



OUTDOOR HERITAGE FUND GRANT APPLICATION
INDUSTRIAL COMMISSION
 SFN 61465 (06-2018)

Project Name North Dakota Outdoor Heritage Education and Events Barn at Alkali Lake		
Name of Organization Audubon Dakota		Federal Tax ID Number 13-1624102
Contact Person/Title Marshall E Johnson		
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City Fargo		State ND
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List Names of Co-Applicants (if this is a joint proposal)		

Major Directive (choose only one response)

Directive A: Providing access to private and public lands for sportsmen, including projects that create fish and wildlife habitat and provide access for sportsmen;

Directive B: Improving, maintaining and restoring water quality, soil conditions, plant diversity, animal systems and by supporting other practices of stewardship to enhance farming and ranching;

Directive C: Developing, enhancing, conserving and restoring wildlife and fish habitat on private and public lands; and

Directive D: Conserving natural areas and creating other areas for recreation through the establishment and development of parks and other recreation areas.

Additional Directive (choose all that apply)

Directive A Directive B Directive C Directive D

Type of Agency

State Agency Political Subdivision Tribal Entity Tax-exempt, nonprofit corporation

Abstract/Executive Summary

Summarize the project, including its objectives, expected results, duration, total project costs and participants. (No more than 500 words)

The Edward M. Brigham III Alkali Lake Sanctuary Education and Events Barn will be a destination outreach center designed to showcase successful, sustainable land management in North Dakota's grasslands. Centrally-located between Fargo and Bismarck, Audubon Dakota will use the space as an outreach site for the general public, school groups, and agriculture sector in a region lacking education centers focusing on natural resource management. The property encompasses approximately 2,000 acres of remnant or restored grassland habitat and 1,000 acre Alkali Lake. Beginning in 2016, the property has incorporated a successful rotational grazing system, demonstrating the value of partnerships between private livestock producers and sustainable resource management. The centerpiece of the Sanctuary will be the Education and Events Barn. Construction of the 6,000 square-foot Barn began in early 2017, with the purpose of providing environmental and agricultural education to a variety of audiences, ranging from the general public to resource and agricultural professionals. Located within a two-hour drive of over one third of North Dakota's population, the Barn will be well-positioned for educational outreach opportunities, including science-based K-12 school classes, landowner workshops, field tours, recreational functions, etc. The Barn will also host undergraduate courses, including those investigating ranching techniques that incorporate native range into grazing strategies. Local and regional school classes, including agriculture-focused high school courses, will be a focus of outreach events in the Barn each year. Students, families and volunteers of all ages will learn not only about prairie ecosystems and adaptive, regenerative grazing management, but will also gain hands-on experience with land management, including practice with tree removal and re-seeding techniques. Audubon Dakota emphasizes programs and projects with a compelling landowner interest, a mission statement that has grown from National Audubon Society's Working Lands Initiative. Success of market-driven but conservation-friendly agriculture requires proof of concept examples, an aspect that can be witnessed at the Sanctuary and showcased in the Barn. The property will be open to the general public year-round.

To date, Audubon Dakota and our partners have succeeded in completing the exterior framework of the barn with in-kind contributions of \$2,160 and cash contributions of \$190,125.

Project Duration

Indicate the intended schedule for drawing down OHF funds.
September 1, 2018 - December 31, 2018

Amount of Grant Request \$125,154.50	Total Project Costs Note: In-kind and indirect costs can be used for matching funds. \$192792.50	Amount of Matching Funds \$67,638.00
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A minimum of 25% Match Funding is required. Indicate if the matching funds will be in-kind, indirect or cash. Please provide verification that these matching funds are available for your project. Note that effective as of July 1, 2015, no State General Fund dollars can be used for a match unless funding was legislatively appropriated for that purpose.

