

Environmental Assessment

John W. and Louise Seier National Wildlife Refuge Habitat Management

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Prepared by

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List of Acronyms

Term	Definition
ABB	American burying beetle
AQI	Air Quality Index
ARM	Adaptive Resource Management
ATV	all-terrain vehicle
AUM	Animal Unit Month
BCC	Bird of Conservation Concern
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO ₂	carbon dioxide
Conceptual Management Plan	<i>Conceptual Management Plan for the John W. and Louise Seier National Wildlife Refuge</i>
County	Rock County
DM	Department Manual
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of no Significant Impact
FR	Federal Register
HUC	Hydrologic Unit Code
Hunting EA	<i>Final Environmental Assessment for Hunting on John W. and Louise Seier National Wildlife Refuge</i>
Hunting Plan	<i>Final John W. and Louise Seier National Wildlife Refuge Hunting Plan</i>
IPaC	Information for Planning and Consultation
NAAQS	National Ambient Air Quality Standards
NDEE	Nebraska Department of Environment and Energy
NDEQ	Nebraska Department of Environmental Quality
NEPA	National Environmental Policy Act
NLEB	northern long-eared bat
NO ₂	nitrogen dioxide
NWR	National Wildlife Refuge
NWRS	National Wildlife Refuge System
NWRSAA	National Wildlife Refuge System Administration Act
O ₃	ozone
OHRV	off-highway recreational vehicle
Pb	lead
PM ₁₀	particulate matter less than 10 microns in diameter
PM _{2.5}	particulate matter less than 2.5 microns in diameter

Term	Definition
Proposed Action	Habitat-management activities on the John W. and Louise Seier National Wildlife Refuge
Proposed Action Area	2,400-acre John W. and Louise Seier National Wildlife Refuge
PUPS	Pesticide Use Proposal System
Seier	John W. and Louise Seier
Service	U.S. Fish and Wildlife Service
SO ₂	sulfur dioxide
U.S.C.	United States Code
WNS	White Nose Syndrome
WPFO	western prairie fringed orchid

Environmental Assessment for Habitat Management on the John W. and Louise Seier National Wildlife Refuge

This Environmental Assessment (EA) has been prepared to evaluate the effects associated with the Proposed Action and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500-1509) and Department of the Interior (43 CFR 46; 516 Department Manual [DM] 8) and U.S. Fish and Wildlife Service (the Service) (550 FW 3) regulations and policies. NEPA requires examination of the effects of proposed actions on the natural and human environment.

1 Introduction

1.1 Proposed Action

The Service is proposing to perform habitat-management activities on the John W. and Louise Seier (Seier) National Wildlife Refuge (NWR), in Rock County (County), Nebraska (Proposed Action). Cattle grazing, haying, invasive-species management, prescribed fire, mechanical tree removal, vegetative mastication, and seed harvesting would occur throughout the 2,400-acre Seier NWR (Proposed Action Area) (see **Figure 1**; all figures are presented in Appendix B). Activities would occur in accordance with the *Conceptual Management Plan for the John W. and Louise Seier National Wildlife Refuge* (Service 2003), referred to herein as the Conceptual Management Plan.

A Proposed Action may evolve during the NEPA process as the agency refines its proposal and gathers feedback from the public, tribes, and other agencies. Therefore, the final Proposed Action may be different from the original. This Proposed Action will be finalized at the conclusion of the public comment period for the EA.

1.2 Background

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (NWRS), the purposes of an individual refuge, the applicable Service policies, and laws and international treaties. Relevant policies includes the Fish and Wildlife Act of 1956, National Wildlife Refuge System Administration Act (NWRSAA) of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the CFR and *U.S. Fish and Wildlife Service Manual* (010 FW 1—905 FW 1).

In 1990, the Service and the Seier family, John W. and Louise Seier, exchanged a series of letters and met concerning the donation of their ranch to the Service. The Service agreed to accept the property and began managing the land in 2003.

The Seier NWR was established pursuant to The John W. and Louise Seier Living Trust. In accordance with Fish and Wildlife Act of 1956, the primary purpose of the Seier NWR is “for the development, advancement, management, conservation, and protection of fish and wildlife

resources...” (16 United States Code [U.S.C.] 742f[a][4]) and “for the benefit of the Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude” (16 U.S.C. 742 f[b][1]). The mission of the NWRS, as outlined by the NWRSA and as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd *et seq.*), is “...to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

Additionally, the NWRSA mandates that the Secretary of the Interior administer the NWRS (16 U.S.C. 668dd(a)(4)), as follows.

- Provide for the conservation of fish, wildlife, and plants, and their habitats within the NWRS.
- Ensure that the biological integrity, diversity, and environmental health of the NWRS are maintained for the benefit of present and future generations of Americans.
- Ensure that the mission of the NWRS, as described at 16 U.S.C. 668dd(a)(2), and the purpose of each refuge are carried out.
- Ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the states in which the units of the NWRS are located.
- Assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the NWRS and the purposes of each refuge.
- Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the NWRS through which the American public can develop an appreciation for fish and wildlife.
- Ensure that opportunities are provided within the NWRS for compatible wildlife-dependent recreational uses.
- Monitor the status and trends of fish, wildlife, and plants in each refuge.

It is a priority of the Service to manage native habitat for resident wildlife and plant species, maintaining biological integrity, diversity, and environmental health in accordance with the purposes for which the refuge was established and ensure that the mission of the Refuge System is carried out.

1.3 Purpose and Need for the Proposed Action

The purpose of this Proposed Action is to meet the Service’s priorities and mandates as outlined by the NWRSA to “provide for the conservation of fish, wildlife, and plants, and their habitats within the NWRS” and “ensure that the biological integrity, diversity, and environmental health of the NWRS are maintained for the benefit of present and future generations of Americans” (16 U.S.C. 668dd[a][4]). The Proposed Action would also help accomplish a goal in the Conceptual Management Plan to facilitate compatible, wildlife-dependent recreational opportunities on refuge lands.

The need for the Proposed Action is that the Service must conduct habitat-management activities in order to meet the Service’s priorities and mandates. Given the current condition of the Seier NWR, the Service would not meet the associated priorities and mandates without holistic habitat management (i.e., with only natural-disturbance regimes).

2 Alternatives

This section presents the Proposed Action and the No-Action Alternative evaluated in this EA. It also includes a summary of alternatives considered, but not carried forward for detailed analysis. This information is included because, as referenced in the CEQ’s NEPA regulations regarding the contents of an EA (40 CFR 1501.5(c)), NEPA Section 102(2)(E) requires federal agencies to develop, study, and briefly describe alternatives to any Proposed Action with the potential to result in unresolved resource conflicts.

2.1 Alternative A – Current Management Strategies – No-Action Alternative

Under the No-Action Alternative, habitat-management activities would not occur in the Seier NWR and the Seier NWR would remain open to the public only for hunting activities under the current hunting plan and EA.

2.2 Alternative B – Habitat Management – Proposed Action Alternative

Under the Proposed Action Alternative, the Service would conduct various proposed habitat-management activities to protect, maintain, and enhance habitat throughout the 2,400 acres of the NWR. As discussed in the Conceptual Management Plan, the primary purpose of the Seier NWR is to preserve, restore, and enhance the ecological diversity and abundance of migratory and resident wildlife. In June 2020, the Service produced an Inventory and Monitoring Plan for the Fort Niobrara and Seier NWRs, identifying priority resources of concern (Service 2020b). Priority ecological communities in the Seier NWR include wetland and grassland habitats that support priority bird, insect, and reptile species designated by the *Service Regional Grassland Ecosystem Conservation Priorities, Rainwater Basin Joint Venture Implementation Plan* (Rainwater Basin Joint Venture 2013), or the *Nebraska Natural Legacy Project State Wildlife Action Plan* (Schneider et al. 2018). Under the Proposed Action, all available habitats would be optimized to support waterfowl production/migration, neotropical migrant production/migration, shorebird/wading-bird production/migration, and habitats for all Sandhill species of resident wildlife (including both small and big-game species) (Service 2003).

The habitat-management activities proposed within the NWR include cattle grazing, haying, invasive-species management, prescribed fires, mechanical tree removal, vegetative mastication, and seed harvesting. Each of these activities is described in further detail below. Through the utilization of Adaptive Resource Management (ARM) techniques, the Service would assess existing natural resources and monitor the effects of management tools.

This alternative fulfills the Service’s mandate under the NWRSA.

2.2.1 Cattle Grazing

Two basic methods of cattle grazing are used as a management tool in grasslands. The first is to use cattle every few years for limited periods to address a particular management issue. The second is to use cattle as part of a permanent grazing method or system, such as rotational grazing or patch-burn grazing (Steinauer et al. 2011).

The Service proposes to use cattle grazing throughout the 2,400-acre NWR at any time of year, primarily April through October. Managing native grasslands to enhance prairie conditions and wildlife habitat would be accomplished using stocking rates dependent on the Service's management objectives, grazing systems, grassland size and condition, and other factors. The time and frequency would depend on the desired outcome determined by objectives outlined in future management plans, based on the best-available biological data.

Future grazing agreements are anticipated to include location, Animal Unit Month (AUM), dates, and specific guidelines related to grazing activities in accordance with the Service's Cooperative Agriculture policy (50 CFR 29.2). Grazing would normally be conducted using cattle, but other livestock animals, such as sheep or goats, may be used with appropriate fencing. The AUM per unit would be dependent on grazing-unit size, animal type, amount and type of forage available, and goals for the unit. Grazing units would be surrounded with appropriate fencing and may include cross-fencing. Watering facilities may or may not exist on a unit; if facilities do not exist, then they may need to be installed, or a rancher may need to deliver water to the site on a frequent basis. Mineral blocks may be used to supplement and distribute animals throughout the unit to meet management objectives.

2.2.2 Haying

Haying, the process of cutting, drying, and baling field grasses, is performed using a swather or tractor with a variety of implements (i.e., mower, hay conditioner, rake, baler, and forks) and a truck or tractor with a flatbed trailer, hay trailer, or stack mover for removing bales. The Service proposes haying in areas throughout the 2,400-acre NWR, primarily from August through September. Haying activities would take 1 to 2 weeks per field. The time and frequency would depend on the desired outcome, as determined by objectives outlined in management plans based on the best-available biological data. Future haying agreements are anticipated to cover the location, dates, and number of acres to be hayed, in accordance with the Service's Cooperative Agriculture Policy (50 CFR 29.2).

2.2.3 Invasive Species and Noxious Weed Management

Invasive herbaceous species and noxious weeds compete with and displace native plants and degrade wildlife habitat (Steinauer et al. 2011). Additionally, some species are directly poisonous or injurious to wildlife, humans, and livestock (Gaussoin et al. 2005). The Service would prioritize ecologically sensitive methods when treating all populations of invasive plant species and noxious weeds. Mechanical controls, such as pulling, hoeing, and grubbing, would be used on a small scale, and the use of herbicide would be minimal.

Broadcast and spot applications of certain herbicides would be used on target plants. Using broadcast spraying, herbicides would be applied to patches and groups of invasive plants. Herbicide would be spot applied directly to the plant. All applications would be performed by hand with hand-pumps and/or backpack sprayers. The Service would use the most species-specific herbicide available for problematic invasives and weeds, with information submitted each year into their Pesticide Use Proposal System (PUPS), regarding potential herbicide use and target plants.

Invasive species and noxious weed management activities would occur in isolated areas throughout the 2,400-acre NWR any time of the year, based on the optimal season for target species. The time and frequency would depend on the desired outcome, as determined by objectives outlined in future management plans, based on the best-available biological data.

2.2.4 Prescribed Fires

Fire was a natural ecological process on Great Plains grasslands before European settlement, and native vegetation evolved under periodic burning and grazing. When planned and implemented properly, prescribed burning can effectively suppress unwanted trees and shrubs and enhance native grass production (Tunnell 2004). Fire can also be necessary for prompting the germination of some plants, including a number of rare and endangered species (Tu et. al 2001).

The Service would perform prescribed burns in areas throughout the 2,400-acre Seier NWR. Most burns would occur between October and April, but the schedule would be dependent on weather and management goals. The planning process for burning would start approximately 9 to 12 months before the burn would be conducted. Following guidelines set forth in a Prescribed Burn Plan, an experienced fire crew would apply fire to a specific area of the Seier NWR, using drip-torches fueled by a mixture of gasoline, diesel, and kerosene. All burns would have at least one power water-sprayer present. Power sprayers may be traditional fire trucks, spray units mounted on skids, herbicide or livestock sprayers, or all-terrain vehicle (ATV) sprayers. Prior to conducting burn activities, the fire crew would establish firebreaks, where needed.

2.2.5 Mechanical Tree Removal and Mastication

The Service proposes to remove native, invasive trees and shrubs throughout the 2,400-acre Seier NWR. More than 61.69 acres of consolidated trees and shrubs are proposed to be removed (**Figure 2**); however, removal would be ongoing throughout the Seier NWR, as needed. Nonsprouting trees would be cut off at ground level, and resprouting species would be cut when their root reserves are low or pulled out of the ground (including roots). Chainsaws, hydro axes, grinders, shears, and other hand tools may be used to remove aboveground biomass (i.e., trunk and branches) and heavy equipment, such as bulldozers and excavators, would be used to remove belowground biomass (i.e., roots). All downed wood would be shredded, chipped, or mulched on site, using equipment such as mulchers, masticators with reticulating arms, or brush cutters. The Service would match equipment to the chosen site and management objectives in the Seier NWR. Masticated woody material would be left on site. If belowground biomass were removed, then the displaced soil would be backfilled.

Species chosen for removal would be assessed on a case-by-case basis but could include common invasive species such as Eastern redcedar (*Juniperus virginiana*)(*Pinus ponderosa Dougl. ex Laws*). This species was introduced via early 1900s tree plantations and wind breaks and is not native to the Nebraska Sandhills ecoregion (NRCS 2023) (Aus der Au 2017).

