

National Park Service
U.S. Department of the Interior

Homestead National Historical Park
Beatrice, Nebraska



Fire Management Plan Environmental Assessment



January 2021

Executive Summary

The National Park Service (NPS) proposes to implement a Fire Management Plan (FMP) for Homestead National Historical Park (park) in Beatrice, Nebraska. The FMP's purpose is to describe how the use and effects of fire as a management tool will be used to: 1) maintain the park's cultural landscape; 2) effectively and efficiently reduce the hazardous fuel load; 3) reduce invasive species; and 4) increase the biodiversity of native species while properly caring for and maintaining the site's natural and cultural resources.

This Environmental Assessment (EA) evaluates three alternatives: Alternative A- 'No Action'; Alternative B - Mechanical Methods; and Alternative C- Non-fire Treatments and Prescribed Fire (Preferred Action). Under Alternative A - No Action, the park would continue using prescribed fire only in the park's prairie. Under Alternative B, prescribed fires would be ceased and only mechanical methods such as mowing, raking, and haying, and chemical treatments would be employed, imitating the effects of prescribed fire in the prairie. Under Alternative C, the park would utilize prescribed fire and non-fire treatments (the reduction of fuels and invasive vegetation by mechanical or chemical treatments) in the prairie, woodland area, and on the adjacent prairie known as the Shum Unit, owned by the Friends of Homestead National Monument of America. The alternatives are described in detail in Chapter 2.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide a decision-making framework as follows: 1) Assess a reasonable range of alternatives to meet the underlying purpose of the proposed action; 2) Evaluate potential issues and impacts to the natural and cultural resources of the park; and 3) Identify required mitigation measures designed to lessen the degree or extent of any potential adverse environmental impacts.

Impact topics are resources identified by agency staff and the public potentially affected by the actions described within the alternatives. The resources NPS staff and members of the public considered important enough to warrant additional analysis include: air quality and smoke management, cultural and historic resources, vegetation, and wildlife (including special status species). For a list of resource topics reviewed and dismissed by the interdisciplinary team see Table 1. After reviewing the potential impacts to resources, and speaking with his staff, the superintendent determined implementing the Proposed Action would result in only minor effects and no significant impacts, thus an Environmental Assessment and accompanying FONSI are appropriate.

The actions summarized in this plan help fulfill park planning priorities to both return and maintain the landscape in a condition similar to what existed before agricultural development and reduce wildfire risks through hazardous fuel management. The park's planning portfolio consists of the individual plans, studies, and inventories, which together guide park decision-making. The planning portfolio enables the use of targeted planning documents (such as this one) to meet a broad range of park planning needs and fulfill legal and policy requirements. The planning portfolio is promptly updated with the development of additional planning documents.

Public Comment

This EA will be on public review for 30 days. The NPS Planning, Environment and Public Comment (PEPC) site provides access to current plans and related documents on public review. Users of the site can submit comments for documents available for public review. If you wish to comment on the EA, you may post comments online at https://parkplanning.nps.gov/HOME_FMP_2021 or mail comments by Feb 20, 2021 to:

Mark Engler, Superintendent
Homestead National Historical Park
8523 West State Hwy 4
Beatrice, NE 68310

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment--including your personal identifying information--may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

ON THE COVER

Prescribed fire activities at Homestead National Historical Park, Nebraska.
Photograph by NPS.

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1.0 Introduction

On March 19, 1936 Congress established Homestead National Monument of America in Beatrice, Nebraska. Legislation passed in 2021 (H.R.1472) renamed the park as Homestead National Historical Park (park). The purpose of the park is to commemorate the Homestead Act of 1862, the effects the Act had upon settlement and immigration in the United States, and celebrates the resulting advancements in agricultural technology. The 211-acre park encompasses the first 160-acre homestead tract filed under the act and claimed by Daniel Freeman on January 1, 1863. An additional 32 acres are privately owned, although the park holds a scenic easement to preserve the viewshed between the Education Center and the Freeman School. The Freeman School, an original 1872 one-room schoolhouse, was added as a unit of the park in 1970 along with approximately four-acres of surrounding land (School House Unit, Figure 4). On December 16, 2002, a bill was signed to provide for additional lands to be included within the boundaries of Homestead National Historical Park (Figure 1) for the construction of the Heritage Center was signed.

The park is home to the second-oldest tallgrass prairie restoration in the nation (NPS, Prairies and Grasslands, 2020). Before NPS acquisition, the 100-acre restored prairie was used for agriculture and grazing. Restoring the prairie had a practical purpose, to restore the landscape following unprecedented historic events, like the drought of 1936 which precipitated the Dust Bowl. Today the restored prairie portrays a pastoral scene as homesteaders might have observed entering the eastern fringes of the Great Plains. Restoring the prairie required a combination of seeding native grasses, installing native plant plugs, and transplanting sod from local areas of unplowed prairie. Management for invasive species has involved mowing, selective herbicide application, and beginning in 1970, reoccurring prescribed fires. The restored prairie reflects the species richness and diversity that it had prior to its agricultural use, but has more woody species in some locations (James and Debacker 2007), changing the historical landscape (Figure 3). Approximately 0.75 acres of undisturbed tallgrass prairie is located next to the Freeman School.

In 1857, a Public Land Office survey recorded a bur oak wooded community, which remnants of are still present at the park along Cub Creek. The NPS undertook a reforestation effort after the site's acquisition in 1936 to restock native tree species and reduce erosion along Cub Creek. Previously, old-growth trees had been removed during the Freeman family's ownership of the land. The woodland reflects the pre-settlement community that occurred here with some very large characteristic bur oak trees and has been studied as a rare natural plant community (Rolfmeier, 2007).

141-acres of tallgrass prairie (Shum Unit) directly south of the park, owned by the Friends of Homestead National Historical Park (Friends), would also be managed through actions described in the Fire Management Plan (FMP). The land was purchased through grants and an Opal Shum bequest¹. This additional tallgrass

¹ Opal Shum willed \$124,000 from her estate to the Friends group to be used for the benefit and support of Homestead National Monument of America.

prairie: provides a landscape buffer for the historic Osage orange (*Maclura pomifera*) hedgerow listed as a historical structure (HS18) on the 1976 National Register of Historic Places Nomination Form (NPS, 1976); reduces agricultural runoff into Cub Creek; provides a buffer for the park's woodland; and provides additional recreational and educational opportunities to visitors by establishing walking trails in the area. Due to proximity of this unit to the park and its similar historic land use, the potential impacts from the proposed alternatives would be comparable in both areas.

1.1 Scope of the Project

NPS Director's Order #18, Wildland Fire Management, requires every NPS unit with burnable vegetation implement an approved FMP. The FMP includes the use of non-fire treatments and prescribed fire to manage park resources and reduce the risk of wildfires. The park suppresses all wildfires within the park to prevent resource and infrastructure damage.

Prescribed fire has been utilized in the park since the early 1970s to increase biodiversity, reduce invasive plant species, maintain the prairie ecosystem, and reduce fuel loads. The park has recently updated its FMP seeking to include prescribed fires in the woodland and the adjacent Shum Unit; to restore the habitat to more closely resemble what the landscape may have looked like prior to agricultural development. The park's 2000 Cultural Landscape Report (CLR) included habitat restoration recommendations for the woodland along Cub Creek including: planting native species to increase vegetative diversity, allowing woodland edge vegetation to evolve with lowland, and utilizing prescribed fire along the woodland-prairie border to prevent an unnatural edge effect.

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that: (1) analyzes a reasonable range of alternatives to meet the objectives of the proposal, (2) evaluates potential issues and impacts on resources and values, and (3) identifies mitigation measures to lessen the degree or extent of these impacts.

1.2 Purpose and Need for Action

1.2.1 Purpose

The park seeks to protect park values (Figure 2), resources, and adjacent properties through hazard fuel management and suppression of wildfires. Additionally, the park seeks to restore and maintain the native landscape similar to what existed prior to agricultural development.

1.2.2 Need

The park needs an FMP to reduce hazardous fuels and mimic the role fire plays as a natural process in this ecosystem, restoring the habitat to its historic state.

Park managers are seeking to use fire as a management tool in the woodland (including on adjacent private property), prairie (the original restoration, Freeman School prairie, and Heritage Center prairie), and the adjacent tallgrass prairie known as Shum Unit. The 1999 FMP and associated EA only addressed use of

prescribed fires in the prairie, specifically excluding the woodland, additionally NPS policy requires that EA's be reviewed and updated periodically.

Project Objectives

Objectives are specific statements providing a basis for comparing the alternatives in achieving the desired outcomes of the action (NPS 2015). All alternatives carried forward for detailed analysis must meet all objectives in no small degree and must resolve the purpose of and need for action. The planning team identified the following objectives: maintain the park's historic landscape, reduce hazardous fuel loads, reduce invasive and exotic plant species, and increase biodiversity of native species.

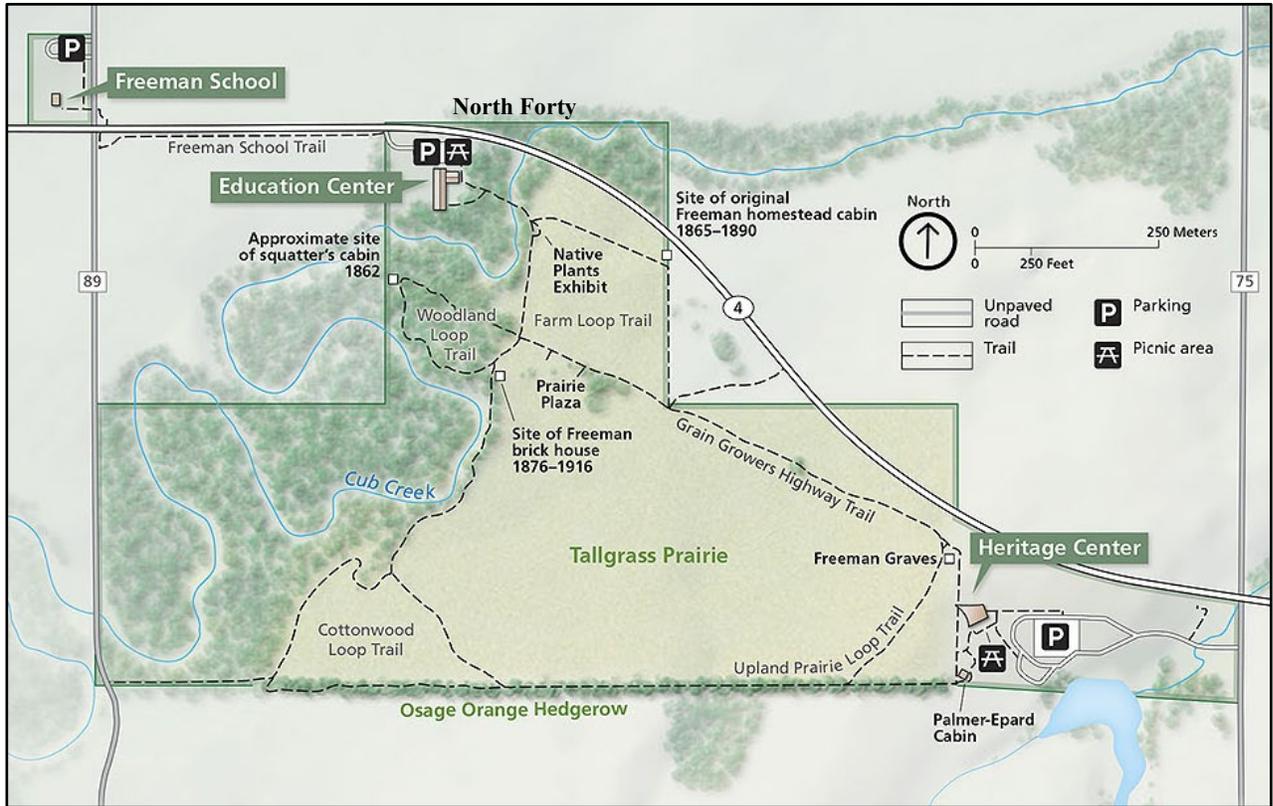


Figure 1. NPS Map of Homestead National Historical Park.