Amount of Match	Funding Source	Type of Match
\$67,638.00	Audubon Dakota	<input checked="" type="checkbox"/> Cash <input type="checkbox"/> In-Kind <input type="checkbox"/> Indirect
		<input checked="" type="checkbox"/> Cash <input type="checkbox"/> In-Kind <input type="checkbox"/> Indirect
		<input checked="" type="checkbox"/> Cash <input type="checkbox"/> In-Kind <input type="checkbox"/> Indirect
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		<input type="checkbox"/> Cash <input type="checkbox"/> In-Kind <input type="checkbox"/> Indirect
		<input type="checkbox"/> Cash <input type="checkbox"/> In-Kind <input type="checkbox"/> Indirect

Certifications

- I certify that this application has been made with the support of the governing body and chief executive of my organization.
- I certify that if awarded grant funding, none of the funding will be used for any of the exemptions listed at the back of this form.

Narrative

Organization Information - Briefly summarize your organization's history, mission, current programs and activities. Include an overview of your organizational structure, including board, staff and volunteer involvement. (No more than 300 words.)
 Audubon Dakota is the North and South Dakota state program within the National Audubon Society. Since 1905, the National Audubon Society has been focused on conserving bird habitat, promoting avian education, and engaging communities in conservation. Audubon Dakota as a state program was instituted in 1997, however Audubon's role in the Dakotas spans back to the mid-1970s. The mission of the National Audubon Society is to protect birds and the places they need, today and tomorrow. Audubon seeks partnerships that advance its habitat conservation goals, including partnerships that support grassland habitat projects and the production ag industry. Currently, Audubon Dakota manages roughly 5,000 acres within the state and administers a multitude of conservation based programs aimed at enhancing and protecting North Dakota's natural heritage in rural and urban settings. ND Outdoor Heritage Fund has been a committed supporter of this work by providing financial support for a number of those programs, including the Grand Forks County and Stutsman County Prairie Management Toolbox projects and the continued support of the Urban Woods and Prairies Initiative expansion throughout North Dakota. These programs would not be possible without the support and help of many different private cooperators, agencies and programs, local businesses and individuals, many volunteers and local Audubon Chapters. As a state office, Audubon Dakota has six full time staff members for the two-state region. Audubon Dakota's Advisory Board is comprised of six ND citizens, and one SD citizen.

Purpose of Grant - Describe the proposed project identifying how the project will meet the specific directive(s) of the Outdoor Heritage Fund Program.

Identify project goals, strategies and benefits and your timetable for implementation. Include information about the need for the project and whether there is urgency for funding. Indicate if this is a new project or if it is replacing funding that is no longer available to your organization. Identify any innovative features or processes of your project. Note: if your proposal provides funding to an individual, the names of the recipients must be reported to the Industrial Commission/Outdoor Heritage Fund. These names will be disclosed upon request. (see additional notes below)

Located northeast of Jamestown, the Edward M. Brigham III Alkali Lake Sanctuary is less than a two-hour drive from both Fargo and Bismarck. The site has been subject to rotational grazing since 2016, when management began focusing on sustainable ranching that preserves prairie habitat and birds while also producing beef and building soil health through an adaptive management system. Successful land management strategies offer the best showcase for the National Audubon Society's Working Lands Initiative, which aims to protect quality bird habitat in partnership with private landowners. The Education and Events Barn on Sanctuary property is a 6,000 square-foot structure that will serve as a center of outreach for visiting school groups, ranging from local elementary school science classes to undergraduates interested in agriculture and natural resources management. The Barn will have classrooms designed for teaching groups of students, allowing for classroom-style learning that can easily transition to hands-on techniques outdoors, where participants can learn about rangeland agriculture, as well as wildlife management. Furthermore, education of students of all ages is critical for continued success of the agricultural industry. At the Barn, people of all ages and demographics will have the opportunity to see successful farm and ranch operations that also allow for the persistence of North Dakota's natural heritage.