2.2.6 Seed Harvesting

The Service proposes to conduct seed harvesting in areas throughout the 2,400-acre Seier NWR at any time of the year, with most of the collection in the fall, when seeds have matured.

Harvesting may require the use of tractors, ATVs, implements, combines, and/or grain carts. Multiple pieces of equipment may be used in the field at a time. The timing of collecting native species seed would depend on the physiology of the target plant species. Agreements and permits would outline the target species and dates for collection. The permit holder would provide all equipment and labor.

2.2.7 Site Access

The Service would access and tow equipment for habitat-management activities using passenger trucks on existing roadways, such as 854th Road and 443rd Avenue, to the greatest extent possible. Trucks, off-highway recreational vehicles (OHRVs), such as ATVs and utility task vehicles, tractors, excavators, and other specialized equipment would travel off road within the Seier NWR.

2.2.8 Best Management Practices to Avoid Conflicts

- **Grazing Requirements:** All grazing agreements will be consistent with agency policy, including 620 FW 2, *Cooperative Agricultural Use Policy*, and the *Region 6 Cooperative Agricultural Program Guidance* (Service 2022c).
- **Prescribed Fire:** All prescribed fire will be accomplished following national and agency policies, including: the Federal Wildland Fire Policy (1995); *Review and Update of the 1995 Federal Wildland Fire Management Policy* (DOI 2001); *National Cohesive Wildland Fire Management Strategy* (USDA 2019); Secretarial Order 3372: *Reducing Wildfire Risks on Department of the Interior Land Through Active Management* (2019); the Service's *Fire Management Handbook* (621 FW 1); and all applicable policy memos.
- **Herbicide Use:** Herbicide applications will be conducted according to label requirements and agency policies, including the PUPS. Best Management Practices (BMPs) for herbicide use and other safety items, as addressed in the Station Safety Plan.

2.3 Alternative(s) Considered, But Dismissed From Further Consideration

Other alternatives that were considered, but eliminated from detailed consideration, included opening the Seier NWR to a limited number of management activities. These alternatives and the reasons for their dismissal are detailed below.

2.3.1 Grazing-Only Alternative

This alternative proposed that grasslands be managed by means of livestock grazing alone. This alternative was not analyzed in detail because experience has shown grazing alone does not

achieve desired grassland or riparian habitat conditions. Allowing dense vegetation to grow is desirable for supporting species that require dense nesting cover but allowing these meadows to get too dense results in unsuitable habitat conditions for dense-cover nesting species. For cattle to be effective in reducing excess biomass, they would need to graze during the bird-nesting season, which would result in trampling of bird nests and possibly of nesting animals. The end of the bird-nesting season coincides the end of the grazing season, limiting the time on the ground during which cattle could be removing biomass. Because cattle grazing alone is unlikely to achieve desired habitat conditions, implementing a grazing-only management option was considered largely impractical. Multiple tools would be needed to accomplish Seier NWR purposes and maintain biological integrity, diversity, environmental health in accordance with the Service's Policy 601 FW 3.

2.3.2 No-Grazing Alternative

Under this alternative, livestock grazing would not be used as a management tool. This alternative was considered during the development of preliminary alternatives, but dismissed from further consideration, primarily because of the detrimental effects that removal of grazing would have on grassland-habitat composition and structure. Managed livestock grazing is currently the most economically feasible tool for providing short-grass habitat conditions for focal wildlife species and controlling exotic grasses (e.g., smooth brome [*Bromus inermis*]). Under this scenario, the grassland habitats would quickly become overgrown and unsuitable for the myriad of species that are a management focus for the Seier NWR. Therefore, a no-grazing alternative would not accomplish Seier NWR purposes, nor maintain biological integrity, diversity, or environmental health, in accordance with the Service's Policy 601 FW 3.

2.3.3 No Prescribed Fire Alternative

This alternative proposed no use of prescribed fire activities to manage grassland habitat. Prescribed fire is a labor-intensive and expensive management tool, but it has value for mimicking natural stochastic events and reinvigorating grassland habitats. Prescribed fire must be used under certain weather conditions, but with the small size of the Seier NWR (i.e., 2,400 acres), such conditions reliably occur every few years for the length of time required to burn the Seier NWR's habitat safely. This alternative was not forwarded for detailed analysis because without prescribed burning, the Service is unlikely to accomplish Seier NWR purposes, nor maintain biological integrity, diversity, environmental health in accordance with Service Policy 601 FW 3.

3 Affected Environment and Environmental Consequences

This section is organized by affected resource categories and, for each affected resource, discusses: (1) the existing environmental and socioeconomic baseline in the action area for each resource; and (2) the effects and impacts that the Proposed Action and any alternatives may have on each resource. The effects and impacts of the Proposed Action considered here are changes to the human environment, whether adverse or beneficial, that are direct, indirect, or cumulative. This EA includes the written analyses of the environmental consequences on a resource only

when the impacts on that resource could be more than negligible, and therefore would be considered an *affected resource*. Any resources that would not be more than negligibly affected by the Proposed Action have been dismissed from further analysis.

The Seier NWR consists of approximately 2,400 acres in Rock County, Nebraska (**Figure 1**). Seier NWR is primarily grassland habitat, and the Proposed Action involves activities throughout the entire Seier NWR.

For more information regarding the general characteristics of the Seier NWR's environment, please see the Refuge's Conceptual Management Plan: <https://ecos.fws.gov/ServCat/Reference/Profile/157091>.

The following resources either: (1) do not exist within the Proposed Action Area; or (2) would either not be affected or only negligibly affected by the Proposed Action.

- Floodplains
- Wilderness or Other Special Designation
- Cultural Resources and Subsistence
- Land Use
- Administration
- Local and Regional Economies
- Environmental Justice

3.1 Natural Resources

3.1.1 Biological Resources

3.1.1.1 Terrestrial Wildlife and Aquatic Species

Affected Environment

More than 300 species of resident and migratory birds, 55 species of mammals, 75 species of fish, and 27 species of amphibians and reptiles have been documented in the Sandhills Ecoregion, where the Proposed Action is located (Schneider et al. 2011). This section of the EA focuses on resident wildlife species that are not federally listed or protected. Migratory birds and threatened and endangered species are discussed below in Section 3.1.1.2, *Threatened and Endangered Species and Other Special-Status Species*.

Many mammals found in the Sandhills Ecoregion have no distinct affiliation to the region. Carnivores and hooved animals are widespread across the landscape, whereas rodent species tend to be adapted to a single habitat type. Small mammals include upland species, such as the plains pocket gopher (*Geomys bursarius*), white-tailed jackrabbit (*Lepus townsendii*), Ord's kangaroo rat (*Dipodomys ordii*), and prairie voles (*Microtus ochrogaster*). Species such as the masked shrew (*Sorex cinereus*), jumping mouse (*Zapus hudsonius*), and meadow vole (*Microtus pennsylvanicus*) are usually associated with wet meadows and other wetlands. The most-abundant large mammals in the Sandhills include mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*). The Sandhills also support a few elk (*Cervus canadensis*) and relatively small numbers of pronghorn (*Antilocapra americana*), particularly in the west.

Coyotes (*Canis latrans*) are common throughout the ecoregion, and bobcats (*Lynx rufus*) can be found in many riparian areas. In recent years, biologists have confirmed several sightings of mountain lions (*Puma concolor*) in the region (Schneider et al. 2011).

Many common fish species are big-river generalists, meaning that they can withstand a wide variation of environmental extremes. Among these are the channel catfish (*Ictalurus punctatus*), flathead chub (*Platygobio gracilis*), and river carpsucker (*Carpiodes carpio*). Game fish, primarily yellow perch (*Perca flavescens*), northern pike (*Esox lucius*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and carp (such as *Hypophthalmichthys nobilis*, *Cyprinus carpio*, *Platygobio gracilis*, and *Ctenopharyngodon idella*) have been introduced into many lakes in the Sandhills, and trout have been introduced into several coldwater streams (Schneider et al. 2011).

The Great Plains toad (*Anaxyrus cognatus*), plains spadefoot (*Spea bombifrons*), and Woodhouse's toad (*Anaxyrus woodhousii*) use Sandhills wetlands for breeding, although they spend most of their adult life in the uplands. The ornate box turtle (*Terrapene ornate*) and Blanding's turtle (*Emydoidea blandingii*) are fairly abundant in lakes and marshes of the Sandhills. Three small lizards are common on the sand dunes: the six-lined race runner (*Aspidoscelis sexlineatus*) prefers dense vegetation; the lesser earless lizard (*Holbrookia maculate*) prefers more sparsely vegetated, open-sand habitats; and the northern prairie lizard (*Sceloporus undulatus garmani*) commonly forages in blowouts. The bullsnake (*Pituophis catenifer*) and western hognose snake (*Heterodon nasicus*) are probably the Sandhills' most common snakes. The prairie rattlesnake (*Crotalus viridis*) is the region's only venomous snake and lives primarily in the Niobrara River valley and prairie dog towns (Schneider et al. 2011).

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

In 2020, the Service prepared the *Final John W. and Louise Seier National Wildlife Refuge Hunting Plan* (Hunting Plan; Service 2020d) to open the Seier NWR to hunting resident game and migratory birds according to federal and state regulations. Resident game species hunted include white-tailed deer, mule deer, pronghorn antelope, elk, badger, beaver, bobcat, coyote, fox, long-tailed weasel, mink, muskrat, opossum, prairie dog, porcupine, rabbit, hare, raccoon, skunk, squirrel, woodchuck, greater prairie chicken, grouse, partridge, pheasant, quail, and turkey. Migratory birds hunted include waterfowl, dove, crow, rail, snipe, and woodcock. Estimated yearly harvest numbers were provided in the *Final Environmental Assessment for Hunting on John W. and Louise Seier National Wildlife Refuge* (Hunting EA; Service 2020e) in order to consider potential environmental impacts of hunting on the Seier NWR.

The cumulative impacts of habitat-management activities and hunting on resident wildlife species within Seier NWR are anticipated to be minimal (Service 2020a). The proposed activities, when appropriately managed, have the potential to enhance overall habitat quality and benefit terrestrial wildlife populations. Through careful monitoring and adaptive management, the Seier NWR can continue to provide vital habitats for its diverse wildlife species.

Impacts on the Affected Resource

Alternative A – Current Management Strategies – No-Action Alternative

Under Alternative A, the No-Action Alternative, no habitat-management activities would occur in the Seier NWR, and the spread of nonnative and noxious plant species would continue. Hunting activities would continue, but expected yearly harvests would have negligible impacts on the present species (Service 2020a).

Alternative B – Current Management Strategies – Proposed Action Alternative

Alternative B is anticipated to result in indirect effects on aquatic species resulting from potential water-quality impacts. These impacts are discussed in Section 3.1.6, *Water Quality*, below; thus, only impacts on terrestrial animals are discussed in this section.

Grazing and Haying

Grazing and haying result in short-stubble habitat that provides for the needs of numerous bird species, often serving as useful shorebird nesting habitat, waterfowl pairing and pre-nesting habitat, and foraging habitat for cranes during nesting season. However, there are some negative aspects to grazing and haying, including the temporary loss of waterfowl nesting habitat. Additionally, use of grazing livestock and haying equipment can trample nests, disturb feeding and resting birds, and possibly expose birds and eggs to predation. To minimize these potential short-term impacts, the Seier NWR would be managed with different treatments during different times of the year, allowing wildlife to find suitable habitat nearby. Over the long term, the practice would result in benefits to a wide suite of avian species, compared to unmanaged grasslands. If grasslands are left unmanaged, then the buildup of decadent material usually renders the area unsuitable as bird habitat.

The livestock–wildlife interface may also negatively affect Seier NWR wildlife by introducing the potential for diseases. A continuous grazing pattern and lack of controls to keep cattle out of water sources can exacerbate pathogen transmission between species, which can occur bidirectionally between wildlife and livestock (Miller et al. 2013). Nonetheless, grazing agreements would include specific guidelines in accordance with the Service’s Cooperative Agriculture Policy (50 CFR 29.2). These guidelines are likely to require that established grazing units be surrounded with appropriate fencing to avoid water resources.

In addition to waterfowl species, haying equipment can negatively affect some small mammals, reptiles, and amphibians by causing mortality for species that cannot move away in time. Habitat conversion of tall pasture grasses to mowed grasses also can result in habitat loss; however, the irregular use of haying as a management tool would allow local populations of small mammals, reptiles, and amphibians to recover quickly. The use of noise-producing equipment, such as ATVs, tractors, swather or rotary mowers, rakes, and other equipment, may cause short-term localized disturbance to wildlife. In general, use of equipment would occur in the late summer and fall, outside of sensitive breeding periods.

Prescribed Fire

After application of prescribed fire, there is an immediate reduction in prey for ground- and aerial-foraging species, especially those that prey on invertebrates. There is also the potential for direct mortality of ground and low-canopy nesting species if fire were to occur during the breeding season. Nesting habitat for ground-nesting species would be expected to be temporarily removed. Birds would have to find suitable nest sites elsewhere, which could lead to competition for limited space. Alternatively, there can be an immediate benefit to raptor species because small mammals would be exposed when making their escape from the fire. This would, in turn, have an immediate negative effect on small mammals, thereby reducing available prey. Longer-term, recovering herbaceous production would produce seeds and attract insects, which would provide forage for insectivores and seed eaters.

Prescribed fires conducted during the late fall and winter would have little negative effect on reptile and amphibian species because the fire's heat would not reach those depths where reptiles hibernate; however, many reptiles and amphibians would need to forage for food elsewhere because of the short-term removal of invertebrates. Populations would be expected to remain constant.