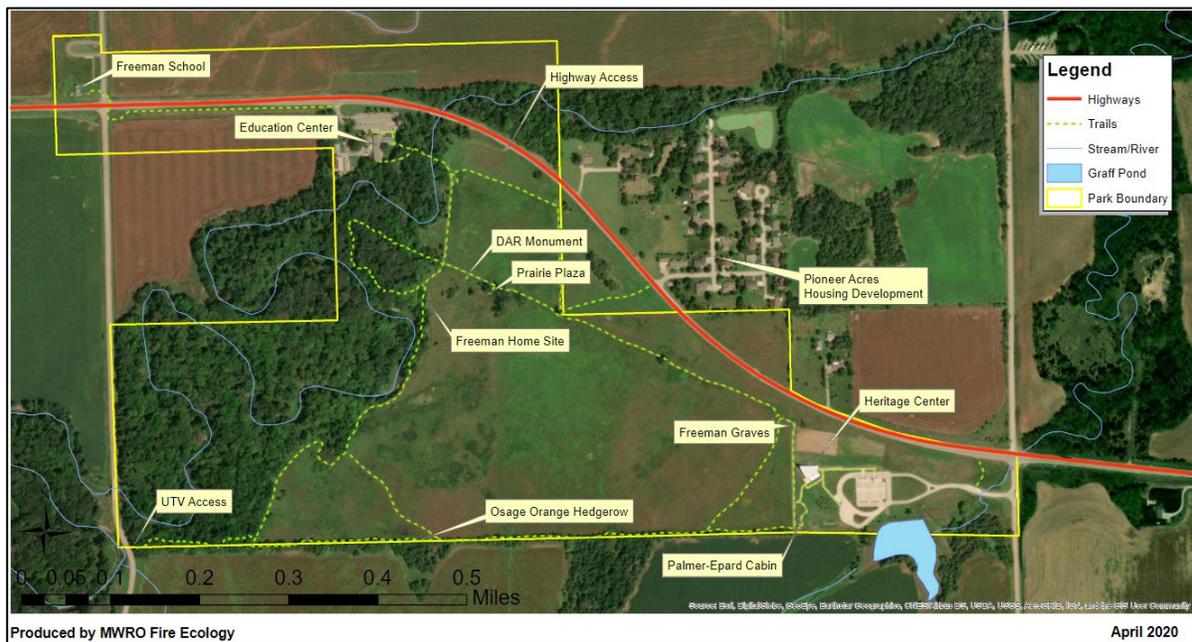


Figure 2. Park Values at Risk.

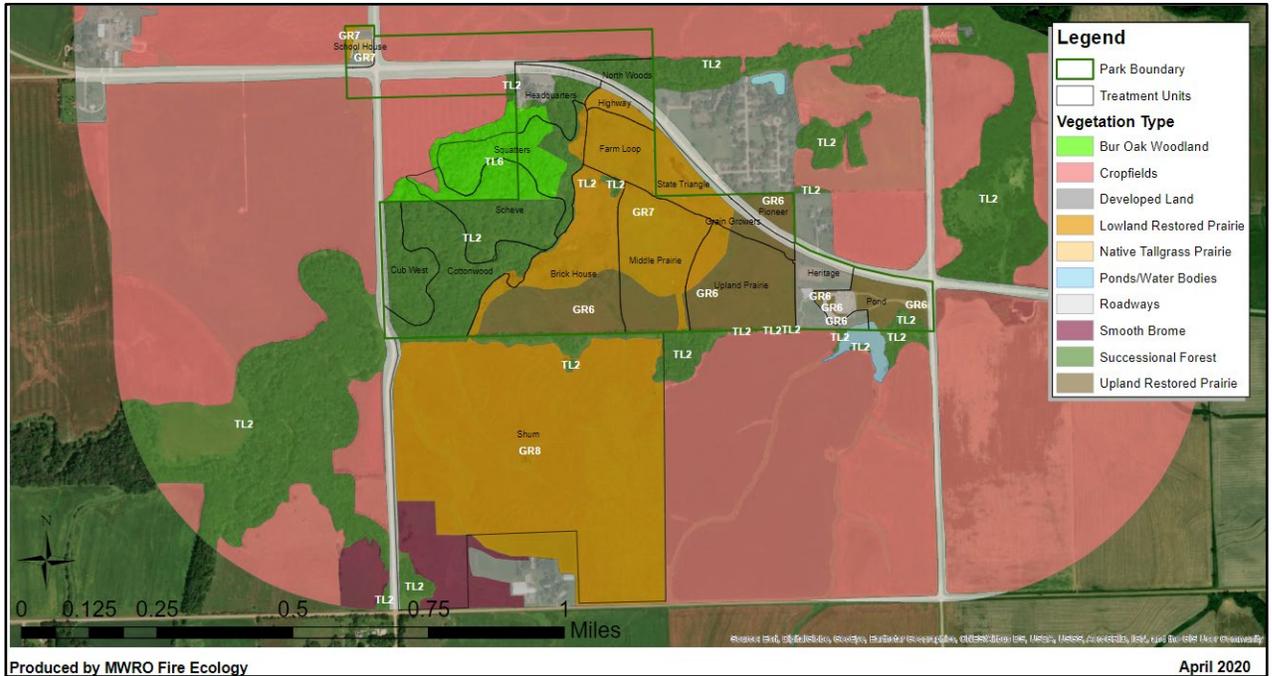


Figure 3. Map of Vegetation Classifications at Homestead National Historical Park.

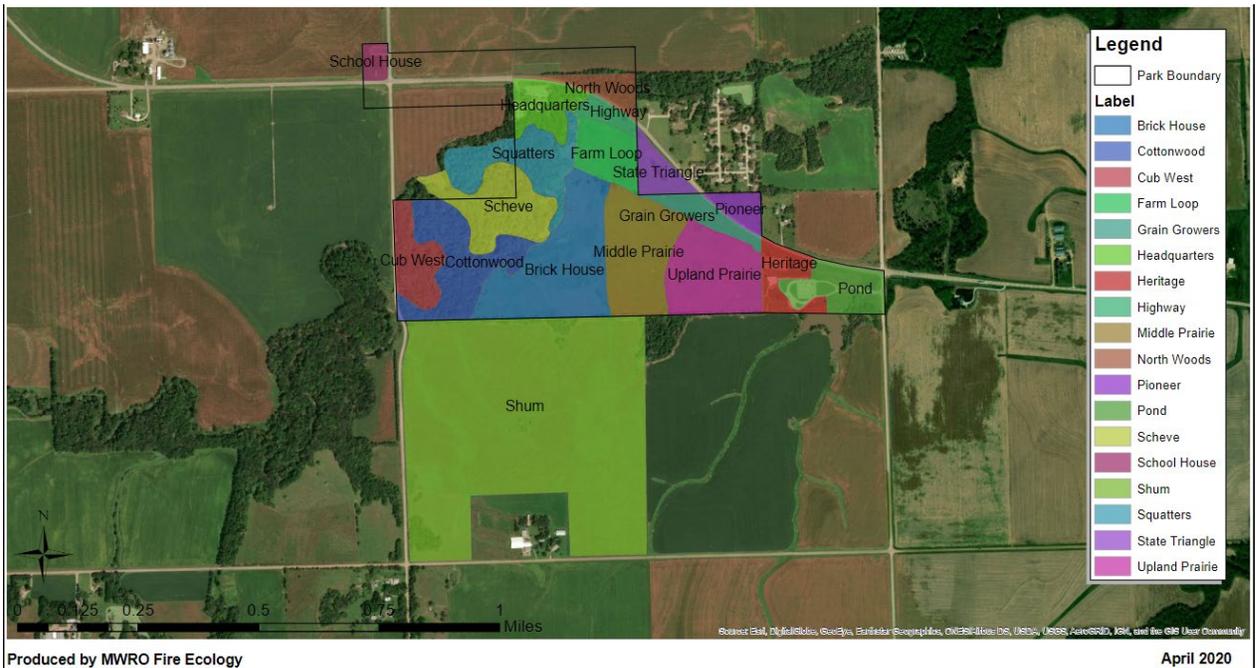


Figure 4. Treatment Units.

1.3 Relationship to Existing Plans and Programs

By incorporating information developed in ongoing research, implementation of the FMP will assist in achieving park objectives outlined in the following documents:

1.4.1 General Management Plan (NPS, 1999)

The General Management Plan (GMP) gives the specific management prescription: “The reconstructed tallgrass prairie is recognized as one valuable tool for interpreting the homesteading story. Resource management practices work to support the park’s legislated purpose while protecting and preserving the reconstructed tallgrass prairie’s significant scientific and historical values.” The GMP does not provide management prescription for the woodland, and the accompanying Abbreviated Final Environmental Impact Statement does not address the use of prescribed fire.

1.4.2 Cultural Landscape Report (Quinn Evans/Architects; Land and Community Associates, 2000)

The cultural landscape report of the area that is now Homestead National Historical Park identifies “treatment recommendations” for both the prairie and the woodland, including to continue the use of annual prescribed fires in the prairie and to allow the prescribed fires to extend into the woodland. The report does not have any accompanying NEPA or NHPA documentation.

1.4.3 Resource Management Plan (2000)

The park’s Resource Management Plan addresses the GMP’s prescription with specific goals that relate to fire management. The goals include the restoration and maintenance of natural resource values, using the best available science for management decisions, and providing visitor safety.

1.4.4 Vegetation Management Action Plan (NPS, 2006)

This plan identifies the desired future condition of the vegetative resources of the park and gives direction on how to achieve the desired condition. The plan has specific guidance on using prescribed fire and managing woody debris in the park to achieve resource goals. As there were no significant changes from the 1993-2002 Prairie Management Action Plan, it was determined that the compliance for that plan was adequate. The 1993-2002 plan referenced the Finding of No Significant Impact (FONSI) from the 1989 Resource Management Plan.

