Draft Compatibility Determination

Compatibility Determination for Livestock Grazing, Jocelyn Nungaray National Wildlife Refuge

Refuge Use Category

Agriculture, Aquaculture, and Silviculture

Refuge Use Type(s)

Grazing

Refuge

Jocelyn Nungaray National Wildlife Refuge (formerly Anahuac National Wildlife Refuge)

Refuge Purpose(s) and Establishing and Acquisition Authorities

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. § 715d]).

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ..." (Emergency Wetlands Resources Act [16 U.S.C. § 3901(b), 100 Stat. 3583]).

"... suitable for— (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." [16 U.S.C. § 460k-1] "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." [16 U.S.C. § 460k-2] (Refuge Recreation Act [16 U.S.C. § 460k–460k-4], as amended).

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." [16 U.S.C. § 742f(a)(4)] "... for the benefit of the United States Fish and Wildlife 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. § 742f(b)(1)] (Fish and Wildlife Act of 1956).

National Wildlife Refuge System Mission

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The mission of the National Wildlife Refuge System (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) reevaluates and replaces the September 16, 2008 CD for controlled livestock grazing on the refuge (formerly Anahuac National Wildlife Refuge). Controlled grazing has been conducted on the refuge for decades as a habitat management tool. The use is consistent with the Texas Chenier Plain National Wildlife Refuge Complex Comprehensive Conservation Plan and associated Environmental Impact Statement (USFWS 2008) and Record of Decision (USFWS, September 16, 2008). The previous CD was made available for public review and comment concurrent with the Draft EIS/CCP/LPP.

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This use is being reevaluated to bring the determination current with the national compatibility determination template and current refuge management direction, and because the prior determination cycle has lapsed (603 FW 2.11(H)).

What is the use?

The use is grazing—the feeding on vegetation by domestic livestock, including the trailing and watering of livestock. Jocelyn Nungaray National Wildlife Refuge (NWR or refuge) proposes to continue controlled cattle grazing in designated units of the refuge through a Cooperative Agricultural Agreement and associated Special Use Permit. Grazing is a refuge management economic use (603 FW 2.6 N.) that serves as an important habitat management tool for coastal marsh and prairie management to benefit migratory birds and other wildlife utilizing the refuge. This CD considers the continuation of the controlled grazing program, including modifications proposed by the Service under Refuge Management Alternative D (proposed action) of the Texas Chenier Plain National Wildlife Refuge Complex Environmental Impact Statement/Comprehensive Conservation Plan/Land Protection Plan (EIS/CCP/LPP) (USFWS 2008).

Is the use a priority public use?

No.

Where would the use be conducted?

The continuation of a controlled grazing program is proposed for approximately 23,784 acres (61.6%) of the 38,597-acre refuge, within Chambers and Galveston counties, Texas. This includes approximately 9,801 acres on Old Anahuac, 10,436 acres on the East Unit, and 3,547 acres on the Middleton Tract. Grazing occurs on 100% of the refuge's transitional high ground and uplands. Areas not currently grazed may be incorporated into the grazing program in the future depending on habitat conditions and management objectives.

When would the use be conducted?

The grazing program is a cow-calf operation with some bulls introduced for breeding purposes. Grazing seasons are established in accordance with the requirements of the wildlife resources, soil, and vegetation, with due consideration given to the management objectives established for the lands involved. Using a graze-rest strategy, permittees typically graze coastal marshes during the cool season (generally October through April) and non-saline uplands during the warm season. Grazing may, where deemed compatible, occur year-round. Details for specific grazing area will be accounted for in Cooperative Agricultural Agreement and associated Special Use Permit.

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How would the use be conducted?

Grazing by cattle is conducted on designated areas of the refuge through a Cooperative Agricultural Agreement and associated Special Use Permit issued to private permittees for the purpose of habitat management. Since 2007, grazing has occurred at an average of approximately 6,353 animal unit months (AUMs) per year (Table 2) across 23,784 acres (0.27 AUM/acre) of the refuge (Figure 1). Permittee selection and associated determination of cost follow relevant regional or national guidance for grazing on National Wildlife Refuges.

