crews to identify and protect ethnographic resources to be avoided and protected during prescribed burn operations. Over time, fuel loads would be reduced by prescribed fire and would reduce or eliminate the impact of unplanned fires to ethnographic resources or tribal member access to them. Any adverse impacts to ethnographic resources and access would be negligible, localized, and short-term. Culturally important plants, discussed further under vegetation environmental consequences section, are a part of the fire-dependent prairie vegetation community and would benefit over the long-term from improvements to prairie vegetation health and sustainability provided by prescribed fire. Therefore, ethnographic resources are dismissed from further evaluation.

Archeological Resources. Archeological survey and testing demonstrates that much of the Coldwater Springs Unit is disturbed or buried by thick, recent fill deposits. Shallow deposits may be encountered near the spring

and springhouse where mechanical treatments would be used to create firebreaks. Since mechanical treatments for either alternative are the same and consistent with current management practices, clearing vegetation would have no adverse impacts on archeological resources. Prescribed burns are expected to be low intensity and the temperature of the ground surface is not expected to reach a threshold where the direct effects of fire or the indirect effect of heating soil would adversely affect these kinds of remains. Ground disturbing activities would not occur during prescribed burn operations. Therefore, archeological resources are dismissed from analysis.

Species of Special Concern. Several species of special concern are present in the Mississippi NRRA, including the rusty patch bumblebee, northern long eared bat, Western fox snake, Bells vireo, Louisiana waterthrush, and woolly milkweed. Woolly milkweed has potential presence at Coldwater Spring, while it has been anecdotally identified it has not been verified. Woolly milkweed is a part of the fire-dependent prairie plant community and impacts from prescribed burning would be natural and positive. Rusty patched bumblebee (RPB) has not been identified at the site, although habitat would support its presence and the Coldwater Spring Unit is in one of the RPB high potential zones. Per the U. S. Fish and Wildlife Service (USFWS) guidance, prescribed fire will be rotated to ensure substantial refugia for the RPB is available each year. When possible, prescribed burns will not take place between March - September to avoid active season for the RPB queens and their colonies. Late fall prescribed fire will be used when possible, and management actions are likely to benefit bees and pollinators in general (N. Smarjesse, personal communication, May 2, 2017). Species of special concern are dismissed from analysis.

Soils and Geology. Mechanical treatments and prescribed burns have the potential to impact soils, but the level of treatment proposed in this EA would not lead to changes in soil chemistry, soil compaction, or soil loss, removal, or contamination.

Wetlands and Water Quality. Mechanical treatments and prescribed burns would not diminish the overall quality and quantity of surface water or wetland in the Coldwater Spring unit. The wetland areas embedded in the Coldwater Spring Unit prairie and savanna areas are small, and do not contain significant amounts of emergent plants around the edges. Thus, these areas are treated the same as the surrounding landscape. Drainage characteristics, hydrology, and natural movement of ground and surface waters would not be altered. There would be no destruction, loss, or degradation of wetland and riparian resources.

Visitor Use and Experience. Visitors to the Coldwater Spring unit could experience some effect from prescribed fire and mechanical treatments. During prescribed fire operations, smoke would be present, however, burns would be one to five hours in duration, planned in accordance with weather conditions, and conducted during periods of lower visitation. Closures of trail would be minimized or not necessary depending on location and timing of operations. Fire operations would result in staff activity and noise. Smoke management and operations planning would mitigate/minimize impacts on experience. Visual evidence of the fire would persist until new growth occurred. Over time, prescribed burns would reduce fuel loads and increase healthy, sustainable prairie and oak savanna communities. This would also reduce the frequency, duration, and intensity of possible unplanned fires. This would reduce the severity of impacts to visitor use and experience (e.g. reduce length of closures from unplanned fire). Prescribed fire would improve restored prairie ecosystems and improve the quality of the natural resources that visitors would encounter and the opportunities for education and interpretation. Adverse impacts to visitor use and experience would, therefore, be negligible, localized, and short-term, and would be balanced out by long-term benefits of enhanced resource conditions and opportunities for education and interpretation. Therefore, visitor use and experience is dismissed from further evaluation

ALTERNATIVES

INTRODUCTION

The fuels management program of the National Park Service has become increasingly important for reducing the risk of severe wildfire to human communities and for maintaining or improving the integrity of park ecosystems. As stated in NPS Reference Manual (RM)-18 (NPS 2014),

NPS fuels management program objectives may include, but are not limited to, maintaining natural processes and natural fire regimes, replicating the effects of natural fire, maintaining cultural and historic scenes, reducing hazardous fuels, managing condition class, managing non-native species, and preserving endangered species and habitat. Throughout the NPS, fuels management treatments [such as mechanical treatments and prescribed fire] are also used to accomplish basic maintenance needs, including maintaining open areas — such as scenic vistas, trails, and roadsides — and disposing of vegetation and debris. Fuels management includes not only naturally occurring fuels but also accumulation of fuels resulting from resource management and land-use activities.

RM-18, chapter 7 states: “Specific non-fire fuels treatments include any vegetation manipulation and wildland fuels removal or modification undertaken to (1) reduce the likelihood of ignition, crowning potential, and fire intensity; (2) lessen potential damage and resistance to control; or (3) limit the spread and proliferation of non-native species and diseases.” Mechanical and manual treatments may also be used in conjunction with prescribed fire treatments as part of the overall treatment process to meet or maintain fuels management goals and objectives. Prescribed fire planning and implementation is conducted in accordance with NPS RM-18 Chapters 4 and 7 (NPS 2014), Interagency Standards for Fire and Fire Aviation Operations (USDA/USDI 2016), and the Interagency Prescribed Fire Planning and Implementation Procedures Guide (NWCG 2014a).

DEFINITION OF TREATMENT METHODS

Mechanical Treatments

Mechanical and manual treatments (also referred to as nonfire fuels treatments) are generally used to remove concentrations of fuels or invasive plants that may not be treated by prescribed fire due to the size and amount of material needing to be removed.

Manual treatments use hand-held tools (such as an ax, Pulaski, cross-cut saw, pruner, shovel) and hand-held power tools (chainsaws, weed eaters, hand-held brush cutters, leaf blowers, and other specialty equipment) to cut, clear, or prune herbaceous and woody species. Mechanical treatments use equipment (such as mowers, chippers, and mulchers) to mow fields, remove fuels, create and maintain firebreaks by removing fuel concentrations, mow “green” fire breaks, and remove single or small groups of trees. Roads can be used as firebreaks so vegetation adjacent to roads may also be removed or reduced to lessen fire threat. The use of the term “mechanical treatments” in this EA refers to both mechanical treatments and manual treatments as described above.

Prescribed Fire

Prescribed fire is a planned, intentionally ignited fire that is conducted according to site-specific objectives, prescriptions, and mitigating measures identified in individual prescribed burn plans — a burn plan is

prepared prior to every burn. The *Guidance for Implementation of Federal Wildland Fire Management Policy* (USDA/USDI 2009) directs federal fire managers to use planned ignitions as one of the tools to help achieve land and resource management goals and objectives.

There are many reasons to conduct prescribed burns. Prescribed fire encourages new growth of native vegetation and helps maintain the many plant and animal species whose habitats depend on periodic fire. Prescribed fire is used to restore the role of fire in certain vegetation communities that are adapted to and benefit from fire. Fire-adapted vegetation communities (such as xeric oak) are more fire tolerant; that is, they are sustainable and resilient to impacts of wildfire. This resilience allows disturbed areas to return to their ecosystem function faster (Millar et al. 2007).

Prescribed fires can be ignited using numerous methods. For example, a fire could be ignited by hand with a drip torch (a hand-carried device that pours out a small stream of burning fuel mix); by a sphere dispenser machine that drops or dispenses a fuel mixture to the surface to ignite the surface fuels and vegetation; or with a flare gun or flare pen (NPS 2016). The firing technique (method of ignition) for each prescribed burn depends on personnel safety, current and predicted weather, topography, fuels, and the intensity of the fire needed to meet the resource objectives of the burn (TDA 2002). Atmospheric conditions should be favorable for smoke to rise into the upper air and away from smoke-sensitive areas such as highways, airports, and urban areas (TDA 2002).

ALTERNATIVE 1: NO ACTION, CONTINUE CURRENT MANAGEMENT

No action is the baseline condition against which proposed activities are compared. It is defined as continuing existing management practices into the future. Current fire management practices would remain in effect. Fire management activities at Mississippi NRRRA would include all appropriate mitigation and best management practices as outlined in NPS Management Policies 2006.

Mechanical treatments - Mechanical treatments would continue to be conducted in the Coldwater Spring area to maintain fire breaks around historic structures, to reduce fuel loads in oak savanna communities, and in other areas of the Mississippi NRRRA as needed. Up to a total of one acre could be maintained for fire breaks.

Prescribed fire - Prescribed fire to achieve resource objectives would not be implemented at any location within the Mississippi NRRRA.

Unplanned fire response - Should a fire start from natural or human-caused ignition on any lands, including NPS-owned land, within the Mississippi NRRRA boundary, staff would continue to respond with a call to 911 and state and local government entities would respond. No fire suppression capability would be maintained by the Mississippi NRRRA.

ALTERNATIVE 2: PROPOSED ACTION, IMPLEMENT FIRE MANAGEMENT PLAN

A fire management plan would be implemented for the Mississippi NRRRA.

Actions to Achieve Fire Management Goals

The fire management plan would use preventative fuel reduction methods, either through prescribed fire or mechanical removal to protect human life, communities, and resources from the adverse effects of wildfire.

Prescribed fire would be used to maintain and restore fire adapted prairie and oak savanna, using appropriate tools and techniques. The effectiveness of prescribed fire operations would be monitored to integrate knowledge generated through fire and natural resource research into fire management priorities, decisions, and actions.

Coldwater Spring Prescription

Prescribed fire operations at the Coldwater Spring Unit would occur every three to five years in prairie and oak savanna to reflect the typical fire regime of a prairie area, and to allow for the organization of resources between fire events. Prescribed fire operations would occur in the mesic forest infrequently (Minnesota Department of Natural Resources, 2005a, 2005b). As the understory restoration progresses there is likely to be a higher accumulation of perennial plant litter, especially when the herbaceous layer becomes well established. This higher litter accumulation rate could increase the need for prescribed fire to maintain diverse plant communities or lessen the chance for unplanned fire. Mississippi NRRA biologists will conduct yearly field assessments to determine a prescribed fire need.