These classrooms will also be used for conservation professionals interested in ranching, as well as learning about native grassland management while still operating a successful grazing operation. Successful rangeland management can incorporate both livestock and prairie flora and fauna when properly planned and resources for ranchers are made available. Ranching that focuses on restoration of native plant species, particularly when also providing public hunting opportunities, is often subject to specialized federal and state grants (CRP, PLOTS). Because of these funding opportunities, the Barn will provide educational opportunities about a source of funding for agricultural operators. Furthermore, Audubon Dakota recently began the Stutsman County Prairie Management Toolbox program, which is designed to assist ranchers with habitat management planning and grazing land infrastructure development. The Toolbox program is taking place in the same county as the Barn, making the Barn a likely location for field tours and landowner workshops for North Dakota's producers.

Completion of the Education and Event Barn requires several enhancements before it can be formally used for events. Though the structure has been built, in order for the barn to realize its full educational potential, the interior still needs to be completed, including the addition of electrical and plumbing. Cosmetic items also need to be completed before the Barn can be used for public use such as installation of sheet rock, wood paneling, flooring, exterior and interior painting, and basic landscaping. These are the final but necessary steps for the Barn to become available for public outreach. Completing Barn construction with final infrastructure and cosmetic components will allow the Barn and the Sanctuary to be an agricultural and environmental outreach destination for the entire state of North Dakota.

Please list the counties that would be impacted by this project:

Stutsman

Is this project part of a Comprehensive Conservation Plan?

No Yes, If yes, provide copy of plan with the application.

Note: Projects involving buildings will only be considered if part of a Comprehensive Conservation Plan. Please refer to the "Definitions" section at the back of the form for more details.

- For tree/shrub/grass plantings: provide a planting plan describing the site design, planting methods, number of trees/shrubs by species and stock size, grass species and future maintenance. A statement certifying that the applicant will adhere to USDA-NRCS tree/shrub/grass planting specifications along with the name of the governmental entity designing the planting may be substituted for a planting plan.
- For projects including Section 319 funding: provide in detail the specific best management practices that will be implemented and the specific projects for which you are seeking funding.
- For projects including fencing: A minimum cost share of 40% by the recipient is preferred. Include detailed information on the type of fencing to be installed, whether funding is requested for boundary fencing, new or replacement of existing fencing, and/or cross fencing.

Management of Project - Provide a description of how you will manage and oversee the project to ensure it is carried out on schedule and in a manner that best ensures its objectives will be met.

Include a brief background and work experience for those managing the project.

Project management will be conducted with frequent site visits by Audubon Dakota management. Close coordination with construction managers has been and will be necessary to ensure deliverable completion by target dates. The principal staff member overseeing construction management will be Marshall Johnson, Executive Director of Audubon Dakota. Marshall Johnson has been Executive Director for 6 years and has overseen other construction projects to completion. All vendors of requested services will be licensed and insured companies that have undergone a bidding process.

Evaluation - Describe your plan to document progress and results.

Please be specific on the methods you will utilize to measure success. Note that regular reporting, final evaluation and expenditure reports will be required for every grant awarded.

All cosmetic services will be determined to be complete based on communication with service providers and through visual inspection of services rendered. Infrastructure services, such as electrical wiring, will be determined to be complete only after all relevant government inspectors have specified that services rendered are up to federal, state, and county construction code laws.

Financial Information

Project Budget - Use the table to provide an itemized list of project expenses and describe the matching funds being utilized for this project.

Indicate if the matching funds are in the form of cash, indirect costs or in-kind services. The budget should identify all other committed funding sources and the amount of funding from each source. **A minimum of 25% match funding is required.** An application will be scored higher the greater the amount of match funding provided. (See Scoring Form.)

