

Draft Compatibility Determination

Title

Draft Compatibility Determination for Farming, Grazing, Haying, Ensilage, or Seed Collection within Karl E. Mundt National Wildlife Refuge.

Refuge Use Category

Agriculture, Aquaculture, and Silviculture

Refuge Use Type(s)

Farming, Grazing, Haying, Ensilage, or Seed Collection

Refuge

Karl E. Mundt National Wildlife Refuge

Refuge Purpose(s) and Establishing and Acquisition Authority(ies)

... “to conserve fish, wildlife, or plants which are listed as endangered or threatened species.”

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System, otherwise known as Refuge System, 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 (Pub. L. 105-57; 111 Stat. 1252).

Description of Use

Is this an existing use?

Yes, this compatibility determination (CD) reviews and replaces the CDs for Prescribed Grazing, Prescribed Haying, and Cooperative Farming in the Lake Andes National Wildlife Refuge Complex Comprehensive Conservation Plan (CCP) dated December 2012.

Cooperative agriculture on National Wildlife Refuges and Waterfowl Production Areas is a management tool used to achieve habitat management and habitat restoration objectives. This includes farming related activities; such as row crop agriculture, grazing, haying, ensilage, and seed collection; that are conducted by a cooperator on National Wildlife Refuge Systems (NWRS) owned or managed lands.

What is the use?

Farming (Cooperative) – use of row crop agricultural practices, especially mechanically disturbing the soil and artificially introducing seeds or other plant parts periodically to produce stands of plants, for use primarily as food by wildlife, domestic animals, or humans. This includes water delivery, irrigation, and drainage and the use of glyphosate-tolerant corn and soybeans for habitat restoration and management purposes on lands owned in fee title or managed through agreement by the National Wildlife Refuge System.

Grazing (Cooperative) – prescribed grazing for habitat restoration and management purposes on lands owned in fee title or managed through agreement by the National Wildlife Refuge System.

Haying or ensilage (Cooperative) – prescribed haying for habitat restoration and management purposes on lands owned in fee title or managed through agreement by the National Wildlife Refuge System.

Seed Collection (Cooperative) – native grass and forb seed collection/harvest for habitat restoration and management purposes on lands owned in fee title or managed through agreement by the National Wildlife Refuge System.

Is the use a priority public use?

No

Where would the use be conducted?

Farming (Cooperative) – The use would be conducted on lands owned in fee title or managed through agreement by the National Wildlife Refuge System, that are currently farmed or have previously been farmed and contain soils and receive average precipitation to support growth of agricultural soybeans and corn. A maximum of 100 acres on 1 unit would be enrolled in farming annually. Farming for habitat reconstruction purposes generally involves a 2-5 year contract; therefore a maximum of 200 acres on 1 unit would be actively farmed each year. This activity is limited by available staff time and resources for identifying cooperators, processing special use permits, submitting bills, implementing seeding, and management of the reconstruction following seeding; therefore the number of implemented acres and units may be less based on these factors.

Grazing (Cooperative) – The use would be conducted on lands owned in fee title or managed through agreement by the National Wildlife Refuge System, that are currently in grassland habitats. A maximum of 600 acres on 1 unit would be grazed annually to meet habitat management objectives. This activity is limited by available staff time and resources for identifying cooperators, processing permits, and submitting bills; therefore the number of implemented acres and units may be less based on these factors.

Haying (Cooperative) – The use would be conducted on lands owned in fee title or managed through agreement by the National Wildlife Refuge System, that are currently in grassland habitats. A maximum of 50 acres on 1 unit would be hayed annually to meet habitat management objectives. This activity is limited by available staff time and resources for identifying cooperators, processing permits, and submitting bills; therefore the number of implemented acres and units may be less based on these factors.

*All three of these activities are dependent upon annual habitat objectives. For that reason, there may be years that one or all of the three management tools listed above may not be needed at the maximum identified acres or units.

Seed Collection (Cooperative) – The use would be conducted on lands owned in fee title or managed through agreement by the National Wildlife Refuge System, that are currently in grassland habitats. Frequency, location, and acreage would be dependent upon availability due to plant composition and annual expression of native plants.

When would the use be conducted?

The use of these management tools would be ongoing.

Farming (Cooperative) – use would occur over a 1-5 year period; generally for a 3 year period. Crops would be planted in either the fall or spring and harvested in the coming fall.

Grazing (Cooperative) – use would generally occur seasonally (1 week to a few months) depending on habitat objectives. Grazing may occur at various times throughout the year depending on the habitat objectives.

Haying or ensilage (Cooperative) – use would generally occur sometime between August 1 and November; however reasons to hay throughout the year might exist depending on habitat objectives. Haying will not occur from April through July to protect ground nesting birds except when no other management alternative is available and the long-term gain would outweigh the short-term loss.

Seed Collection (Cooperative) – use would be ongoing, but most actions will happen in the fall when seeds have matured over 1-7 days. The timing of collecting native species seed will depend on the physiology of the target plant species.

How would the use be conducted?

These practices are only permissible when prescribed in plans developed to achieve habitat management objectives or refuge purposes. Farming, grazing, haying, ensilage, and seed collection will be administered under a Cooperative Agricultural Agreement (CAA) permit. This allows a person or entity to use agricultural practices on National Wildlife Refuge System lands in support of refuge management objectives.

A CAA will include a Commercial Special Use Permit and a Plan of Operations that details operation requirements. When substantial involvement between the Service and the agricultural cooperator is anticipated, the CAA will necessitate communication on a regular basis and annual reviews.

Farming (Cooperative) – Use would be conducted by cooperative farmers through a Cooperative Agriculture Agreement (CAA) and by a Special Use Permit (SUP). The use of glyphosate-tolerant soybeans and corn would be allowed as part of an integrated pest management program used to prepare a seedbed for habitat restoration and management and/or to control noxious and invasive vegetation.