Each fire operation for the Coldwater Spring Unit prescribed burn area would be based on assessment of fuel conditions and key weather and fire behavior parameters at the time of the operation. Prior to ignition, prescription elements would be compared against local weather forecasts and other predicted conditions to ensure operations safety and effectiveness. During implementation of the burn, if objectives would not be met, further ignition would be evaluated. Prescription parameters would be wide to accommodate established objectives while staying within fire personnel capabilities.

Fire management subunits A through H (Figure 5) are delineated along physical boundaries provided by existing trails, roads or mowed fire breaks. The breaks provided between units would allow ignitions to be sequenced and managed within the prescribed burn area according to conditions at the time of the operation. Burn operations would be weather dependent, completed in a single same day, typically lasting one to five hours, and would include all prairie and savanna subunits.

Mechanical Treatments

The spring house, two bridges, and two former Bureau of Mines building foundation remnants and ore bins at the Coldwater Spring Unit are the structures that require protection from fire, which can be done by mechanically removing fuel from around the areas before burn activities are conducted. Fuel removal would be accomplished using manual and mechanical methods. This would be the same as in Alternative 1.

Partnerships

The Coldwater Spring area includes property owned by the National Park Service, U.S. Veterans Administration (VA), and the Minnesota Historical Society (MHS). Memoranda exist or are being developed with these management partners that would support prescribed fire operations on lands not owned by NPS.

The Metropolitan Airports Commission (MAC) provides coordinated aviation services for the Minneapolis-Saint Paul International (MSP) airport, including the control of runway and flight operations. Due to concerns with the flight path for Runway 22 at MSP, prescribed burns would be coordinated with MAC to manage and minimize smoke impacts to the runway and incoming and outgoing flights. Notification of prescribed burns by NPS would continue under the informal agreement between NPS and MAC.

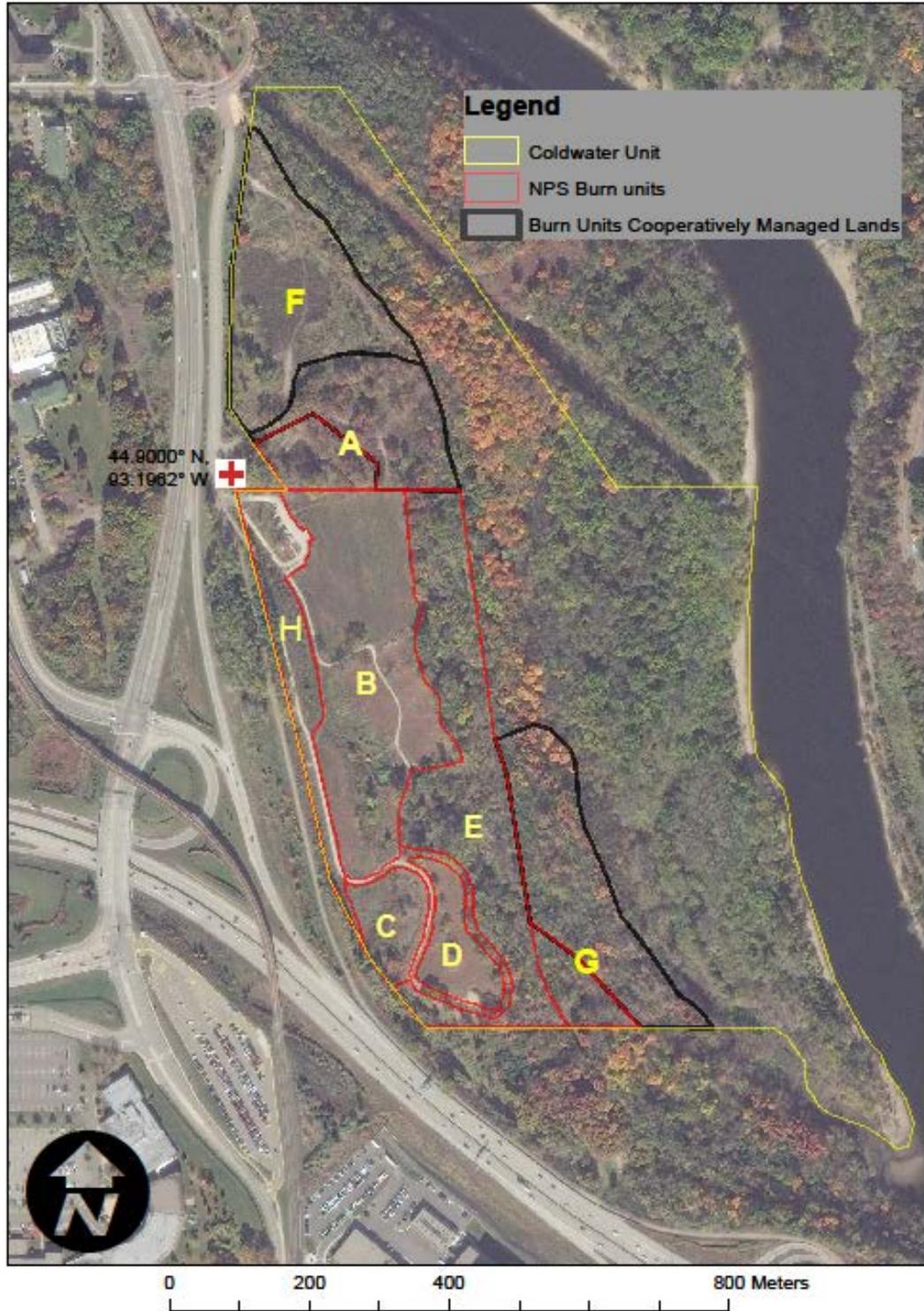
Islands

There is no strong historic role, either culturally or ecologically, of fire on the islands owned by the Mississippi NRRRA. Most of these islands are inundated by floodwaters yearly, during seasonal flood events, and are either too wet or lack enough fuel to carry fire across the islands. There are no special considerations to be made for the islands. No prescribed fire would be used and only wildfire prevention and attack measures would apply. This would be the same as the no action alternative.

Lands not owned by NPS within the Boundary

Similar to no action, throughout the Mississippi NRRRA corridor, except for the Coldwater Spring Unit as described, other federal, state and local fire management agencies would continue to be responsible for fire use and suppression on their lands. Unplanned fires would be typically suppressed following notification of emergency responders. Notification would most likely be made by citizens or local entities other than NPS via the 911 system. No fire suppression capability would be maintained by NPS.

FIGURE 5. COLDWATER SPRING UNIT, FIRE MANAGEMENT SUBUNITS



AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter describes the resources and conditions in the Mississippi NRRA, and how the proposed action and no-action alternatives would affect resources. The analysis of environmental consequences presents direct, indirect, and cumulative impacts in accordance with Council on Environmental Quality regulations (40 CFR 1502.16). The impacts are assessed in terms of context and intensity (40 CFR 1508.27). The assessment of direct, indirect, and cumulative impacts, as a result of mechanical treatments, prescribed fire, and unplanned fire response are based on literature reviews of previous studies and the expertise and judgment of the fire management team and natural and cultural resource staff.

ANALYSIS OF CUMULATIVE IMPACTS

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts are determined for each impact topic by combining the impacts of the alternative being analyzed and other past, present, and reasonably foreseeable actions that also would result in beneficial or adverse impacts. In addition, connected actions would have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography (40 CFR 1508.25). Other past, present, and reasonably foreseeable actions identified through the scoping processes are the following:

- The Minneapolis-Saint Paul International Airport is a major international airport and commercial airline hub in close proximity to the Coldwater Spring unit. In 2016, the airport served over 37.5 million passengers which was a two percent increase over 2015 and a 15 percent increase since 2010. Airline traffic is increasing and will continue to contribute to regional air pollution. (Star Tribune 2017)
- Highway traffic and congestion is increasing in the metropolitan area, including roads and highways in the proximity of the Coldwater Spring unit. Freeway congestion occurs 23.4 percent of the time during rush hours, and is expected to increase as population grows and highway system approaches capacity. Highway traffic will continue to contribute to regional air pollution (MnDOT 2015)
- There have been numerous prairie restoration projects in the Twin Cities area. Many are adjacent to or within the Mississippi NRRA boundary, including the 112-acre Pilot Knob historic site, of which 35 acres have been restored to prairie and oak savanna. In addition, there are nine acres of prairie planted by NPS and Anoka County in 1994 around Cenaiko Lake in Coon Rapids Dam Regional Park and hundreds of acres of prairie are being restored in Dakota County, including Schaars Bluff and Pine Bend Bluff overlooking the Mississippi. Hennepin, Ramsey and Washington counties have hundreds of acres of restored prairies including the 237 acre Grey Cloud Dunes Scientific and Natural area owned by the MN DNR. There are also increasing numbers of homeowners in the Twin Cities who have native prairie in place of the traditional yards around their homes.
- The US Fish and Wildlife Service conducts mechanical treatments and prescribed burns for prairie restoration and habitat improvements on lands they manage in the Minnesota Valley Wildlife Refuge. This contributes to the presence and quality of grassland vegetation and habitats in the region.

- Minnehaha Trail, a paved pedestrian and bike trail, running through the center of the Coldwater Spring Unit, will be reconstructed to improve visitor safety and use. These are cumulative impacts on visitor safety and use. The areas disturbed by construction within the trail corridor will be restored to using native plant species for prairie, oak savanna and hardwood forest landscapes.
- The Great Lakes Exotic Plant Management Team (GLEPMT) conducted inventory, treatment, and retreatment activities to manage invasive plants in the Mississippi NRRA in each year from 2004 to present. Treatment locations included the Coldwater Spring unit.

PUBLIC HEALTH AND SAFETY

Affected Environment

Fire management operations throughout the Mississippi NRRRA take place under existing policy and guidance regarding safe execution of fire management, including NPS Management Policies 2006. The Mississippi NRRRA does not maintain fire staff and relies on local fire departments to respond to and suppress unplanned fire. The surrounding fire jurisdictions that would respond to fire within the national river and recreation boundary also operate under state and federal regulations and industry best practices.