1.4.5 Bur Oak Forest Restoration Plan: Reference Condition and Management Considerations (Rolfmeier, 2007)

This document, prepared by noted Nebraska botanical consultant and collections manager Steven Rolfmeier, identifies reference conditions and sites with which to compare the park’s woodlands. It also outlines a management recommendation for the park’s woodland to reach the desired future condition as outlined in the 2006 Vegetation Management Action Plan and serves as a basis for several actions in this FMP. There is no NEPA document associated with this report.

1.4.6 Foundation Document (NPS, 2015)

This document identifies the tallgrass prairie as a significant feature of the park. Significant features are important enough to merit designation as a unit of the NPS system. It also identifies additional natural resources as fundamental resources and values, specifically highlighting the rare lowland bur oak (*Quercus macrocarpa*) forest. The document identifies data needs as well as threats and opportunities for each fundamental resource but does not propose specific actions and does not have NEPA documentation associated with it.

1.4.7 Natural Resource Condition Assessment (Jones et al., 2019)

This study employed Colorado State University and NPS staff to identify valuable park resources and consolidate existing information and data. The data was analyzed to provide summaries and address condition, trend and confidence using a standardized but flexible framework. A total of 19 focal resources were examined: six addressing landscape context, three addressing chemical and physical attributes, nine addressing biological attributes, and one addressing integrated natural/cultural resources. These focal resources serve to guide the target natural resource condition of the park.

1.4.8 Vegetation Monitoring 1998-2017 (Leis S. A., 2019)

This report is a summary of the grassland and woodland monitoring data collected by the Heartland Inventory and Monitoring Network in the park from 1998 to 2017.

1.4.9 Breaking New Ground: Administrative History of Homestead National Monument of America, Nebraska (NPS, 2020)

This report focuses on NPS management from the mid-1930s to the present based on park records and oral history interviews.

1.4.10 Problematic Plant Monitoring in Homestead National Monument of America (NPS, 2020a)

This report provides information on the abundance, distribution, and location of problematic plants, including exotic, invasive, and pest plant species, that is essential for developing risk-based approaches to managing these species.

1.4 Impact Topics

Issues related to air quality and smoke management, cultural and historic resources, vegetation, and wildlife are analyzed in detail in this EA. Resources were retained for detailed analysis either because (a) they are central to the proposal or of critical importance, (b) analyzing them will inform the decision making process, or (c) because the environmental impacts associated with the issue are a significant point of contention.

Issues related to floodplains, human health and safety, socioeconomics, soils, visitation and visitor development, and water resources, have been dismissed from detailed analysis because they are not central to the proposal, do not assist with making a reasoned choice between alternatives, or are not a point of contention.

Table 1 below summarizes which topics were retained or dismissed and includes the rationale for dismissal.

Table 1. Impact Topics Retained or Dismissed

Impact Topic	Retain	Dismiss	Rationale for Dismissal
Air Quality and Smoke Management	X		
Cultural and Historic Resources	X		
Geology		X	The park lies within the glaciated Drift Hill Region of southeastern Nebraska. The topography is level to rolling with the landscape strongly influenced by surface hydrology, particularly the 92,350-acre Cub Creek watershed. As impacts would be limited to surface level, this impact topic has been dismissed.
Human Health and Safety		X	The restored prairie is bounded on the north by Nebraska Highway 4, an important commuter and commercial artery in the immediate area. Approximately 2,600 vehicles travel on Highway 4 daily. A residential development, Pioneer Acres, is located along the northeast boundary of the park. The potential impacts from smoke is addressed under the Air Quality and Smoke Management. Therefore, it has been dismissed.
Socioeconomics		X	The potential treatment alternatives for this project would not impact the employment, occupations, income, or tax base at the park or surrounding area. Therefore, this impact topic was dismissed.
Soils		X	No adverse impact on soils is expected due to the extensive root systems of the native prairie grasses and the prevalence of native, fire adapted vegetation. Wildfire and prescribed fires do not reach the intensity needed to kill the deep fibrous root systems which anchor the soils. Firelines will be hand constructed and returned to their pre-fire condition as soon as possible. Any trees removed will be flush cut, with stumps and roots remaining in place, and will not impact soils. Therefore, this impact topic has been dismissed.
Vegetation	X		
Visitor Use and Experience		X	Most visitation at the park occurs from March to October. Much of the visitation consists of educational groups and family units. Prescribed fires and fuels management activities would have only minimal and temporary impacts to visitors, including closing some areas temporarily to protect their safety, and would provide a beneficial interpretive opportunity. Therefore, this impact topic has been dismissed.
Water Resources		X	Cub Creek, a tributary of the Big Blue River, meanders for approximately 2 1/2 miles through the park. During periods of heavy precipitation, Cub Creek occasionally floods, causing widespread erosion and threatening developed areas. During periods of major flooding, often influenced by the backing up of waters of the Big Blue River, the creek has overflowed its banks to a width of 125 feet or more. During these periods, depth measurements taken at the footbridge have approached 16 feet. The western quarter of the prairie restoration, as well as the developed area of the park, lie within the 100-year floodplain of Cub Creek. Check dams, terracing, fill, and plantings along the boundary have been implemented to prevent erosion. A bank stabilization project to prevent soil loss was completed in 1988. Rock-filled gabions have repeatedly been installed to stabilize the creek banks in the vicinity of the footbridge and remain present today; they have been moderately effective in checking this streambank erosion. Water pollution affects the Big Blue River Basin through both point (municipal and industrial wastewater treatment facilities) and non-point (agricultural run-off) sources. Prescribed fires can temporarily remove some vegetation, however trees and large woody debris would remain post-fire and continue to slow flood waters. Any impacts to erosion and water resources from this plan are expected to be negligible, short term, and localized. Therefore, this impact topic has been dismissed.
Wildlife	X		

2.0 Alternatives

This EA analyzes a no-action alternative and two action alternatives. This chapter describes the alternatives in detail, while impacts associated with the actions proposed under each alternative are outlined in Chapter 3: Affected Environment and Environmental Consequences.

2.1 Elements Common to all Alternatives:

Wildfires within the park, whether naturally occurring or not, would be suppressed with the least possible impact to cultural and natural resources. Surveys were conducted to identify archeological and ethnographic sites, which would be protected wherever possible during fire suppression activities. Chemical treatments would be used under all alternatives.

2.2 Alternative A: No Action

The "no action" alternative is presented to provide a benchmark for evaluation of the action alternatives. Under this alternative, the park would continue its current use of prescribed fire and chemical treatments in the park's prairie, as well as, suppression of wildfires. The park would also continue to not conduct prescribed fires within the woodland. During prescribed fire activities, prescriptions would be strictly observed. Any deviations from the prescription would result in the suspension or cancellation of the operation.

The following BMPs would be adhered to during all phases of the FMP.

- No prescribed fires will be ignited during air pollution alerts, temperature inversions, or when a burn ban has been established by local government agencies.
- Fire weather forecasts will be used to predict smoke dispersal, and prescribed fires will only be conducted when conditions permit rapid smoke dispersal.
- Prescribed fire prescriptions will be developed and firing techniques utilized that minimize smoke production and mitigate smoke impacts on highways and areas of human activity.
- Press releases and media advisories to print and broadcast media will be issued to notify residents of impending prescribed fire events.
- Interpretive brochures, specially developed by the NPS to interpret fire in national parks, will be issued to visitors.
- Ignitions may occur as early as one hour after sunrise to as late as two hours before sunset.
- Firing operations will be reevaluated were smoke to impact the Pioneer Acres housing area.
- Local fire and police agencies will be notified of any prescribed fire activities, so they may provide any needed assistance with traffic flow if any problems with smoke dispersal occur.
- Smoke advisory signs will be placed on Highway 4, approximately ¼ mile east and west of the park boundary.
- Smoke monitors will be posted to observe the direction of smoke movement, column heights, and the effect of smoke upon area highways.
- If conditions become hazardous because of visibility, traffic will be stopped

until the smoke has lifted from the highway.

- Scatter or remove debris as prescribed by the Incident Commander (IC).
- Decisions on suppression practices will be made by the IC.
- Class A foam may be used during the mop up stage, after the prescribed fire.
- Vegetative fuels may be piled and burned as disposal. Before piling fuel, staff will need to ensure they are staying away from known potential archeological sites. Burn piles will be mapped, and those locations will be shared with the Midwest Archeological Center.

The park will utilize the following stipulations to minimize adverse impacts:

- Use water instead of fire-retardant chemicals when feasible.
- Cold trail the fire-edge when practical.
- Utilize soaker hose or foggers in mop-up. Avoid "boring" and hydraulic action.
- Wetlines, mow lines, or environmental lines, will be used wherever possible in lieu of handline construction if water and pumps are available. Waterbars will be constructed on handlines on steep slopes.
- The historic Osage orange hedgerow will not be treated with prescribed fires and will be protected by control lines formed by mowing approximately 20 feet wide area the units that will be burned.
- Firelines will be kept to the minimum width necessary to allow backfiring or safe blackline to be created. Utilize natural barriers wherever possible.
- Known archeological and ethnographic sites will be identified prior to a fire and protected wherever possible. Minimize ground disturbance to protect cultural resources.
- All firelines or other disturbance in visually sensitive areas will be rehabilitated to maintain a natural appearance.
- After the fire emergency is over, the transport of personnel, equipment, and trash out of the park will be consistent with national park resource management objectives

2.3 Alternative B: Mechanical Methods (Mowing, Raking, Haying and Chemical Treatments)

This alternative would entail cessation of prescribed fires and would substitute the effects of fire with chemical treatments and mowing, raking, and haying in meeting the objectives of a reduction in both exotic and woody vegetation in the prairie. This alternative would not address the woodland or Shum units. There would be two separate and distinct methods for conducting mechanical operations in the prairie.

The first method is the use of heavy machinery including modern tractors and implements to cut the prairie growth. After mowing, balers would be used to bundle the grass for removal. This would be a time-efficient method but would be expensive, due to the operating costs of this equipment. This method would also result in a greater use of petroleum products in operating the equipment.

The second option under this alternative would be the use of antique draft animal-drawn equipment to mow, rake, and hay the prairie. This option would create an excellent interpretive opportunity to highlight the methods used by farmers of the mid-to-late homestead era. However, the time inefficiency of such an operation

makes this option less desirable.

The park would utilize the following stipulations to minimize adverse impacts:

- Mowing, raking and haying of the prairie should not occur from May 15th to July 15th to minimize adverse impacts on wildlife.
- Known archeological and ethnographic sites will be identified prior to use of mechanical prescriptions and protected wherever possible. Ground disturbance would be minimized to protect cultural and ethnographic resources.
- Mechanical methods would not be implemented when the ground is soft or muddy to avoid the potential to impact archeological resources.
- Any disturbance in visually sensitive areas will be rehabilitated to maintain a natural appearance.
- Draft animals will be given weed free feed and their hoofs would be cleaned prior to entering the site to mitigate the potential to spread invasive plant species through seeds contained in manure.
- Heavy equipment will be washed prior to transportation to the site to mitigate the potential to act as vectors for invasive species.