Farming agreements will outline the crop(s), location and amount of acreage to be planted on specified years, up to a five-year agreement. The cooperator is responsible for all equipment, fuel, seed, fertilizer, chemical and labor. Farming will require the use of tractors, combines, implements and grain trucks to plant, treat weeds, fertilize, and harvest crops.

Grazing (Cooperative) – Use would be conducted by cooperative ranchers through a Special Use Permit (SUP). Timing, intensity, and duration of grazing would be based on habitat objectives.

Grazing agreements will include location, AUM, dates and specific guidelines related to grazing activities. Grazing will normally be conducted using cattle but other livestock animals such as sheep, goats or bison may be used with appropriate fencing. The AUM per unit will be dependent upon grazing unit size, animal type, amount and type of forage available and goals for the unit. Grazing units will be surrounded with appropriate fencing and may include cross-fencing. Watering facilities may or may not exist on a unit. If they do not exist, they may need to be installed or a rancher may need to deliver water to the site on a frequent basis. The use of mineral blocks may be used to supplement and to distribute animals throughout the unit to meet management objectives.

Haying or ensilage (Cooperative) – Use would be conducted by cooperative farmers/ranchers through a Special Use Permit (SUP). Haying is the cutting and removal, by baling and transport to an off-site location, of grass or other upland vegetation for the production of livestock forage.

Haying agreements will cover the location, dates and number of acres to be hayed. Haying will be accomplished using a swather or tractor with a variety of implements (mower, hay conditioner, rake, baler and forks) as well as a truck or tractor with a flatbed trailer, hay trailer or stack mover to remove bales. Grass will be mowed at the appropriate time to meet unit objectives and removed by the date set in the agreement.

Seed Collection may require the use of combines or tractors, ATVs and implements. There may be multiple pieces of equipment in the field at a time to complete this activity. Agreements and permits will outline the target species and dates for collection. The permit holder will provide all equipment and labor.

Why is this use being proposed or reevaluated?

Reevaluation is due per policy 603 FW 2.11 H(2). Except for uses specifically authorized for a period longer than 10 years (such as rights-of-way), we will reevaluate compatibility determinations for all existing uses other than wildlife-dependent recreational uses when conditions under which the use is permitted change significantly, or if there is significant new information regarding the effects of the use, or at least every 10 years, whichever is earlier. Again, a refuge manager may always reevaluate the compatibility of a use at any time.

Cooperative agricultural practices for wildlife and restoration of habitat on refuge lands include farming, grazing, haying, ensilage, and seed collection. When prescribed in a plan, these resource management activities are used to meet refuge goals and objectives; typically benefiting grassland health and the restoration of high-quality habitat for migratory birds, pollinators, and other wildlife. Cooperative agriculture is an indispensable management tool utilized to restore the ecological diversity and habitat quality of refuge lands.

Farming (Cooperative) – Row crop farming is an essential tool in the reconstruction of grassland habitats. This management tool is used to prep the soil for seeding. Combining row crop agriculture with glyphosate-tolerant farming practices can increase reconstruction success. Refuge managers' experience combined with published literature indicates that use of glyphosate-tolerant soybeans and corn – which allows for the application of an herbicide containing the active ingredient glyphosate during the growing season – is effective at killing invasive cool season grasses and other noxious and invasive species. This results in a weed-free seedbed used for habitat restoration purposes, which increases the possibility of successful habitat reconstruction efforts on lands owned in fee title or managed through agreement by the National Wildlife Refuge System.

Grazing (Cooperative) – Prescribed grazing is the use of livestock, usually cattle, as a management tool to improve and maintain grasslands on lands owned in fee title or managed through agreement by the National Wildlife Refuge System to remove standing vegetation, reduce vegetative litter, suppress woody vegetation or noxious weeds, open up vegetation-choked wetlands, or open up areas to sunlight and provide a competitive advantage to native grass and forb species. Prescribed grazing is carefully timed, and usually of short duration (usually 2-4 weeks), to target certain species for grazing impacts in order to benefit other species for growth after the competing vegetation has been removed.

Haying or ensilage (Cooperative) – Haying is an effective management tool as part of an overall grassland management plan to improve and maintain grasslands on lands owned in fee title or managed through agreement by the National Wildlife Refuge System for the benefit of migratory birds and other wildlife. Haying can be an alternative to prescribed burning or grazing, which are the two other methods used to manage grassland habitats, If local conditions preclude the use of prescribed fire,

or livestock numbers are not available, removal of biomass through haying serves to reduce unwanted overstory, reduce woody plant invasion, and open the soil surface up to sunlight. Such removal of vegetation allows for more vigorous regrowth of desirable species following the haying although results are neither as dramatic nor as positive as with fire or grazing.

Haying can be used in conjunction with cooperative farming in the grassland reconstruction process, in preparation for an herbicide application to control noxious weeds, or to provide a fire break prior to implementing a prescribed burn.

Haying of grassland easement-protected properties is not restricted after July 15 each year. Landowners may hay their lands every year after this date without compromising the terms of the easement. However, one viable management tool is to permit early haying (prior to July 15 for grassland easements and prior to August 1 on fee title land) of the uplands to accomplish some management purpose on the land. Reasons for early haying may include noxious weed control, improve vigor and health of grasses, and increase plant diversity by encouraging tillering. Early haying should be used very sparingly and only when necessary.

Availability of Resources

Grassland management plans have been identified in the CCP and further defined in step down plans at the station. Evaluating the grassland for farming, grazing, or haying prescriptions, developing Special Use Permits (SUPs), monitoring compliance, monitoring for biological effects, and bill collection administration requires some Service resources but are already part of the stations grassland management responsibilities.

Resources involved in the administration and management of the use:

- No additional management or administrative costs will be associated with this activity.
- Special equipment, facilities, or improvements necessary to support the use: none
- Maintenance costs: none
- Monitoring costs: none
- Offsetting revenues: none

Anticipated Impacts of the Use

Potential impacts of a proposed use on the refuge's purpose(s) and the Refuge System mission

The effects and impacts of the proposed use to refuge resources, whether adverse or beneficial, are those that are reasonably foreseeable and have a reasonably close causal relationship to the proposed use of Farming, Grazing, Haying, Ensilage, or Seed Collection. This CD 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 considered an "affected resource." Resources that will not be more than negligibly impacted by the action have been dismissed from further analyses.