Overall, wildlife would realize a beneficial effect to prescribed fire because native forage would become re-established, invasive species would be reduced, and nesting habitat would increase gradually. Increased production of native forbs and ground cover would benefit focal species. Seier NWR populations of ground- and water-foraging species would gradually increase as forage quality increases. Ground-nesting species would realize a recovery as forage and cover return to conditions suitable for supporting nesting. Maintenance of proper canopy densities would benefit nesting waterfowl species.

Invasive-Species Management

The use of herbicides or other control methods for invasive-species management may temporarily disturb wildlife during ground application. However, the disturbance associated with ground herbicide application would be temporary and limited to the duration of the treatment. Despite this disturbance, invasive-species management would accelerate the Seier NWR's ability to control and prevent the expansion of undesirable vegetation, leading to improved and suitable habitats for wildlife species. By increasing the quality of habitat across the Seier NWR, invasive species management could support increased wildlife use and abundance within Seier NWR.

Mechanical Tree Removal and Vegetative Mastication

Mechanical removal of trees and woody vegetation can lead to a reduction in the availability of woodland habitats used by a variety of species for shelter, nesting, and foraging. Tree-nesting birds and roosting bats would be particularly vulnerable, with disturbances potentially leading to nest abandonment or destruction. Birds and bats would have to find suitable nesting and roosting sites elsewhere, which could lead to competition for limited space. Conservation measures would be applied for the protection of species listed under the Endangered Species Act (ESA), as discussed in Section 3.1.1.2, *Threatened and Endangered Species and Other Special-Status Species*.

The operation of motorized, noise-producing equipment during mechanical tree removal and vegetative mastication could also cause localized disturbance to wildlife, which would be likely to temporarily avoid or flee the area during periods of equipment use. Furthermore, motorized equipment could result in mortality for mammal, reptile, and amphibian species that were not able to move away in time. Fragmentation of woodland habitats may affect species' movement and dispersal. The removal of dense vegetation could affect disease dynamics indirectly by altering wildlife-movement patterns and interactions.

Tree species slated for removal from the Seier NWR include nonnative species that result in the conversion of grassland habitat to woodland habitat. This conversion causes impacts on resident wildlife, including reductions in forage, increases in wildfire occurrence and intensity, displacement of upland mammal and grassland bird species, reductions in small mammal and plant diversity, and declines in streamflow (NISP 2023). Species chosen for removal would be assessed on a case-by-case basis but could include common invasive species such as Eastern redcedar (*Juniperus virginiana* L) (*Pinus ponderosa* Dougl. ex Laws). These species were introduced via early 1900's tree plantations and are not native to the Nebraska Sandhills ecoregion (NRCS 2023) (Aus der Au 2017). Therefore, tree removal and mastication would result in a long-term benefit to wildlife by restoring native grassland habitat.

Seed Harvesting

Seed harvesting allows for the restoration of native plant species, providing essential food sources for various bird species, including granivorous birds. Seed-rich habitats can support migratory and resident birds during their foraging and nesting seasons. Many small mammals, such as mice, squirrels, and chipmunks, rely on seeds as a primary food source. Seed-rich habitats resulting from seed-harvesting activities can sustain these mammal populations and contribute to the overall food web. Native plants and their seeds attract diverse invertebrate species, including butterflies and other pollinators. A thriving invertebrate population further supports various wildlife, such as insectivorous birds and small mammals.

Careful consideration would be required to ensure that seed harvesting does not deplete seed sources excessively. Collecting seeds sustainably and from a wide range of plant species would ensure the preservation of plant diversity and ecosystem health. Seed harvesting would be timed to avoid disrupting critical wildlife activities, such as nesting and foraging. Seed harvesting would also be managed with caution to prevent the spread of invasive plant species. Proper cleaning and processing of harvested seeds would minimize the unintentional dispersal of invasive plants within the Seier NWR.

3.1.1.2 Threatened and Endangered Species and Other Special-Status Species Affected Environment

Threatened and Endangered Species

The Service's Information for Planning and Consultation (IPaC) Resource List for the Proposed Action Area and the County identified three endangered species and four threatened species with ranges that include the Proposed Action Area (Service 2023a, 2023b). These species may potentially be affected by the proposed action. According to the ESA of 1973, as amended, 16

U.S.C. 1531–1544; 36 CFR Part 13; and 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450, the effects of the Proposed Action on these species must be considered. The three endangered species are pallid sturgeon, whooping crane, and northern long-eared bat (NLEB). The Service has also proposed listing the tricolored bat (*Perimyotis subflavus*) as endangered (87 FR 56381). It is anticipated that the tricolored bat will be listed as endangered by the state of Nebraska under NESCA, if and when the Service’s proposed rule is finalized. The four threatened species are American burying beetle, piping plover, and two plants: blowout penstemon and western prairie fringed orchid (WPFO). The candidate species is monarch butterfly.

Although the range of the species described above includes the Proposed Action Area, the habitat in the area is not suitable for two species: pallid sturgeon and piping plover. Pallid sturgeon inhabit large rivers and are found in the Missouri River and associated large tributaries (Service 2021a). No large rivers are found in the Proposed Action Area. In the Northern Great Plains, piping plover “breed and raise young on sparsely vegetated sandbars and reservoir shorelines on river systems as well as on the shorelines of alkaline lakes” (Service 2016). The Proposed Action Area does not contain rivers or alkaline lakes.

NLEB may be found in the Proposed Action Area in the summer,¹ when female NLEBs reproduce in maternity colonies, under the bark of live, dead, and dying trees. More than 61 acres of trees are present in the Seier NWR in four defined stands, which meet the definition for suitable habitat for breeding NLEB. During the winter, approximately October through April, NLEB hibernate in caves and mines, and there are no caves or mines in the Proposed Action Area.

Tricolored bat occurs primarily in forested and woodland habitats in Nebraska, with most documented occurrences in southeastern Nebraska and scattered observations in central and western Nebraska (White et al. 2016; FWS 2021c). It is generally restricted in the eastern third of Nebraska, as its roosting is associated with deciduous woodlands (Schneider et al. 2018). Suitable tricolored bat summer habitat consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields, and pastures. During the active season (April 1 to November 1), tricolored bat habitat in Nebraska is primarily associated with forested areas that provide roost trees (such as along rivers and breaks) (White et al. 2016). This includes forests and woodlots containing trees with potential roost substrate (i.e., live and dead leaf clusters of live and recently dead deciduous trees, Spanish moss [*Tillandsia usneoides*], and beard lichen [*Usnea trichodea*]), as well as linear features such as fencerows, riparian forests, and other wooded corridors. Tricolored bats will

¹ The NLEB was identified on the county IPaC Resource List, but not the Proposed Action Area Resource List, and is protected by the ESA wherever NLEB is found. This discrepancy between the two Resource Lists is the likely result of a delay in updating IPaC after the species was uplisted from threatened to endangered in March 2023. When the species was listed as threatened, specific 4(d)-rule conservation measures existed in areas where White Nose Syndrome had been identified. White Nose Syndrome has been identified in the Proposed Action Area.

roost in a variety of tree species, especially oaks (*Quercus* spp.), and often select roosts in tall, large diameter trees, but will roost in smaller diameter trees when potential roost substrate is present (e.g., 4-inch). Similar to NLEB, the Proposed Action Area meets the definition for suitable habitat for breeding tricolored bat. Tricolored bat also hibernate in caves, mines, and human infrastructure when available. However, there are no caves or mines in the Proposed Action Area and limited human infrastructure.

Nebraska is within the range of endangered whooping crane, and the Proposed Action Area contains wetlands, ponds, and riverine habitat that provide suitable habitat for whooping cranes (Service 2023a). However, no whooping crane have been sighted in the Proposed Action Area.

The range of the threatened American burying beetle (ABB) also includes the Proposed Action Area, which is part of the Northern Great Plains, one of three areas that the ABB currently occupies. The range of the Northern Plains populations is relatively large, with a combined area of more than 11 million acres of suitable habitat in the Niobrara and Sandhills. These areas support populations with moderate-to-high resiliency² and another 1.6 million acres in the Loess Canyons areas that have low-to-moderate resiliency (Service 2019). Suitable habitat for ABB is found in the Proposed Action Area and includes areas where suitable soils contain the excavation-favorable soil elements for the formation of brood chambers and where appropriate carrion for reproduction is available. Some exceptions to the ESA's 4(d)-rule conservation measures are made for soil-disturbing activities, such as grazing, livestock ranching, and wildlife management (Service 2020c), which may include grazing livestock activities (e.g., cattle, horse, sheep, goats or other grazing animals), such as gathering of livestock, construction and maintenance of fences associated with livestock grazing, installation and maintenance of corrals, loading chutes, and other livestock working facilities, development and maintenance of livestock watering facilities, placement of supplements, such as salt blocks for grazing livestock, and, when associated with livestock grazing, the control of noxious weeds, haying, mowing, and prescribed burning. Ranching and grazing do not include any form of tillage, conversion of grassland to cropland, or management of cropland.

Also included in the Proposed Action Area (Service 2023a) is the range of the endangered blowout penstemon, a unique species dependent on high levels of grassland disturbance in sandy substrates for the creation of its habitat: sand blowouts mostly void of grasses. No known blowout areas exist in the Proposed Action Area, nor do any known occurrences of blowout penstemon.

The range of the threatened WPFO includes the Proposed Action Area; however, no WPFO are known in the area (Service 2023a). Soil moisture is a critical determinant of growth, flowering, and distribution of WPFO (Service 2009). Life history research has revealed that WPFO is dependent on mycorrhizal fungi for seed germination and photosynthesis enablement and on

² The ABB SSA Report published by the Service in February 2019 discusses and analyzes ABB resiliency as it relates to land use and climate change. The Services considers several factors when analyzing future ABB resilience to stochastic events. Factors includes habitat availability, carrion availability, and climate conditions.

periodic disturbance from fire, mowing, or grazing (Service 2021b). In addition, the species cannot produce seeds for reproduction without pollination from sphinx moths.

Migratory Birds

The Seier NWR is located in the Central Flyway for migratory birds. The ranges of four Birds of Conservation Concern (BCC) overlap with the Proposed Action Area: bald eagle, bobolink, lesser yellowlegs, and red-headed woodpecker (NGP 2023). According to the following laws and Executive Order, impacts of the Proposed Action on these species must be analyzed: Migratory Bird Treaty Act, as amended; 16 U.S.C. 703–712; 50 CFR Parts 10, 12, 20, and 21; Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, 66 *Federal Register* [FR] 3853 (2001); and the Bald and Golden Eagle Protection Act, as amended, (16 U.S.C. 668–668c, 50 CFR 22).

Both bald eagle and red-headed woodpecker prefer habitat that is not found in the Proposed Action Area. Bald eagle habitat is primarily found adjacent to major river systems (NGP 2023). The Proposed Action Area is not near a major river system. Red-headed woodpecker habitat is open woodland, especially with beech or oak, open situations with scattered trees, parks, cultivated areas, and gardens, and the Proposed Action Area is a grassland with small tree stands only (NatureServe 2023a).

Bobolink breeding habitat includes tall-grass areas, flooded meadows, prairie, deep-cultivated grains, and hayfields, and the species may find suitable habitat in the Proposed Action Area (NatureServe 2023b).

Lesser yellowlegs nonbreeding habitat includes marshes, ponds, wet meadows, lakes, and mudflats, which are present in the Proposed Action Area (NatureServe 2023c).

Candidate Species

The monarch butterfly is a candidate for listing under the ESA but is not yet listed nor proposed for listing. As such, consultation under ESA Section 7 is not required. However, agencies are encouraged to conserve the species, when possible (Service 2023d). Monarch butterflies are found in Nebraska and are likely to be found in the Proposed Action Area (NatureServe 2023d).

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

Threatened and Endangered Species

The primary threat to NLEB, which resulted in the March 2023 uplisting of the species from threatened to endangered, is White Nose Syndrome (WNS). WNS has been documented in Nebraska and surrounding states. Although loss, modification, or disturbance of winter roosts (i.e., activities that make hibernaculum unsuitable for NLEB) are the second-largest threat to NLEB, no known winter roosts occur in the Proposed Action Area.

WNS is also a primary threat to tricolored bat populations. A study conducted by Bockart (2020) documented that WNS was likely a result of the tricolored bat's extended hibernation period. The declines observed at hibernacula are further supported by White et al. 2016. Inferences made from the WNS surveillance work conducted by Dr. Ian Abernathy (2018, 2020, 2023) suggest the fungus has been detected more recently in Nebraska. In addition to WNS, other threats to the

tricolored bat include wind energy–related mortality, climate change, and habitat loss (87 FR 56381).

Loss of summer habitat for NLEB and tricolored bat (including, but not limited to, tree removal and forest conversion) may also affect the species. This includes loss of suitable roosting or foraging habitat, resulting in longer flights between sources of food and shelter due to habitat fragmentation, fragmentation of maternity colony networks, and direct injury or mortality (Service 2022a). The Proposed Action of tree removal could contribute to these cumulative impacts by removing suitable summer-roosting, foraging, and maternity-colony habitat.

Additionally, reduction in edge habitat could have disproportionate effects on the NLEB given their preference for edge habitats, albeit in forests, which are not present in the Seier NWR (Pauli et al. 2015). Tricolored bats could also be notably affected with reductions in forested habitat or in cases of significant surface disturbance. During spring, summer and fall months, tricolored bats prefer to roost among leaf clusters of live or recently dead deciduous hardwood trees (USFWS 2022d). In these cases, displacement of woody debris or trees could indirectly harm local tricolored bat populations.