2.4 Alternative C: Non-fire treatments and Prescribed Fire (Preferred Alternative)

This alternative would implement the 2020 FMP for Homestead National Historical Park. This FMP is a multi-year fuel treatment plan proposing prescribed fires on a 1 to 10-year interval for both the park's prairie and woodland as well as the adjacent Shum Unit, based on annual habitat assessments. The FMP includes using Cub Creek as a fire break which will require burning areas of land (Cottonwood, Scheve and Squatter's Unit) that are privately owned by Richard Scheve, with whom the park has a Memorandum of Agreement. The past agricultural uses of these areas are appreciable to that of the park's woodland due to immediate proximity and similar historic uses, including crop farming, haying, and cattle grazing. For the purposes of the impacts analysis these areas will be considered as falling within the park's woodland area with identical potential impacts.

A survey would be undertaken by the Cultural Resources Management team prior to the execution of any management activities. Prescribed fire and mowing of the prairie will be avoided whenever possible from May 15th to July 31st to minimize adverse impacts on wildlife. When it is necessary to burn or mow within peak breeding season, a focus will be on limiting the area burned or mowed as well as severity of the fire by burning on a wet day (which will result in less intense fires with more patches of unburned area) that will result in lower litter consumption. Prescribed fire will not be utilized in the woodland from May 1st to July 31st to minimize impacts to wildlife such as the federally threatened northern long-eared bat. Additionally, April to July is the window when oak trees are most vulnerable to being infected with oak wilt disease (OWD). OWD is transmitted by beetles that are active during these months. The beetles enter through any kind of wound and transmit the fungus (*Bretziella fagacearum*, formerly *Ceratocystis fagacearum*). Once infected the fungus readily travels through root grafts to infect other nearby oaks and ultimately through entire oak stands. In a 2004 report by D. D. Fogell, *A Herpetofaunal Inventory of Homestead National Monument of America*, it was recommended that prescribed fires should occur earlier in the season before the herpetofauna has emerged. Fogell surveyed the May 22, 2003 burn area and found

several burned snakes, frogs and toads. Prescribed fire should not be used on more than half of the prairie or woodland at one time. Rolfmeier's 2007 *Homestead National Monument of America Bur Oak Forest Restoration Plan* will guide management activities within the woodland.

The park would follow the same BMPs and stipulations outlined in Alternative A for prescribed fires.



Figure 5. Post-burn regeneration progression with Heritage Center view.



Figure 6. Post- burn regeneration progression with the Freeman School view.

3.0 Affected Environment and Environmental Consequences

3.1 Introduction

This chapter describes the affected environment and documents the existing conditions of the park. These descriptions serve as a baseline for understanding the resources potentially impacted were the alternatives described enacted. This chapter analyses the environmental consequences or “impacts” of the no-action alternative and action alternatives for each resource. The resource topics presented in this section correspond to the environmental issues and concerns identified during internal scoping.

In accordance with the Council on Environmental Quality (CEQ) regulations, the environmental consequences analysis includes the direct, indirect, and cumulative impacts (40 CFR 1502.16) of each alternative. The intensity of the impacts are assessed in the context of the park’s purpose and significance and any resource-specific context that may be applicable (40 CFR 1508.27). The methods used to assess impacts vary depending on the resource considered, but generally are based on a review of pertinent literature and park studies, the information provided by on-site experts and other agencies, professional judgment, and park staff knowledge and insight.

3.2 Air Quality and Smoke Management

3.2.1 Affected Environment

National Park Service wildland fire activities resulting in the emission of air pollutants are subject to all local, state, and federal air pollution control requirements. Federal requirements for air quality control are outlined in Section 118 of the Clean Air Act (42 USC 7418). The park is located by Nebraska Highway 4, an important commuter and commercial artery in the immediate area. Approximately 2,600 vehicles travel on Highway 4 daily.

3.2.2 Environmental Consequences

3.2.2.1 Alternative A- No Action - Impacts

The park is designated as a Class II air quality area, which allows for a moderate amount of air quality deterioration. Impacts would be a temporary, expected part of the burn process, and mitigation efforts would take place to lessen impacts on air quality and visibility due to smoke. As smoke is a natural and inevitable byproduct of fire, a prescribed fire or wildfire are not considered to be point sources of air pollutants.

With the residential area and the very significant highway traffic, smoke management is a primary concern. Prescribed fires can produce particulate matter (colloquially called smoke), reducing visibility and having adverse health impacts, especially if conducted concurrently with nearby agricultural activities, such as when adjacent farmers are tilling soil. Large volumes of particulate matter can be produced from fire, and depending on

meteorological conditions, may affect large areas for extended periods of time. Smoke has an increased impact on those with preexisting respiratory ailments such as asthma and respiratory disease (Robison, 2007). Best Management Practices (BMPs) would be followed to manage smoke and notify the public of pending prescribed fire events. Short-term adverse conditions may exist during periods of prescribed fire or wildland fire. Despite the lack of enforced regulations, all prescribed fire plans will be developed to lessen potential adverse impacts on local highways and unit neighbors. Impacts will be a temporary, localized and short-term.

3.2.2.2 Alternative B-Mechanical Methods - Impacts

While the use of gas-powered heavy equipment releases some fumes, and there would be additional particulate dust from soil disturbance, the effect on air quality would be immeasurable, temporary, and localized.

3.2.2.3 Alternative C- Non-fire Treatments and Prescribed Fire - Impacts

Although this alternative covers a larger area and includes the woodland it will not result in an appreciable difference in impacts to air quality and smoke management than the impacts identified for Alternative A.

3.3 Cultural and Historic Resources

3.3.1 Affected Environment

Cultural and Archeological Resources

Homestead National Historical Park is listed on the National Register of Historic Places (NRHP). Archeological investigations were conducted of the Freeman Cabin Site, the Freeman School, and a prehistoric village site in 1948, 1984, and 1985. At the time of these investigations the original historic structures on the site had been removed, destroyed, or disappeared due to disuse, and no-above ground structures remained, with the exception of the Freeman School. Visual reminders of the time the Freeman's spent on the land are evident, an example of this is the fence row trace in the central part of the prairie. There are likely to be several such reminders or traces scattered through the prairie and woodland, which have been long hidden and unaffected by modern farm equipment. The exact locations of a brick kiln and the original squatter's cabin have not been located, but the probable locations are within the bounds of the woodland of the north forty (Figure 1). The former Freight Road/Old Highway 4 is distinguishable in several areas, including through the woodland and across Cub Creek. Some concrete supports and pilings remain of a bridge that crossed Cub Creek, as noted in the 1986 Archeological survey of the park. Of the historic structures currently in the park, most have landscaped areas surrounding them, serving as a buffer against damage by fire.

Due to the Shum Unit's history of cultivation, terracing and restoration actions, it is unlikely to contain archeological resources that would be

threatened by prescribed fire or mechanical methods. There may be historic features between the park boundary and Cub Creek (Scheve, Cottonwood, Squatters Units) that could be threatened by fire and other management activities, as these areas were not previously cultivated. A pre-burn pedestrian inventory would be conducted prior to the implementation of management activities. As these non-Federal property units would be treated using Federal resources, the project would comply with Section 106 and it would qualify as an undertaking under NHPA.

Cultural Landscape

The park's 2000 CLR notes a prehistoric zone of probable concentration that includes an area of prairie and a small portion of woodland. The prehistoric archaeological remains are typical of the Central Plains Tradition, which dates to the time period between 1000 AD and 1400 AD. These sites are located primarily in the north forty acres of the site (Figure 1), however this does not rule out prehistoric habitation at other locations since flooding and erosion on the Upland Prairie slopes and in the Cub Creek basin could have moved or destroyed artifacts. The prehistoric remains are heavily disturbed due to historical cultivation and building on the site, and they are mixed with historical remains in many places. Since many artifacts are not in-situ and given the extent of the limited substrate of the testing, the full size and significance of the prehistoric site was unable to be determined.

The park commemorates the Homestead Act; preserves cultural and natural resources (including the Freeman School); and erects and manages suitable buildings to be used as a museum for the preservation, education and interpretation of homesteading literature, history and culture. The park's Foundation Document states that the mission of the park is to "maintain the 160-acre homestead ... in a manner that provides visitors a perspective of the influences and impacts upon the land in its transition from its natural state to cultivation and agriculture." The tallgrass prairie and the riparian corridor represent this transition.

Several trees in the riparian woodland are notable for their height, diameter, and presumed age. This includes a group of at least 80-foot tall cottonwoods (*Populus deltoides*) at the western edge of the prairie and a cottonwood adjacent to the woodland-prairie edge with a diameter in excess of 60 inches (indicating it may be associated with early Freeman homesteading activities). The park's CLR recommends preserving and managing these trees, due to their presumed age.

The Osage orange hedgerow is a rare surviving bio-cultural feature from the homesteading period and represents the early settlers' efforts to enclose cultivated areas and mark their boundaries with living fences. This hedge is listed on the National Register of Historic Landmarks. Many of these trees are reaching the end of their life expectancy, and an effort is underway to plant additional Osage orange plants to maintain the historic hedgerow.

The adjacent 141-acres, known as the Shum Unit, is currently managed as tallgrass prairie. It has a beneficial impact on the cultural landscape.

3.3.2 Environmental Consequences

3.3.2.1 Alternative A- No Action- Impacts

Cultural and Archeological Resources

Under the No Action Alternative impacts upon underground resources will be minimal. No resources that could be impacted by prescribed fire have been identified in the burn areas, but prescribed fires might temporarily expose resources not previously identified. If such resources were exposed, per the stipulations outlined in the Alternatives section, their significance would be determined, and appropriate protection actions taken. Except for the Osage orange hedgerow, all historic structures have landscaped areas surrounding them that serves as a buffer against damage by prescribed fire. Impacts would be negligible, localized, and limited to the duration of the management activity.

Cultural Landscape

Prescribed fires within the park's prairie would have beneficial impacts on the cultural landscape. However, not including the Shum Unit in the park's burn plan would result in this unit being burned less frequently than the park prairie, which will result in different plant communities within the two prairie areas. If the woodland is not burned, it will continue to favor fire-intolerant species not representative of the historic ecosystem that existed at arrival of the first homesteaders. The long the woodland is not burned, the more difficult it will be to return it to a historic, natural state. Impacts would be beneficial in the park's prairie, but adverse in the Shum Unit and woodland. Impacts would be localized and long-term, but not irreversible.

3.3.2.2 Alternative B- Mechanical Methods - Impacts

Cultural and Archeological Resources

Under Alternative B heavy equipment will be used. The BMPs outlined in the Alternatives section would be implemented to avoid adversely impacting underground resources. Although fence row traces may have existed historically, the use of mechanized equipment, like tractors, is unlikely to have an adverse impact on archeological resources because they are subterranean and have been unaffected by modern farm equipment. The impacts of this alternative would be beneficial, localized and long-term.