The mission of the Refuge System provided in the Refuge Improvement Act of 1997 states that "The mission of the [National Wildlife Refuge] System 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."

Conservation and management mean to sustain and, where appropriate, restore and enhance, healthy populations of fish, wildlife, and plants utilizing, in accordance with applicable Federal and State laws, methods and procedures associated with modern scientific resource programs. These definitions denote active management and are in keeping with the House Report on the Act which states that the "Refuge System should stand as a monument to the science and practice of wildlife management."

It thus follows that if an economic use of a natural resource is shown to be conservation and management as defined in the Act, it does contribute to the mission by the very definition of terms used. If a use contributes to the mission, it thus meets the standard or threshold established in 50 CFR 29.1. In accordance with 50 CFR 29.2, cooperative farming, grazing, haying, ensilage, and seed collection as described in this compatibility determination, significantly contributes to the mission, purposes, goals, and objectives of the District.

In grassland management, a fundamental assumption is that with management focused on vertical structure over other prairie qualities and values, native herbaceous flora would continue to decline and disappear on native and seeded grassland tracts. Over the last several decades, rest (lack of disturbance) was emphasized as a management approach to increase densities of duck nests in uplands on WPAs in the Dakotas. In the short term (2–20 years), greater vertical structure may be maintained in northern grasslands that are rested. The structure of such idle vegetation is believed to be more important than plant species composition when the management goal is waterfowl production. This is because the density and survival of

nests of prairie ducks was believed to be greatest on rested grasslands (Naugle et al. 2000, Schranck 1972).

However, a management approach for upland-nesting duck habitat that emphasizes rest has long-term implications that are often overlooked in short-term management studies, because continuous idling without periodic disturbance fails to promote long-term grassland health (Naugle et al. 2000). With extended rest, introduced grasses, especially smooth brome and Kentucky bluegrass, may more rapidly displace native vegetation (Murphy and Grant 2005). Monotypic stands of smooth brome and Kentucky bluegrass are less attractive to upland-nesting ducks than other types of grass-forb cover (Nenneman 2003).

Managers in the District aim to provide diverse, heterogeneous nesting habitat that meets the habitat requirements of waterfowl and other resources of concern, including grasshopper sparrow, clay-colored sparrow, bobolink, marbled godwit, and northern harrier. Priority management activities include: providing suitable vegetation structure for waterfowl, reconstructing former seeded introduced grasslands to diverse native vegetation, and restoring native prairie. Management by cooperative grazing and haying have been used to mimic natural grassland pressures and processes for decades, and the body of research on these techniques continues to grow. Cooperative grazing, haying, farming, and seed collection will be used to complete our priority management activities and meet the objectives for fee-title waterfowl production areas as laid out in the Western South Dakota Wetland Management District Complex Habitat Management Plan dated January 2023.

When threatened and endangered species are known or suspected to be on a site, the proper steps will be taken to determine how management activities will affect that species and the local FWS Ecological Services office will be consulted.

Farming (Cooperative) – Row crop farming to prepare suitable seed beds for planting better cover and habitat will result in short-term disturbances and long-term benefits to both resident and migratory wildlife that use these areas. In most situations, when the decision to implement this management tool is made, the habitat is so highly degraded that even temporary losses are minimal and greatly outweighed by the long-term gains.

Grazing (Cooperative) – Prescribed grazing will result in short-term disturbances and long-term benefits to both resident and migratory wildlife that use these grasslands. The habitat and many of the wildlife present are adapted to grazing. Without grazing, the habitat would degrade overtime and the suitability for wildlife would greatly decrease.

Haying or ensilage (Cooperative) – Haying will result in short-term disturbances to wildlife and long-term benefits to grasslands and the wildlife species that use these grasslands.

Short-term impacts

Farming (Cooperative) – Short-term impacts include disturbance and displacement of wildlife typical of any noisy heavy equipment operation, and the loss of poor quality cover while the tract is farmed. Wildlife may also use the farmed area as an additional food source for the period which it is farmed.

In preparations for farming, a unit will usually be treated with a combination of the following practices: haying or burning to remove current standing vegetation, herbicide broadcast application to suppress and kill live vegetation, mechanical tillage to overturn soil, expose root systems and kill vegetation. Many species of wildlife, especially insects, species with a life process that includes a shallow underground or near-ground component, amphibians, and slow-moving species, will be terminated during this process. Mobile wildlife such as deer, coyotes, jackrabbits, and sharp-tailed grouse will be displaced to surrounding areas. Initial farming preparations typically take place in the fall or early spring. Field prep, planting, weed control and harvesting will generally only cover a few days per month from April through November, but will completely disturb all areas of the farm unit. Throughout the remainder of the growing period disturbance will be minimal. After harvest, steps can be taken to improve winter habitat and soil health. Leaving residue standing instead of tilling it or using cover crops can provide food and cover for over-wintering wildlife including soil micro-organisms, which promotes soil health and ensures important nutrient cycling continues year-round. It is Service policy that the long-term productivity of the soil will not be jeopardized to meet wildlife objectives (601 FW3, 569 FW1).

The use of pesticides is a normal practice used during farming. Pesticides can be used to remove undesired species from the area. Pesticides can also have negative impacts on non-targeted plants and wildlife species on the farm unit or in nearby lands. To decrease the likelihood of negative effects, only EPA registered pesticides that are approved through the Service's Pesticide Use Proposal (PUP) System will be applied. All pesticides must be used and applied according to the label, EPA guidelines, and following best management practices listed on the PUP. Application of pesticides must follow the Department of Interior's Pesticide Use Policy (517 DM 1) and the Service's Integrated Pest Management Policy (569 FW1). Refuge managers' experience combined with published literature indicates that use of glyphosate-tolerant soybeans and corn – which allows for the application of an herbicide containing the active ingredient glyphosate during the growing season – is very effective at killing invasive cool season grasses and other noxious and invasive species. The use of glyphosate results in a cleaner seedbed with less weed competition for habitat restoration purposes. This increases the possibility of successful habitat reconstruction efforts on System-managed and System-owned lands (2011 Environmental Assessment).