Threats to whooping crane relevant to the Proposed Action Area include human settlement, human disturbance, disease and parasites, predation of chicks and young, life history, food availability, sibling aggression, climate change, collision with power lines, fences, and other human-made structures, collision with airplanes, and exposure to pesticides (Service 2007). The primary current threat is the conversion of pothole and prairie ecosystem to hay and grain production, which has made much of the area’s historic nesting habitat unsuitable for whooping crane. Continued settlement of the midcontinent and coastal prairies and associated disturbance, in addition to alteration of habitat, is considered to have interfered with breeding whooping crane use of prairies and wetlands. The ongoing extensive drainage of wetlands in the prairie pothole region of Canada and the United States also has resulted in a loss of migration habitat available to whooping crane. Water diversions on major river systems, such as the Platte River, degrades migration habitat.

All ABB populations are expected to experience future threats from a changing climate over varying time periods (Service 2020c). Increased air temperatures, changes in precipitation, increased evaporative losses, and prolonged droughts may stress or kill individual ABBs, negatively affect reproductive success, or reduce the time periods with suitable conditions for reproduction. Most current ABB populations are threatened by habitat loss, primarily from conversion to agricultural land uses, although wind-energy development is also a driver of habitat loss. In addition, the expansion of red cedar and other brush decreases habitat quality. All habitat alterations have the potential to affect carrion populations, competing scavenger populations, and carrion availability, the ABB’s primary food source. Anecdotal evidence indicates that the reduction of appropriate carrion resources is a primary mechanism of population decline for ABB (Service 2019).

The primary threats to the blowout penstemon are the loss and degradation of its blowout habitat from control of unstable sand dunes from fire suppression and controlled grazing and a lack of effective habitat management. Historically, the blowouts in which this species lives were caused

by two factors: wildfires and overgrazing. Since European settlement, control of both factors has resulted in the decline of blowouts. Without persistent disturbance, blowouts would heal naturally, further reducing suitable habitat for blowout penstemon. Conservation of this species is complicated because managers are often reluctant to provide the level of disturbance required; furthermore, if a population of blowout penstemon were established, then the manager would have to actively manage destabilizing healing blowouts to ensure adequate quantity and distribution of blowout penstemon habitat. The Proposed Action may contribute to the cumulative impacts of the blowout penstemon if the intense fire and grazing management needed to create blowouts and maintain long-term habitat were not provided (Service 2012).

The main threats to the WPFO include the conversion of remnant prairie to cropland, other land-use or management changes, inappropriate application of herbicides and pesticides, spread of nonnative invasive plant species, encroaching woody vegetation, and changes in soil moisture and hydrology (Service 2021b).

Migratory Birds

The Seier NWR is not covered by Inviolate Sanctuary protections, as are many other NWRs, because it was not acquired under the authorities that provide that statutory language. Migratory bird hunting occurs in the Seier NWR within the federal and state frameworks. As part of the Hunt EA (Service 2020a), the Service estimated low harvest numbers for migratory birds.,

Due to these low harvest numbers, migratory bird hunting is not anticipated to significantly affect the overall migratory bird populations in the Central Flyway or at national levels (Service 2020a). The primary threat to the BCCs identified for the Proposed Action Area remains habitat loss.

Candidate Species

Monarch butterflies are considered imperiled in the State of Nebraska (NatureServe 2023d): the species has declined by roughly 90 percent. The primary driver of the decline is large-scale changes to monarch breeding habitat in North America, largely because of loss of their host plant, milkweed, which has resulted from the use of glyphosates in agriculture and land conversion of 25 million additional acres of Roundup Ready corn since 2007 (Solis-Sosa et al. 2021). In addition, climate change effects on local weather are also emerging as a threat to monarchs.

Impacts on the Affected Resource

Alternative A – Current Management Strategies – No-Action Alternative

Under Alternative A, the No-Action Alternative, no habitat-management activities would occur in the Seier NWR. As a result, no new impacts on the NLEB, tricolored bat, ABB, whooping crane, or western fringed prairie orchid would occur.

Alternative B – Habitat Management – Proposed Action Alternative

Under the Proposed Action Alternative, the Service would conduct various proposed habitat-management activities to protect, maintain, and enhance habitats throughout the 2,400 acres of the Seier NWR. The proposed habitat management activities include cattle grazing (including installing fencing and providing watering facilities), haying, mechanical and chemical control of invasive species and noxious weeds, prescribed fires, mechanical tree removal and vegetation mastication, seed harvesting, and offroad travel.

Threatened and Endangered Species

The Service would perform surveys to confirm the presence or absence of threatened and endangered species prior to implementing habitat-management activities. If threatened or endangered species were discovered during these surveys, then the appropriate conservation measures would be implemented, as described below.

There are no known NLEB or tricolored bat hibernacula, staging areas, acoustic records, or roosts located within 3 miles of the Proposed Action Area (Baker Pers. Comm.). However, the Service would perform surveys to determine whether the species is present in the Seier NWR prior to any habitat-management activities. If surveys determine the species is present in the Seier NWR, then the Service would implement the following conservation measure.

- **CM-BIO-1:** To safeguard NLEB and tricolored bat populations, tree-removal activities proposed between March 1–November 15 will require site-specific presence/probable-absence surveys. Surveys would be conducted in accordance with the Service’s survey guidelines. If present, then suitable roost trees or roosting structures will not be removed during the Nebraska non-volant pup season (May 11–August 10).

The Proposed Action of mechanical tree removal would not likely directly affect NLEB or tricolored bat provided that either surveys are conducted to confirm probable absence and/or trees are not removed during the summer months. Tree removal would indirectly affect NLEB by reducing potential habitat; however, the habitat provided in the Proposed Action Area is not considered high-quality because NLEB prefer forested habitat, rather than small stands of trees, so the net effect on the species would likely be small. If additional NLEB roosting was discovered during future site surveys or field work, then the Service (and its contracting parties) would ensure that tree-removal plans are altered accordingly to avoid NLEB and tricolored bat habitats and resources. However, given that the tricolored bats’ preferred tree species are not present in the Proposed Action Area, indirect effects from mechanical tree removal could be less than those for NLEB populations.

The disturbance of migrating whooping cranes by human presence and activity is likely to be minimal because no whooping cranes have been documented in the area, the area is remote, and the Proposed Action would be managing the area as grasslands. Impacts on whooping cranes are unlikely, even though the species is sensitive to human presence and activities. If whooping cranes were documented as being present within the Seier NWR during surveys, then the Service would employ the following conservation measure.

- **CM-BIO-2:** Habitat-management activities would be scheduled outside of the spring (March 6–April 29) and fall (October 9–November 15) whooping crane migration periods.

Within the Northern Plains areas, including the Proposed Action Area, notable impacts on ABB populations are prohibited when the species occurs in suitable habitat³ and is the result of soil disturbance⁴. Exceptions to this prohibition include activities that would occur during normal livestock ranching, grazing, and wildlife management. Livestock ranching and grazing in suitable habitat, resulting in soil disturbance, is not prohibited because soil disturbance in suitable habitat from these activities is not expected to have an appreciable negative impact on the species, and retaining land uses for these activities (rather than converting the land to row crops) would provide potential habitat for the species.

The Northern plains are believed to be the only remaining self-sustaining populations of ABB with moderate or high resiliency by the midcentury time period (Service 2019). Therefore, protecting existing habitat in the Northern Plains is important for the future viability of the species. ABB is sensitive to expansion of eastern red cedar (*Juniperus virginiana*) and may benefit from the proposed tree-removal habitat-management activities described in this EA. Some impacts may occur on ABB from the Proposed Action, specifically any actions that disturb the soil; however, the benefits of livestock grazing, and tree removal are expected to outweigh the impacts.

Neither blowouts nor blowout penstemon have been found in the Proposed Action Area. However, if blowouts were to occur or blowout penstemon were found in the future, then blowout penstemon may be affected by the Proposed Activity if the activities were not intensive enough to maintain open blowouts for habitat. In addition, grazing and haying may directly affect blowout penstemon by cutting and/or killing individuals. To avoid impacts on the blowout penstemon, the following conservation measures would be followed in locations where areas of open sand exist (should they be discovered in the future).

- **CM-BIO-3:** Blowout penstemon surveys will be conducted before conducting ground-disturbing activities or herbicide applications. When possible, surveys should be conducted during flowering (May 15–June 30). If the species were found during surveys, then further consultation with the Service must be conducted.

³ *Suitable habitat* is defined, consistently with the SSA Report (Service 2019), as areas where suitable soils contain the appropriate abiotic elements (e.g., soil temperature, soil moisture, particle size) that are favorable for excavation and formation of brood chambers and where appropriate carrion for reproduction is available.

⁴ *Soil disturbance* means movement or alteration of soil associated with modifying the existing land use. Soil disturbance includes actions such as grading, filling, soil excavating, or topsoil stripping. Soil disturbance also includes non-physical alterations, such as chemical treatment, including ground or soil sterilizers, and pesticides that would make the habitat unsuitable. However, typical agricultural levels of applications like liming or fertilizer should not affect ABBs, and we do not intend to regulate such practices.

- **CM-BIO-4:** Concentration or trailing of livestock will be avoided in suitable blowout penstemon habitat, and grazing must not occur more than 1 out of 3 years in occupied habitat during flowering.

Although WPFO has not been found in the Proposed Action Area, the habitat is suitable for the species, so it may be discovered in the future. WPFO is dependent on grassland disturbance from fire, grazing, and haying and would benefit from these proposed activities. These practices may also cause adverse effects and must be carefully implemented (Service 2023c). Due to the species' biological requirements, mitigation for the proposed activities is complicated. However, conservation measures would only apply if the Proposed Action Area were to contain or be adjacent to areas with grasses and flowering plants located on low, flat areas adjacent to a stream, or lie within 100 feet of a sidehill seep with grasses and flowering plants that has no history of tillage. The Proposed Action Area contains streams and freshwater seeps, so the following conservation measures would be implemented.

- **CM-BIO-5:** WPFO surveys will be performed during the flowering period (June 15–July 15), prior to ground-disturbing activities, herbicide application, and/or conversion from haying to grazing, with management for shorter duration or timing. If WPFO is found during the survey, then further consultation will be required prior to commencement of project activities.
- **CM-BIO-6:** The Service will not use heavy equipment that causes compaction in suitable WPFO habitat at any time.
- **CM-BIO-7:** During the growing season (April 15–October 1), no repetitive travel or use of light equipment (e.g., ATV, pickup, small tractor) will occur in suitable WPFO habitat.
- **CM-BIO-8:** Haying and grazing will not occur annually or will occur variably year to year during the growing season (April 15–October 1), if WPFO occupied habitat is excluded.
- **CM-BIO-9:** If not previously hayed 3 out of 5 years and not grazed 3 out of 5 years during growing season, then a survey will be performed during the flowering period (June 15–July 15), prior to ground-disturbing activities, herbicide application, and/or conversion from haying to grazing, with management for shorter duration or timing. If WPFO is found during the survey, then further consultation will be required prior to commencement of project activities.
- **CM-BIO-10:** Concentration or trailing of livestock will be avoided in suitable WPFO habitat, and grazing must not occur more than 1 out of 3 years in occupied habitat during flowering.

- **CM-BIO-11:** The Service will knife in⁵ outside of April 15–October 1 growing season or have a blooming presence survey completed.

Migratory Birds

As previously mentioned, the primary threat to the BCCs identified for the Proposed Action Area is habitat loss. The Proposed Action will protect existing habitat for these species, resulting in a positive conservation outcome.

Candidate Species

The Proposed Action includes management for invasive species and noxious weeds, which may have negative effects on monarch butterflies and their host plant, milkweed, because herbicides are lethal to both. Cattle grazing, haying, and prescribed burns may negatively affect monarch if conducted while monarch are present. Mechanical tree removal would likely benefit the species by creating additional suitable habitat. The following conservation measures would be implemented (Service 2022b).

- **CM-BIO-12:** Proposed management areas identified for herbicide treatments, haying, and prescribed burns will be surveyed for the presence of monarch butterflies between June 1 and September 1.
- **CM-BIO-13:** Service staff will visually survey each area identified for broadcast application of herbicide to confirm that no milkweed plants are present prior to application. If milkweed is present, then spot application (i.e., plant-by-plant) will be used to avoid milkweed.

3.1.1.3 Habitat and Vegetation

Affected Environment

The Seier NWR lies within the Nebraska Sandhills Level 4 ecoregion. The Sandhills Level 4 Ecoregion consists of expansive areas of sand sheets and undulating fields of grass-stabilized sand dunes. Dune size, pattern, and alignment generally follow a west- to east-trending axis, with larger dune hills in the west having local relief as great as 400 feet. Few lakes and streams are found in this area; however, ground water is accessible (Chapman et al. 2004).

The Sandhills contain a variety of native plant communities, ranging from wetlands to dry upland prairie. Nearly 700 native plant species have been documented in the Sandhills, including several at-risk species. Two principal plant community types are found in the Sandhills ecoregion: dune prairie and valley wetlands (Schneider et al. 2011).

Land cover was calculated for the Seier NWR using the U.S. Geological Survey's LANDFIRE database (USGS 2023). Approximately 2,299 acres of the 2,400-acre Seier NWR (i.e., 96 percent) is classified as grassland vegetation, with the majority (i.e., 1,693 acres) identified as

⁵ *Knifing in* is a habitat-management practice that includes the use of a sharp agriculture tool to cut into a section of soil, creating a small trench. These trenches are often used as bases to apply nitrogen fertilizer.

central tallgrass prairie. The remaining portions of the Seier NWR are mainly classified as riparian (i.e., 77.2 acres), particularly Western Great Plains Open Freshwater Depression Wetland (i.e., 60.1 acres) (Table 1).