Cultural Landscape

The use of draft animals and historic farm equipment would maintain the historic prairie landscape while providing interpretive opportunities in the park. However, while farm equipment can maintain the statue of the prairie, haying is not equivalent to burning with respect to ecological outcomes over the long-term. Mixing haying in this manner with fire can be beneficial, but it is not an ecological replacement. The impacts of this alternative would be both beneficial and adverse, localized and long-term.

3.3.2.3 Alternative C- Non-fire Treatments and Prescribed Fire - Impacts

Cultural and Archeological Resources

Impacts on underground cultural and archeological resources would be minimal. No resources that could be impacted by prescribed fire have been identified in the burn areas. Prescribed fires may temporarily expose resources not previously identified. If such resources were exposed, such as during the construction of firelines, their significance would be determined, and appropriate protection actions would be taken. BMPs listed in the Alternatives section would be followed to avoid impacts to cultural resources.

Future archeological surveys using a magnetic gradiometry could be impacted by pile burns by potentially causing magnetic anomalies. Stipulations would be followed to avoid known potential archeological sites, and burn piles would be mapped, and locations would be shared with the Midwest Archeological Center to mark potential false magnetic anomalies.

Cultural Landscape

This alternative will maintain the cultural landscape in the woodland and both the park's and friend's group prairie units. It will have beneficial, localized, long-term impacts.

3.4 Vegetation (Native Plant Communities)

3.4.1 Affected Environment

Today, the vegetation of the park is roughly two-thirds reconstructed prairie and one-third woodland, the same general ratio found by the original surveyors of the area (Bolli, 2005). The visual appearance of the restored prairie and riparian woodland can be characterized as approximating that of the pre-settlement landscape condition relative to mid to late 20th-century native landscape community research. The restored prairie is composed of a mixture of native grasses (big bluestem (*Andropogon gerardi*), little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*)), non-native species (smooth brome (*Bromus inermis*), reed canary grass (*Phalaris arundinacea*), Kentucky bluegrass (*Poa pratensis*)), forbs (sunflowers (*Helianthus* spp.), goldenrods (*Solidago* spp.), coneflowers (*Echinacea* spp.)), shrubs (wild plum (*Prunus americana*), dogwood (*Cornus drummondii*)), and trees (American elm (*Ulmus americana*)), cottonwood (*Populus deltoides*), hackberry (*Celtis occidentalis*), ash (*Fraxinus pennsylvanica*), and willows (*Salix* spp.)). The restored tallgrass prairie is predominant in approximately 100-acres of the park. During the spring of 2009 the Friends of Homestead enrolled the 141-acre Shum Unit of tallgrass prairie into the State Acres for Wildlife Enhancement (SAFE) program benefiting the greater prairie chicken administered by the United States Department of Agriculture. To accomplish the diverse mixture needed for the program they received a grant to hire the Prairie Plains Resource Institute from Aurora, Nebraska to start the restoration of the cropland to a high diversity tallgrass prairie. 160 different species of local ecotype seed were planted as part of

the restoration effort. The Friend's group used grazing in 2013 and a prescribed fire in 2018 to manage the prairie. The main invasive plants in this unit are nonnative elm species, and smooth brome along the edges. The area along the Osage orange hedgerow was restored to native buffalo grass (*Buchloë dactyloides*), prior to the tallgrass prairie restoration, as a buffer of low growth and mowed as a fire break. Additional habitat covered by this plan includes a small native prairie fragment measuring .75-acres next to the schoolhouse and a riparian, lowland bur oak woodland approximately 60-acres in size.

Both tallgrass prairie and lowland bur oak woodland are fire dependent ecosystems. Management over the years has been focused almost entirely on the prairie with the main goals of decreasing woody species, managing exotic cool season grasses and promoting species biodiversity. Managing the prairie is primarily accomplished by haying, selective mowing, and invasive species control using herbicides and manual removal. Since the 1970's prescribed fire has been an important tool for prairie management in the park. The prairie has been divided into administrative units so about 1/3 of the prairie is burned on an annual basis. Weather, staffing, and funding all play roles in adding a variety to the actual rotation. During the 1990's there was a lot of focus on using prescribed fire to reduce smooth brome. In the early 2000's exotic cool season grass management became more of a co-dominant goal with using late summer and fall prescribed fire to promote biodiversity. Through the late 1990's and early 2000's in addition to prescribed fire many different tactics were utilized to try and combat woody species. They ranged from hiring a local farmer to broadcast spray thickets to the other extreme of utilizing weed wrenches to try and pull thickets so no herbicide would be used. Methods that have been utilized to manage the thickets included:

- Mowing thickets with brush hog or a drum mulcher. It is a good way to reduce the thicket and can make subsequent treatments more effective, however it also increases stem density which can hamper achieving long-term management goals. Short-term it increases weedy native plants like tall thistles (*Cirsium altissimum*) and sunflowers: a boon for pollinators.
- Rope wick applicator mounted to the forks on tractor. This was an effective way to reduce non-target species injury and is somewhat successful, however the only chemical that is labeled for use in a rope wick applicator is glyphosate and it is not the most effective chemical for thicket control.
- Weed wrenches, are effective for when just a few woody species need to be removed, however it is inefficient for treatment of large areas.
- Basal bark treatment was slow and required profuse application of herbicide.
- Pruning loppers, brush blades on weed cutters, or use of a chainsaw followed up with application of herbicide using a weed wand or a spray bottle with herbicide. This is the preferred method for dormant season removal or removal of tall brush in small areas but is very slow and not feasible when there is more than a couple of acres to treat.
- Broadcast spraying with mechanical powered hydraulic sprayers is the least labor intensive, however it poses the most potential for non-target damage from herbicide. It is used only on the densest of thickets. This method is most efficient when a burn occurs prior to chemical treatment.
- The preferred method for treating woody species is to have a crew with

backpack sprayers grid the treatment areas and spray the foliage. This works best in late May or early June. This treatment uses the least amount of chemical.

Other management activities in the prairie include spot treatment with herbicide or manual removal of invasive and exotic weeds and mowing and haying of firebreaks; including the Pioneer Acres Triangle (NE). The Pioneer Triangle is the northeast corner of the east forty. The almost 8-acre triangle was orphaned from the rest of the park when State Hwy 4 was moved in the 50's. The vegetation is dominated by upland prairie vegetation with encroaching sumac and dogwood at the west point of the triangle. It is hayed on about a 3-year cycle. Because fire is not used on that area it is necessary to cut cedar trees (*Juniperus virginiana*) from it on a yearly basis. Most years 50 to 100 small trees are removed. A fire break is maintained between the residential area and the rest of the prairie.

When the park acquired the land, the woodlands had been thinned by the Freeman family for use as building materials and fuel. A reforestation effort was undertaken in the 1930s to restock native tree species. The woods undoubtedly are different in composition and density than when the first settlers encountered them, due to disease, harvesting, planting and the cessation of fires. The woodlands area along the margins of Cub Creek was noted in a United States' surveyors' field notes made in 1857, observing tree species as mature bur oaks, elms, walnuts, and box elders. "The accompanying edge of undergrowth at the juncture of the woods and grass consisted of smaller wild "plum[s] & vines," possibly including sumac, hawthorn, dogwood, snowberry, and coralberry." (Homestead National Monument of America Cultural Landscape Report 2000). The surveyors' field notes lacked scientific name, allowing for some ambiguity in the specific species observed.

The woodland received little attention until the Heartland Network released their 2003 report "Forest Inventory of Vascular Plants at Homestead National Monument of America" (2003 Mlekush and DeBacker). In this report their monitoring data led them to believe that they had found a rare community type for Nebraska, the lowland mesic bur oak woodland, and local expert Steven Rolfmeier was consulted. Rolfmeier's report is found as an appendix in Mlekush and DeBacker 2003. In the report Rolfmeier states, "Given the scarcity of this community in Nebraska (it is listed as an S1² community by Nebraska Heritage), it represents one of relatively few sites in good condition in the state." Rolfmeier states that the park's 60-acres of woodland "primarily represents a closed-canopy forest that has been subject to varying degrees of logging, grazing, fire, and other disturbances since settlement." The woodland in the north forty acres of the site appears to have not been as heavily harvested by the Freeman's as the woodland in the west and middle forties. Today the north forty is classified a lowland bur oak woodland, while the woodland in the west and middle forties is classified as a successional woodland dominated by hackberry trees. There are some areas within the northern half of the site that are relatively undisturbed. In the highest-quality portions of the site, the canopy is dominated by sizeable spreading-crowned bur oaks (*Quercus macrocarpa*) about 60 ft. tall, with

² S1=Critically imperiled in state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation from the state.

large scattered cottonwoods (*Populus deltoides*) and honey-locust (*Gleditsia triacanthos*).

Immediately along the stream, oaks are absent and the dominant trees include a few large cottonwoods and some tall hackberry and black walnut (*Juglans nigra*). The outer margins of the forest along the prairie margin also lack the characteristic bur oak canopy. They are dominated by small to medium trees of hackberry, green ash (*Fraxinus pennsylvanica*), honey-locust (*Gleditsia triacanthos*), American elm (*Ulmus americana*), and white mulberry (*Morus alba*). The south portion of the forest was extensively logged before the establishment of the park and, at the time of Rothsmeier's report, had a 40-50 ft. high woody canopy dominated by hackberry and honey-locust, with a few large cottonwoods. The understory in this area was also less diverse in this area (Mlekush & DeBacker 2003, Rolfsmeier, 2007). A list of 116 species observed in the Cub Creek woods can be found in Mlekush & DeBacker (2003)."

As recommended by the report, management has focused on removal of exotic species. In 2010 a major project was undertaken to remove or kill exotic white mulberry trees and Osage orange trees that are not part of the historic hedgerow. During that project a small population of garlic mustard (*Alliaria petiolata*) was discovered. Since 2010 the focus has been on spring removal of garlic mustard by hand pulling and removal of hazardous trees along trails and roads. In 2019 the west boundary was cleared of dead trees and large woody debris to about 100 feet east of the west boundary fence. Several windstorms over the years have inflicted considerable damage on the trees of the woodland, most recently in June of 2017. That storm uprooted and broke branches from numerous trees, resulting in the need to manually remove truckloads of debris. Fire has not been recorded as being used in the woodland as a management tool since the site became a NPS unit in 1939.

The knowledge that the woodland was a rare community type encouraged the park to enter a data gathering phase. Research and management discussions have been encouraging managers to use prescribed fire to promote species diversity (Rolfsmeier 2007, Chimner and Resh 2010). Other nearby natural woodland areas with similar situations have been successful in using fire to increase native biodiversity and decrease exotic species. In the 2020, "Annual Understory Plant Recovery Dynamics in a Temperate Woodland Mosaic during a Decade of Ecological Restoration" by Reid et al., 12 years of thinning cedar trees and dormant season burning led to a 36% increase in biodiversity and an increase in floristic quality. During personal discussions between with Indian Cave managers, Kent Pfeiffer and Chance Brueggman, and the park's biologist, Jesse Bolli, regarding management actions at Indian Cave (located 70 miles east of Homestead); it was stated restoration goals are being achieved using annual prescribed fires and selective thinning (NPS Correspondence).