Wildlife observations will decrease initially when the area is prepped for farming.

Depending on the crop planted, observations and use by mammals and waterfowl may increase as the crop is used for feed or cover during the growing season. Corn is readily used as cover by pheasants and deer. Waterfowl use on post-harvested corn, soybean, or small grain fields is likely during fall and spring migrations. Insect, amphibian, and small bird species use will likely be reduced during the entire farming agreement due to the monoculture of cropped fields. Cover cropping when possible will boost use by other species. Certain shorebird species may increase use of the open temporary wetlands during migration.

Lands will be more susceptible to wind and water erosion during the farming agreement. Units will receive a determination from the Natural Resource Conservation Service about whether the unit is classified as highly erodible or not highly erodible. Cropping systems and farming practices that can be used to reduce erosion will be considered, where appropriate, especially in highly erodible soils and landscapes.

Grazing (Cooperative) – Prescribed grazing by domestic livestock has the short-term effect of removing some or much of the standing vegetation from a tract of grassland. Grazing in the spring may cause the loss of some bird nests due to trampling, and may cause some birds not to nest in areas being grazed. Grazing on public wildlife lands can create an aesthetic issue of concern for some people or visitors who do not understand grassland management. Grazing livestock may create a minor and temporary disturbance to wildlife but generally do no harm. There is a slight potential for conflict between the visiting public and the livestock or the permittee, particularly during fall hunting seasons. These situations can be educational opportunities.

Domestic livestock grazing removes and tramples some to much of the standing vegetation from a tract of grassland. In general, grazing will decrease vegetative heights and litter depths and affect plant composition. The measure of short-term impacts will depend upon the grazing timing (time of year), duration (length of graze), and utilization level (i.e., light, moderate, full, close, or severe) in addition to climactic factors like rainfall and temperature. Depending on the utilization level, hoof action may help to break up litter and increase its ground contact, thereby increasing the rate of litter decomposition. These actions open up the ground for native plants to grow and aid in nutrient cycling. Nutrient cycling is also naturally increased by the herbivory, digestion, and excrement of plants in a grassland. Areas around watering systems, along fence lines and at the location of mineral blocks may experience heavy trampling and compaction resulting in the mortality of perennial vegetation and the establishment of early successional species.

Bird species differ in their vegetation height preferences so typically the management goal is to provide a mosaic, with heterogeneity of vegetation heights across the landscape. Pollinators are similar in their need for a heterogeneity of heights and plant species. Following a graze, depending on the remaining vegetation height, a site will be more or less attractive for use by certain wildlife species during the respective growing season. Cattle do not always graze uniformly, and there is typically

heterogeneity of height within a prescribed grazed site as compared to a prescribed hayed site. Birds that prefer shorter stature grasslands, such as upland sandpiper and savannah sparrow may benefit from the reduced vegetative height resulting from grazing while others such as mallards and bobolink, which typically require taller and dense nesting structure, may be negatively impacted by grazing in the short-term. Litter reduction and reduced vegetative structure resulting from grazing may create openings within wetlands “choked” by cattails and reed-canary grass, improving wetland habitat for breeding waterfowl pairs.

In situations where grazing utilizations are close or severe, it is possible that there will be less litter available for grassland nesting birds who utilize this material for nest construction. Kruse and Bowen (1996) found that grazing alone reduced nest densities during the grazing years, but the vegetation and ducks recovered quickly after grazing ended. Several studies have reported greater nesting success in grazed grasslands than in other habitats in the Prairie Pothole Region (Barker et al. 1990, Greenwood et al. 1995). However, grazed areas may attract fewer predators because of low densities of some types of prey, such as small mammals (Grant et al. 1982, Runge 2005); less cover for concealment; or both. Higher nesting success in grazed fields may occur because predators respond negatively to low prey density (Clark and Nudds 1991, Larivière and Messier 1998). If a site is completely devoid of litter prior to winter, certain pollinator larvae may lack the needed cover to survive for that year. High grass utilization rates late in the year can also reduce food and winter cover for resident species in the short term. It is likely that other large herbivores, such as white-tailed deer, will reduce their use of a unit due to grazing competition from domestic livestock and the associated disturbances as ranchers repair fence or check on and move livestock.

Haying (Cooperative) – Short-term impacts will include disturbance and displacement of wildlife typical of any noisy heavy equipment operation. Prescribed haying will typically be scheduled after July 31 to avoid impacts to most nesting birds. Cutting and removal of standing grass will result in the short-term loss (late-summer to mid-summer the following year) of habitat for those species requiring taller grass for nesting, feeding, and perching.

There will be disturbance during the process of cutting, baling and removing bales from the field. The grass must be cut and allowed to dry before it is raked (if used) and baled. A combination of tractors, rakes, balers, trucks and trailers will be used during this process, and their use will cause disturbance for local wildlife. Depending on weather, this process can take a few days to a couple of weeks.

Grassland vegetation will be removed during the haying process, and it will no longer be available for wildlife to use for food or cover. Removing the litter layer along with the standing vegetation will allow native or planted vegetation to grow with better access to sunlight. With the vegetation removed and heights of only a few inches remaining, winter habitat and early spring nesting habitat will be greatly reduced at that location until the next growing season. Haying in wetlands will reduce vegetative

cover, opening choked wetland areas which may be used by spring migrating waterfowl and shorebirds.

In the event that early haying (before August 1) is allowed, it may result in the destruction of waterfowl nests and nests of other grassland nesting bird species. Haying could also result in mortality of nesting hen ducks, ducklings and young grassland and upland birds such as ring-necked pheasant, bobolink, and sharp-tailed grouse.