According to the natural resource condition assessment (Kraft 2014), the distribution of vegetation types at the Mississippi NRRRA are outside of their natural historic ranges. In areas where fire has not occurred, there has been limited fuels reduction activity and surface fuels have accumulated. Accumulated surface fuels can increase the intensity and extent of unplanned fires.

Coldwater Spring Unit is located proximal to the Minneapolis-Saint. Paul International Airport. Flight patterns are administered by the Metropolitan Airports Commission with whom the Mississippi NRRRA has an internal working relationship regarding management operations at the Coldwater Spring Unit. The Unit is also adjoined by properties owned by several other public agencies (Figure 4). The threat of fire spread and danger to these properties is low to nonexistent due to vegetation types and physical boundaries. The Unit is also surrounded by a heavily traveled network of roads and highways, including highways 55 and 62, Hiawatha Avenue, Minnehaha Avenue, and East 54th Street. With the close proximity of important urban functions, however, actions to manage smoke production that can affect local visibility and air quality must be considered when applying fire.

The Coldwater Spring unit is in an urban setting with moderate air quality and the addition of natural fire particulates may reduce air quality when burn conditions are not appropriate (e.g., if smoke is unable to lift out of the area because transport winds are absent). According to Environmental Protection Agency air quality standards regarding fine particles, ozone, sulfur dioxide, and carbon monoxide, the Twin Cities have been undergoing a slow increase in the number of days with moderate levels of air pollutants but a decrease in unhealthy levels from 2003-2012 (Minnesota Pollution Control Agency 2014).

Environmental Consequences

Alternative 1: No Action

Prescribed burning would not be a tool used to manage natural resources or to reduce fuel loads under the no action alternative. As a result, there would be no impact to public health and safety from this fire management method.

Under current fire management practice, fuel loads in prairie, oak savanna, and mesic hardwood communities in Coldwater Spring Unit would continue to accumulate until an unplanned fire occurred or fuels were reduced by mechanical means within the 83-acre site. Increased fuel loads would increase the potential for a higher intensity unplanned fire, particularly during dry periods. Greater fuel loads would increase uncontrolled smoke production which could occur under potentially unfavorable atmospheric conditions. This could reduce visibility and adversely affect driver safety on highways 55 and 62, Hiawatha Avenue, Minnehaha Avenue., East 54th Street, and potentially the MSP International Airport.

Smoke from unplanned fire could impact individuals using Coldwater Spring Unit trails, those at Minnehaha Regional Park, the Minnehaha off-leash dog park, and the Historic Fort Snelling facilities. There could be potential impacts of settling smoke over the river affecting recreational and commercial boat traffic in the case of high atmospheric pressure or low-wind days.

Increased surface fuels could increase fire behavior and resistance to control during an unplanned fire. Fire could spread quickly through the heavier fuel loads and burn more intensely, making fire suppression efforts more difficult. This could create greater short-term, local adverse impacts on fire responder safety as fires could take several hours longer to contain and would burn with greater intensity.

Without an improved communication and coordination plan, 911 responders and local agencies would be relied upon to notify surrounding communities and neighbors of fire events. This could result in short-term, adverse impacts on public safety if notification times are affected.

Without the reduction of surface fuel accumulation through prescribed fire, mechanical treatments would be the means to mitigate the effects of accumulated surface fuel loads. Because unplanned fire would not likely occur when atmospheric conditions were ideal, the potential would be present for increased fire intensity, smoke production, and smoke drift from unplanned fire that could have short-term, local adverse impacts to public health and safety, including to highway users, the airport, and visitors to the Coldwater Spring for several hours until a fire was suppressed.

Mechanical treatments to reduce fuels would help create safer conditions for firefighters because it would lower predicted fire behavior and shorten the time it would take to extinguish a wildfire if it occurred in areas where fuels were treated. It is unlikely that mechanical treatments would create unsafe conditions for park visitors, staff, and neighbors because, where necessary, access may be briefly restricted in the vicinity of treatments.

Cumulative Impacts. Emergency responders in the Coldwater Spring Unit would continue to extinguish unplanned fire as quickly as possible to protect NPS visitors and neighbors and mitigate adverse smoke impacts on visitors and neighbors including impacts from reduced visibility on area roads and the airport. Overall safety hazards of the surrounding metropolitan area would continue and may increase with increasing population. This includes traffic safety hazards and pollution from highway vehicles and aircraft arriving and departing from the airport. These produce overall adverse impacts to public health and safety. The additional impact of infrequent unplanned fire in the Mississippi NRRRA mitigated by mechanical treatments and requiring typically less than a day to suppress would result in a small increase to adverse local and regional cumulative impacts. This increase would likely be small enough to go unnoticed as an addition to the past, present, and reasonably foreseeable impacts described above. At worst, unplanned fire would involve small, ground-based flames and 12 hours of low lying smoke from the burning that would dissipate within a day.

Conclusions for Alternative 1. Without the reduction of surface fuel accumulation through prescribed fire, mechanical treatments would be the means to mitigate the effects of accumulated surface fuel loads. Because unplanned fire would not likely occur when atmospheric conditions were ideal, the potential for increased fire intensity and smoke production from unplanned fire could have several hours of short-term adverse impacts to public health and safety including to highway users, the airport and visitors to the Coldwater Spring Unit until the fire was suppressed. Mechanical treatments to reduce fuels would help create safer conditions for firefighters.

Overall safety hazards of the surrounding metropolitan area would continue and may increase with increasing population. This includes traffic safety hazards and pollution from highway vehicles and aircraft arriving and departing from the airport. These produce overall adverse impacts to public health and safety. The additional impact of infrequent unplanned fire in the Mississippi NRRA mitigated by mechanical treatments and requiring typically less than a day to suppress would result in a small increase to adverse, local and regional cumulative impacts.

Alternative 2: Proposed Action

Prescribed fire would be the primary management tool to reduce surface fuels accumulation and manage natural resources. The extent of adverse impacts from smoke would be limited because the Mississippi NRRA would burn up to 35 acres of prairie and oak savanna during each individual burn and each burn would be completed in one to five hours. Prescribed burns would be conducted every three to five years in restored prairie and in oak savanna and would be conducted only under favorable weather conditions. Smoke from prescribed fire would not result in long-term adverse impacts on public health and safety.

Given the proximity of the Coldwater Spring unit to private and public land and infrastructure, prescribed burns could have short-term, adverse impact on public health and safety outside park boundaries. Fire could reduce visibility along highways 55 and 62, Hiawatha Avenue, Minnehaha Avenue., East 54th Street, and potentially affect flight paths to the MSP International Airport. Smoke could impact individuals sensitive to smoke using trails, those at Minnehaha Regional Park, the Minnehaha dog park, and at Historic Fort Snelling facilities, and there would be potential impacts of settling smoke over the river affecting recreational and commercial boat traffic in the case of high atmospheric pressure or low-wind days.

Prescribed fire operations would generally be designed to occur when transport winds favor rapid dispersal away from the areas of concern listed above. Planned ignitions would not be initiated unless conditions outlined in the operation's burn plan are met. If conditions are outside of prescription, it would be up to the burn boss to wait until conditions improve. Adherence to the operation's burn plan would also reduce the probability of a prescribed fire escaping beyond a planned burn boundary.

The proposed action would use eight fire management subunits to control prescribed burn operations. The seven units would be delineated by existing trails, roads and landscape features that could serve as fire breaks. Depending on prevailing conditions, prescribed burns would be sequenced between the subunits to maximize control of the burn operation. This would decrease the possibilities of uncontrolled fire and increase public and staff safety.

Communications and coordination with surrounding fire and emergency response jurisdictions would be defined under the proposed action. This would provide notice to communities and neighbors prior to prescribed burns and improve response capabilities, if needed, and allow individuals to avoid areas/conditions that may be hazardous.

As a result, the impacts to public health and safety from prescribed burn operations would be small, adverse, and short-term because burn execution under appropriate conditions would limit smoke amount and drift, and burn durations would be only one to five hours.

Over time, prescribed fire would reduce surface fuels accumulation. This would improve predictability of fire behavior, reduce fire intensity, and reduce risk to fire staff during both prescribed fire operations and

unplanned fires. Appropriate staff training and “red card” certification would further mitigate safety risks to fire personnel. The reduction in surface fuels as a result of prescribed fire would reduce the need for mechanical methods. This would provide additional health and safety benefit by reducing the need for staff to operate equipment for mechanical fuels reduction. The direct benefits to staff health and safety would be long-term.

Cumulative Impacts. Emergency responders in the Coldwater Spring Unit would continue to extinguish unplanned fire as quickly as possible to protect NPS visitors and neighbors and mitigate adverse smoke impacts on visitors and neighbors and smoke impacts from reduced visibility on park and area roads. Prescribed fire operations would generally be designed to occur when transport winds favor rapid dispersal away from the areas of concern, while reduced surface fuel accumulations would reduce fire intensity and smoke production. Overall safety hazards of the surrounding metropolitan area would continue and may increase with increasing population. This includes traffic safety hazards and pollution from highway vehicles and aircraft arriving and departing from the airport. These produce overall adverse impacts to public health and safety. The additional impact of periodic prescribed fire (once every three to five years and lasting one to five hours) and infrequent unplanned fire under conditions of managed fuel loads would result in a small increase to adverse local and regional cumulative impacts. This increase would likely be small enough to go unnoticed as an addition to the past, present, and reasonably foreseeable impacts described above. At worst, the prescribed fire prescription would involve small, ground-based flames and 12 hours of low lying smoke from the burning that would dissipate under appropriate weather conditions before the next day

Conclusions for Alternative 2. Given the proximity of the Coldwater Spring Unit to private and public land and infrastructure, prescribed burns could have short-term, adverse impact on public health and safety outside park boundaries. Prescribed fire operations would generally be designed to occur when transport winds favor rapid dispersal away from the areas of concern and operations safety would be increased through sequencing ignitions between the fire management subunits. Communications and coordination with surrounding fire and emergency response jurisdictions would be defined under the proposed action. This would provide notice to communities and neighbors prior to prescribed burns and improve response capabilities, if needed, and allow individuals to avoid areas/conditions that may be hazardous. As a result, the direct and indirect impacts to public health and safety from prescribed burn operations would be small, adverse, and short-term.