Grazing strategies include variations in stocking rate, timing (cool versus warm season), and duration. Stocking rates and rotations are determined annually according to the management objectives for the various grazing units and the quantity and condition of forage in those units, and are often influenced by the availability of freshwater. Grazing does not take place uniformly across units, particularly in coastal marshes; cattle tend to concentrate grazing pressure adjacent to upland areas, with decreasing grazing pressure as distance from high ground increases. Acres grazed and grazing pressure vary from year to year.

Grazing units are typically stocked at light-to-moderate levels based on recommendations published in the U.S. Natural Resources Conservation Service range ecological site descriptions for the area and on recommendations made by refuge and complex biologists based on observed and measured habitat conditions. Responses of vegetation are monitored and stocking rates are evaluated on an ongoing basis. Current stocking rates are approximately 0.27 AUM/acre.

Associated infrastructure necessary for or supportive of the use—including fences, gates, cattleguards, and watering facilities—is maintained by the permittee with materials provided by the refuge. A Special Use Permit is required for all grazing on the refuge.

Why is this use being proposed or reevaluated?

Grazing is a refuge management economic use that provides an inexpensive, dependable, and effective tool for the management of refuge habitats, specifically for migratory birds including wintering and resident waterfowl, shorebirds, and wading birds. Coastal marshes have evolved with a disturbance regime that includes fire, herbivory by native wildlife, and the infusion of saline waters during tidal surges associated with tropical storms. Natural fire and herbivory by native species now occur less frequently or at reduced levels due to human influences on the ecosystem (Stutzenbaker and Weller 1989). Water level and salinity management, prescribed burning, and controlled grazing are available tools for influencing plant communities (species composition and physical structure) in marsh habitats. Grazing is used to: (1) mimic historic grazing pressure in the marsh to encourage a mosaic of land-cover types and structures; (2) open up dense vegetation; (3) depress perennial plants; (4) encourage the growth of annual grasses and sedges; and (5) reduce tall, rank grass types and encourage creeping grass species.

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This use is being reevaluated to bring the determination current with the national compatibility determination template and current refuge management direction, and because the prior determination cycle has lapsed (603 FW 2.11(H)

Availability of Resources

To comply with the Refuge Recreation Act (Public Law 87-714), the Project Leader must determine whether sufficient resources—financial, staffing, facilities, or other infrastructure—are available to support the proposed use without materially interfering with the refuge purpose(s) or the mission of the National Wildlife Refuge System. This determination should be informed by a review of current capacity and, where applicable, the refuge's Comprehensive Conservation Plan (CCP).

Assessment of current resources and capacity

Through the Cooperative Agricultural Agreement and associated Special Use Permit, the permittee(s) provide the labor and livestock, while the refuge dictates the number of cattle and the areas to receive grazing pressure necessary to meet habitat objectives. Regular communication with the permittees, rotation and rest planning, boundary and interior fence inspection, and habitat monitoring require approximately 5 percent of one full-time equivalent, or roughly 96 staff hours per year (Table 1). The refuge provides materials for the fence, gates and cattleguards that support the program; the annual replacement reserve for approximately 131 miles of fence is estimated at $114,476, and for nine cattleguards at $5,738. Grazing is allocated 15 percent of the hunt, farm and resource gravel road, $29,999 per year, and 2 percent of the shared road, mowing and sanitation costs carried under the refuge's visitor-access allocation, $26,390 per year. Half of annual levee repair is attributed to cattle, $5,082 per year and 22 staff hours. With associated vehicle travel of $437, recurring non-labor costs total approximately $182,121 per year. The resources required to administer the program are within the refuge's existing operational capacity and do not materially interfere with refuge purposes or the mission of the Refuge System.