When used as part of an integrated pest management program, haying can reduce or eliminate the need for herbicide applications which may positively impact plant species diversity. Haying can also improve the efficacy of herbicide applications aimed at noxious weeds. This potentially reduces overall herbicide use and impacts to non-target native plants.

Seed Collection – Harvesting seed will take place over a couple of days up to a week on a single unit per year. This activity can take place at any time during the growing season but usually happens in the fall when most seeds have matured. When this is the case, nesting activities are completed for the year and most migratory birds have moved south. The use of tractors, ATVs, implements, combines and grain carts is expected during this activity. The disturbance from this equipment will affect local wildlife that will be temporarily displaced. This activity will decrease the seed source initially, but it should not have a significant impact on the local plant community. The removal of seeds will cause a decrease in available food for certain wildlife species that rely on seeds for a food source. Best management practices should specify the percent or frequency of seed collected to minimize short and long-term impacts dependent on the species harvested.

Long-term impacts

Farming (Cooperative) – Long-term benefits are extremely positive to the establishment of diverse or more desirable habitat for nesting, escape cover, perching, or non-crop feeding activities. The resulting habitat will generally improve conditions for most of the species negatively affected by the short period of farming activity.

Depending on the condition of a unit prior to farming and overall goals for the unit, this practice could run from 2-5 years and possibly longer. During this time, the area will not be suitable as habitat for most wildlife especially grassland nesting birds and many insects and pollinators. Deer, pheasants and migrating waterfowl will take advantage of waste grain left in the field, so use by some of these species may increase during the post-harvest period while farming is ongoing.

Although pesticide use will be closely regulated during farming activities, local wildlife will be negatively affected by this. Invertebrates that are a food source for many species and that contribute to important ecological processes, such as pollination, will be drastically reduced and communities will shift geographically. There is

potential for some local populations of species to have long-term population reductions and slow recoveries. However, the proper use of chemicals combined with the practice of leaving nearby habitat can facilitate rebuilding of resident animal and invertebrate populations. The appropriate use of pesticides can also reduce or eliminate most weed species, allowing native species to have a better chance of survival when planted due to decreased competition.

Mechanical tillage practices will break up and compact the soil and negatively impact the micro-organisms in the soil. These mycorrhizal associations will take time to rebuild. Important nutrient cycling activity will slow. Decomposition rates will slow, and subsequent building of soil organic matter will be negatively affected. If the plan allows, leaving residue standing (no-till) over-winter or incorporating cover crops into the farming plan will provide food and cover for migrating and wintering wildlife and soil micro-organisms.

Nearly all farming practices use either synthetic or natural fertilizers. The addition of these fertilizers can change the ratio of soil available nutrients to favor the growth of undesirable plants during prairie species planting. High nitrogen (N) availability may be particularly problematic in the restoration of native plant communities, where prolific weed growth can delay or even preclude the reestablishment of native species (NRC 1992, Packard and Mutel 1997). Controlling the availability of N and phosphorus (P) prior to reconstruction planting can reduce the likelihood of invasion (Funk and Vitousek 2007, Rowe 2008). Soil sample analysis for nutrient levels prior to native species seeding will give managers insight into the potential for weedy invasion and can help direct the planning process for seeding (Dixon 2017). There is ongoing research into mitigating high N and P levels including soil carbon addition (Blumenthal 2003) and seeding of certain native species (Levang-Brilz and Biondini 2002). Fertilizer runoff and deposition in wetlands is another possibility on farmed units. Similar to ratios in soil, the effects of high N and P in wetlands can change plant communities, favoring non-native cattails or monoculture stands of cattail over other diverse emergent plant communities. Buffers around wetland areas and appropriate application procedures can mitigate this outcome.

Grazing (Cooperative) – Properly prescribed, the effect of this removal of vegetation increases the vigor of the grassland, stimulates the growth of desired species of grass and forbs, and reduced the abundance of targeted species such as cool season exotics, woody species, noxious weeds or invasive species to cattails. Prescribed grazing is usually of short duration and enhanced, diverse, and vigorous grassland habitat are the end result.

During periods of normal precipitation, regrowth following grazing activities usually occurs within a single growing season. While typically small in relation to the larger grazing unit, areas with heavy livestock concentrations (e.g., watering areas, mineral block sites) may require 2-3 years to fully recover from the impacts of grazing. Over time, a strategic prescribed grazing program could effectively alter species composition and improve overall plant diversity. Disturbance of grassland habitats is

essential to maintain plant vigor and reduce infestations of noxious weeds.

As vegetative heights recover following a grazing treatment, habitat conditions will favor birds which prefer denser nesting structure such as bobolinks and mallards and may become less favorable to species that prefer sparser vegetation such as upland sandpipers. Because of rapid regrowth of herbaceous vegetation, no long-term negative impacts are anticipated for waterfowl or other grassland nesting bird species, though positive impacts of increased diversity and heterogeneity are likely in the long-term.

Negative effects of grazing on a grassland and the associated wildlife may occur under scenarios where grazing occurs every year, at the same time, using the same utilization, or where there is season-long grazing that annually occurs. This has the potential to negatively affect the nutrient cycle, energy capture, and hydrologic cycle of a grassland. Also, the homogenous vegetation height and litter depths that would be created by this annual management scenario, will likely be attractive only to the suite of birds that prefer this type of cover type. This scenario also favors weed species, such as Canada thistle, to thrive.

Haying (Cooperative) – Long-term benefits will accrue due to the increased vigor of the regrown grasses of the establishment of highly desirable native grass and forb species, which will improve habitat conditions for the same species affected by the short-term removal of cover. Longer-term negative impacts may occur to some resident wildlife species such as pheasant that may lose overwinter habitat in hayed areas. Strict time constraints, and limiting grass stands to no more than 50 percent being hayed at any one time will limit the anticipated impacts to these areas.