Certain values have been identified for in-kind services as detailed under "Budget Information" at the back of this form. Refer to that section and utilize these values in identifying your matching funds. **NOTE: No indirect costs will be funded.**

Project Expense	OHF Request	Applicant's Match Share (Cash)	Applicant's Match Share (In-Kind)	Applicant's Match Share (Indirect)	Other Project Sponsor's Share	Total Each Project Expense
Electrical		\$42,500.00				\$42,500.00
Wood paneling	\$43,247.00	\$18,092.00				\$61,339.00
Wood flooring	\$37,684.00	\$7,046.00				\$44,730.00
Interior wall finishing	\$27,124.00					\$27,124.00
Bathroom fit-up	\$6,600.00					\$6,600.00
Septic system and drain field	\$10,500.00					\$10,500.00
Total Costs	\$125,155.00	\$67,638.00				\$192,793.00

Budget Narrative - Use the space below to provide additional detail regarding project expenses.
See attached

Sustainability - Indicate how the project will be funded or sustained in future years.
Include information on the sustainability of this project after OHF funds have been expended and whether the sustainability will be in the form of ongoing management or additional funding from a different source.
Once fully operational, the Education and Events Barn will be open to the public and available for weekend and evening rental accessible for public and private events at a fair market value. The income generated from these events will fund a significant portion of project sustainability. Additional sustainability funds and sources will be obtained through seeking additional gifts and in-kind support.

Partial Funding - Indicate how the project will be affected if less funding is available than that requested.
This will result in loss of educational outreach and community engagement opportunities. However, Audubon Dakota will continue to pursue additional funding opportunities to ensure full funding is secured for timely completion of this educationally critical structure.

Partnership Recognition - If you are a successful recipient of Outdoor Heritage Fund dollars, how would you recognize the Outdoor Heritage Fund partnership? * There must be signage at the location of the project acknowledging OHF funding when appropriate.
Signs acknowledging the contribution of OHF to the Education and Events Barn will be present in both the Barn interior and exterior. In all forms of press release about the Barn as well as any public events involving discussion about the Barn, the role of OHF will be prominently mentioned.

Awarding of Grants - Review the appropriate sample contract for your organization on the website at <http://www.nd.gov/ndic/outdoor-infopage.htm>.

Can you meet all the provisions of the sample contract? Yes No

If there are provisions in that contract that your organization is unable to meet, please indicate below what those provisions would be:

OHF Grant Proposal: North Dakota Outdoor Heritage Education and Events Barn at Alkali Lake

Budget Narrative:

Electrical materials and labor expense of \$42,500 was determined using an estimate provided by the electrical company, Direct Electric Inc. Wood paneling expense of \$61,339 was calculated using a surface area of 3,000 sq. ft. and a rate of \$7.80/sq. ft. plus tax for lumber equaling \$25,155 (estimate provided by Dakota Timber Company LLC), \$3.50/ sq. ft. for 6,064/sq. ft. for ceiling installation equaling \$21,224, and \$2.75/sq. ft. for 5,440 sq. ft. of ceiling installation. Wood flooring expense of \$44,729.50 was calculated using a surface area of 3,000 sq. ft. and a rate of \$9.50/sq. ft. plus tax for lumber equaling \$30,637.50 (estimate provided by Dakota Timber) and \$5.20/sq. ft. for 2,710 sq. ft. installation (estimate provided by Rode Construction) equaling \$14,092. Interior wall finishing labor and material expense of \$27,124 was determined using the contractor's estimate (Rode Construction, Inc.). Bathroom fit-up expense of \$6,600 for two bathrooms was estimated by Rode Construction, Inc. Septic system and drain field labor and material expense of \$10,500 was determined using the contractor's estimate (Rode Construction, Inc.). Funding partners to date include: Jamestown Tourism, ND Game & Fish, Jamestown Area Foundation, Dr. Robert & Kathy Bates, and Roger Minch, Pifer's Auction & Realty, and Tom and Katie Hutchens



Conservation Plan

Edward M. Brigham III Alkali Lake Sanctuary

Spiritwood, ND

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Introduction

This conservation plan meets the mission and management goals of Audubon Dakota's Edward M. Brigham III Alkali Lake Sanctuary. The conservation plan aims to maintain and restore the ecological integrity of the Sanctuary, addresses significant issues, and is consistent with the National Audubon Society's conservation initiatives.