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Basis for cost and staffing estimates. Staffing is expressed as full-time equivalents (FTE) at 2,080 hours per FTE. Equipment is charged at published hourly ownership and operating rates: agricultural tractor with batwing mower at $100 per hour (FEMA Schedule of Equipment Rates, cost code 8400 plus mower attachment), and road grader, dump truck, front-end loader and track hoe at rates from the U.S. Army Corps of Engineers Construction Equipment Ownership and Operating Expense Schedule (EP 1110-1-8). Operator time is counted separately as staff hours and is not included in those rates. Vehicle travel is estimated at 50 miles per 8-hour workday at the 2026 Internal Revenue Service standard business mileage rate of $0.725 per mile. Fence materials are estimated as a straight-line replacement reserve using the U.S. Department of Agriculture Natural Resources Conservation Service Texas Payment Schedule for fiscal year 2026, Practice 382 (Fence), multi-strand barbed wire at $3.30 per linear foot installed, over the 20-year NRCS practice lifespan. Road and facility costs are annualized on a straight-line basis over their maintenance or replacement cycle. Costs of refuge law enforcement are not attributed to individual uses.

Allocation of shared costs. Costs not caused by a single use are allocated among uses by the refuge's observed share of road and facility use, as recorded in the

refuge cost and FTE workbook. Costs that cannot be attributed to a single use are carried under base refuge management and are not charged to any individual use.

Table 1. Estimated costs to administer grazing on Jocelyn Nungaray National Wildlife Refuge.

Category and Itemization	One-time Cost	Recurring Annual Expenses
Supplies and equipment (fence materials replacement reserve, 131.4 miles, $114,476; cattleguard replacement reserve, 9 units, $5,738; vehicle travel $437)	—	$120,650
Staff time (program coordinator 40 hr; management and administration 20 hr; road, mowing and sanitation shares 14.4 hr; levee repair 22.0 hr)	—	96.4 hr / 0.05 FTE
Maintenance (15 percent share of the hunt/farm/resource gravel road, $29,999; 2 percent visitor-access share of paved and all-use gravel roads, roadside mowing equipment and shared sanitation, $26,390; 50 percent cattle share of levee repair, $5,082)	—	$61,471
Total recurring annual expenses		**$182,121 + 0.05 FTE**
Offsetting revenues	—	Grazing fees and/or permittee in-kind services
Total expenses	**—**	**$182,121 + 0.05 FTE**

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Offsetting revenues. Under Service policy for cooperative agriculture (620 FW 2, Cooperative Agricultural Use), the permittee may compensate the Service through cost-sharing, through bids for payment, or through a combination of both. Consistent with the Texas Chenier Plain National Wildlife Refuge Complex Comprehensive Conservation Plan (USFWS 2008), the refuge provides fence, gate and cattleguard materials and the permittee provides the labor to construct and maintain grazing infrastructure. Any payments received are handled in accordance with the Refuge Revenue Sharing Act (16 U.S.C. 715s). The specific cost-sharing and payment terms are established in each Cooperative Agricultural Agreement and associated Special Use Permit.

Impacts of changes to resources and capacity

The availability of resources is subject to change and the level of use provided may vary based on current staffing, partner support, funding, or infrastructure conditions.

For other refuge uses, if resource conditions shift such that the refuge can no longer sustain the use in a compatible manner, the Project Leader may modify or suspend the use pursuant to 50 CFR 25.21. The public will be notified of any such modification or suspension.

Anticipated Impacts of the Use

Controlled grazing serves as a habitat management tool to maintain and improve the coastal marsh and prairie habitats for which the refuge is managed. Applied at light-to-moderate intensity with rotation and rest, the use maintains the early-successional habitat mosaic that supports migratory birds and other trust resources, and is therefore consistent with the purposes for which Jocelyn Nungaray NWR was established and with the mission of the National Wildlife Refuge System. The use does not materially interfere with or detract from either.

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Controlled grazing can be an effective and inexpensive tool in wetland and grassland management, providing habitat components that benefit waterfowl and other wildlife species. The relation of cattle grazing to wildlife varies considerably, depending on stocking rate, seasonality, plant community, and the wildlife concerned (Chabreck 1968). Research indicates that dual use of grasslands by wildlife and livestock is often compatible when livestock grazing is carefully managed and wildlife needs are considered (Holechek 1982). Coastal marshes of the upper Texas coast experience high annual rainfall distributed throughout the year, a long growing season, very fast nutrient recycling, and vegetation that recovers quickly following disturbance. These conditions require protracted and synergistic disturbance events, such as grazing coupled with prescribed fire or wildfire, to maintain a habitat mosaic interspersed with early-successional conditions, resulting in increased biodiversity (Starns et al. 2019).