Haying will increase the vigor of grassland areas for several years following a treatment. Periodic removal of heavy litter layers within grasslands should improve grassland vigor and contribute to maintenance of plant diversity. Haying may reduce the need for herbicide use which could result in higher plant diversity and species richness. The rotation and periodic haying of areas also helps to create a mosaic and interspersed habitats that many species find attractive for feeding, breeding, and protection (Maxson and Riggs 1996).

The year following a haying treatment, vegetative height and structure will likely favor species such as savanna sparrow and upland sandpipers, which generally prefer shorter nesting structure. Species such as mallard and bobolink, which generally prefer taller and denser nesting structure, will prefer hayed areas 2+ years after haying.

Seed Collection – Because all species are not abundant in every year, most units will not be collected from on an annual basis. Plant species should recover from the lost seed sources quickly. Being able to distribute seeds from local native plants will allow the continuation of those species to prosper across the landscape over time. Without harvesting restrictions in place, annual harvest of all species can deplete a seed bank and jeopardize the long-term success of those species. This long-term effect is

mitigated by best management practices of collecting only certain percentages of available seed or by collection and harvest on a restricted frequency (e.g. only every 3 years). With proper collection, no long-term negative impacts are expected at harvest sites.

Public Review and Comment

The draft compatibility determination will be available for public review and comment for 14 days. The public will be made aware of this comment opportunity through postings at Refuge headquarters, and on the Refuge website. The State and Tribes have been asked to review and comment on the draft compatibility determination. A hard copy of this document will be posted at the Refuge Headquarters or Visitor Center located at PO Box 18 (218 White Swan Drive), Pickstown, SD 57367. It will be made available electronically on the Refuge website. Please contact the Refuge Manager if you need the documents made available in an alternative format. Concerns expressed during the public comment period will be addressed in the final document.

Determination

Is the use compatible?

Yes

Stipulations Necessary to Ensure Compatibility

1. All activities will be conducted in accordance with the CAAs.
2. The criteria for evaluating the need for habitat management, including all uses described in this CD, will be determined during annual planning activities.
3. Activities must meet specific and articulated habitat and related wildlife objectives and contribute to the achievement of the purposes for which the refuge units were established. These objectives may be outlined in a Comprehensive Conservation Plan, a Habitat Management Plan, an Annual Work Plan, or in the Special Use Permit.
4. Farming (Cooperative) –
 - A. SUPs or Cooperative Farming Agreements will specify the type of crop to be planted and describe the Refuges' share.
 - B. The SUP may specify any herbicide or agricultural restrictions of the tract.
 - C. The SUP may specify timing constraints to insure that the proper field work is completed at the appropriate time.
 - D. All activities will adhere to general condition for cooperative farming programs as listed in the Cooperative Agriculture Use Policy (620 FW 2).

- E. All operations are to be carried out in accordance with the BMPs and soil conservation practices.
 - F. Pesticide use is restricted by type and economic threshold limitation. Annually, all proposed pesticides must be submitted to and approved by the Refuge Manager or the Regional or National Integrated Pest Management (IPM) coordinator.
 - G. The only Genetically Modified (GM) crops allowed are glyphosate- tolerant corn and soybeans.
 - H. Activity will occur only on currently farmed or previously farmed System-owned or -managed lands.
5. Grazing (Cooperative) –
- A. SUPs will specify the stocking rate, dates of use, and timing for each unit or grazing cell on the Refuge or WPA.
 - B. The standard grazing fee; as determined for each state by the Regional Office or local market research, and any standard deduction for any labor or work done on the Service lands will be included on the SUP.
 - C. Fencing, water supply, and other livestock management infrastructure needs and costs will be outlined on a site by site basis in the SUP.
 - D. Grazing permittees must comply with all applicable State Livestock Health laws.
 - E. No supplemental feeding will be allowed without authorization from the Project Leader/Manager.
 - F. Control and confinement of livestock will be the responsibility of the permittee.
 - G. No insecticides may be used on District lands.
6. Haying (Cooperative) –
- A. Prescribed haying will generally not take place before August 1 in any given year, unless there are documented management reasons for prescribing an earlier hay date.
 - B. Generally, not more than 50 percent of a tract may be hayed in any one year, unless size restrictions or habitat conditions warrant haying of more than half of the area.
 - C. Any Special Use Permits and Cooperative Agricultural Agreements will be written consistent with 620 FW 2 Cooperative Agricultural Use Policy and Region 6 Cooperative Agricultural Program Guidance (2022).

Justification

The stipulations outlined above would help ensure that the use is compatible at Karl E. Mundt NWR. Farming, Grazing, Haying, Ensilage or Seed Collection; as outlined in this compatibility determination, would not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge. Based on available science and best professional judgement, the Service has determined that the Farming, Grazing, Haying, Ensilage or Seed Collection; at Karl E. Mundt NWR, in accordance with the stipulations provided here, would not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purpose of the Karl E. Mundt NWR. Rather, appropriate and compatible Farming, Grazing, Haying, Ensilage or Seed Collection, would be beneficial to the use of the Karl E. Mundt NWR through which the public can develop an appreciation for wildlife and wild lands.

Farming – It is well known by grassland practitioners that the best way to prepare a site for reconstruction is with a minimum of 2 years farming, preferably with soybeans as the final crop. Using mechanical and chemical means to clear the field and through regular farming practices, most, unwanted plants are terminated and the seed bank from these plants is greatly reduced. This practice reduces competition with planted seedlings and prepares a seedbed for proper soil contact and establishment of native plants. All of these actions make it easier for native plants to flourish once planted due to reduced competition and root space availability. This will save money for the station in the long run as they will not need to battle noxious and invasive plants during the establishment phase. Reconstructing tracts of homogeneous stands of degraded dense nesting cover on fee-title lands to diverse stands of native grasses and forbs contributes to biological integrity, diversity, and environmental health by increasing ecosystem services of these grasslands.