Table 1. Land Cover Class and Type by Acre for the Proposed Action Area

Land Cover Class and Type	Acres
<i>Grassland</i>	–
Central Mixedgrass Prairie Grassland	108.5
Central Tallgrass Prairie	1,692.8
Western Great Plains Sand Prairie	305.8
Western Great Plains Tallgrass Prairie	191.7
Grassland Subtotal	2,298.8
<i>Riparian</i>	–
Western Great Plains Closed Depression Wetland	5.8
Western Great Plains Open Freshwater Depression Wetland	60.1
Western Great Plains Riparian Herbaceous	4.0
Western Great Plains Riparian Woodland	7.3
Riparian Subtotal	77.2
<i>Agricultural</i>	–
Western Cool Temperate Close Grown Crop	10.2
Western Cool Temperate Fallow/Idle Cropland	0.9
Western Cool Temperate Pasture and Hayland	0.7
Agricultural Subtotal	11.8
<i>Developed</i>	–
Developed – Low Intensity, Medium Intensity, Roads	4.4
Northern and Central Plains Ruderal & Planted Grassland	0.2
Western Cool Temperate Developed Deciduous Forest	0.9
Western Cool Temperate Developed Herbaceous	0.2
Western Cool Temperate Urban Herbaceous	1.3
Developed Subtotal	7.0
<i>Conifer</i>	
Northwestern Great Plains–Black Hills Ponderosa Pine Woodland and Savanna	6.0
Conifer Subtotal	6.0
Total	2,401.0

Source: USGS 2023.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

Twenty-eight established invasive plant species, 10 State-designated noxious weed species, and 5 County-designated noxious weed species have been identified in the Sandhills Ecoregion of Nebraska, where the Proposed Action would be located. Most of Nebraska’s native grasslands

include a mix of native and nonnative species. Exotic grasses, such as smooth brome, Kentucky bluegrass, and cheatgrass, are aggressive and often increase under season-long grazing or when soil disturbance occurs. Invasive forbs, such as musk thistle and leafy spurge, affect both natural communities and grazing lands, resulting in impacts on biological diversity and the grazing industry (Schneider et al. 2011). Purple loosestrife and reed canary grass threaten riparian areas and wetlands, and musk thistle and leafy spurge threaten prairie communities (Schneider et al. 2011). The most problematic of the Sandhill's invasive species is the eastern red cedar, whose encroachment is slow, but, once established, expands quickly, converting rangelands into red cedar woodlands (NISP 2023).

At this time, the only public use within the Seier NWR is hunting, which does not have a significant impact on habitat and vegetation.

Impacts on the Affected Resource

Alternative A – Current Management Strategies – No-Action Alternative

Under the No-Action Alternative, habitat-management activities would not occur in the Seier NWR because only hunting activities are allowed under the current Hunting Plan (Service 2020d) and Hunting EA (Service 2020e). Under this alternative, invasive plant and noxious weed management would be limited, and impacts on native plant communities would continue.

Alternative B – Habitat Management – Proposed Action Alternative

The maintenance of biological integrity, diversity, and environmental health pertains to the protection of habitat composition and structure, as well as functional natural ecosystem processes that shape and maintain the landscape for native wildlife and plants. The Proposed Action Alternative is intended to restore the native habitat composition and structure, resulting in long-term beneficial impacts on the vegetation communities in the Seier NWR. When prescribed properly, both livestock grazing and fire can be used to mimic past ecological processes that increase the productivity of native species and remove excessive mulch and debris (Tunnell 2004). Haying also maintains site vigor by preventing excessive litter accumulation from hindering the diversity and expression of plant species (Foster and Gross 1998; Xiong et al. 2003). Removal of invasive woody species can improve plant diversity and increase streamflow, restoring habitat for grassland species (NISP 2023). Herbicide applications target invasive and noxious species that compete with native species for moisture, nutrients, and space (Tunnell 2004). Finally, native grass and forb seed collection/harvest aids in native habitat restoration. These habitat-management activities would result in minimal, short-term adverse effects to vegetation and habitat, which are discussed below, but the long-term conservation of native species would outweigh these effects.

Under the Proposed Action Alternative, native vegetation may incur negligible-to-moderate short-term adverse effects through disturbances and impacts caused by the use of motorized equipment. Noxious weeds and invasive nonnative plant species tend to become established along developed roads and in other congregation areas. Areas such as roads and trails provide weeds with an avenue to spread and propagate and are usually human-caused. The use of motorized equipment could lead to a temporary increase in noxious weeds and invasive

nonnative growth, which would occur mainly through a lack of vehicle-washing procedures leading to seed transport, but also from ground disturbance that could lead to the destruction of competing native vegetation. However, the level of spread is likely to be minimal because motorized equipment would be used in isolated areas, and established roadways would be used during habitat-management activities to the greatest extent possible.

Potential negative effects of herbicide treatments would be indirect and could include herbicide inadvertently being applied to non-target plants while treating invasive species and other undesirable vegetation. The greatest potential for non-target effects would occur when herbicides are applied via broadcast spray because the potential for drift would be much higher.

Nonetheless, the potential for non-target species effects can be minimized by using plant phenology: in spring, many invasive species begin actively growing before native species and continue active growth after native species have gone dormant in the fall. Impacts related to herbicide application would be reduced if applied before and after the growing season of native plants, ensuring that non-target treatment damage to native plants would be minimal, if any. Furthermore, herbicide applications would be conducted according to label requirements and agency policies, including the Service's PUPS. BMPs for herbicide use and other safety items would be implemented in accordance with the Station Safety Plan.

Other habitat management activities, such as prescribed fire and livestock grazing and movements, could also result in a short-term decline in terrestrial vegetation quality, if not properly prescribed. Overgrazing and over-burning can lead to destruction to native habitats, allowing for the colonization of invasive and noxious weeds. To avoid these potential impacts, the Service would ensure that all fire and grazing activities are prescribed in accordance with federal and agency policies and regulations.

To maintain ecological processes, correctly prescribed habitat-management activities would be used at the Seier NWR, resulting in the removal of decadent material, stimulation of vegetative production, maintenance of species diversity of herbaceous plants, and improvement of wildlife habitat and foraging. The growing season after these activities are performed usually results in a flush of vigorous new growth, and, by the end of the growing season, the vegetation has usually recovered enough to provide ideal habitat conditions.

3.1.2 Geology and Soils

3.1.2.1 *Affected Environment*

The soils in the Seier NWR Proposed Action Area mainly consist of Valentine series material with varying pockets of Peat, Tryon, and Loup (see **Figure 2** for a land breakdown of Seier NWR by soil type). In general, the Valentine series consists of very deep, excessively drained soils formed in eolian sands and are found on interdunes, dunes, and valley sides of sandhills; a few areas are on stream terraces of valleys. These soils have slopes ranging from 0 to 80 percent (**Table 2**) (USDA 2007).

Table 2. Soil Type by Acre in the Proposed Action Area

Soil Type	Acres
Boelus Loamy Sand, 0–3% slopes	1.3
Els Loamy Sand, 0–3% slopes	26.2
Els–Ipage Complex, 0–3% slopes	142.8
Elsmere Loamy Fine Sand, 0–3% slopes	55.5
Els–Tryon Complex, 0–3% slopes	64.2
Loup Fine Sandy Loam, 0–1% slopes	148.2
Loup Fine Sandy Loam, frequently ponded	44.8
Marlake Mucky Peat	17.9
Tryon Loamy Fine Sand, 0–3% slopes	30.2
Tryon Loamy Fine Sand, frequently ponded, 0–3% slopes	23.3
Valentine Fine Sand, 3–9% slopes, moist	263.9
Valentine Fine Sand, Rolling, 9–24% slopes, moist	827.0
Valentine Loamy Fine Sand, 3–9% slopes, moist	112.4
Valentine–Els Complex, Moist, 0–9% slopes	643.2
Total	2,401.1

Source: USDA 2023.

3.1.2.2 Description of Cumulative Impacts, Environmental Trends, and Planned Actions

Natural factors can contribute to increased erosion in the Seier NWR, including climate change, natural topography, changes to local vegetation, and the movement of tectonic plates. Given the notable impact of vegetation disturbance on the rate of erosion, human activity can also drastically increase its intensity. Under the previous owners’ management, the Seier NWR was used for cattle ranching. At this time, the only public use within the Seier NWR is hunting, which would not have a significant impact on geology and soils throughout the Seier NWR.

3.1.2.3 Impacts on the Affected Resource

Alternative A – Current Management Strategies – No-Action Alternative

Under the No-Action Alternative, habitat-management activities would not be permitted. The Seier NWR would remain open to public use, solely for hunting. Impacts on soils resulting from hunting activities would remain minimal, resulting from limited foot traffic through the NWR. In addition, soil compaction is minimal, given the lack of mowing and the infrequent use of other vehicles. As a result, any soil movement due to wind or precipitation sheet flow would continue to be minimal.

Alternative B – Habitat Management – Proposed Action Alternative

Although livestock grazing contributes to soil compaction in most habitats over the course of the grazing season, this compaction is mostly short-lived. The Seier NWR’s long, hard, freeze-and-thaw cycles in fall, winter, and spring are likely to loosen compacted soils by the summer

grazing season, resulting in no adverse effects to soil porosity or permeability. Livestock grazing can, however, result in stream banks being incised, leading to soil loss along any adjacent watercourses. Impacts are anticipated to be minor.

Use of heavy equipment and vehicles for habitat-management activities, particularly tree removal, could also negatively affect soils via compaction and erosion. Although seasonal freeze and thaw would abate some compaction, this natural process may not result in full mitigation. Nonetheless, heavy equipment travel throughout the Seier NWR would be isolated and minimal, with particular focus on the existing 61.69 acres of trees.

The use of an excavator or bulldozer for tree and root removal and the spraying of herbicides could both decrease overall soil health by affecting the diversity of microorganisms and mixing soil layers (Gunstone et al. 2021). Removal of the belowground biomass would increase the potential for soil erosion from exposure to wind and rain. Following tree removal, an overall reduction in shade coverage and biomass debris may occur, sometimes creating drier, nutrient-deficient, and structurally unstable soils. These impacts can ultimately create poorer soil hydrology and reduce permeability.

Prescribed fires and the resulting removal of vegetation can expose small areas of soil to wind and water, which may result in increased erosion. However, these impacts are generally associated with over-burning or improper fire siting, both of which would be avoided by following federal and Service policies associated with prescribed burns.

Seed-harvesting efforts are unlikely to cause substantial ground disturbance or an increased risk of erosion and soil damage. The extent of motorized equipment use for seed-saving activities would be the most important factor for assessing the level of impact. The movements of ground teams equipped with nonelectrified hand tools would contribute to soil effects that would be negligible. Larger operations that may employ utility vehicles or heavy farming equipment would likely mirror the minor negative effects detailed above.

Ultimately, habitat-management activities, such as prescribed fire and herbicide applications, have been shown to increase soil nitrogen and net nitrogen-transformation rates, which improve native plant performance and diversity (Rhoades et al. 2002). Additionally, invasive plants can have direct negative effects on soil health (Weidenhamer et al. 2010; Gibbons et al. 2017), so efforts to control them would indirectly benefit soils. Therefore, habitat-management activities are likely to improve overall soil health in the long term.

3.1.3 Air Quality

3.1.3.1 *Affected Environment*

Air pollution has potentially negative effects on the environment, including human health. The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six pollutants considered harmful to public health and the environment: sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), ozone (O₃), lead (Pb), and fine particulate matter less than 10 microns in diameter (PM₁₀) and less than 2.5 microns in diameter (PM_{2.5}) (EPA 2023a). The standards were set at the level required to provide an ample margin of safety for protecting the public health. At elevated ambient concentrations, ground-

level O₃ can cause respiratory distress in sensitive persons and retard vegetation growth. Fine particulate matter (PM_{2.5} and PM₁₀) can cause cardiopulmonary symptoms in certain individuals and is the leading cause of regional haze (i.e., visibility impairment). Areas that exceed the NAAQS are designated as being in *nonattainment*.

In addition to attainment status, air-quality agencies issue air-quality forecasts for the pollutants in the form of the Air Quality Index (AQI). The AQI is color-coded, as illustrated in **Table 3**. An AQI of Codes Orange, Red, Purple, or Maroon indicates that air quality in the area has been predicted to exceed the NAAQS.

Table 3. Air Quality Index

AQI Category and Color	Index Value	Description of Air Quality
Good	0–50	Air quality is satisfactory, and air pollution poses little or no risk.
Moderate	51–100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101–150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Unhealthy	151–200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201–300	Health alert: The risk of health effects is increased for everyone.
Hazardous	301+	Health warning of emergency conditions: Everyone is more likely to be affected.

Source: EPA 2023b.

The State of Nebraska’s air quality regulations are based on the EPA’s regulations, are regulated through the Nebraska Department of Environment and Energy (NDEE), and are codified in Title 129 of the Nebraska Administrative Code (NDEE 2022). The State utilizes AirNow to monitor and predict air quality in the state. Two air-monitoring stations are near the Seier NWR, one approximately 95 miles northeast (Santee Sioux), and one approximately 110 miles southeast (Grand Island DOT). According to AirNow’s available online data points, the Santee Sioux station currently shows an O₃ level of 31 (i.e., Green Zone, concentration 36 parts per billion), and the Grand Island DOT station shows a PM_{2.5} level of 29 (Green Zone, concentration of 6 micrograms per cubic meter) (AirNow 2023).

3.1.3.2 Description of Cumulative Impacts, Environmental Trends, and Planned Actions

The main source of air pollution is emissions from vehicles as they pass through the area. The next-largest source is industry and power production. In the Proposed Action Area, however, smoke from wildfires can have a significant effect on air quality.

Seasonally, Nebraska suffers from the effects of wildfires in neighboring regions and states. The AQI can rise sharply in a very short space of time from the large quantity of pollutants carried within the smoke. Strong winds push the smoke from prairie-grass burn-offs in Kansas into eastern Nebraska and western Iowa. Kansas cattle ranchers burn off their pastures to encourage more robust growth of next year's crop. The ranchers usually perform these fires between mid-March and mid-April each year (IQ Air 2023).