Overall safety hazards of the surrounding metropolitan area would continue and may increase with increasing population. This includes traffic safety hazards and pollution from highway vehicles and aircraft arriving and departing from the airport. These produce overall modest adverse impacts to public health and safety. The additional impact of periodic prescribed fire (once every three to five years and lasting one to five hours) and infrequent unplanned fire under conditions of managed fuel loads would result in a small increase to adverse local and regional cumulative impacts.

BIOLOGICAL RESOURCES

Affected Environment

Vegetation

There are three distinct sections of the Mississippi NRRA with differing physiography and vegetation. At the northern end, prairie, barrens, and savanna-type vegetation historically came up to the river's edge. Today, most of this area is developed. The next section to the south is defined by a very steep gorge, and the current vegetation within the boundaries is largely dry, upland forests, and a mesic oak forest subtype. Dominant land cover types are developed areas and open water/aquatic beds. In the most southern section, south of the confluence of the Minnesota River, the valley becomes wider, and there is a greater diversity of plant communities. The vegetation communities range from floating and emergent to herbaceous-dominated, meadow-like communities to floodplain forests.

Coldwater Spring Unit falls along the transition from eastern deciduous forest to tallgrass prairie. In the vicinity of Coldwater are tallgrass prairie, red oak-white oak mesic hardwood forest, southern Minnesota floodplain forest, and southern Minnesota mesic savanna areas. Currently, mesic hardwood and floodplain forests have persisted but are heavily degraded due to disturbances involving development by the U.S. Bureau of Mines. From the 1820's to the mid-1900's European settlement eradicated tallgrass prairie from the site. This prairie, along with oak savanna, is currently being re-established at Coldwater by the NPS.

Figure 6 and Table 1 present the distribution and characterization of vegetation resources in the NPS-owned portion of the Coldwater Spring area. The 13 vegetation subunits are comprised of three primary vegetation communities; tallgrass prairie, oak savanna, and mesic hardwood forest. Small areas of wetland are interspersed within oak savanna but are not analyzed separately as discussed under impact topics dismissed from analysis. It is the three primary communities that are the subject of analysis in this EA. Total area of each community subject to fire management actions, including NPS, VA, and MHS resources, are: 35 acres of prairie and oak savanna and 10 acres of mesic hardwood forest.

Native grasses and forbs have been broadcast, frost seeded and seedlings planted on the Coldwater Spring Unit prairie and oak savanna. These native prairie and oak savanna species are spreading and maturing. Without fire and the active clearing of invasive species, however, the native grasses and forbs are less likely to persist and reproduce, as they will be outcompeted by the faster-growing, non-native pioneer species. Prescribed fire, in addition to other management techniques, would be required to fully restore and maintain the fire-dependent ecologic communities and ensure vegetative community health.

Restored oak savanna is present on NPS-owned land and on land owned by the VA. Similar to the prairie subunits, prescribed fire, in addition to other management techniques, would be required to fully restore and maintain this fire-dependent ecologic community and ensure vegetative community health. Under memoranda of agreement discussed in the description of the proposed action, non-NPS owned areas would also be subject to and benefit from NPS prescribed fire operations

Mesic hardwood forest subject to fire management action is found within NPS-owned areas of the Coldwater Spring unit (10 acres). Mesic hardwood forest is subject to accumulation of surface fuels and periodic fuel reductions may be necessary to reduce fire hazard and combat invasive species. Fuel reduction can be accomplished by mechanical methods or prescribed burning. As discussed in the alternatives descriptions, only forested areas on NPS-owned land would be the subject of fuel reduction actions under the fire management plan. Presently, surface fuel accumulation in NPS-owned mesic hardwood forest is low and

prescribed fire would be the method for future fuel reduction and likely needed infrequently (Minnesota Department of Natural Resources 2005a, 2005b)

According to the natural resource condition assessment (Kraft 2014), prior to prairie restoration, the distribution of vegetation types was outside of natural historic ranges, and the Mississippi NRRRA was and remains at high risk for invasion by non-native species. A prolonged lack of active land management at the Coldwater Spring Unit, in combination with disturbance from the removal of structures on the property, resulted in the inundation of the prairie area with invasive grasses and forbs, including smooth brome (*Bromus inermis* Leyss.), yellow sweet clover (*Melilotus officinalis* L. Lam.), red clover (*Trifolium pretense* L.), white clover (*Trifolium repens* L.), garlic mustard (*Alliaria petiolata* [M. Bieb.] Cavara & Grande), and garden yellowrocket (*Barbarea vulgaris* W.T. Ait.). Eradication efforts in several areas are underway, but without a systematic approach to both controlling the invasive species and surveying their spread, it is unknown what effects efforts to control are having. Controlling invasive plant species would require the use of prescribed fire, in addition to mechanical and chemical treatments not the subject of this EA.

FIGURE 6. COLDWATER SPRING VEGETATION SUBUNIT COMMUNITIES

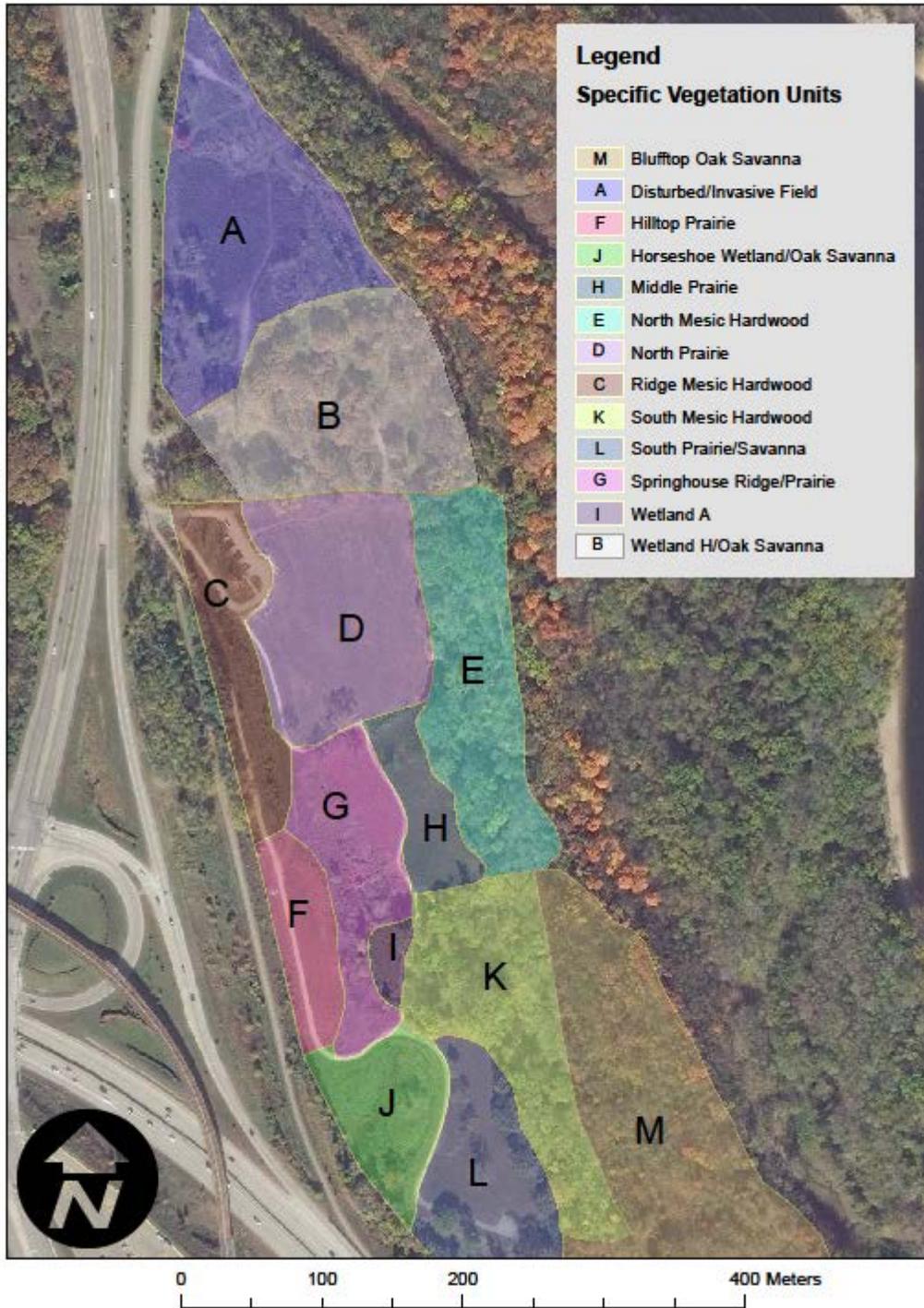


Table 1. Coldwater Spring Vegetation Subunit Characterization

Vegetation Subunit	Area (acres)	Characterization
A – Disturbed/Invasive Field	5.94	This area remains largely disturbed due to a variety of construction projects throughout the years. Large patches of invasive species like Crown vetch, Leafy spurge, and Garlic mustard have invaded and remain persistent.
B - Wetland H/Oak Savanna	5.41	Various wildflowers are present near the wetland, including Turk’s cap lily, Spotted Joe pye weed, Blue flag iris, Swamp milkweed, Prairie blazing-star, and Boneset. Sensitive ferns grow along the wetland edge, along with Willow trees, Chokecherry and Dogwood shrubs. Several old-growth Cottonwood trees tower above. A mature stand of Bur oaks grows just east of the wetland with typical oak savanna understory, including Hoary and Blue vervains, Blazing-stars, Leadplant, Goldenrods, Culver’s root, asters, and Canada anemone.
C – Ridge Mesic Hardwood	2.47	Trees include Red, Bur and Pin oaks, Hackberry, Elm, Boxelder, and Serviceberry. Various fruit-bearing shrubs and vines are present, including Chokecherry, Serviceberry, Raspberry, and Elderberry. Wild rose, Green-headed coneflower, Yellow giant hyssop, and Wild bergamot are also present.
D – North Prairie	4.75	Mesic prairie plants, including Little bluestem, Big bluestem, Indian grass, Side-oats and June grasses, and a mixture of forbs that provide nectar through the growing season: Pale purple coneflower, Cream gentian, Hoary vervain, Purple prairie clover, Wild lupine, Stiff goldenrod, Swamp and Common milkweeds, Large flower penstemon, Black-eyed Susan, Wild bergamot, Golden Alexanders, Fragrant hyssop, and several species of aster. A cluster of sapling Bur oaks was planted along the southeast edge of the north prairie.
E - North Mesic Hardwood	4.26	Trees include Cottonwood, Elms, Bitternut hickory, Boxelder, Green ash, and Ironwood. Understory plants include Virginia waterleaf, Bloodroot, Yellow violet, Wild leek, Early meadow-rue, Zigzag goldenrod, Dutchman’s breeches, Wild ginger, Wild geranium, Red baneberry, and Jewelweed. Canada moonseed and Virginia creeper vine are present, as well as Gooseberry, Chokecherry, and Dogwood.
F – Hilltop Prairie	1.47	The hilltop prairie plant community is made up of mesic prairie plants, including Little bluestem and June grasses, and a mixture of forbs that provide nectar throughout the growing season: Hoary vervain, Purple prairie clover and White prairie clover, Wild lupine, Stiff goldenrod, Butterfly-weed, Large flower penstemon, Black-eyed Susan, Wild bergamot, Golden Alexanders, Fragrant hyssop, and several species of aster. Sapling Bur oak trees are planted near the road.