Osage orange (*Maclura pomifera*), occurring as a hedgerow on the southern border of the park and in the woodland, occupies at least five acres. While this species is normally considered an exotic species, the Osage orange hedgerow is an important cultural resource at the park. The trees have not demonstrated invasive tendencies

under existing conditions, and as they are not native to this ecosystem, this species is likely to be topkilled by fire. Larger trees may survive topkilling (Carey, 1994).

One special status plant species has the potential to occur within the park. The federally threatened western prairie fringed orchid is a perennial herb that is a member of the orchid family. The USFWS 1996 "*Platanthera praeclara* (western prairie fringed orchid) Recovery Plan" lists the species habitat requirements as "unplowed, calcareous prairies and sedge meadows." This species has not been documented in park boundaries and due to the recent historic land use including heavy grazing and agricultural uses, it is unlikely there is suitable habitat for this species within the park. Loss of habitat to cropland is listed as a major cause of this species decline, restoration of the prairie through appropriately timed management efforts would have a beneficial impact on habitat.

3.4.2 Environmental Consequences

3.4.2.1 Alternative A- No Action - Impacts

Invasive and Nuisance Species

Prescribed fire will have a positive impact in reducing invasive or nuisance species. It has been established that spring burns (late-April, early May) are most damaging to the main invasive plant species, smooth brome. Burning can cause mortality while the plant is growing but is most effective after the boot stage (5 leaves) and before seed production (Howard, 1996). Brome has entered the park from outside the north, south, and east boundaries and where established, out-competes the native grasses and forbs, almost completely turning infected areas into a monoculture of brome. If invasive species in the Shum unit are not managed as effectively as within the park, invasive species will increase and migrate over to the park, inhibiting control within both units. These impacts resulting from not using prescribed fire would be adverse, localized and long-term, but not irreversible.

Native Vegetation

Substantial impacts would occur in the woodland. Without fire, vegetation management efforts would be insufficient to maintain the low bur oak woodland and succession would eliminate oaks as they are "likely be replaced by hackberry and other secondary successional species after they die" (Rolfsmeier, 2007). Fire suppression activities, widespread pesticide use, and conventional farming practices have decreased ecosystem diversity and favor non-native and nuisance species. An increase in fire-intolerant species, combined with a lack of regeneration of many fire-adapted species, would result in further unnatural changes in vegetation structure, composition, and function. If vegetation in the Shum unit is not managed by the same protocol as the park, it will lead to changes in the prairie structures between the units, but these changes would be negligible, localized and long-term.

Not using prescribed fires within the woodland could decrease native diversity at the park, reducing the opportunity for genetic material to be shared with other sites, further fragmenting native habitat, and leading to

the extirpation of more woodland plant species. In addition to these changes, continued accumulation of fuels would lead to unwanted wildland fires with uncharacteristically severe fire effects, lead to increased mortality, and inhibit postburn regeneration. These impacts within the woodland would be adverse, localized and long-term, but not irreversible.

3.4.2.2 Alternative B- Mechanical Methods - Impacts

Invasive and Nuisance Species

Prior to present fire management activities being utilized on a regular basis, mowing and haying within the prairie were used to maintain the restored prairie. Haying is a potential substitute for burning, but does not have the same results in promoting biodiversity, and is limited to the time of year that it can be implemented if you want to be able to use the hay as a quality feed source for livestock. Previous mechanical method management resulted in a rich diversity of prairie grasses but did not favor a diversity of other native prairie species such as forbs and woody species. Grasses, forbs, and woody species were all an integral part of the historic tallgrass ecosystem. The use of mechanical methods can inhibit the growth cycle of some non-native species but must be appropriately timed to avoid stimulating the growth and spread of some undesirable species or this action could be counter-productive for the control of exotic vegetation.

Native Vegetation

The use of mowing and haying mimics the grazing activity of native ungulates such as buffalo, that were a historic component of the prairie ecosystem. However, without fire nutrients become stagnant in the soil and plant systems. Fire stimulates the movement of nutrients, benefiting plants and microorganisms. Also, mechanical operations would result in some thatch being left behind. Prior to the use of prescribed fires on the prairie, it built up to the point of adversely impacting the health of the prairie vegetation and creating a hazardous fuel load. Previous efforts of using mechanical methods to control exotic species invasions have had limited success (NPS 2020). Mechanical methods would not be used in the woodland and the rare bur oak forest would continue to convert to an oak hardwood climax forest. Impacts would be adverse, localized and long-term.

3.4.2.3 Alternative C- Non-fire Treatments and Prescribed Fire - Impacts

Invasive and Nuisance Species

Late spring prescribed fire would reduce the dominance of cool season grasses, such as smooth brome, and can also make treatments of invasive thickets more effective. Summer burns can reduce the dominance of grasses and promote forb diversity. Prescribed fires in the woodland would decrease undesirable species such as hackberries and other fire intolerant tree species, while promoting the growth of desirable species such as oaks. Non-fire fuel treatments of species such as garlic mustard, wild plum, smooth sumac, reed canary grass, and various tree species would reduce invasive and nuisance species. This alternative would have beneficial, long-term, and

localized impacts.

Native Vegetation

Less than 4% of the 170 million acres of Tallgrass Prairie survive today in North America (NPS, Prairies and Grasslands, 2020). Prescribed fires are used to replicate natural fire regime and fire mosaic to restore and maintain the native vegetation of the restored tallgrass prairie. Although there is a short-term adverse impact, fire is a natural feature of these ecosystems, and within a few weeks, the vegetation responds quickly to the increased exposure to sunlight, precipitation, and newly released nutrients. Two months after the first prescribed fire at the park in 1970 70% of the brome and 75% of the invasive juniper trees were destroyed, with native grasses showing an increase. However, within a few years woody vegetation in the prairie showed vigorous sprouting, suggesting that a single prescribed fire was ineffective in the long term. Professor Roger Landers, commissioned to do a study of NPS native prairie areas in the Midwest, recommended prescribed fires on a 4-5 year cycle to achieve long-term beneficial impacts (NPS 2020). The proposed action would enhance the visible scene as well as restore and maintain the tallgrass prairie ecosystem as identified in various management plans and the prairie vegetation composition would become closer to that occurring historically. More habitat conditions favorable to fire-adapted species would be created, but not necessarily in the same patterns associated with natural ignitions. The distribution of habitat would be determined by prescribed fire timing, locations, conditions, and pattern and could result in less natural habitat conditions. Impacts would be beneficial, long-term, and localized.

3.5 Wildlife and Special Status Species

3.5.1 Affected Environment

General Wildlife

Wildlife is relatively abundant in and around the park. Mammal species known to inhabit or migrate through the area include muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), fox squirrel (*Sciurus niger*), eastern cottontail (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), bobcat (*Felis rufus*), badger (*Taxidea taxus*), and coyote (*Canis latrans thamnus*). Over 100 species of birds have been observed in or near the park. Pheasant (*Phasianus colchicus*) and quail (*Colinus virginianus*) are common. Wild turkeys (*Meleagris gallopavo*) have also been observed (NPS 1997a). Reptiles and amphibians include garter snakes (*Thamnophis* sp.), bullsnakes (*Pituophis* sp.), painted turtles (*Chrysemys picta*), common snapping turtles (*Chelydra serpentina*), and several common frogs and toads. Fish species, which occur in the Big Blue River and, under favorable conditions, have been documented in Cub Creek, including channel catfish (*Ictalurus punctatus*), minnows, and several species of sunfish (NPS 1980, 1988a). Several species of pollinators utilize the park, including bees, butterflies, and moths. The global decline of pollinators is due to several factors, including pesticide use, and loss of habitat, and their preservation has become a nationwide initiative, as

pollinators are vital to the success of an ecosystem and serve as indicators of ecosystem health. In 2015 the National Strategy to Promote the Health of Honeybees and Other Pollinators was issued to facilitate this nationwide conservation effort.

Special Status Species

A 2020 Environmental Review Report generated by the Nebraska Conservation and Environmental Review Tool indicated that 29 special status species are present or potentially present in the park due to habitat suitability and two additional species were identified on a report generated by the U.S. Fish and Wildlife (USFWS) Information for Planning and Consultation Tool (Appendix A).

This list included six species of bats listed as at-risk species by Nebraska: the silver-haired bat (*Lasiorycteris noctivagans*), the eastern red bat (*Lasiurus borealis*), the hoary bat (*Lasiurus cinereus*), the smoky-eyed brown (*Lethe eurydice fumosus*), the little brown bat (*Myotis lucifugus*), the tricolored bat (*Perimyotis subflavus*). As well the federally threatened northern long-eared bat (*Myotis septentrionalis*). This species is known to inhabit the park during the summer months, roosting singly or in colonies underneath bark, in cavities or crevices of both live trees and snags (dead trees). Threats to the northern long-eared bat include loss or degradation of summer habitat and white-nose syndrome, a fungal disease that affects hibernating bats. No known maternity roots or hibernaculum have been identified in the project area, but it is vital that the timing of forest management takes the bats into consideration. Although these seven species of bats occupy different niches within the park, the potential impacts of this FMP will be similar. Where possible and not a safety hazard, dead or dying trees would be left in place. Required removal of trees or roosting structures will not occur between June 1st and July 31st.

Eleven special status insects potentially occur within the project area: Lakota mayfly (*Apobaetis lakota*), Iowa skipper (*Atrytone arogos iowa*), Nebraska fritillary (*Boloria selene nebraskensis*), married underwing (*Catocala nuptialis*), Whitney underwing (*Catocala whitneyi*), monarch (*Danaus plexippus*), mottled duskywing (*Erynnis martialis*), two-spotted skipper (*Two-spotted Skipper*), Ottoo skipper (*Hesperia ottoo*), byssus skipper (*Problema byssus kumskaka*), and regal fritillary (*Speyeria idalia*).

The regal fritillary is a bright red-orange butterfly with black forewings. It is considered as a species of concern, meaning that the USFWS has been petitioned to list and protect this species under the Endangered Species Act. Their habitat consists of tall-grass prairie with adults and caterpillars using various prairie plants for food or as hosts, including milkweeds, thistles, birds' foot violets, and Nuttal's violet. This species is quickly declining or vanishing across much of its range due to habitat loss, degradation, and pesticide use. A 2007 study on the response of prairie butterflies to prescribed fires found that the regal fritillary population increased post-fire for more than 70 months (Vogel et al. 2007). Additionally, the study found that prairie habitat specialist abundance took 50 months to recover and

prairie specialist richness took more than 70 months to recover. Appropriately timed burns with more than 50 months between burns is a recommended method to maintain suitable habitat for this species.