3.1.3.3 Impacts on the Affected Resource

Although the habitat-management actions may include many different types of activities, the activity that would affect air quality at any level would be prescribed fires. Therefore, prescribed fires are the focus of this air-quality discussion.

Alternative A – Current Management Strategies – No-Action Alternative

Under the No-Action Alternative no major changes would occur to the present air quality. Exhaust emissions and dust from vehicles passing through the Seier NWR would continue. The only potential change would be associated with the increased risk of wildfires as more fuels build up from lack of decadent-material removal. Also, without prescribed fires, air quality could decrease because wildfire releases more pollutants than prescribed fire.

Alternative B – Habitat Management – Proposed Action Alternative

Wildfire smoke is composed of a mixture of gaseous pollutants (e.g., CO), hazardous air pollutants (e.g., polycyclic aromatic hydrocarbons), water vapor, and particle pollution. Particle pollution represents a main component of wildfire smoke and is the principal public health threat from wildfire smoke (EPA 2023c).

Prescribed fire emits particulate matter (i.e., PM_{2.5}), along with pollutants such as CO and nitrogen oxides. The major local effects of prescribed burning are visibility reduction and respiratory impairment near the fire. The planned prescribed burning would increase particulate matter in the air, thus reducing atmospheric visibility. It would also reduce air quality by emitting CO and hydrocarbons, but not to the extent that air-quality standards would be violated.

Carbon dioxide (CO₂) is an odorless and colorless nontoxic gas formed abundantly in nature by the decomposition of organic substances. It is exhaled by all living organisms during breathing and absorbed from the air by plants for use in photosynthesis. CO₂'s only potential as a pollutant is as a contributor to the overall greenhouse effect that is causing a rise in the Earth's air temperatures. In light of concern over global climate change, fire has come into scrutiny as a producer of CO₂. Studies are underway to document the quantity of CO₂ emitted during burns of varying fuel types and the amount of time needed for burned areas to return to equilibrium. At this time, the Clean Air Act does not require EPA to establish air-quality standards for CO₂ emissions.

The Service has not yet set boundaries for when and where prescribed fires may be conducted. If a prescribed fire were to take place on all 2,400 acres, impacts could occur without proper management. Fire managers would be made aware of downwind concentrations of fine particulate matter and work to ensure that prescribed fire emissions are not contributing to any

violations of the NAAQS. Additionally, proper firing techniques and the timing of the prescribed burn would limit the impacts from smoke.

In order to lessen potential impacts associated with prescribed fires, the Service would require a Prescribed Fire Plan be developed and implemented prior to any future prescribed burns. Development and implementation of this plan would ensure that impacts associated with fires and air quality would not significantly affect NAAQS standards by requiring BMPs and evaluating the existing and forecasted AQI and weather. With implementation of these measures, impacts related to air quality would be minimal.

3.1.3.4 Air Quality Best Management Practices/Mitigation Measures

The Service would be required to follow all protocols in Section 1.16 of the Service’s Fire Management Program, which addresses prescribed burns and requires that a Fire Management Plan be in place for each project. The Service’s *Fire Management Handbook* (621 FW 1) details the requirements for preparing, reviewing, approving, and implementing Prescribed Fire Plans.

3.1.4 Water Quality

3.1.4.1 Affected Environment

In Nebraska, 1,558 stream segments flow over 16,670 miles, and 539 lakes and reservoirs cover more than 134,389 acres. As of the 2018 Integrated Report (NDEE 2018), Nebraska Department of Environmental Quality (NDEQ) staff has conducted assessments on 628 stream segments and 329 lakes, equating to more than 11,312 miles of streams and 125,269 lake acres (NDEE 2018). Of the 628 stream segments assessed, 351 were found to be supporting their assigned uses, whereas 277 were impaired. Lake assessments found 208 of the 329 lakes assessed to be impaired, whereas 121 lakes were supporting their uses (NDEE 2018).

The Seier NWR contains two watersheds, Bloody Creek (Hydrologic Unit Code [HUC] 102100080303) and Hornburger Lake–Skull Creek (HUC 102100080302), as shown on **Figure 5**. The Seier NWR also contains approximately 1.35 miles of intermittent streams (i.e., 0.70-mile Bloody Creek, 0.55-mile Skull Creek, and 0.10-mile unnamed creek) and approximately 33.2 acres of other water bodies (i.e., 16.4 acres of lake/pond and 16.8 acres of marsh). The Seier NWR also contains several wetlands, as shown in **Table 4**.

Table 4. Wetland Type by Acre within the Proposed Action Area

Wetland Type	Acres
Freshwater Emergent Wetland	281.6
Freshwater Forested/Shrub Wetland	16.3
Freshwater Pond	0.3
Riverine	1.5
Total	299.8

Source: Service 2023e.

3.1.4.2 Description of Cumulative Impacts, Environmental Trends, and Planned Actions

In May 2021, the NDEE released their *2020 Water Quality Integrated Report* (NDEE 2021), which evaluated the water quality of streams throughout Nebraska. Both Bloody Creek and Skull Creek were listed in the report; however, neither was sampled, thus they are both listed as Category 3, *Waterbody where there is insufficient data to determine if any beneficial uses are being met*. Nonetheless, waters from the Seier NWR eventually flow into the Calamus River, approximately 8 miles south of the Seier NWR. In 2018, the Calamus River was first listed as Category 5, a *Waterbody where one or more beneficial uses are determined to be impaired by one or more pollutants and all of the total maximum daily loads have not been developed*. Currently, the Calamus River is impaired by *E.coli* bacteria for recreational uses and by naturally high-water temperatures that affect aquatic life (NDEE 2021).

The primary producers in Nebraska streams generally appear to be limited by nitrogen concentrations. Several parameters in different basins correlate with nitrogen availability (especially nitrate and nitrite), including tolerant and sensitive algal species, the ratio of cyanobacteria to diatom cells, and overall algal assemblage structure. In some basins, increased sestonic chlorophyll-a levels with increased nitrogen were found, which suggests that increased nitrogen in the streams is the most likely factor to alter the structure and function of these ecosystems.

3.1.4.3 Impacts on the Affected Resource

Alternative A – Current Management Strategies – No-Action Alternative

Under the No-Action Alternative, habitat-management activities would not occur in the Seier NWR. Without the ability to effectively treat invasive species, the potential exists for adverse soil and water impacts. A monoculture of invasive annual grasses can also increase the incidence of wildfire and subsequent erosion and sedimentation, which can degrade water quality and kill aquatic biota.

Alternative B – Habitat Management – Proposed Action Alternative

Cattle grazing throughout the Seier NWR could result in increased nutrient loads from animal wastes and sedimentation into water sources. These effects can lead to increased water temperatures and a drop in dissolved oxygen levels, leading to eutrophication. Toxic blue green algae (i.e., i.e., cyanobacteria) can form, which is deadly not only to wildlife within the water column, but also to animals that may drink the water, including cattle and deer. Additionally, cattle can trample vegetative cover along shorelines and incise streambanks, leading to erosion-related soil loss along water courses. Nonetheless, erosion and sediment transport are primarily associated with high-density stocking, which would not be likely to occur with implementation of grazing agreements that comply with the Service's Cooperative Agriculture policy (50 CFR 29.2).

Prescribed fire, tree removal, and heavy equipment use often removes protective vegetation from the soil surface, thus resulting in a potential for increased siltation of water resources. Timing the use of fire to minimize root damage to native vegetation would ensure that minimal siltation

occurs. Effects are expected to be temporary, lasting no more than 1 year as the habitat recovers from unaffected perennial root stock, seed bank resources, and immigration from surrounding untreated areas.

Potential negative effects of herbicide treatments would be indirect and include herbicide inadvertently dripping off target plants and leaching through the soil into groundwater and/or running off into nearby surface waters. Impacts of herbicides on water quality can be easily mitigated by applying only those herbicides approved for specific sites. Impacts can be further mitigated by timing of herbicide application. For example, most herbicide applications near ephemeral wetlands would be performed from late summer to early fall, when the wetlands are dry. However, when herbicide applications must be made near or over water, herbicide use would be restricted to those approved for use over or near water. The potential for groundwater and surface water contamination has been analyzed as part of the labeling process for all herbicides, and measures to minimize those effects, including restrictions, are included in the product label. With applications performed in accordance with the label, the potential for groundwater or surface water contamination is expected to be very minimal.

The use of pesticides, cattle grazing, and prescribed burns could possibly lead to a toxic blue-green algae (i.e., cyanobacteria) bloom that is capable of depleting oxygen from the surrounding waters and harming humans, terrestrial wildlife, and livestock. Furthermore, habitat-management activities, specifically cattle grazing without fencing, could erode wetland margins and lead to a reduction in the plant growth needed to stabilize the soil and remove excess nutrients. The environmental effects of the lack of vegetation in these areas could lead to a continued decline in overall wetland productivity, high levels of turbidity, and lack of oxygen in the water column.

With implementation of BMPs, impacts on water quality from habitat-management actions under Alternative B would be negligible. Pesticides traveling to surface and groundwater resources would be minimized by following label directions, including application rates and appropriate formulations, using targeted application methods under a response framework, and following Service requirements under its PUPS. Under Alternative B, minimizing sedimentation and runoff into aquatic environments by using herbicides instead of soil-disturbing methods (especially for rhizomatous invasive species) would reduce the impacts of sedimentation on water resources. Additionally, impacts on water quality would be reduced by following BMPs for prescribed burns and rangeland management. Combined overall with the beneficial ecological effects of removing invasive plants, the negative effects to water resources would be minor to negligible.

3.2 Visitor Use and Experience

3.2.1 Affected Environment

Visitor use in the Seier NWR consists solely of resident-game and migratory-bird hunting, as authorized under the Hunting Plan (Service 2020d) and Hunting EA (Service 2020e). *Resident game* includes all nonmigratory wildlife hunted in Nebraska under the Nebraska Game and Parks Commission's hunting regulations: white-tailed deer, mule deer, pronghorn antelope, elk, badger, beaver, bobcat, coyote, fox, long-tailed weasel, mink, muskrat, opossum, prairie dog, porcupine, rabbit, hare, raccoon, skunk, squirrel, woodchuck, greater prairie chicken, grouse,

partridge, pheasant, quail, and turkey. *Migratory birds* include waterfowl, dove, crow, rail, snipe, and woodcock. Hunting-dog use is not currently allowed during the nesting season of ground-nesting birds, and camping is not allowed in the Seier NWR at any time.

3.2.2 Description of Cumulative Impacts, Environmental Trends, and Planned Actions

Seier NWR is currently open to the public only for hunting, which began in 2021, with the authorization of the Hunting Plan (Service 2020d). Since then, the Seier NWR has continued to experience minimal visitation from hunters, with the majority of visitors arriving during peak hunting season (i.e., August to January). The Service expects that the number of hunters will likely increase over time due to population growth in Nebraska and surrounding states (U.S. Census 2023): wildlife and furbearer-harvest data gathered by the Service show that out-of-state hunters visit Nebraska to recreate in the state during the various hunting seasons (Service 2020b).

3.2.3 Impacts on the Affected Resource

3.2.3.1 Alternative A – Current Management Strategies – No-Action Alternative

Under the No-Action Alternative, habitat-management activities would not be implemented to support migratory-bird and resident-wildlife species. Over time, increased eastern red cedar would likely lead to a decrease in prairie grouse numbers and a decrease in prairie grouse harvest, which could limit the experience of visitors seeking hunting opportunities. Under the current Hunting Plan (Service 2020d) and Hunting EA (Service 2020e), the Seier NWR would only allow for hunting activities.

3.2.3.2 Alternative B – Habitat Management – Proposed Action Alternative

Under this alternative, grazing would occur at any time of the year, depending on the determined outcomes outlined in future management plans and based on the best-available biological data. The potential for cattle and visitor interactions is low; however, cattle have been known to be protective when calves are present in the spring and summer months. Furthermore, bulls have also been known to be aggressive when present in pastures for breeding activity. To control grazing activity, gates and fences may need to be installed, potentially reducing access for hunters. Additionally, visitors would need to maintain situational awareness to avoid cattle-eroded areas and cattle manure, potentially reducing the quality of their experience in the Seier NWR. In general, visitors would be expected to avoid actively grazed areas demarcated with cattle fencing, which would result in little impact on overall Seier NWR visitor use, even with potentially reduced access from cattle fencing.

The Service proposes regular haying and seed harvesting, as well as mechanical tree removal throughout the Seier NWR, as needed. These habitat-management practices can be performed concurrently with visitor use and occur in localized areas of the Seier NWR. Transportation of tractors and other equipment could cause slower traffic surrounding the NWR, although this would likely occur during early mornings or later evenings, rather than during high visitor-use hours. Visitor experience may also be affected by increased noise associated with haying, seed

harvesting, and operation of tree-removal equipment, but impacts would be isolated and temporary.

Broadcast spraying of herbicides and mechanical controls (e.g., pulling, hoeing, grubbing) for the removal of invasive species and noxious weeds would also be performed throughout the Seier NWR, as needed. For mechanical controls, the impact on visitor use would be minimal because these techniques generate no noise and allow visitors to continue visiting all parts of the Seier NWR. However, herbicide use requires the temporary closure of treatment areas that are otherwise open to the public. Impacts would be minimized by posting closure signs indicating ongoing herbicide treatment and by prioritizing herbicide applications on days when the Seier NWR is closed to public use. Invasive plants and other undesirable vegetation near facilities and roads also would be adequately treated with ground application of herbicides when visitors are not present.