Grazing - Prior to Euro-American settlement, grasslands and the associated wildlife in the Northern Great Plains thrived under periodic defoliation, primarily from fire and grazing. Notable grazing animals included bison, elk, small mammals, and even insects such as grasshoppers. Today, domestic livestock are used to mimic the defoliation once provided by bison and elk. It is well documented that grasslands devoid of grazing and burning over the long-term will deteriorate to a point where they no longer support the overall ecosystem functions. Excessive litter build-up occurs, which negatively affects the nutrient cycle, energy capture, and hydrologic cycle of a grassland. The latter may end up negatively affecting plant composition and causing increases in introduced cool-season grasses (i.e., Kentucky bluegrass and smooth brome grass), while decreasing the native plants. Certain butterflies are closely associated with native plants for larval food and nectaring. Additionally, not only does excessive litter build up negatively affect the overall health of the grassland, many bird species will also find the area less attractive over time. Instead of providing heterogeneity of thickness, only the suite of birds that prefer a thick litter and plant height will use the grassland. When incorporated into an integrated grassland

management program and implemented over time, grazing can result in enhanced native plant diversity, structure, and overall improved grassland health.

Haying - Haying is an effective grassland management tool. While certain aspects of haying can have negative short-term impacts on wildlife, improved grassland vigor, potential of reduced herbicide use and structural diversity improvements linked to haying make this a beneficial use to meet refuge purposes and contribute to fulfilling the mission of the national wildlife refuge system. Without occasional disturbance, it is anticipated that grasslands would deteriorate in species richness and diversity negatively impacting plant and wildlife resources.

Seed Collection - Using local native seed ensures the best chance for a successful reconstruction. Using seeds from local sources gives a better chance that the species will flourish once planted and that they are the right species of plants required by local wildlife, especially pollinators.

Signature of Determination

Refuge Manager Signature and Date

Signature of Concurrence

Assistant Regional Director Signature and Date

Mandatory Reevaluation Date

2034

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Figure(s)

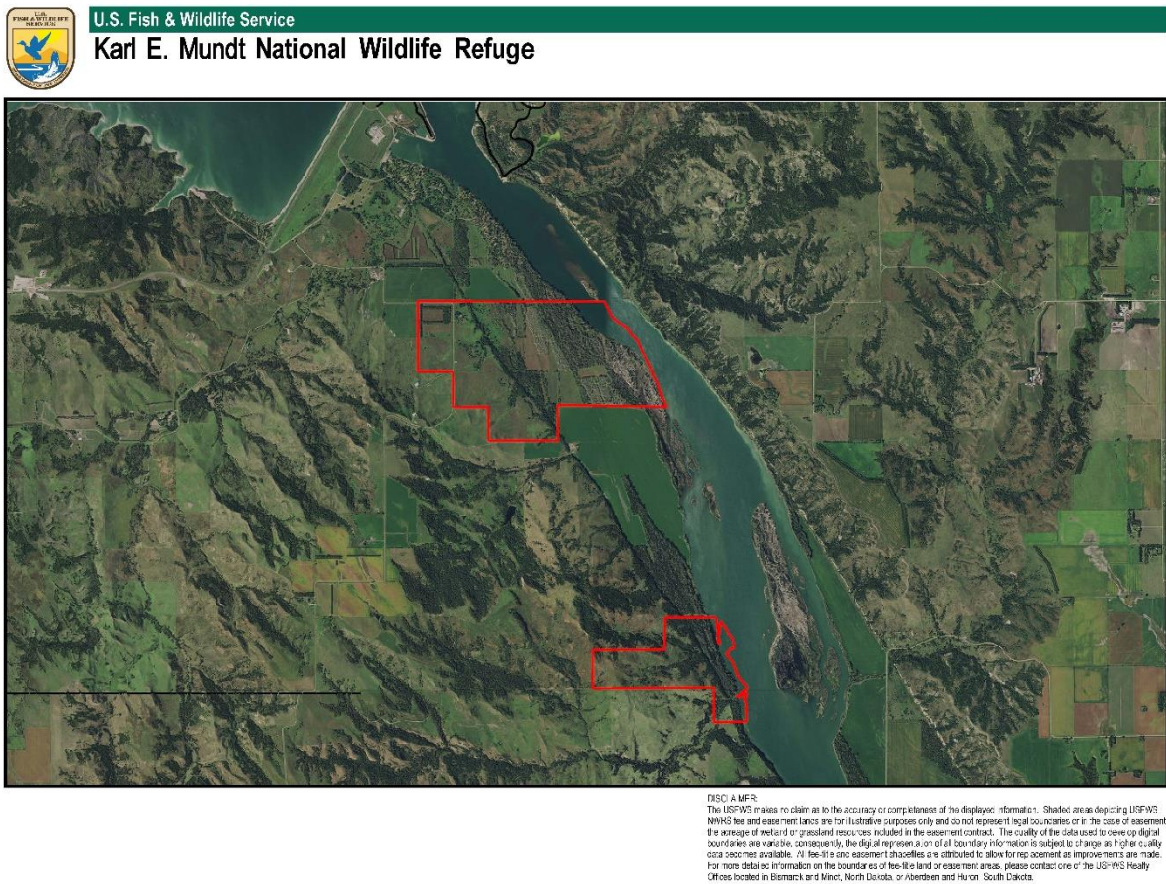


Figure 1. Map of Karl E. Mundt National Wildlife Refuge.