TABLE 1. COLDWATER SPRING VEGETATION SUBUNIT CHARACTERIZATION (CONTINUED)

G – Springhouse Ridge/Prairie	2.81	Mesic prairie vegetation is present, including grasses such as Little bluestem, Virginia wild rye, Side-oats and June grasses, and a mixture of forbs that provide nectar through the growing season: Hoary vervain, Purple prairie clover, Stiff goldenrod, Common milkweed, Large flower penstemon, Black-eyed Susan, Wild bergamot, Golden Alexanders, Fragrant hyssop, Early false sunflower, and several species of aster. Wild grape is also present.
H – Middle Prairie	1.31	Mesic prairie vegetation is present, including grasses such as Little bluestem, Big bluestem, Indian grass, Canada wild rye, Side-oats and June grasses, and a mixture of forbs that provide nectar through the growing season: Hoary vervain, American germander, Purple prairie clover, White prairie clover, Stiff goldenrod, Swamp milkweed, Black-eyed Susan, Wild bergamot, Golden Alexanders, Fragrant hyssop, Cup plant and several species of aster.
I – Wetland A	0.35	Forbs present include Tufted loosestrife, Virginia mountain mint, Spotted Joe pye weed, Blue flag iris, Marsh marigold, Sweet flag, Blazing-star, Turtlehead, and Boneset. Willow trees, Chokecherry and Dogwood shrubs are present along the southwest edge of the wetland.
J – Horseshoe Wetland / Oak Savanna	2.01	Vegetation along wetland edges includes swamp milkweed, prairie blazing-star, Joe pye weed, willows, and dogwood shrubs, with more typical oak savanna species in the drier areas, such as: frost asters, stiff goldenrod, golden Alexanders, rough and dotted blazing-stars, and yarrow. There is a large black maple tree on the wetland's south side, and a colony of sumac along the west edge.
K – South Mesic Hardwood	4.31	Elm, Boxelder, Black walnut, Bitternut hickory, and Butternut trees are present. Understory plants include Virginia waterleaf, Bloodroot, Trillium, Jack-in-the-pulpit, Zigzag goldenrod, Wild ginger, Wild geranium, Red baneberry, and Jewelweed. Canada moonseed and Virginia creeper vines are also present. Obedient plant, Marsh marigold, and Cardinal flower are found in the wetland areas that are fed by the spring itself.
L – South Prairie/Savanna	2.87	Mesic prairie vegetation is present, including grasses such as Little bluestem, Big bluestem, Indian grass, Virginia wild rye, Side-oats and June grasses, and a mixture of forbs that provide nectar through the growing season: Hoary vervain, Purple prairie clover, Wild lupine, Stiff goldenrod, Swamp and Common milkweeds, Large flower penstemon, Black-eyed Susan, Wild bergamot, Golden Alexanders, Fragrant hyssop, and several species of aster. This area includes some mature Bur oaks along the perimeter which creates more of a savanna effect.
M – Blufftop Oak Savanna	6.7	Much of the southern portion of this unit has been cleared of buckthorn and restored. Bur oaks, black walnuts, and bitternut hickory are remnant. Forbs found in open areas include Whorled milkweed, Butterflyweed,

		<p>Cream gentian, Yellow coneflower, Partridge pea, Prairie spiderwort, Rattlesnake master, Culver’s root, Rough and Dotted blazing-stars, Prairie phlox, a variety of asters, Great blue lobelia, and Wild leek. The northern section is littered with large remnant bur oaks, but the understory is entirely invaded by buckthorn and honeysuckle. A continuation of savanna restoration into the northern section is currently underway.</p>
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Wildlife

The Mississippi NRRRA covers a 72-mile piece of the Mississippi River corridor, the largest and possibly most important riverine ecosystem in North America. The river provides the most extensive migration corridor on the continent for waterfowl and other migrating birds, and the survival of millions of birds is dependent on the quality of this habitat.

Bottomland hardwood forest provides habitat for tree-nesting ducks, such as wood ducks and mergansers, and a large bald eagle population. These forests also provide habitat for raccoons, white-tailed deer, cottontail rabbits, foxes, songbirds, upland game birds, salamanders, frogs, snakes, and turtles. This habitat includes areas that are seasonally flooded but generally well-drained during the growing season. When these areas are inundated, they also provide habitat for several fish species.

Meadow and prairie habitats are used by migratory waterfowl, raptors, deer, pheasants, wild turkeys, squirrels, coyote, mice, songbirds, and by fish when inundated. Bat concentrations identified in the corridor include a colony at Lilydale Regional Park, St. Paul, and a colony at Riverside Park, Minneapolis, both on the west bank (NPS 1994). A multitude of fish, amphibian, reptile, arthropod, and fungi species are found at Coldwater Spring Unit. Bells vireo, Louisiana waterthrush and Western fox snake are state listed species of concern in the area. Only the Western fox snake has been positively identified in the Coldwater Spring Unit.

Invasive Plants

The Mississippi NRRRA has a relatively high invasive risk (Kraft 2015). Heavy recreational use provides a common vector for plants, and the river serves as a dispersal vector for many floodplain species (Honnay 2001). The landscape near the corridor is heavily disturbed (agriculture, roads, right-of-ways, urban development) (Gignac and Dale 2007) and provides frequent and widespread opportunities for species such as Canada thistle and spotted knapweed to establish (Czarapata 2005). Alteration of the hydrologic regime can also favor an exotic species over a native of the same life form (Mortenson and Weisberg 2010).

Among the exotic species found and treated by Great Lakes Exotic Plant Management Team, more area was treated for common buckthorn than any other species. Other species that were treated over more than 1 ha (10,000 m²) included common tansy, honeysuckle, Canada thistle, and garlic mustard. Exotic and invasive species continue to be problematic are garlic mustard, burdock, bittercress, Canada thistle, common buckthorn, and Siberian elm (Kraft 2015).

Environmental Consequences

Alternative 1: No Action

Vegetation. Without prescribed fire there would be no beneficial impacts resulting from its use to restore and maintain grasslands. There would be long-term, adverse impacts as woody plants and trees and invasive plant species would be more likely to encroach into the re-established prairie. Over time, the desired species composition of prairie vegetation would decline along with overall health and vitality of the desired vegetation community.

In oak savanna, there would be no fire to help remove dense woody vegetation in understories and promote growth of desirable fire-adapted species. Short- and long-term adverse impacts may result from a lack of fire and the benefits associated with its use in the oak savanna. Similar to the prairie communities, over time, the desired species composition of the oak savanna would decline along with overall health and vitality of the desired vegetation community.

In the absence of prescribed fire to reduce fuel loads in all three primary vegetation communities in the 83-acre Coldwater Spring Unit, unplanned fires could spread faster, burn more intensely, and take longer to extinguish, which could result in more burned area. This would result in short- and long-term adverse impacts from higher intensity fire consuming native plant communities. Some of this would be mitigated by mechanical methods to reduce accumulated surface fuels. In the absence of prescribed fire, unplanned fire would be the only source of gaining beneficial impacts of fire on park lands. Suppressing unplanned fire to the least amount of acres burned may result in areas of Coldwater Spring not realizing the benefits of fire.

The Mississippi NRRRA would not conduct prescribed fire under alternative 1 and could see an increase in abundance of exotic plants over time, which would result in short- and long-term adverse impacts on native plant communities and ecosystems and affect predicted fire behavior from increased fuel loads. Considering the negative effects exotic plants can have on native vegetation and fuel loads, the Mississippi NRRRA could realize greater adverse impacts in the short and long term from lack of treatments.

Cumulative Impacts. In the absence of prescribed fire in the Coldwater Spring unit there would little incremental contribution to regional restoration of prairie and oak savanna communities and no potential for cumulative impacts on vegetation.

Wildlife. Without the use of prescribed fire there would be no potential for adverse impacts from the disturbance of animals or habitat by operations or fire. Because most animals are able to escape humans or fire during prescribed fire operations; the animals return quickly following fire. The benefits of not implementing a prescribed fire program would be small and short-term.

There would be no prescribed fire to improve habitats or help maintain animal species whose habitats depend on periodic fire. Without periodic fire, restored native habitats would degrade and be invaded by woody species over time. The opportunity to protect, restore, and maintain native plant species in the absence of prescribed fire would be low. The ability to provide the diverse structure in grasslands that creates a variety of food sources; roosting, nesting, and escape cover; and improved brood-rearing habitat for the array of grassland-dependent wildlife would be greatly reduced. Natural resource staff would not have the ability to use prescribed fire to increase or improve habitats or to meet other natural resource objectives. Wildlife species that inhabit grasslands benefit from a greater abundance of native warm-season grass and forb species, but prescribed burns, as a way of converting cool-season grasses to native warm-season grasses, would not occur. Fire has been shown to increase species richness and diversity in the herbaceous layer and result in greater seed production. Seed germination and establishment is increased because burning allows

plant nutrients to be returned to the soil and used again. These fire-related functions would not be realized in the absence of prescribed fire. Reduced species richness and diversity would provide less ideal cover for foraging, nesting and breeding. The grassland-dependent wildlife species that inhabit grass and shrub areas would not benefit from a greater abundance of native grass and forb species except where mechanical treatments could reduce woody species. There would be long-term adverse impacts to wildlife that inhabit the approximately 35 acres of fire-dependent vegetation communities if meadows, prairies, and savannas are not maintained and restored, and these communities could undergo succession, eventually converting to woodlands where historically prairies and savannas existed.