Prescribed burns would occur in areas throughout the 2,400-acre Seier NWR, with most burns occurring between October and April. For public safety purposes, visitors would be prohibited from entering certain areas of the Seier NWR during prescribed burn activities. Moreover, smoke from burning could cause temporary air quality–related issues for people who have breathing difficulties or above-average sensitivity to smoke and particulates. People with these conditions may need to leave the area of the burn on the day of the burn. This impact would be temporary because smoke usually dissipates within a few hours.

To minimize potential impacts, the planning process for burning would begin 9 to 12 months before the burn is conducted. The Service Burn Plan would dictate the location of the burns and outline all required safety practices, including notification signs posted in strategic locations for public view. Due to the short duration of prescribed burns and the limited number of burns that can be conducted in any burning period, the Seier NWR would still be able to support visitor use during this practice.

Overall, the Proposed Action Alternative maximizes the Service’s ability to control and prevent the expansion of invasive plants and other undesirable vegetation in the Seier NWR. These activities are likely to benefit the visitor experience in the long-term by increasing the quantity and quality of native habitat in the Seier NWR, which would, in turn, attract more migratory-bird and resident-game species for ongoing hunting activities.

4 Monitoring

Regardless of the alternative selected, monitoring would occur to ensure that the alternatives continue to have no adverse impacts on the environment beyond those already described. To address impacts to the greatest extent possible, the Seier NWR uses an adaptive approach as part of all management programs. Impacts that may occur from habitat-management activities would continue to be monitored through ongoing efforts. Furthermore, vegetative-response monitoring may be increased under Alternative B, especially regarding invasive species. Additional follow-up monitoring of invasive species populations would be implemented to ensure success following any invasive-species treatments prescribed as a result of monitoring under Alternative

B. Inventory and monitoring of wildlife and their habitats would be performed at the Seier NWR in conjunction with federal and state partners. In addition, Seier NWR staff would remain knowledgeable about the status of threatened and endangered species through consultation and local monitoring.

5 Summary of Analysis

The purpose of this EA is to briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of no Significant Impact (FONSI).

5.1 Alternative A – Current Management Strategies – No-Action Alternative

The No-Action Alternative would not change use of, or have any impacts on, the Seier NWR. Under this alternative, habitat-management activities would not occur in the Seier NWR, and the refuge would remain open to the public only for hunting activities, as outlined under the current Hunting Plan (Service 2020d) and Hunting EA (Service 2020e). This alternative would not manage native habitat for resident wildlife and plant species, nor maintain biological integrity, diversity, or environmental health; therefore, the No-Action Alternative would not be in accordance with the purposes for which the Seier NWR was established, nor the mission of the NWRS. This alternative would not accomplish the goals in the Conceptual Management Plan of preserving, restoring, and enhancing the ecological diversity and abundance of migratory and resident wildlife, nor would it satisfy the purpose and need statement of this EA (see Section 1.3, *Purpose and Need for the Proposed Action*).

5.2 Alternative B – Habitat Management – Proposed Action Alternative

As described above, under the Proposed Action Alternative, the Service would conduct various proposed habitat-management activities to protect, maintain, and enhance habitats throughout the 2,400 acres of the Seier NWR, including cattle grazing, haying, invasive-species management, prescribed fires, mechanical tree removal, vegetative mastication, and seed harvesting.

As shown in Section 3, *Affected Environment and Environmental Consequences*, overall, the Proposed Action would have minimal impacts on the Seier NWR. The potential impacts on resident and migratory wildlife species is expected to be minor to negligible, depending on the habitat-management approach. However, conservation measures would be implemented to reduce impacts, as needed. Habitat-management activities would most likely result in increased temporary disturbance or displacement, or both, of wildlife species from foot and vehicle traffic moving through the area or noise resulting from equipment use. There would be minimal conflict with other public uses, such as hunting, because activities are limited in geographic area within the Seier NWR.

This alternative would help meet the purpose and needs of the Service as described in Section 1.3 because it would accomplish the goals of the Conceptual Management Plan to preserve, restore, and enhance the ecological diversity and abundance of migratory and resident wildlife.

The Service has determined that the Proposed Action would be compatible with the purposes of the Seier NWR and the mission of the NWRs.

6 List of Sources, Agencies, and Persons Consulted

- Nebraska Game and Parks Commission
 - Amelia Baker, Environmental Specialist II

7 List of Preparers

- U.S. Fish and Wildlife Service
 - Katie Schober, Project Manager, John W. and Louise Seier National Wildlife Refuge
 - Matt Sprenger, Refuge Manager, Sandhills National Wildlife Refuge Complex
- ICF (Contractor)
 - Libby Fortin, Project Manager
 - Lucas Bare, Project Director
 - Scott Meyers, Deputy Project Manager
 - Lily Sweikert, Author
 - Courtney Farge, Author
 - Tatum Hastings, Author
 - Tamar Love Grande, Editor
 - Anthony Ha, Publications Specialist

8 State Coordination

The Service has coordinated with the State of Nebraska and would distribute a letter summarizing its efforts to initiate habitat-management activities in alignment with State regulations regarding conservation and land management. The Service would continue to consult and coordinate with the State to ensure a safe, healthy, and diverse environment within the Seier NWR. A letter with an attached copy of the Draft EA has been sent to the State, requesting feedback and guidance regarding the document's alignment with State management goals.

9 Tribal Consultation

The Service mailed an invitation for comments to all Native American tribes that could potentially be affected by habitat-management activities within the Seier NWR. The Service extended an invitation to engage in government-to-government consultation in accordance with Executive Order 13175, *Consultation and Coordination With Indian Tribal Governments*. A letter with an attached copy of the Draft EA has been sent to nearby tribes, requesting feedback and guidance regarding the document's alignment with tribal management goals. As of the time of this EA's publication, the Service has not received any responses from Native American tribes.

10 Public Outreach

The Service made the public aware of the availability of the Draft EA by sending public notices to surrounding landowners, posting on the Seier NWR's website, publishing in local newspapers, and providing noticing in the Sandhills NWR Complex Headquarters Office.

11 Determination

This section will be filled out on completion of the public comment period and at the time of finalization of this EA.

- ☐ The Service's action will not result in a significant impact on the quality of the human environment. See the attached **Finding of No Significant Impact**.
- ☐ The Service's action **may significantly affect** the quality of the human environment, and the Service will prepare an Environmental Impact Statement.

12 Signatures

Submitted By:

Project Leader Signature:

Date:

Concurrence:

Refuge Supervisor Signature:

Date:

Approved:

Regional Chief, National Wildlife Refuge System Signature:

Date:

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Appendix A. Applicable Statutes, Executive Orders, and Regulations

- **Fish and Wildlife**

- Bald and Golden Eagle Protection Act, as amended: 16 U.S.C. 668–668c; 50 CFR 22
- Endangered Species Act of 1973, as amended: 16 U.S.C. 1531–1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450
- Fish and Wildlife Act of 1956: 16 U.S.C. 742a–m
- Lacey Act, as amended: 16 U.S.C. 3371 *et seq.*; 15 CFR Parts 10, 11, 12, 14, 300, and 904
- Migratory Bird Treaty Act, as amended: 16 U.S.C. 703–712; 50 CFR Parts 10, 12, 20, and 21
- Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*: 66 FR 3853 (2001)

- **Natural Resources**

- Clean Air Act, as amended: 42 U.S.C. 7401–7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23
- Wilderness Act: 16 U.S.C. 1131 *et seq.*
- Wild and Scenic Rivers Act: 16 U.S.C. 1271 *et seq.*
- Executive Order 13112, *Invasive Species*: 64 FR 6183 (1999)

- **Water Resources**

- Federal Water Pollution Control Act of 1972 (i.e., Clean Water Act): 33 U.S.C. 1251 *et seq.*; 33 CFR Parts 320–330; 40 CFR Parts 110, 112, 116, 117, 230–232, 323, and 328
- Safe Drinking Water Act of 1974: 42 U.S.C. 300f *et seq.*; 40 CFR Parts 141–148
 - Executive Order 11988, *Floodplain Management*: 42 FR 26951 (1977)
- Executive Order 11990, *Protection of Wetlands*: 42 FR 26961 (1977)

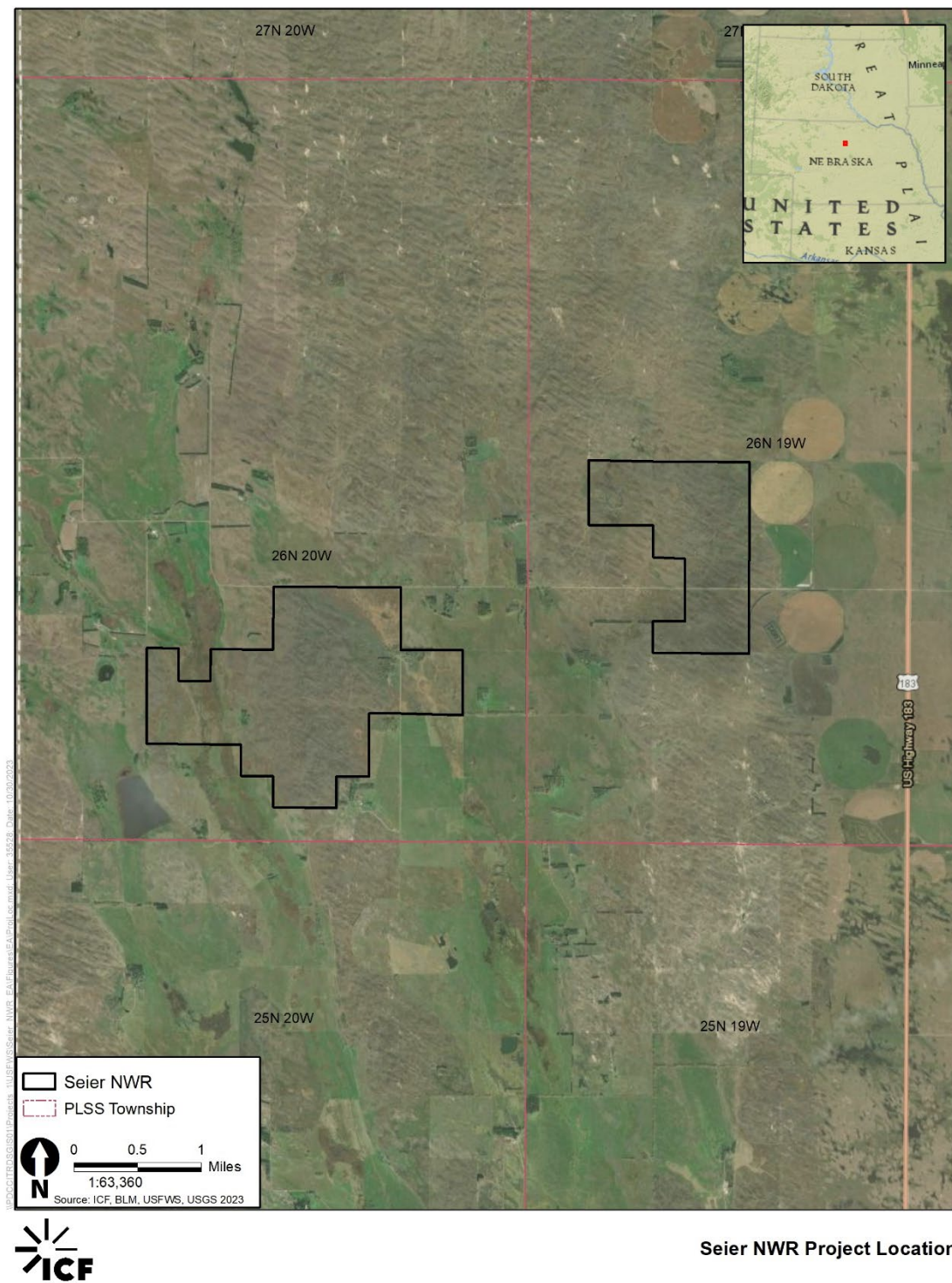
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Appendix B. Maps and Figures

FIGURE 1. PROJECT LOCATION AND VICINITY	B-3
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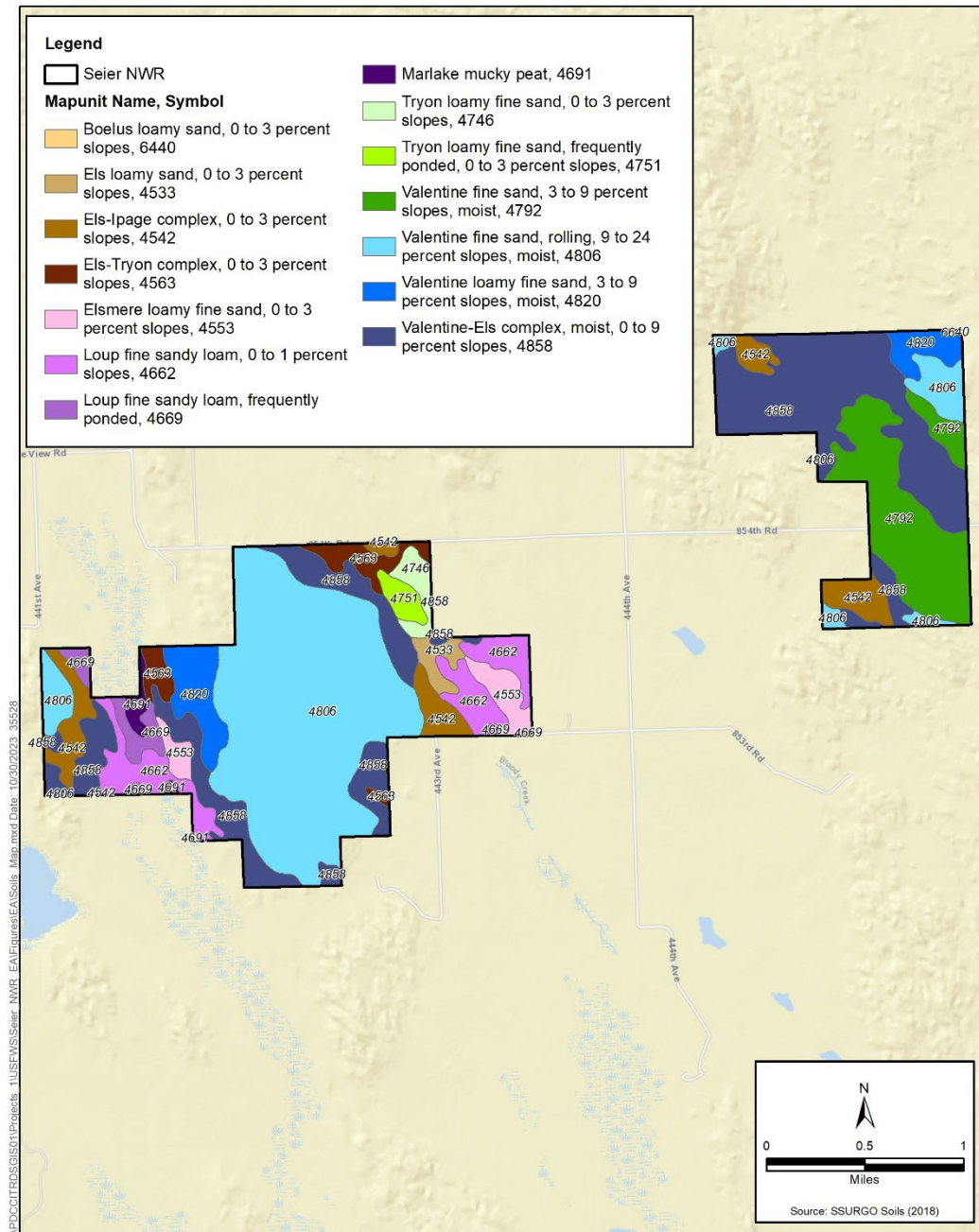
Figure 1. Project Location and Vicinity