Audubon Dakota's mission is to "conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity". Through this conservation plan, Audubon Dakota can ensure that this mission is kept at the forefront of all management practices implemented at the Brigham Alkali Lake Sanctuary by outlining land use history, land use goals and strategies, and identifying target species for management.

Background

Edward M. Brigham III Alkali Lake Sanctuary is located 11 miles northeast of Jamestown, ND. The Sanctuary is a wildlife area that is dominated by approximately 1,750 acres of mixed grass prairie (remnant, former hay fields, and cropland) and the 1,000 acre Alkali Lake, with includes roughly 8 miles of riparian woodlands. The edge habitat and overall habitat diversity of the Sanctuary provides habitat for a great diversity of wildlife not commonly seen in such a small geographical area within North Dakota. In the midst of an agricultural dominated landscape, the Sanctuary illustrates and provides education on how active, and effective grassland/wetland management can provide many benefits for native wildlife populations. Audubon Dakota aims to have the Sanctuary become a showcase of proper wildlife management on diverse grasslands, woodland, and wetland complex.

The Sanctuary has historically (1980's) supported a high diversity of avian species due to its mosaic of grasslands, woodlands, wetlands, and shoreline habitat. For example, endemic prairie species such as upland sandpiper, sharp-tailed grouse, chestnut-collared longspur, many sparrow species, bobolink, dickcissel, dabbling ducks, and mammals such as red fox, coyote, and badger all inhabit the Sanctuary habitat. In the riparian woodlands, species such as wood duck, hooded merganser, screech owl, woodpeckers, orchard and northern orioles, black-billed cuckoo, flycatchers, rose-breasted grosbeak, eastern bluebird, warblers, and mammals like eastern cottontail rabbit, beaver, fox squirrel, and white-tailed deer flourish. The lake shores support species such as sora, Virginia, and yellow rails, marsh wrens, sharp-tailed sparrow, common snipe, American bittern, and black crowned night herons. The lake and smaller wetlands have been utilized extensively by dabbling and diving ducks, herons, terns, white pelicans, grebes, Wilson's phalaropes, spotted sandpipers, yellowlegs,

other shore birds, and mammals such as muskrats, mink, and raccoons. Every species of waterfowl that have nested in North Dakota have been found nesting at the Sanctuary (16 species). The Sanctuary has also been used as a migratory stopover for snow geese, Canada geese, tundra swan, dabbling and diving ducks, and shorebird species. Throughout the year, raptors have been found in all habitats of the Sanctuary, from bald eagles, great horned owls, Swainson's, ferruginous, and red-tailed hawk, short-eared owl, snowy owl, northern harrier, and American kestrels.

Habitat Goals and Objectives



Working Lands

I. Continue Audubon Dakota participation in Native Prairie Adaptive Management Program, led by USFWS.

Audubon Dakota became a volunteer participant of Native Prairie Adaptive Management (NPAM) in the summer of 2016. NPAM was a program created by the USFWS in response to the rampant spread of invasive cool-season grass, like smooth brome grass and Kentucky bluegrass, into native remnant prairies. The expansive invasion of these species within many remnant prairies throughout the northern Great Plains is due to common management history of limited disturbance, which historically shaped the Great Plains.

While the Sanctuary is enrolled within NPAM, Audubon Dakota is responsible for monitoring each of the enrolled cells using NPAM protocols. Collected data must be input and sent to USFWS area data manager (as of 2017 – Jennifer Zorn) by an annually designated date in early August. This data will be put through the NPAM data model to determine the most effective land management recommendation for each cell surveyed. The management recommendations are just that, recommendations. However, Audubon Dakota puts high importance on implementing these recommendations since Audubon has higher flexibility with management when compared to USFWS refuges. In addition to receiving management recommendations, Audubon Dakota's participating within the program contributes to overall understanding of how management influences remnant prairie health. Additional information about NPAM can be found in Appendix 2.