Mechanical treatments to reduce surface fuel accumulation would have temporary adverse impacts on birds and small and large mammals through brief disturbance or displacement due to human presence and noise from mechanical equipment. Adult animals would flee during treatments, but nests and young may be impacted. Treatments would be conducted over brief periods of one or two days with work crews of two to three individuals using mechanical and non-mechanical hand tools. The potential for adverse impacts on these animals would be reduced by employing mitigation measures that restrict treatments from occurring during the nesting season for ground-nesting birds and small animals.

Cumulative Impacts. In the absence of prescribed fire in the Coldwater Spring unit there would little incremental contribution to regional restoration of prairie and oak savanna communities and related benefits to wildlife and their habitats. There would be no potential for cumulative impacts on wildlife.

Conclusions for Alternative 1. Without prescribed fire there would be short- and long-term adverse impacts as woody plants and trees would be more likely to encroach and accumulate in the approximately 35 acres of prairie and oak savanna. Unplanned fires could spread faster, burn more intensely, and take longer to extinguish, which could result in more burned area. Reduced prairie and oak savanna species richness and diversity would provide less ideal cover for foraging, nesting and breeding and would have long-term adverse impacts to wildlife at Coldwater Spring.

The Mississippi NRRRA would not conduct prescribed fire under alternative 1 and could see an increase in abundance of exotic plants over time. Considering the negative effects exotic plants can have on native vegetation and wildlife habitats, the Mississippi NRRRA could realize greater adverse impacts in the short and long term from lack of treatments.

There would be no potential for cumulative impacts on vegetation or wildlife.

Alternative 2: Proposed Action

Vegetation. Fire is considered a significant ecological factor, and ecosystems have become adapted to frequent fires (Odum and Barrett 1971). The extent of prairie prior to European-American settlement can be attributed, at least in part, to frequent grass fires that prevented the establishment of woody vegetation. Without the presence of fire, much of the grassland prairie quickly becomes filled with woody invaders. Sustainable, fire-adapted vegetation communities are highly fire tolerant and resilient to the impacts of fire.

Prescribed fire would be applied to maintain and improve up to 35 acres of re-established prairie and oak savanna. Fire would kill woody plants and allow sunlight to reach the soil and change the soil pH and nutrient availability (NIFC 2010; USFWS 2010). Fire would promote the growth of native grasses and forbs and provide a competitive advantage for native species. Native grasses and forbs would have greater seed production, germination, and establishment after a fire because burning would allow plant nutrients to return to the soil. (Weiler 1982).

The beneficial impacts of prescribed fire for restoring and maintaining prairie and oak savanna in the Coldwater Spring Unit would be both short and long term and would be important for maintaining the vegetation communities. The duration and degree of beneficial impacts would be sustained by application of prescribed fire every three to five years in prairie and oak savanna areas.

Grassland fires with fire-managed fuel loads would tend to move rapidly with little penetration of heat below the surface (Collins 1990) with little effect on root stock survival and re-sprouting. Managing fuel loads would increase resilience to infrequent unplanned fires and provide substantial short and long term local benefits.

During prescribed fire applications there would be local short-term adverse impacts from direct mortality of individual plants and the potential for localized trampling by fire staff during the operation. The long-term benefits of prescribed fire, stated above, would result in resilient plant communities that would recover quickly in a matter of days or weeks.

Periodic application of prescribed fire would reduce the need for mechanical methods to reduce surface fuels and undesired species. This would reduce the presence of work crews and trampling of vegetation during mechanical operations. With small crew sizes working intermittently, vegetation would recover quickly and direct adverse impacts would be short-term, local, and small.

Removing and reducing exotic and invasive plants using prescribed fire would result in short- and long-term beneficial impacts because burning would help check the spread of some exotic plants into native plant communities, reduce fuel loads, and lessen the potential for large or unusually intense fires.

Cumulative Impacts. Regional projects to restore several hundred acres of prairie and oak savanna communities and reduce exotic and invasive plants are resulting in long-term, beneficial impacts on regional vegetation. Prior and future treatments of invasive plant infestations will continue to support prairie and savanna vegetation community health. The use of prescribed fire at Coldwater Spring would add beneficial impacts of approximately 35 acres of improved prairie and oak savanna and reduced invasive and exotic plants. This would add to the beneficial impacts of other projects resulting in a beneficial contribution to regional beneficial cumulative impacts on vegetation.

Wildlife. Over time, prescribed fire would improve grassland and oak savanna communities. Fire would encourage new growth of native vegetation and help maintain the animal species whose habitats depend on periodic fire. Fire would remove dry, dead plant matter that had built up over the years, open space for new growth, create thicker, younger cover, and stimulate seed production.

Wildlife species that inhabit these communities would benefit from the greater abundance of native grass, forb, and shrub species. Protecting, restoring, and maintaining native plant species would help provide the diverse structure that creates cover and nesting sites for grassland-dependent wildlife. Native grasses would provide nesting, brood rearing sites, roosting areas, and escape cover. Plant diversity would increase food sources, such as seeds, in addition to increasing the number of different insects that use a grassland and oak savanna area. Insects are an important food source for young birds as they begin to grow and fledge (Maser and Thomas 1983).

Prescribed fire would also treat areas infested with nonnative plants that encroach on native plant communities. Nonnative plants can diminish habitat value and add to fuel loads.

During prescribed fire operations, temporary adverse impacts on birds and small and large mammals would include brief disturbance or displacement due to human presence and noise from mechanical equipment.

Adult animals would flee during treatments, but nests and young may be impacted. Prescribed burn ignition patterns would provide wildlife escape routes as the burn progresses (PGC 2016). Birds and some mammals would usually leave the area ahead of the fire (USFWS 2015c). Most animals would be able to escape prescribed fire, and small mammals, reptiles and amphibians would find shelter by burrowing under a log or staying in an underground burrow (Gleason and Gillette 2009). The potential for adverse impacts on these animals would be reduced by employing mitigation measures that restrict treatments from occurring during the nesting season for ground-nesting birds and small animals.

Cumulative Impacts. Regional projects to restore prairie and oak savanna communities and reduce exotic and invasive plants are resulting in modest long-term, direct and indirect beneficial impacts on regional wildlife and habitat. Regional population growth and development is altering or removing wildlife habitat. This is resulting in substantial long-term direct and indirect adverse impacts to regional wildlife habitat. The use of prescribed fire at Coldwater Spring would add beneficial impacts of improved tallgrass prairie and oak savanna and reduced invasive and exotic plants, and thus improved wildlife habitat. This would add to the beneficial impacts of other projects and reduce some adverse impacts of regional development resulting in a small beneficial contribution to regional beneficial and adverse cumulative impacts on wildlife.

Conclusions for Alternative 2. The beneficial impacts of prescribed fire for restoring and maintaining prairie and oak savanna in the Coldwater Spring area would be important for maintaining the approximately 35 acres of fire-dependent vegetation communities, promoting the growth of native grasses and forbs and providing a competitive advantage for native species. Prairie fires with fire-managed fuel loads would increase resilience to infrequent unplanned fires and provide benefits through greater seed production, germination, and establishment after a fire. During prescribed fire applications there would be local short-term adverse impacts from direct mortality of individual plants and the potential for localized trampling by fire staff during the operation with recovery generally within days or weeks. The long-term benefits of prescribed fire would result in resilient plant communities that would recover quickly. Periodic application of prescribed fire would reduce the need for and presence of work crews and trampling of vegetation during mechanical operations resulting in small, direct, adverse impacts. Removing and reducing exotic and invasive plants using prescribed fire would result in short- and long-term beneficial impacts by reducing competition with native species.

The beneficial impacts to wildlife from prescribed fire to restore and maintain prairie and oak savanna in the Coldwater Spring Unit would be both short and long term and would be important for maintaining wildlife and their habitat by providing the diverse structure that creates cover, food source, and nesting sites for grassland-dependent wildlife. The duration and degree of beneficial impacts would be sustained by application of prescribed fire every three to five years in prairie and oak savanna areas. Prairie fires with fire-managed fuel loads would tend to move rapidly within a few hours duration and most animals would be able to escape resulting in low potential for short-term adverse impacts from fire. Periodic application of prescribed fire would reduce the need for mechanical methods and reduce the direct short-term adverse impacts of work crews compared to alternative 1. Removing and reducing exotic and invasive plants using prescribed fire would result in short- and long-term beneficial impacts to wildlife and their habitats.

The use of prescribed fire at Coldwater Spring would add beneficial impacts of 35 acres of improved structure and function of prairie and oak savanna and reduced intrusion of woody and invasive plants, and thus improved fire-dependent wildlife habitat. This would add to the beneficial impacts of other prairie restoration and invasive plant treatment projects and result in a beneficial contribution to regional beneficial cumulative impacts on vegetation and wildlife.

AIR QUALITY

Affected Environment

National Park Service fire activities resulting in the emission of air pollutants are subject to all local, state, and federal air pollution control requirements. Federal requirements are outlined in Section 118 of the Clean Air Act (42 USC 7418) (CAA). As smoke is a natural and inevitable byproduct of fire, prescribed burns or unplanned fires are not considered to be point sources of air pollutants. Impacts are temporary, and are expected as part of the burn process. Therefore, mitigation efforts take place to lessen impacts on air quality and visibility due to smoke.

The Mississippi NRRRA is designated as a Class II air quality area. Class I air quality areas, such as Isle Royal or Voyageurs national parks, are provided with the highest degree of protection under the CAA and its amendments. Class II areas have higher ceilings on additional pollution over baseline concentrations, allowing for moderate development.

Based on NPS Air Resources Division data, overall, air quality in the Mississippi NRRRA is moderate with individual scores for wet deposition of total sulfur, ozone, and visibility listed as significant concern. Fires affect visibility through direct emission of smoke (particulate matter) and emission of substantial amounts of volatile and semi-volatile organic materials and nitrogen oxides that form ozone and organic particulate matter (Kraft 2015).