Short-term and long-term impacts from the proposed grazing program may vary depending on the season of use, grazing intensity, and the influence of weather. Any grazing program carries inherent risks associated with overlapping biotic and abiotic resources (e.g., localized heavy grazing, trampling, and trailing). Resources that do not occur within the grazing-use area, or that would experience no or only negligible impacts, have been dismissed from further analysis.

Threatened and Endangered Species

Federally listed and proposed species with the potential to occur on or near the refuge, and considered in this determination, include:

- Green Sea Turtle (*Chelonia mydas*) (Threatened)
- Hawksbill Sea Turtle (*Eretmochelys imbricata*) (Endangered)
- Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) (Endangered)
- Loggerhead Sea Turtle (*Caretta caretta*) (Threatened)
- West Indian Manatee (*Trichechus manatus*) (Threatened)
- Piping Plover (*Charadrius melodus*) (Threatened)
- Red Knot (*Calidris canutus rufa*) (Threatened)
- Eastern Black Rail (*Laterallus jamaicensis jamaicensis*) (Threatened)
- Whooping Crane (*Grus americana*) (Endangered)
- Monarch Butterfly (*Danaus plexippus*) (Proposed Threatened)
- Tricolored Bat (*Perimyotis subflavus*) (Proposed Endangered)

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Four sea turtle species and the West Indian manatee may occur in the marine and coastal waters adjacent to the refuge; sea turtles nest on Gulf beaches, and the manatee occurs infrequently in nearshore and estuarine waters. Although cattle may at times access areas relatively near the Gulf shoreline, the grazing program is conducted within coastal marsh and upland habitats and does not occur on the beaches or dunes used for sea turtle nesting, nor in the open waters used by the manatee. No more-than-negligible impacts to sea turtles or the West Indian manatee are anticipated from the grazing program.

Piping plovers and red knots have been documented wintering and foraging on the beaches, mudflats, and coastal shoreline portions of the refuge. Grazing is excluded from these coastal areas, and no impacts to these species are anticipated from the grazing program.

The eastern black rail has been documented on the refuge year-round. While information on the effects of grazing on the eastern black rail remains limited, a study on the refuge and other coastal Texas refuges by Tolliver et al. (2019) determined that eastern black rail occupancy and abundance were not significantly different among coastal Texas NWRs with and without an active grazing program.

Light-to-moderate, rotational stocking maintains the moist-soil and marsh vegetation structure used by rails, and cattle grazing and eastern black rails have co-occurred on the refuge since its establishment. Cattle move through marsh habitat at a slow walking pace that allows rails to move ahead of any disturbance, and the heaviest marsh use occurs during the cool season (generally October through April), largely outside the rail's breeding and molting period (March 1–September 30). No more-than-negligible impacts to the eastern black rail are anticipated.

Two whooping crane populations are relevant to the upper Texas coast: the wild, self-sustaining Aransas-Wood Buffalo population, which winters along the central Texas coast, and the reintroduced Louisiana non-migratory population, designated as a nonessential experimental population under section 10(j) of the Endangered Species Act. Individuals from either population may occur on or near the refuge as rare transients. Controlled grazing maintains open, early-successional coastal marsh and prairie that is consistent with whooping crane foraging habitat. Given the rarity of occurrence and the compatibility of the resulting habitat conditions, no more-than-negligible impacts to the whooping crane are anticipated.

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The monarch butterfly (proposed Threatened) relies on milkweeds and nectar-producing forbs during breeding and migration. Light-to-moderate, rotational grazing maintains a forb-diverse prairie and marsh mosaic and is not expected to reduce milkweed or nectar availability at a meaningful scale; the resulting habitat heterogeneity may benefit nectar resources. No more-than-negligible impacts to the monarch butterfly are anticipated.

The tricolored bat (proposed Endangered) roosts in forested areas, including in trees and Spanish moss, and forages over water and along habitat edges. The grazing program does not remove forested roosting habitat. No more-than-negligible impacts to the tricolored bat are anticipated.