II. Implement rotational grazing throughout the Sanctuary – Spring 2017

After awarded with an Outdoor Heritage Fund grant in 2015, Audubon Dakota initiated the installation of 8 miles of fencing throughout the entire Sanctuary in the

spring of 2016. The first phase includes 15 cells, composed of remnant mixed grass or tame grasslands. In the spring of 2017, cattle will be introduced as a land management method. Rotational grazing schedules each year will be determined in consideration to Native Prairie Adaptive Management program recommendations and the preferences of Audubon's partnering rancher (Brian Amundson in 2017).

III. By periodic prescribed burning, maintain and manage existing grasslands.

Prescribed burning of the Sanctuary will be determined by NPAM land management recommendations each year for the remnant portions. Recommended management actions per unit are determined by selecting the appropriate policy based on the management restriction of the unit and then matching the defoliation level (Low, Med, High), years since last defoliation (1, 2-4, 5+), and vegetation state (Native Cover and Dominant Invader) of each unit to the corresponding management action for that state found in the policy.

For restored acres, the need for burning will be determined by annual vegetative surveys conducted by Audubon employees, dependent upon invasive species and woody vegetation dominance in each cell. Decisions will also put an emphasis on habitat requirements of priority grassland nesting species. The annual habitat management plans for the Sanctuary will further detail the location of planned burn, the frequency, and the explanation of timing.

IV. Convert acres currently residing in cropland into seeded native grassland, and manage with burning or grazing.

In 2017, approximately 750 acres remained in cropland, typically rotating between soybeans and corn. In 2018, restoration practices will begin. By 2021, Audubon Dakota aims to restore all of those acres back into native prairie with high diversity seedings. As native restorations typically require up to five years to become fully established, Audubon Dakota will need to implement essential management practices to ensure full restoration success.

Restoration management will require seasonal spot herbicide treatment for invasive or noxious weed species control throughout the first two initial years of restoration. To track restoration progress, restoration monitoring should be implemented. By utilizing adaptive management, Audubon Dakota can learn which management methods are most effective for these restorations. In the third year of restoration, prescribed burning will be needed. Following the fifth year, the restorations should support rotational grazing.

V. Manage the white-tailed deer population so that it remains within the winter carrying capacity.

Audubon Dakota permits up to 7-10 deer hunting permits each hunting season to local hunters who apply. The office typically places priority on hunters who have exhibited continued commitment to the Sanctuary through annual volunteering. Harvest can have a significant impact on deer populations, therefore, to ensure that the Sanctuary deer population remains within the winter carrying capacity, it is essential for Audubon Dakota to manage the white-tailed deer population.

To achieve this goal, Audubon Dakota must begin consistent collection of harvest data and possibly camera surveys, which would reveal much about the local deer population and will help Audubon make management decisions. Data necessary for documenting the impacts of harvest include: date of harvest, sex, weight, age, location, number of points, antler spread, beam circumference, and beam length (worksheet in Appendix). Audubon's goals for deer management for 2017-2027, are the following:

1. Improve buck:doe ratio
 - i. Ideal ratio – 5:1
 - ii. Benefits: More does bred on first estrus cycle (fewer late-born fawns, lower winter fawn mortality, more intense rut = higher quality hunting opportunities)
2. Improve age structure of bucks within herd: More evenly distributed
 - i. Benefits: higher genetic diversity (only the healthiest, fittest bucks are able to reproduce), overall health of herd is increased
3. Larger bucks
 - i. Antlers: more mature bucks; best genetics get passed on, Size: much more variance in body size because of distributed age
 - ii. Benefits: Better hunting opportunities for larger deer

Possible Management Options to achieve these goals:

4. Antler Point Restriction: prohibits hunters from shooting a buck with fewer than 4* legal tines (>1") on one side of the rack
 - i. Benefits: fewer young deer harvested - more bucks able to reach maturity, helps diversify the age structure of a herd, improves buck:doe ratio - improves chance of all does being bred
 - ii. Costs: Reduced chance in shooting a buck (for the first few years of the program), can be harder to distinguish "legal" bucks, possibility of higher end young bucks being killed as opposed to

inferior older bucks, may alienate hunters who don't want more regulations.