Seier NWR Project Location

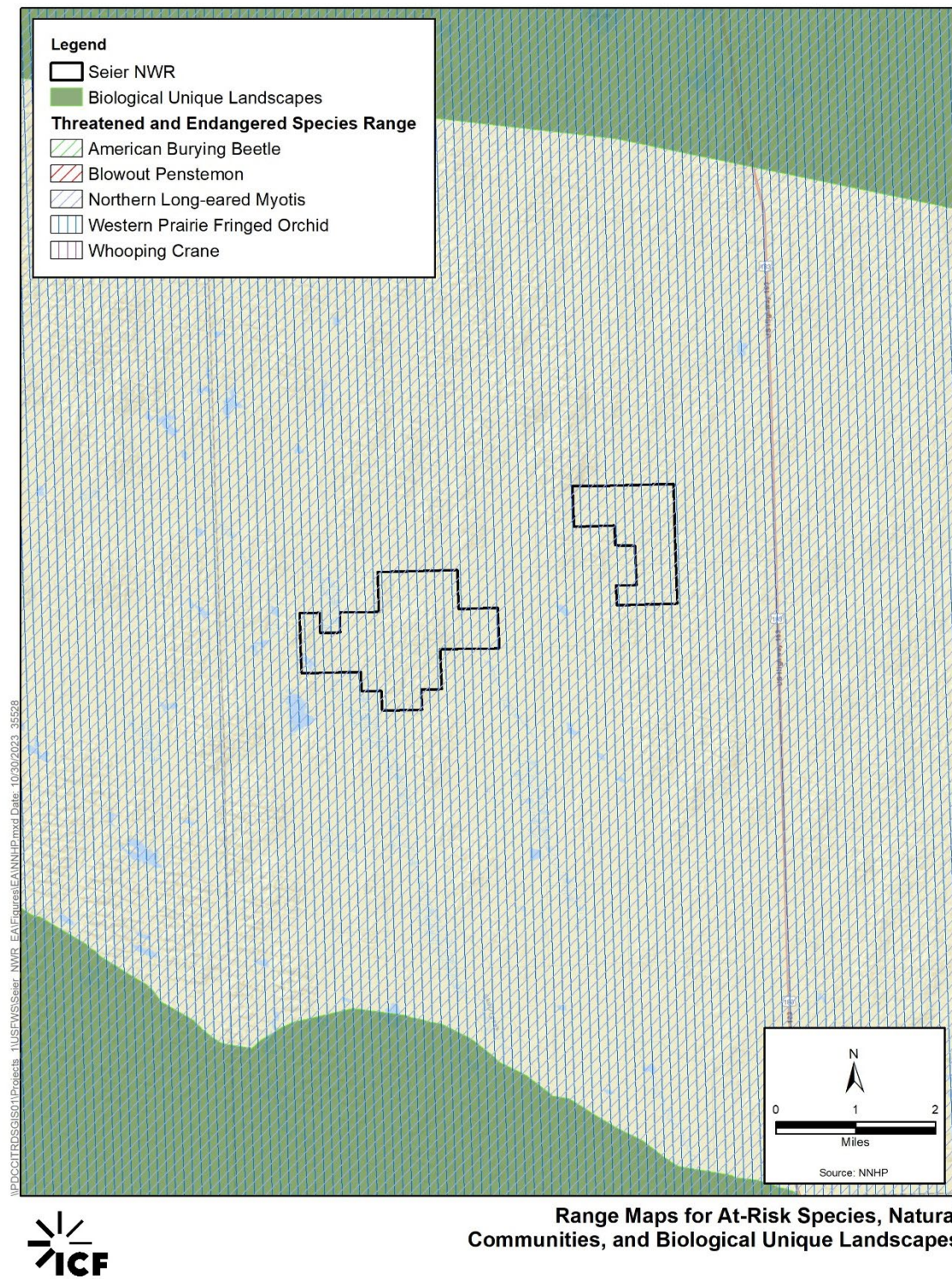
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Figure 2. Soil Types within the Seier National Wildlife Refuge



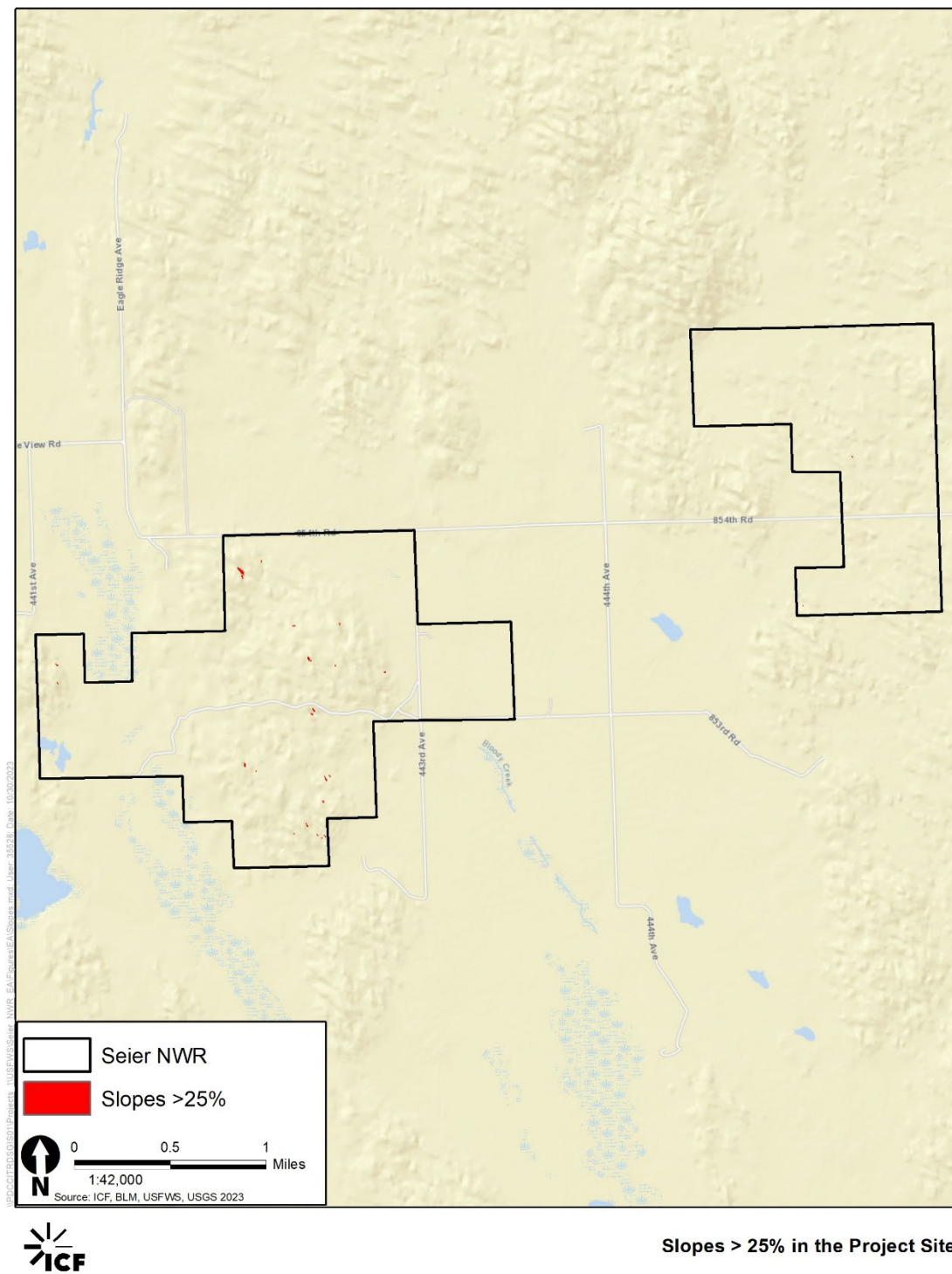
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Figure 3. At-Risk Species with Ranges within the Seier National Wildlife Refuge



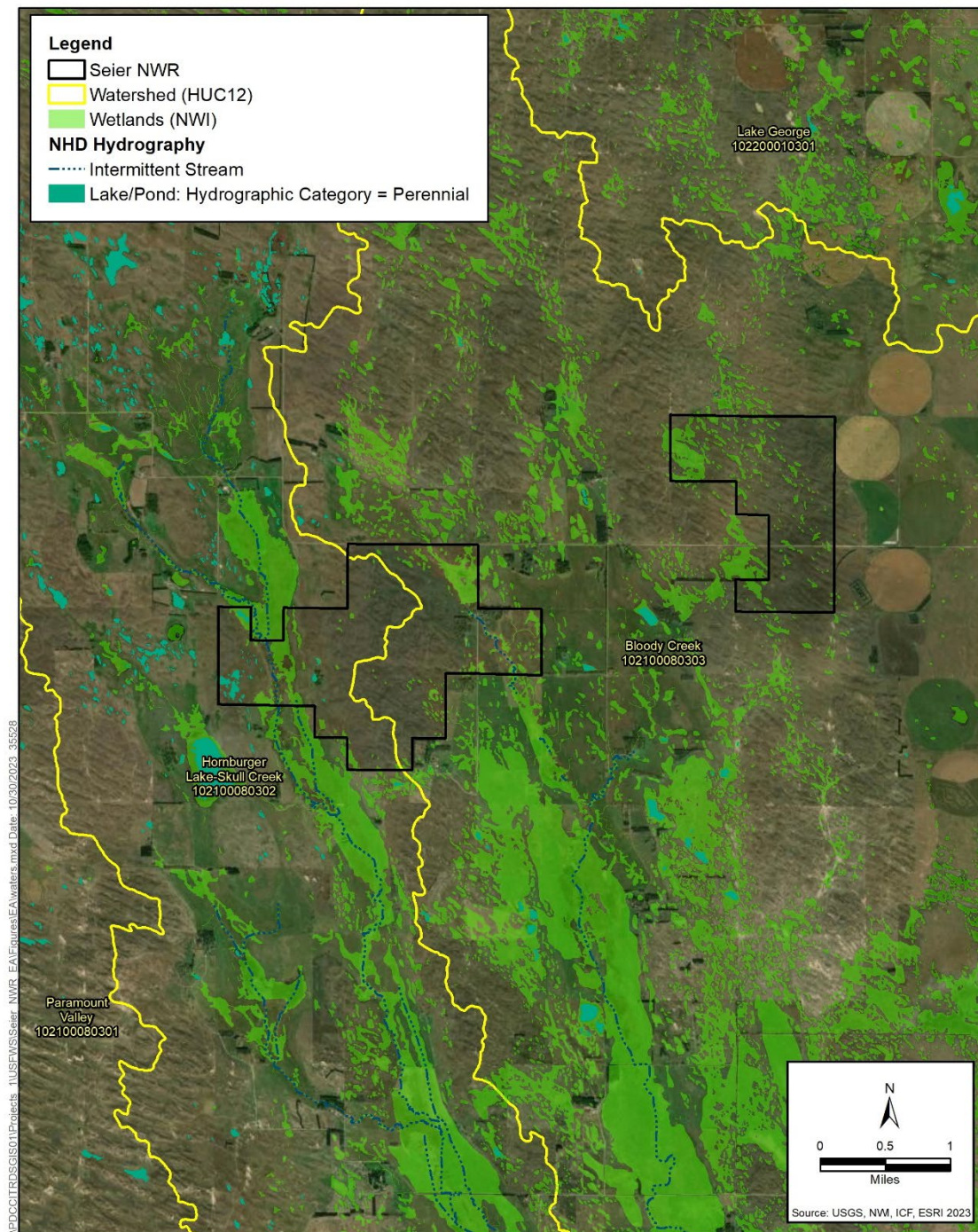
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Figure 4. Slopes within the Seier National Wildlife Refuge



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Figure 5. Surface Water within the Seier National Wildlife Refuge



Surface Waters in the Project Site

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