Two special status mammals may occur in the project area: the plains pocket mouse, (*Perognathus flavescens perniger*) and the southern flying squirrel (*Glaucomys Volans*). The southern flying squirrel, state-listed as threatened in Nebraska, has not been observed in the park, but the park does have suitable habitat availability. Southern flying squirrels are found in riparian areas within hardwood and mixed pine-hardwood forests, where they subsist primarily on fungi and lichens, supplemented with seeds, insects, fruits, and some animal matter. Their primary threat is habitat loss, degradation, and fragmentation due to human activities as well as from the introduction of exotic pests that could kill trees within the squirrel's range (USFWS Appalachian Northern Flying Squirrels Recovery Plan 1990).

There are seven special status bird species that may occur within the project area: Henslow's sparrow (*Ammodramus henslowii*), short-eared owl (*Asio flammeus*), buff-breasted sandpiper (*Calidris subruficollis*), wood thrush (*Hylocichla mustelina*), loggerhead shrike (*Lanius ludovicianus*), and bald (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*). Bald and golden eagles are protected under the 1940 Bald and Golden Eagle Protection Act, which prevents the taking or disturbance of these eagles or their nests or eggs. No nests have been documented in the park, but these eagles may occur locally, year-round.

Twenty-five species of mollusk historically occur in the Big Blue River basin in southeastern Nebraska, however many of these species have been extirpated from the basin. These species are threatened by water withdrawals, erosion, siltation, grazing, and water quality impacts. The Environmental Review Report generated by the Nebraska Conservation also indicated the potential for four special status aquatic species to occur within the project area: pimpleback (*Cyclonaias pustulosa*), fatmucket (*Lampsilis siliquoidea*), yellow sandshell (*Lampsilis teres*), and pistolgrip (*Tritogonia verrucosa*). Nebraska Game and Parks reintroduced the plain pocketbook mussel (*Lampsilis cardium*) and the fatmucket mussel to Cub Creek in July 2020.

3.5.2 Environmental Consequences

3.5.2.1 Alternative A- No Action - Impacts

General Wildlife

Fires can result in the mortality or decrease of wildlife and invertebrate species within the burned area. A 2003 study in Konza Prairie Biological Station in the Flint Hills, Kansas found that while two species of snakes, eastern racer (*Coluber constrictor*) and common garter snake (*Thamnophis sirtalis*), occurred less frequently immediately following a spring prescribed fire, by the fall the snakes had recolonized the area. The common garter snake demonstrated a slight preference for the burned area in the fall

(Setser and Cavitt 2003). To minimize the short-term adverse impacts prescribed fire activities would burn no more than 1/3 of the prairie annually to provide adjacent refugia for wildlife. Timing the burns to avoid peak emergence and breeding season for wildlife has been shown to minimize adverse impacts from prescribed fire activities. Impacts would be beneficial, localized, and long-term.

Special Status Species

This alternative would continue to have beneficial impacts on special status species, such as pollinators and the western prairie fringed orchid, in the park's prairie, but would not address habitat within the adjoining Shum Unit. Although longer breaks (50 months) between burns are recommended for species such as the regal fritillary, the prevalence of invasive plant species may necessitate more frequent burns. Burning no more than a third of the prairie at one time will mitigate potential impacts. Any impacts to special status species within the woodland would result from loss of the rare low bur oak habitat as it converted to secondary successional plant species. If nothing is done to help restore and maintain the habitat, it will become unsuitable for many of the special status species. Impacts in the park's prairie would be beneficial, long-term and localized.

3.5.2.2 Alternative B- Mechanical Methods - Impacts

General Wildlife

Mowing and haying techniques used would adhere to the "1/3 of the prairie or woodland" treatment prescription as used for prescribed fire, allowing wildlife to take refuge in untreated areas. The woodland and the Shum unit would not be treated by the park in this alternative and, as with Alternative A, would lead to a loss of low bur oak wildlife habitat. The impacts would be beneficial in the park's prairie, but adverse in the Shum Unit and in the woodland. Impacts would be minor, long-term and localized.

Special Status Species

Utilizing mowing and haying techniques that mimic grazing activity, is not expected to have a long-term, adverse impact on any special status species as grazing was a natural part of the ecosystem in which these species inhabit. These methods are expected to improve suitable habitat for special status species such as the western prairie fringed orchids' habitat in the long-term, although would not provide the additional beneficial impacts such as nutrient recycling provided by fire. The impacts would be both beneficial, long-term and localized.

3.5.2.3 Alternative C- Non-fire Treatments and Prescribed Fire - Impacts

General Wildlife

As with the prairie in Alternative A to minimize the short-term adverse impacts prescribed fire activities would burn no more than 1/3 of the woodland annually to provide adjacent refugia for wildlife. Timing the burns

to avoid peak emergence and breeding season for wildlife has been shown to minimize adverse impacts from prescribed fire activities. Impacts would be beneficial, localized, and long-term.

Special Status Species

Although not currently found in the park this alternative would have beneficial impacts on habitat for southern flying squirrel. Impacts would be limited to the duration of the prescribed fire activities and any wildlife displaced by prescribed fires or wildfire should return to the area within a short time. Impacts would be beneficial, localized, and long-term.

4.0 Consultation and Coordination

4.1 Lead Agency

This Fire Management Plan and Environmental Assessment has been prepared and reviewed by the National Park Service staff at Homestead National Historical Park and by staff at the Midwest Regional Office located in Omaha, Nebraska.

4.2 Federal Agencies

U.S. Fish and Wildlife Service

4.3 State Agencies

Nebraska Game and Parks Commission
Nebraska Department of Environmental Quality
Nebraska State Historic Preservation Office
Nebraska Forest Service

4.4 American Indian Tribes

Ponca Tribe of Nebraska
Ponca Tribe of Indians of Oklahoma
Otoe-Missouria Tribe of Oklahoma
Pawnee Nation of Oklahoma

4.5 Local Agencies

Friends of Homestead
Beatrice Fire and Rescue Department
Beatrice Rural Fire District

4.6 Other Environmental and Regulatory Requirements

Endangered Species Act: Section 7 consultation with U.S. Fish and Wildlife Service

Executive Orders 11988 and 11990: Floodplain management

National Historic Preservation Act (Section 106): Provide for review by the Advisory Council on Historic Preservation

NPS Director's Order #18, Wildland Fire Management

A Notice of Availability of the Fire Management Plan and Environmental Assessment will be published in the local newspaper, allowing 30 days for public comment.

5.0 List of Preparers and Contributors

The persons responsible for the review of the proposed action, the supporting information and analyses, and the preparation of this EA are listed below:

US DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE

Homestead National Historical Park

8523 West State Hwy 4

Beatrice, NE 68310

- Mark Engler, Superintendent
- Jesse Bolli, Resource Management Specialist

Department of Interior Unified Regions 3, 4, and 5 Regional Office

601 Riverfront Drive

Omaha, NE 68102

- Cody Wienk, Fire Ecologist
- Tokey Boswell, Planning & Compliance Division Program Manager
- Christine Gabriel, Regional Environmental Coordinator
- Amber Rhodes, Environmental Protection Specialist

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Appendix A

Nebraska Game and Parks Environmental Review Report: List of Special Status Species

System Project ID: NE-CERT-002183

Report Generation Date: 1/8/2020 03:42:20 PM

Table 1
Protected Areas in Immediate Vicinity of Project (project review area)

Area Name	Owner/Manager	Information Source
Homestead Land Grant	Private	USGS Protected Areas Database
Homestead National Monument	National Park Service	USGS Protected Areas Database
Homestead National Monument	Other or Unknown Federal Land	USGS Protected Areas Database
Homestead National Monument	Unknown	USGS Protected Areas Database
Homestead	Other or Unknown Federal Land	USGS Protected Areas Database

Table 2
**Documented Occurrences in Immediate Vicinity of Project (project review area):
Natural communities and special areas**

This table has no results.

Table 3
Township-level Documented Occurrences of Species within 1 Mile of Project Review Area

Scientific Name	Common Name	USFWS	State	SGCN	USFS	SRank	GRank
Cyclonaias pustulosa	Pimpleback			Tier 1		S2	G5
Haliaeetus leucocephalus	Bald Eagle			Tier 2	S	S3	G5
Lampsilis siliquoidea	Fatmucket			Tier 2		S1	G5
Lampsilis teres	Yellow Sandshell			Tier 2		S1	G5
Myotis septentrionalis	Northern Long-eared Myotis	T	T	Tier 1		S1S2	G1G2
Tritogonia verrucosa	Pistolgrip			Tier 1		S1	G4G5

Table 4
**Potential Occurrences in Immediate Vicinity of Project (project review area):
Special status species (Tier 1 at-risk species and Bald and Golden Eagle), based on models or range maps**

Scientific Name	Common Name	Data Type	USFWS	State	SGCN	USFS	SRank	GRank
Ammodramus henslowii	Henslow's Sparrow	Range			Tier 1		S1	G4
Apobaetis lakota	Lakota Mayfly	Range			Tier 1		SNR	G2G3
Asio flammeus	Short-eared Owl	Range			Tier 1	S	S2	G5
Atrytone arogos iowa	Iowa Skipper	Range			Tier 1		S1	G3T3
Boloria selene nebraskensis	Nebraska Fritillary	Range			Tier 1		SNR	G5T3T4
Calidris subruficollis	Buff-breasted Sandpiper	Range			Tier 1		S2N	G4

Table 4
Potential Occurrences in Immediate Vicinity of Project (project review area):
Special status species (Tier 1 at-risk species and Bald and Golden Eagle), based on models or range maps

Scientific Name	Common Name	Data Type	USFWS	State	SGCN	USFS	SRank	GRank
<i>Catocala nuptialis</i>	Married Underwing	Range			Tier 1		SNR	G3G4
<i>Catocala whitneyi</i>	Whitney Underwing	Range			Tier 1		S1	G3G4
<i>Danaus plexippus</i>	Monarch	Range			Tier 1	S	S2	G4
<i>Erynnis martialis</i>	Mottled Duskywing	Range			Tier 1		S2	G3
<i>Euphyes bimacula illinois</i>	Two-spotted Skipper	Range			Tier 1		S3	G4T1T2
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Range			Tier 2	S	S3	G5
<i>Hesperia ottoe</i>	Ottoe Skipper	Range			Tier 1	S	S2	G3G4
<i>Hylocichla mustelina</i>	Wood Thrush	Range			Tier 1		S3	G4
<i>Lanius ludovicianus</i>	Loggerhead Shrike	Range			Tier 1	S	S3	G4
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	Range			Tier 1		S3	G3G4
<i>Lasiurus borealis</i>	Eastern Red Bat	Range			Tier 1		S3	G3G4
<i>Lasiurus cinereus</i>	Hoary Bat	Range			Tier 1	S	S3	G3G4
<i>Lethe eurydice fumosus</i>	Smoky-eyed Brown	Range			Tier 1		S3	G5T3T4
<i>Myotis lucifugus</i>	Little Brown Myotis	Range			Tier 1		SNR	G3
<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Range	T	T	Tier 1		S1S2	G1G2
<i>Perimyotis subflavus</i>	Tricolored Bat	Range			Tier 1		S3	G2G3
<i>Perognathus flavescens perniger</i>	Plains Pocket Mouse	Range			Tier 1		SNR	G5TNR
<i>Problema byssus kumskaka</i>	Byssus Skipper	Range			Tier 1		S1	G4TNR
<i>Speyeria idalia</i>	Regal Fritillary	Range			Tier 1	S	S3	G3?
<i>Tritogonia verrucosa</i>	Pistolgrip	Range			Tier 1		S1	G4G5

Appendix B
USFWS Consultation Letter (PENDING)

Appendix C Tribal Consultation Letters



United States Department of the Interior

NATIONAL PARK SERVICE
Homestead National Monument of America
8523 W. State Hwy
Beatrice, Nebraska 68310-0673
www.nps.gov/home

IN REPLY REFER TO:

6. A.1 (HOME)

May 21, 2020

Ponca Tribe of Nebraska
Nicholas Mauro, THPO
P.O. Box 288
Niobrara, NE 68760

Dear Mr. Mauro:

We are writing to seek your consultation and feedback on a proposal to change the use of prescribed fire at Homestead National Monument of America. Homestead is a 212-acre National Park located in Gage County, Nebraska, four miles west of Beatrice, Nebraska. The park is on the land of your ancestors, and so we ask for your guidance as the National Park Service manages this land so that it is unimpaired for future generations while helping to tell the story of the Homestead Act and how while it gave millions the opportunity to own land, that opportunity came at a great cost to your ancestors and the land.