Overall, no more-than-negligible impacts to federally listed or proposed species are anticipated as a result of the controlled grazing program on the refuge.

Short-term Impacts

Trampling and temporary disturbance of wildlife, particularly nesting waterbirds, may occur. Cattle distribution tracks forage accessibility and availability: cattle use the transitional high ground and uplands during the warm season, when those grasses are most productive, and shift into the marsh and moist-soil units during the cool season; they make little use of inundated stands, favoring areas of fresh, accessible growth. This warm-season shift onto the uplands draws grazing pressure

away from the marsh during the spring and summer, reducing disturbance to waterbirds during the breeding, nesting, and brood-rearing seasons. Stocking densities are also maintained at the light end of the range, further reducing potential impacts to wildlife.

Immediate loss of vegetation and seed sources may result from grazing. Warm-season annuals are particularly vulnerable if grazed prior to seed dispersal (Chabreck 1968). These potential impacts are readily mitigated through cattle rotation and exclusion of cattle from areas of wildlife and habitat importance. The high vegetative productivity documented on the Texas Chenier Plain would be expected to recover quickly following a disturbance event such as controlled grazing.

Soil compaction and erosion may occur in areas with sensitive soils or that receive frequent cattle traffic and hoof action. High ground (e.g., levees, cattle walks, roads, watering sites) and mineral-supplement areas typically receive the most cattle traffic and the greatest impacts to soil and vegetation. Cattle pasture rotations and movements allow impacted areas to rest and recover from grazing pressure.

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Excessive nutrient deposition in the form of cattle waste into nearby water bodies is another potential short-term impact, particularly around areas of frequent cattle congregation (water troughs, mineral-supplement areas, levees). While nutrient cycling in grazed units is generally a benefit, overloading of nutrients into water bodies may affect microbial communities and some aquatic invertebrates and vertebrates. Rotating cattle, maintaining conservative stocking rates, and responding to undesirable habitat alterations avoid or minimize these potential impacts.

Long-term Impacts

Long-term impacts to wildlife and habitat resources may include reductions in vegetation diversity from overgrazing in areas of high use, and soil erosion from excessive cattle traffic. Seasonal rotations and stocking-rate adjustments have been, and will continue to be, employed to obtain a mosaic of habitat types and plant successional stages across the landscape, thereby benefiting multiple plant and wildlife species on the refuge. In the practical application of a tool like grazing, the available herd is focused in certain areas to achieve the moderate grazing regime desired, leaving large areas lightly grazed or ungrazed to the benefit of species that require the cover of emergent vegetation. Neither intensive grazing nor the absence of grazing is desired across the whole refuge.

Proper grazing can promote habitat for a variety of waterbirds, and multiple studies have found grazing to be inconsequential or beneficial to many of the avian species of concern that use the refuge (Chabreck 1968; Mizell 1998; Yeargan 2001; Richmond et al. 2010, 2012; Kane 2011; Tolliver 2017; Tolliver et al. 2019). Yeargan (2001) determined that the numbers of shorebirds, herons, and egrets were greater in grazed than in ungrazed marshes on Galveston Island, Texas, while the numbers of gulls, terns, sparrows, rails, and other species did not differ. Mizell (1998) studied wintering yellow rails (Coturnicops noveboracensis) on the refuge and suggested that cattle grazing may increase the availability of yellow rail habitat, which may be beneficial for other sensitive rail species as well. Carefully managed grazing in coastal prairie habitats increases the vigor of native prairie grasses and increases overall plant species composition and structural diversity. Beneficial effects of grazing wetland habitats include:

- The reduction of rank vegetation, which enables migratory birds to access roots and tubers of mature plants and shoots of new vegetative growth.
- The reduction of competing growth of marshhay cordgrass and other dominant climax plant communities, which allows for the growth of subdominant plant species often preferred as forage by waterfowl.
- The creation of open water used by waterfowl for loafing and foraging.
- The improvement of plant vigor, productivity, and nutrient cycling.
- The reduction of excessive residual plant-material build-up and hazardous fuel loading.
- Soil break-up and turnover through hoof action, leading to seedling establishment.
- The suppression of regrowth in overlapping burned areas, thereby maintaining palatable waterfowl forage.