Water

I. Reduce degradation of the lake and wetland complex from agricultural runoff of silt, pesticides, fertilizers, and herbicides.

Many of the acres surrounding the Sanctuary are cropland, which leads to an increased probability of pollution into Alkali Lake and ground water. To prevent the possibility of agricultural runoff containing pesticides, fertilizers, etc. Audubon will focus conservation efforts on protecting riparian areas around Alkali Lake and the Sanctuary's wetlands. In addition to simply protecting existing riparian areas, Audubon recognizes that general restoration of native vegetation will facilitate in reducing runoff, while also increasing water quality since native prairie plants are proficient in filtering chemicals from ground percolating water.

Audubon staff will also promote environmentally friendly agricultural practices, such as no till, preventing cattle access to riparian areas, and limited use of chemicals (herbicides, pesticides, fertilizers), all of which could potentially reduce contamination risk of area water bodies.



Climate Change

I. Increase vegetation diversity by reducing invasive plant species for the benefit of target wildlife

Invasive cool season grasses are dominant at the Sanctuary (as of 2017), likely due to very limited land management practices over the last 30 years. Species with the highest presence include Kentucky bluegrass, smooth brome grass, crested wheat, Canada thistle, and sweet clover. The implementation of rotational grazing and prescribed fire in the next 10 years will decrease these species, while supporting the recovery of native forbs and grasses.

Decreasing the density of invasive species will provide higher quality of habitat to Audubon's target bird and wildlife species, in grassland and wetland settings.

II. Reduce woody vegetation encroachment

As much of the NPAM data (2016) illustrated, the Sanctuary has a strong snowberry (*Symphoricarpos albus*) presence throughout much of the remnant acres. This high density is once again the result of limited land management, therefore the

implementation of grazing and prescribed burning will facilitate with reducing these densities. Management actions will be influenced by NPAM recommendations.

Russian olive (*Elaeagnus angustifolia*) tree patches are prominent throughout the Sanctuary as well. Tree removal and stump treatment with Garlon4A will be necessary to prevent the continued growth and spread of this non-native species.



Bird Friendly Communities

I. Identify sharp-tailed grouse leks and establish viewing blinds for public use.

Current (2017) knowledge of the Sanctuary's resident sharp-tailed grouse leks is limited – though there is confirmed observations of their presence. Audubon would like to provide education and viewing opportunities to the public by establishing 2 to 3 viewing blinds at the Sanctuary. This will require the identification of where the sharp-tailed grouse leks are dancing throughout the Sanctuary. Once these locations are recorded, then viewing blinds can be placed, and opened up to the public.

II. Enhance reproductive success of grassland nesting bird species.

Grassland birds are the most rapidly declining suite of birds in North America, therefore Audubon will be focusing land management practices at the Sanctuary on fulfilling habitat and nesting requirements for many grassland bird species. Not only will Audubon be restoring up to 750 acres of native prairie in the next 10 years, but adaptive management practices will ensure that remnant and restored acres receive the most appropriate management to ensure productivity success. Additionally, management activities will be focused on producing a mosaic of various vegetative heights, litter depths, and growth to provide habitat that appeal to a variety of target grassland bird species.

III. Establish an education center and meeting area for public entities and education. Focus on prairie fauna and flora, wetlands, wetland values, and conservation practices.

An interpretive meeting space will be constructed in 2017 – official naming has yet to be determined. This building will be utilized to further engage the public with Audubon's conservation work and provide an entry for people to explore the Sanctuary. Though the Sanctuary has always been open to the public, signage is often lacking throughout the Sanctuary, therefore it is important that with the construction of the barn that Audubon focuses on promoting respectful Sanctuary exploration by the public.