U.S. Fish & Wildlife Service

Karl E. Mundt National Wildlife Refuge - North Mundt Unit Upland Management Unit Map

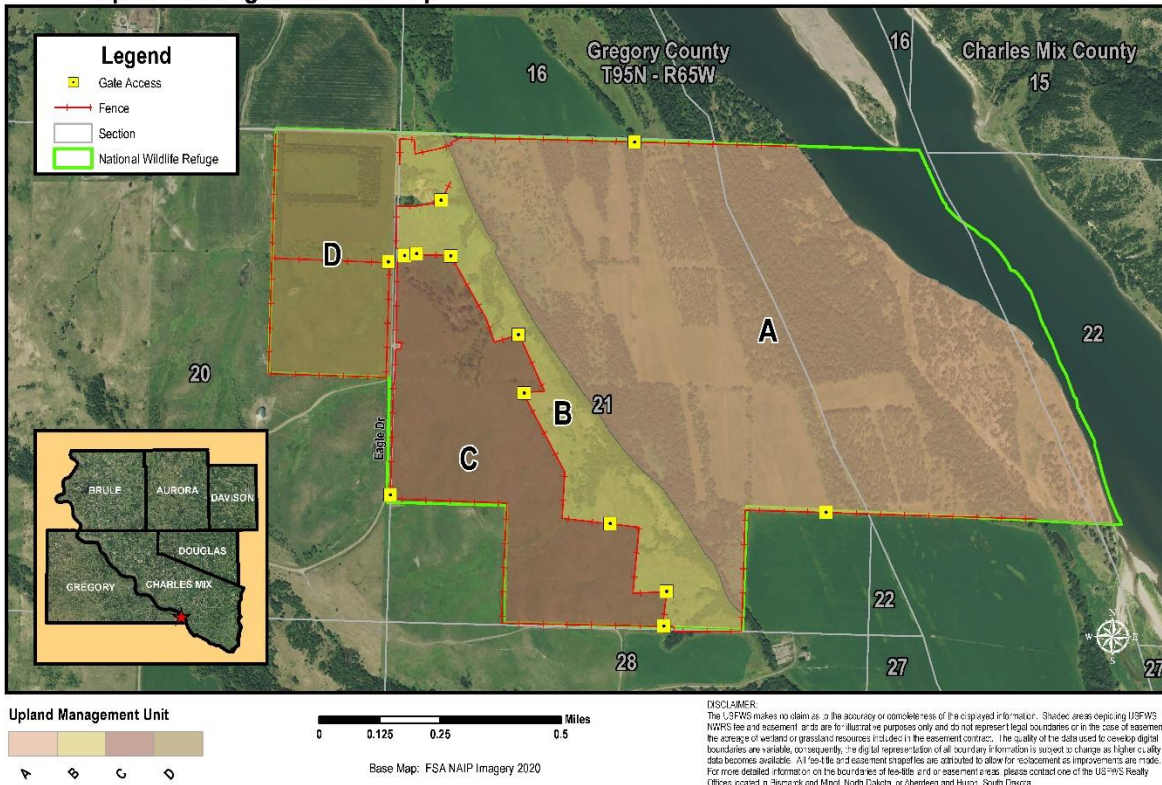


Figure 2. Map of Karl E. Mundt National Wildlife Refuge – North Unit.



U.S. Fish & Wildlife Service

Karl E. Mundt National Wildlife Refuge - South Mundt Unit Upland Management Unit Map

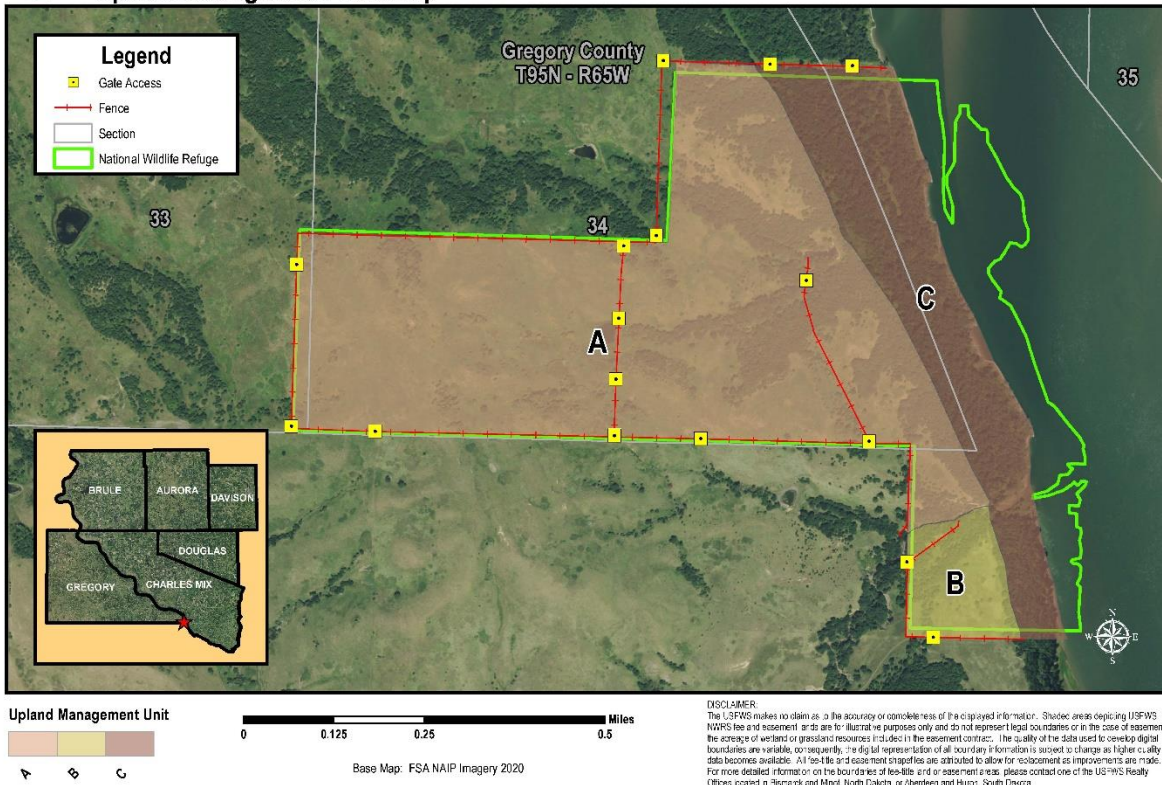


Figure 3. Map of Karl E. Mundt National Wildlife Refuge – South Unit.