Homestead National Monument has about 120 acres of burnable prairie and 60 acres of burnable woodland, with the rest of the landscape of the park being developed areas. Since 1970, the National Park Service has used prescribed burns to maintain the prairie. Approximately one-third of the prairie is burned each year. The main goal of these prescribed fires is to reduce invasive species while promoting native biodiversity. Fire as a management tool for the prairie has proven very successful. The most recent sampling showed that in 2017 the prairie had 109 native species – a number which has remained stable over the last twenty years of monitoring.

The NPS is proposing to use fire and selective thinning to manage the bur oak woodland. The goal would be to shift the woodland to more of an oak dominated woodland and to increase the diversity of the ground flora. Currently ground vegetation diversity in the woodland is just over 20 species.

Enclosed is a map of the monument showing the proposed burn units and a chart showing the proposed location and frequency of the fires.

We are seeking consultation with the following consulting parties— the Otoe-Missouria Tribe of Oklahoma, the Pawnee Nation of Oklahoma, the Ponca Tribe of Oklahoma, and the Ponca Tribe

of Nebraska. Please notify us of any additional parties you feel may be interested in participating in these consultations as soon as possible. Please contact either Homestead's Resource Management Specialist, Jesse Bolli, at (402)223-1705 or by email: Jesse_Bolli@nps.gov if you have any questions, or myself at (402)223-1702 or by email: Mark_Engler@nps.gov.

Sincerely,

Mark Engler
Superintendent

Enclosures

HOME:ME:BS:P/ADMIN DIV/OUTGOING LETTERS/SUPT/2020/TRIBE/PONCA OF NE



United States Department of the Interior

NATIONAL PARK SERVICE
Homestead National Monument of America
8523 W. State Hwy
Beatrice, Nebraska 68310-0673
www.nps.gov/home

IN REPLY REFER TO:

6. A.1 (HOME)

May 21, 2020

Otoe-Missouria Tribe of Oklahoma
Elsie Whitehorn, THPO
8151 Hwy 177
Red Rock, OK 74651

Dear Ms. Whitehorn:

We are writing to seek your consultation and feedback on a proposal to change the use of prescribed fire at Homestead National Monument of America. Homestead is a 212-acre National Park located in Gage County, Nebraska, four miles west of Beatrice, Nebraska. The park is on the land of your ancestors, and so we ask for your guidance as the National Park Service manages this land so that it is unimpaired for future generations while helping to tell the story of the Homestead Act and how while it gave millions the opportunity to own land, that opportunity came at a great cost to your ancestors and the land.

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of Nebraska. Please notify us of any additional parties you feel may be interested in participating in these consultations as soon as possible. Please contact either Homestead's Resource Management Specialist, Jesse Bolli, at (402)223-1705 or by email: Jesse_Bolli@nps.gov if you have any questions, or myself at (402)223-1702 or by email: Mark_Engler@nps.gov.

Sincerely,

Mark Engler
Superintendent

Enclosures

HOME:ME:BS:ADMIN DIV/OUTGOING LETTERS/SUPT/2020/TRIBES/WHITEHORN



United States Department of the Interior

NATIONAL PARK SERVICE
Homestead National Monument of America
8523 W. State Hwy
Beatrice, Nebraska 68310-0673
www.nps.gov/home

IN REPLY REFER TO:

6. A.1 (HOME)

May 21, 2020

Pawnee Nation of Oklahoma
Matt Reed, THPO
P.O. Box 470
Pawnee, OK 74058

Dear Mr. Reed:

We are writing to seek your consultation and feedback on a proposal to change the use of prescribed fire at Homestead National Monument of America. Homestead is a 212-acre National Park located in Gage County, Nebraska, four miles west of Beatrice, Nebraska. The park is on the land of your ancestors, and so we ask for your guidance as the National Park Service manages this land so that it is unimpaired for future generations while helping to tell the story of the Homestead Act and how while it gave millions the opportunity to own land, that opportunity came at a great cost to your ancestors and the land.

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Sincerely,

Mark Engler
Superintendent

Enclosures

HOME:ME:BS:ADMIN DIV/OUTGOING LETTERS/SUPT/2020/TRIBES/HENSLER



United States Department of the Interior

NATIONAL PARK SERVICE
Homestead National Monument of America
8523 W. State Hwy.
Beatrice, Nebraska 68310-0673
www.nps.gov/home

IN REPLY REFER TO:

6. A.1 (HOME)

May 21, 2020

Ponca Tribe of Indians of Oklahoma
Staci Hesler, THPO
121 White Eagle Drive
Ponca City, OK 74601

Dear Ms. Hesler:

We are writing to seek your consultation and feedback on a proposal to change the use of prescribed fire at Homestead National Monument of America. Homestead is a 212-acre National Park located in Gage County, Nebraska, four miles west of Beatrice, Nebraska. The park is on the land of your ancestors, and so we ask for your guidance as the National Park Service manages this land so that it is unimpaired for future generations while helping to tell the story of the Homestead Act and how while it gave millions the opportunity to own land, that opportunity came at a great cost to your ancestors and the land.

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Sincerely,

Mark Engler
Superintendent

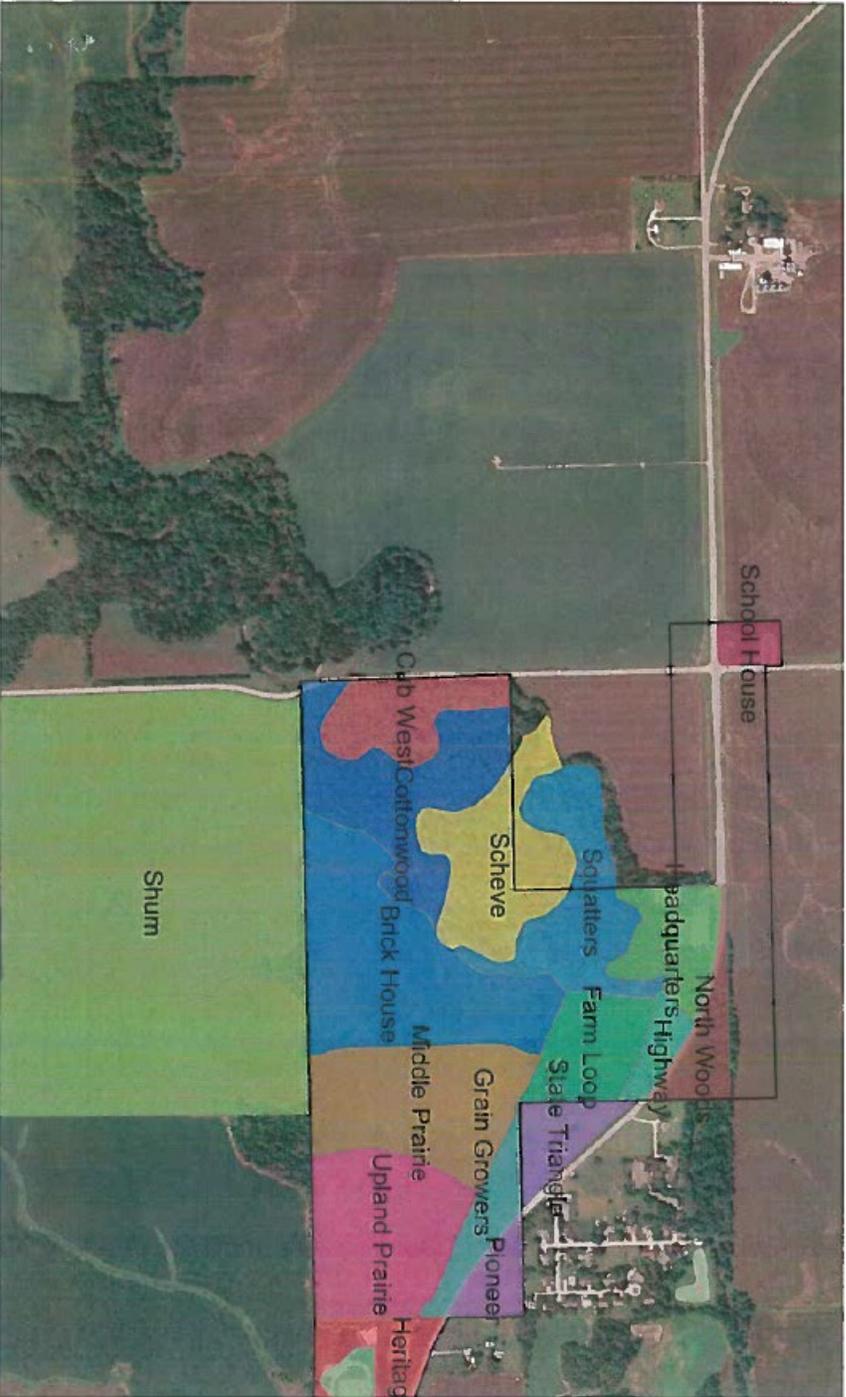
Enclosures

HOME:ME:BS:ADMIN DIV/OUTGOING LETTERS/SUPT/2020/TRIBES/HENSLER

	Brick House Prairie	Farm Loop Prairie	Freeman School Prairie	Grain Growers Prairie	Highway Prairie	Middle Prairie	Pond Prairie	Upland Prairie	Cotton-wood Woodland	Cub West Woodland	Shave Woodland	Squatters Woodland	Head-quarters Woodland	North Woods Woodland	Pioneer Prairie	Heritage Prairie
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Homestead National Monument of America
Nebraska

Homestead NM Treatment Units



Appendix D
Nebraska State Historic Preservation Office Consultation Letter
(PENDING)