Visibility is a measurement of how well and at what distance visitors can see the park's natural features. Using the metric called Group 50 (visibility minus natural conditions), visibility was of moderate concern at the Mississippi NRRRA in 2001-2005, but has become of significant concern from 2005-2007 and beyond (Kraft 2015).

Environmental Consequences

Alternative 1: No Action

Prescribed burning would not be a tool used to manage natural resources or to reduce fuel loads under the no action alternative. As a result, there would be no impact to air quality from this fire management method.

Under current fire management practice, fuel loads in prairie and oak savanna communities in the Coldwater Spring Unit would continue to increase until an unplanned fire occurred. Increased fuel loads would increase the potential for a higher intensity unplanned fire, particularly during dry periods. Greater fuel loads would increase uncontrolled smoke production and emissions of particulates, dust, and air pollutants, including nitrogen oxides and carbon monoxide. For durations of up to one day, increased smoke could adversely affect visibility and the experience of visitors to the Coldwater Spring Unit and short-duration closure of the trails would likely be necessary during an unplanned fire.

Depending on winds and the speed with which emergency responders could extinguish the fire, adverse impacts to air quality would be short-term (one day or less) and could be substantial if air quality conditions in the metropolitan area were already at a moderate quality level or worse. Mechanical treatments to reduce fuels would help reduce accumulated surface fuels and reduce smoke and air pollution. This would mitigate some of the adverse effect from not employing prescribed fire.

Cumulative Impacts. Regional air quality will continue to be adversely affected by increasing regional population and development that will generate more highway and airline traffic. According to Environmental

Protection Agency air quality standards, the Twin Cities have been undergoing a slow increase in the number of days with moderate levels of air pollutants but a decrease in unhealthy levels from 2003-2012 (Minnesota Pollution Control Agency 2014). Increased surface fuel accumulations without the use of prescribed burning and with mechanical treatment could result in an unplanned fire on a moderate air quality day becoming unhealthy for durations up to one day, and add a moderate, short-term increment to the adverse cumulative regional impacts on air quality.

Conclusions for Alternative 1. Under current fire management practice, fuel loads in tallgrass prairie and oak savanna communities in the Coldwater Spring Unit would continue to increase until an unplanned fire occurred. For durations up to one day, increased smoke could adversely affect visibility and the experience of visitors to Coldwater Spring and short-duration closure of the trail would likely be necessary during an unplanned fire. Depending on winds and the speed with which emergency responders could extinguish the fire, adverse impacts to air quality would be short-term (one day or less) and could be substantial if air quality conditions in the metropolitan area were already at a moderate quality level or worse. Mechanical treatments to reduce fuels would help reduce accumulated surface fuels and reduce smoke and air pollution. As a result, unplanned fire could add a moderate, short-term increment to the cumulative regional impacts on air quality.

Alternative 2: Proposed Action

The burn programs within the Mississippi NRRRA would be in compliance with Air Quality – Smoke Management Guidelines, as outlined in RM-18 (NPS 2014), and the fire management program would comply with local and state air pollution regulations, as well as the Clean Air Act.

Smoke would be the primary air pollutant from prescribed fire and prescribed fire operations would generally be designed to occur when atmospheric mixing and transport winds favor rapid dispersal. The 35 acres of prairie and oak savanna would be weather dependent, burned in a single-day operation lasting up to five hours. Planned ignitions would not be initiated unless conditions outlined in the operation's burn plan, including wind speed and direction, fuel loads, and distance to areas sensitive to smoke, are within prescription. Operations during dry fuel and low-humidity conditions (though not in extreme drought conditions) would reduce emissions, as well. If emissions conditions are outside of prescription, it would be up to the burn boss to either reduce the size of the burn area or wait until conditions improve.

Prescribed fire would be employed once every three to five years in prairie and oak savanna areas and operations would be weather dependent and completed within one to five hours of initiation. Lighter fuel loads over time on 45 acres would reduce the expected duration of fire, amount of smoke, and rate of dispersion. This would be expected for both prescribed and unplanned fires. Due to the expected short duration and infrequent use of prescribed fire; the development and use of burn plans with specific mitigation measures; and the reduction of fuel loads over time, the short-term, direct, local adverse impacts to air quality would be small. Similarly, unplanned fires would be less intense and shorter duration resulting in reduced, short-term, direct, local adverse impacts to air quality compared to alternative 1.

Cumulative Impacts. Regional air quality will continue to be adversely affected by increasing regional population and development that will generate more highway and airline traffic. According to Environmental Protection Agency air quality standards, the Twin Cities have been undergoing a slow increase in the number of days with moderate levels of air pollutants but a decrease in unhealthy levels from 2003-2012 (Minnesota Pollution Control Agency 2014). Prescribed burning would result in lower surface fuel accumulations than in alternative 1. It would be less likely that fire would cause a moderate air quality day to become unhealthy. Prescribed fires and lower intensity, shorter duration unplanned fires would likely add a smaller increment to the adverse cumulative regional impacts on air quality than alternative 1.

Conclusions for Alternative 2. Due to the expected short duration (up to five hours) and infrequent use (every three to five years) of prescribed fire; the development and use of burn plans with specific mitigation measures; and the reduction of fuel loads over time, the short-term, direct, local adverse impacts to air quality from prescribed burns would be small. Similarly, unplanned fires would be less intense and shorter duration resulting in reduced, short-term, direct, local adverse impacts to air quality compared to alternative 1. Prescribed fires and lower intensity, shorter duration unplanned fires would likely add a smaller increment to the adverse cumulative regional impacts on air quality than alternative 1.

CONSULTATION AND COORDINATION

U.S. Fish and Wildlife Service (FWS)

The NPS has consulted the FWS technical assistance website for endangered species listing in the project area on numerous occasions with February 12, 2018 as the last review date. The following species were listed under the federal ESA as being present in Hennepin County: Higgins eye pearlymussel (*Lampsilis higginsii*), Rusty patched bumble bee (*Bombus affinis*) and Northern Long-Eared bat (*Myotis septentrionalis*). Higgins eye is an aquatic species and is present in the river adjacent to the Coldwater Spring Unit. While habitat is conducive to rusty patched bumble bee and northern long eared bat, neither species has been observed within the Coldwater Spring Unit.

The Mississippi NRRA has developed best practice management guidelines for protection of the rusty patched bumble bee under a memo dated May 2, 2017.

The NPS believes that plans to conduct prescribed fire burns will have little to no adverse impact on these species.

Consultation with the FWS under Section 7 of the Endangered Species Act will continue throughout this EA review process.

Minnesota Department of Natural Resources (MN DNR)

The NPS has coordinated with the MN DNR endangered species review coordinator for a project review on the proposed reconstruction of the Minnehaha Trail within the Coldwater Unit (July 2017). That review has indicated that the western foxsnake (*Pantherophis ramspotti*) had been documented within the Coldwater Spring unit.

Bell's vireo, (*Vireo bellii*), and Louisiana waterthrush (*Parkeesia motacilla*), both state listed bird species of special concern, have been documented in the vicinity.

Prescribed burn units within the Coldwater Spring Unit have been developed with the idea that adjacent areas and woodland edges that will not be burned can be refugia for the state listed wildlife species as well as other non-listed species. Woolly milkweed (*Asclepias lanuginosa*) has potential presence at the Coldwater Spring Unit, but while it has been anecdotally identified it has not been verified. Woolly milkweed is a part of the fire-dependent prairie plant community and impacts from prescribed burning would be natural and positive.

Consultation with MN DNR will continue throughout this EA review process.

Minnesota Historic Preservation Office (MN SHPO)

The NPS will consult with the MN SHPO on the undertaking's effects on historic properties pursuant to the 2008 Nationwide Programmatic Agreement and Section 106 of the National Historic Preservation Act of 1966, as amended. A final decision document for NEPA will not be issued until the Section 106 process has concluded.

Tribal Consultation

The Mississippi NRRA has previously consulted with the some federally recognized tribes under a previous effort in 2016 to develop a fire management plan/environmental assessment for the Coldwater Spring Unit. A letter was sent during scoping for that process identifying the NPS intent to develop a fire management plan and environmental assessment for the Mississippi NRRA. The following federally recognized tribes were

contacted under that scoping effort. No written comments were received during that review period which ended April 18, 2016.

- Sisseton-Wahpeton Oyate, Sisseton, SD
- Upper Sioux Community, Granite Falls, MN
- Lower Sioux Indian Community, Morton, MN
- Flandreau Santee Sioux, Flandreau, SD
- Prairie Island Community of Minnesota, Welch, MN
- Crow Creek Sioux Tribe, Fort Thompson, SD
- Santee Sioux Nation, Niobara, NE
- Shakopee Mdewakanton Sioux (Dakota) Community, Prior Lake, MN

The Mississippi NRRA will continue to provide for effective tribal consultation during the review process for this EA. In addition to the federally recognized tribes listed above the NPS has contacted the following tribes:

- Bois Forte Band of Chippewa (Nett Lake and Vermillion)
- Cheyenne River Sioux Tribe
- Fond du Lac Band of Lake Superior Chippewa
- Fort Peck Assiniboine and Sioux Tribes
- Grand Portage Band of Chippewa
- Ho-Chunk Nation of Wisconsin
- Iowa Tribe of Kansas and Nebraska
- Leech Lake Band of Ojibwe
- Mille Lacs Band of Ojibwe
- Red Lake Band of Chippewa Indians
- Rosebud Sioux Tribe
- Spirit Lake Nation
- White Earth Band of Ojibwe
- Winnebago Tribe of Nebraska

The NPS has also notified the following federally recognized tribes of the availability to comment on the environmental assessment and whether they have a desire to be informed of actions by the Mississippi NRRA regarding this and future projects:

- Bad River Band of the Lake Superior Tribe of Chippewa Indians
- Forest County Potawatomi County
- Iowa Tribe of Oklahoma
- Lac Courte Oreilles Band of Lake Superior Chippewa Indians
- Lac du Flambeau Band of Lake Superior Chippewa Indians
- Lower Brule Sioux Tribe
- Menominee Indian Tribe of Wisconsin
- Meskwaki Nation, Sac and Fox Tribe of the Mississippi in Iowa
- Oglala Sioux Tribe
- Oneida Tribe of Indians of Wisconsin
- Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
- Sac and Fox Nation

- Sac and Fox Nation of the Missouri in Kansas and Nebraska
- St. Croix Chippewa Indians of Wisconsin
- Sokaogon Chippewa Community
- Standing Rock Sioux Tribe
- Turtle Mountain Band of Chippewa
- Yankton Sioux Tribe

Additional Coordination

The NPS has coordinated with the Veterans Affairs, Minneapolis and the Minnesota Historical Society throughout the development of the fire management plan and environmental assessment.