Rotational grazing is also among the most cost-effective and least disruptive tools available for creating the interspersion of open water and emergent vegetation favored by ducks and geese. Compared with the alternatives, grazing avoids many of their drawbacks: mowing depends on dry conditions and precise timing and can only be conducted in suitable years; rolling or aerating with specialized equipment muddies the water for extended periods, impeding submerged aquatic vegetation, and contributes to soil compaction, soil erosion, and substantial equipment and fuel costs; and prescribed fire, while useful, falls outside the routine scope of these operations. Because the moist-soil unit seed bank holds abundant waterfowl food,

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rotational grazing followed by flooding or water capture makes an area usable to waterfowl almost immediately—the seed already at the surface of the seed bank is available forage before any regrowth occurs. The same grazed-and-flooded openings then create conditions for submerged aquatic vegetation, such as southern naiad (Najas guadalupensis) and sago pondweed (Stuckenia pectinata), to develop through the fall and winter as an additional forage source for waterfowl.

Grazing also maintains seashore paspalum (Paspalum vaginatum) as a low, actively growing sward. This salt-tolerant, stoloniferous grass resists overgrazing because of its low growth habit, and when grazed it produces fresh, palatable growth that cattle take preferentially over the rank, ungrazed plant; seashore paspalum is used as forage by cattle and is also used by waterfowl, which consume both the plant and its seed (USDA NRCS). The refuge's wetlands and moist-soil units are managed on drawdown and flood cycles and are never permanently flooded; under this periodic flooding regime, the grazed-low paspalum sward provides a replenishing source of forage for wintering waterfowl.

Where grasslands and marsh edges are managed for mottled ducks (Anas fulvigula), grazing is used to maintain the grassland structure that supports nesting and brood-rearing. Mottled ducks select nesting habitat associated with recent grazing and in proximity to the shallow freshwater used by broods (Haukos et al. 2010; Wilson 2007). Applied at light-to-moderate intensity, and including periodic deferment of grazing where taller nesting cover is the objective, grazing helps maintain the mosaic of grassland structure and adjacent brood water on which the species depends.

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Cumulative impacts on other biological or physical resources are not anticipated to arise from the administration of a controlled grazing program on the refuge. The program is not expected to incrementally add to other state, private, or federal actions proposed or occurring in the area, and the program benefits numerous wildlife species while supporting the refuge's priority public uses.

Public Review and Comment

The draft Compatibility Determination will be available for public review and comment for 30 calendar days, from November 30 through December 30, 2026. The draft Compatibility Determination will be shared directly with relevant stakeholders, including representatives of the State of Texas and federally recognized Tribes in Texas, for review and comment. The public will be made aware of this comment opportunity through postings at the refuge, a refuge bulletin, and notices in media outlets with local distribution. A hard copy of this document will

be posted at the Texas Chenier Plain National Wildlife Refuge Complex headquarters at 4017 FM 563, Anahuac, Texas 77514. It will be made available electronically on the refuge website at https://www.fws.gov/refuge/jocelyn-nungaray. Concerns expressed during the public comment period will be addressed in the final determination.

Determination

Is the use compatible?

Yes.

Stipulations Necessary to Ensure Compatibility

To ensure compatibility with the National Wildlife Refuge System mission and the goals and objectives of Jocelyn Nungaray NWR, the controlled grazing program must provide the refuge with a management tool to improve habitat quality for migratory birds, and must assist the refuge in meeting its habitat management objectives.

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The controlled grazing program is governed through a Cooperative Agricultural Agreement and associated Special Use Permit (SUP) and Plan of Operations issued to permittees. Stipulations necessary to ensure compatibility with the refuge's establishing purposes and the mission of the Refuge System are included as the Special Conditions of the SUP. Permittees must adhere to all conditions set forth in the SUP, including the following:

1. Permittees will graze cattle only in designated locations of the refuge.
2. Stocking rates and pasture rotations will be specified by the Refuge Manager.
3. The Refuge Manager must be notified in advance of any introduction or removal of cattle.
4. Permittees must annually provide a written record of cattle numbers and movements on and off the refuge.
5. Fences, gates, and cattleguards must be maintained by the permittee with materials provided by the refuge.
6. Permittees must comply with all state and federal livestock health laws.
7. Grazing activities will comply with all species-specific avoidance and minimization measures established through Section 7 consultation with the Service's Texas Coastal and Central Plains Ecological Services Field Office

(Project Code 2026-0104377). These measures will be incorporated into each Cooperative Agricultural Agreement and associated Special Use Permit and may be updated as consultation is completed or revised.

Refuge staff and grazing permittees must monitor habitat conditions and communicate throughout the adaptive management cycle. Factors such as stocking rate, duration, and seasonality must be adjusted as necessary to meet refuge objectives under changing environmental conditions. To be successful, all participants must understand the successional relationships of plant communities and the effects of management decisions under changing environmental conditions, in order to keep the program aligned with refuge goals and habitat management objectives. Both short- and long-term monitoring of grazing impacts on refuge habitats is needed to guide this adaptive management approach. The staff effort associated with the monitoring described above is accounted for in the Availability of Resources section.

Justification

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Controlled cattle grazing is an inexpensive, dependable, and effective tool for managing habitats on Jocelyn Nungaray National Wildlife Refuge. The application of other disturbance tools, such as fire, is strongly influenced by weather conditions and numerous regulatory restrictions and is less likely to be available when needed. Grazing is a management tool that, in most instances, can be more dependably implemented to assist in maintaining habitat diversity by creating sub-climax vegetative conditions. This habitat diversity is critical to maintaining natural biological diversity on the refuge. In the refuge's coastal marshes, properly applied controlled grazing creates high-quality habitat for wintering and resident waterfowl, shorebirds, wading birds, and other migratory birds.

Controlled livestock grazing creates temporary disturbances to vegetation, many of which are desirable for grassland and coastal-marsh management. Without occasional disturbance from mowing, haying, burning, or grazing, the health of the grassland and marsh communities would decline, as would their potential for waterfowl production. Controlled grazing is an alternative management tool that can be used to replace or complement prescribed burning, mowing, or haying, and is frequently the most cost-effective and least disruptive of these tools. When properly managed, grazing has few detrimental effects on coastal marshes, most being aesthetic in nature.

This activity will not conflict with any of the refuge's priority public uses or adversely impact biological resources. Therefore, through the compatibility

determination process, the refuge has determined that controlled livestock grazing on Jocelyn Nungaray NWR, conducted in accordance with the stipulations provided above, is a compatible use that will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes for which the refuge was established.

Signature of Determination

Refuge Manager Signature and Date

Signature of Concurrence

Assistant Regional Director Signature and Date

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Mandatory 10-Year Reevaluation Date

September 2036

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Tables and Figures

Table 2. Annual Animal Unit Months (AUM) by grazing unit on the 23,784 acres open to grazing on Jocelyn Nungaray National Wildlife Refuge, FY 2007–2018. Overall total = 76,230.63 AUM; overall annual average ≈ 6,352.55 AUM.

Year	Old Anahuac (9,801 ac)	East Unit (10,436 ac)	Middleton (3,547 ac)
2007	868.82	372.47	289.90
2008	1,722.89	1,562.04	701.74
2009	489.01	2,102.43	592.70
2010	2,713.75	3,515.46	1,851.64
2011	3,613.06	3,347.86	1,322.27
2012	1,695.33	2,998.68	1,397.89
2013	4,207.07	2,915.49	1,155.79
2014	2,375.20	3,122.47	388.39
2015	3,957.70	3,199.90	630.66
2016	4,181.88	3,286.15	1,283.22
2017	4,316.84	2,721.38	734.97
2018	2,745.95	3,050.86	798.75
Total	**32,887.50**	**32,195.20**	**11,147.93**
Average	**2,740.63**	**2,682.93**	**928.99**

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Figure 1. Annual Animal Unit Months (AUM) by grazing unit on Jocelyn Nungaray National Wildlife Refuge, FY 2007–2018.