Coordination and review of this environmental assessment and fire management plan will also occur with the following agencies: Metropolitan Airports Commission, Minneapolis Park and Recreation Board, Minnesota Department of Transportation and the Minnesota Department of Natural Resources – Fort Snelling State Park.

The NPS will also seek and consider the views of other groups and organizations that have demonstrated an interest in the environmental review process and the National Historic Preservation Act Section 106 process.

PREPARERS AND REVIEWERS

Park-Level Reviewers	Name, Title	Responsibility
Mississippi National River and Recreation Area	Nancy Duncan, Natural Resource Program Manager	EA park-level assistance, review, and comment
	Neil Smarjesse, Biologist/Field Manager	EA park-level assistance, review, and comment
	Alan Robbins-Fenger, Chief of Resource Management	EA park-level assistance and review
Review by Regional Fire Management Officer		
Midwest Region	Paul Mancuso, Fire Management Officer	EA regional-level assistance, review, and comment
Review by Regional Environmental Coordinator		
Midwest Region	Scott Blackburn, Regional Environmental Coordinator	EA regional-level review and comment
Contractor		
Project Support Services	John Hoestery, JWH Environmental Consulting LLC	EA document writer and editor

LITERATURE CITED

- Collins, S. L. and D. J. Gibson
1990 Effects of fire on community structure in tallgrass and mixed-grass prairie. Pp. 81–98. In: Collins S.L. & Wallace, L. L. (eds), *Fire in North American tallgrass prairies*. University of Oklahoma Press, Norman, Oklahoma.
<http://books.google.com/books?hl=en&lr=&id=GS5k9EAuNr0C&oi=fnd&pg=PA81&dq=%22Effects+of+fire+on+community+structure+in+tallgrass+and+mixed-grass+prairie%22+Collins&ots=smggqECtSW&sig=qilypJef0ZCtq5syLqBITXdRSvg#v=onepage&q=%22Effects%20of%20fire%20on%20community%20structure%20in%20tallgrass%20and%20mixed-grass%20prairie%22%20Collins&f=false>
- Czarapata, E. J.
2005 *Invasive plants of the Upper Midwest – an illustrated guide to their identification and control*. University of Wisconsin Press, Madison, Wisconsin.
- Gleason and Gillette
2009 Myth Busting About Wildlife and Fire: Are Animals Getting Burned? In *Fire Management Today*, Vol. 69 No. 1. Available at
<https://www.fws.gov/northeast/refuges/fire/pdf/Gleason%20Gillette%20story%20on%20wildlife%20and%20fire.pdf>
- Gignac, L. D., and M. T. Dale
2007 Effects of size, shape and edge on vegetation in remnants of the upland boreal mixed-wood forest in agro-environments of Alberta, Canada. *Canadian Journal of Botany* 85:273–284.
- Honnay, O., W. Verhaeghe, and M. Hermy
2001 Plant community assembly along dendritic networks of small forest streams. *Ecology* 82:1691–1702.
- Kraft, G.J, et al
2015 Natural Resource Condition Assessment, Mississippi National River and Recreation Area, Natural Resource Report NPS/MISS/NRR-2015/990, University of Wisconsin.
- Metropolitan Council
2017 Population Growth In The 7-County Metro Remains Strong; Metropolitan Council 2017;
<https://metrocouncil.org/News-Events/Communities/News-Articles/Population-growth-in-the-7-county-metro-remains-st.aspx>
- Millar, C.I., N.L. Stephenson, and S.L. Stephens
2007 *Climate Change and Forests of the Future: Managing in the Face of Uncertainty*. *Ecological Applications*, 17(8), 2007, pp. 2145–2151 . 2007 by the Ecological Society of America. Accessed at <http://www.werc.usgs.gov/ProductDetails.aspx?ID=3521>
- Minnesota Department of Natural Resources
2005a *Field guide to the native plant communities of Minnesota: the Eastern Broadleaf Province*. Ecological Land Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. MNDNR St. Paul, MN.
- Minnesota Department of Natural Resources
2005b *Field guide to the native plant communities of Minnesota: the Prairie Parkland and Tallgrass Aspen Parklands provinces*. Ecological Land Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. MNDNR St. Paul, MN.

- Minnesota Department of Transportation
 2015 Metropolitan Freeway System 2015 Congestion Report;
<http://www.dot.state.mn.us/rtmc/reports/congestionreport2015.pdf>
- Minnesota Pollution Control Agency
 2014 Minnesota air quality index trends: 2003-2013. Minnesota Pollution Control Agency, aq1-46. 7pp.
 Available at <http://www.pca.state.mn.us/index.php/view-document.html?gid=19493>
- Mortenson, S. G., and P. J. Weisberg
 2010 Does river regulation increase the dominance of invasive woody species in riparian landscapes?
Global Ecology and Biogeography 19:562–574
- National Interagency Fire Center
 2010 Communicator’s Guide for Wildland Fire Management.
 Available at https://www.nifc.gov/prevEdu/comm_guide/TOC.html
- National Park Service, U.S. Department of the Interior
 1994 Comprehensive Management Plan/Final Environmental Impact Statement, Mississippi National
 River and Recreation Area, Minnesota.
https://www.nps.gov/parkhistory/online_books/miss/gmp_vol1.pdf
- 2006a *Management Policies* Access at <http://www.nps.gov/policy/MP2006.pdf>
- 2006b Sacred Site and Traditional Cultural Property Analysis, Bureau of Mines Twin Cities Re-
 search Center, Main Campus, Hennepin County, MN October 4, 2006.
<https://www.nps.gov/miss/learn/management/upload/TCPCCommentsFinal.pdf>
- 2014 *Director’s Order 18: Wildland Fire Management* and Reference Manual 18: access at
<http://www.nps.gov/fire/wildland-fire/resources/documents/directors-order-18.pdf> and
<http://www.nps.gov/fire/wildland-fire/resources/documents/reference-manual-18.pdf>
- 2016 Fire and Aviation Management. Fire In-Depth
 Available at <https://www.nps.gov/fire/wildland-fire/learning-center/fire-in-depth/prescribed-fire.cfm>
- National Wildfire Coordinating Group
 2014 Interagency Prescribed Fire Planning and Implementation Procedures Guide. Available at
<http://www.nwcg.gov/sites/default/files/products/pms484.pdf>
- O’Brien, M.M., Rucks, P., Terrell, M.M., and Vermeer, A.C
 2006 The cultural meaning of Coldwater Spring: Final ethnographic resources study of the former U.S.
 Bureau of Mines Twin Cities Research Center property, Hennepin County, Minnesota. GSA RFQ
 No. 71599. 228pp.
- Odum, E.P. and G.W. Barrett
 1971 Fundamentals of Ecology. Fifth edition published July 27, 2004, by Cengage Learning. 624 pages.
 Available through https://www.goodreads.com/book/show/2402354.Fundamentals_of_Ecology
- Pennsylvania Game Commission
 2016 PGC Website: Habitat Management. Available at
<http://www.pgc.pa.gov/Wildlife/HabitatManagement/Pages/default.aspx#.V13Tfrznabw>
- Summit Envirosolutions, Inc. and Two Pines Resources Group LLC
 2006 The Cultural Meaning of Coldwater Spring: Final Ethnographic Resources Study of the Former
 U.S. Bureau of Mines Twin Cities Research Center Property, Hennepin County, Minnesota.
 Prepared for: National Park Service, Mississippi National River and Recreation Area.

- Star Tribune
2017 Twin Cities airport posts near-record passenger traffic in 2016; Jan 26, 2017;
<http://www.startribune.com/twin-cities-airport-posts-first-increase-in-passenger-traffic-since-2010/411790946/>
- Texas Department of Agricultural
2002 Prescribed Burn School Manual v1.3 5-2002: Chapter 8, Firing Techniques for Prescribed Burn Managers. Available at
http://campus.extension.org/file.php/475/Conducting_the_Burn/FiringTechniques.pdf
- U.S. Department of Agricultural and U.S. Department of the Interior
2009 *Guidance for Implementation of Federal Wildland Fire Management Policy*. Available at
https://www.nifc.gov/policies/policies_documents/GIFWFMP.pdf
- 2016 Interagency Standards for Fire and Fire Aviation Operations. Available at
<https://www.nifc.gov/PUBLICATIONS/redbook/2016/RedBookAll.pdf>
- 2017 Culturally Significant Plants. Available at <https://plants.usda.gov/culturalinfo.html#links>
- U.S. Department of the Interior
2015 Office of Wildland Management Policy Memorandum 2014-005 Subject: Fire Management Plans. Available at <https://www.doi.gov/sites/doi.gov/files/migrated/pmb/owf/upload/Final-Signed-OWF-2014-005-Fire-Mgmt-Plans-Memo-121514.pdf>
- U.S. Fish and Wildlife Service, U.S. Department of the Interior
2010 Prescribed fire information accessed at
http://www.fws.gov/refuge/Windom_WMD/about/faq.html
- 2015 Frequently Asked Questions: Why does the USFWS periodically burn their grasslands? Accessed at
http://www.fws.gov/refuge/Windom_WMD/about/faq.html
- Weiler, G.J.
1982 *The use of saline water to establish native species on topsoiled mine spoil*. Aldon, Earl F.; Oaks, Wendall R., eds. Reclamation of mined lands in the Southwest: a symposium; 1982 October 20-22; Albuquerque, NM. Albuquerque, NM: Soil Conservation Society of America--New Mexico Chapter: 174-177. Cited in K.A. Johnson, 2000, *Sporobolus airoides*. In: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available at
<http://www.fs.fed.us/database/feis/plants/graminoid/spoair/all.html>



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