To facilitate public engagement, Audubon will begin hosting environmental outreach and education events at the Sanctuary for area students and community members. Additionally, nearby partners, such as the USFWS, will be encouraged to also use the barn and the Sanctuary for meetings or workshop events. These conferences and workshops will be focused on utilizing the Sanctuary as a pilot site for “bird friendly” management techniques through rotational grazing, cover crops, prairie restoration, and prescribed fire.

Inventory and description of habitat

(1) Location – The Sanctuary is approximately 11 miles northeast of the city of Jamestown in Stutsman County, North Dakota.

(2) Physical or geographic setting – The western two-thirds of North Dakota is comprised of the mixed grass prairie, dominated by midgrasses, shortgrasses, and upland sedges (Weaver and Clements, 1938). The eastern one-third of the state is comprised of remnant stands of tall grass prairie. There is a broad transition grassland type, in which the taller grasses gradually decrease in abundance and stature toward the west while the mid- and shortgrasses increase (Kuchler, 1964). The Sanctuary is located within this vegetative transition zone—also known as the eastern mixed-grass prairie.

The topography of North Dakota is likened to stair steps becoming progressively higher from east to west (Laird, 1962). The eastern edge of the state is the former basin of glacial Lake Agassiz, which is now referred to as the Red River Valley. The Red River Valley is broad and flat. The western part of the state is located on the Missouri Plateau, which is characterized by a rise in elevation from about 550 m to 915 m. The Sanctuary is located in the middle region called the Drift Prairie. The soil of the Drift Prairie is very rocky. Glacial deposits, or drift, composed of rocks of different sizes cover the area. Glacial melt also caused small ponds or “potholes” to form. Gently rolling hills surround these potholes. These slopes form a drainage from the well-drained hilltops to standing water in depressions. In a study of the vegetation of Nelson county, North Dakota, drainage was determined to be the most important environmental factor determining plant distribution (Dix and Smeins, 1966). This drainage regime creates five vegetational units: 1) high prairie; 2) mid-prairie; 3) low prairie; 4) meadows; and 5) marshes (Godfread and Barker, 1974). Godfread and Barker (1974) characterized the plant communities of these zones in the *Vascular Flora of Barnes and Stutsman Counties, North Dakota*, which are detailed below:

High Prairie: Relatively few forbs are numerous. The grasses are primarily those that characterize the mixed prairie to the west. Prairie sandreed (*Calamovilfa longifolia*) is found on sandy high prairie. Western wheatgrass (*Agropyron smithii*) and needle-and-thread (*Hesperostipa comate*) also are characteristic. Shorter grasses and sedges also appear, such as blue grama (*Bouteloua gracilis*), prairie junegrass (*Koeleria cristata*), and threadleaf sedge (*Carex filifolia*).

Mid-prairie: Other forbs, along with the grasses of the high prairie, are not restricted to that zone but are found on mid-slopes as well. In addition, the mid-prairie supports grasses not present on the high prairie such as sideoats grama (*Bouteloua curtipendula*) and little bluestem (*Schizachyrium scoparium*). The mid-prairie supports many forbs, such as pasqueflower (*Anemone patens*), yellow whitlow-grass (*Draba nemorosa*), western rockjasmine (*Androsace occidentalis*), prairie violet (*Viola pedatifida*), purple milkvetch (*Astragalus agrestis*), prairie smoke (*Geum triflorum*), and lambstongue ragwort (*Senecio integerrimus*).

Low prairie: Characteristic grasses of the low prairie include: big bluestem (*Andropogon gerardii*), switchgrass (*Panicum virgatum*), mat muhly (*Muhlenbergia richardsonis*), (*Carex prae-gracilis*), and (*Carex brevior*). A small group of forbs seem restricted to the low prairie: white lettuce (*Prenanthes racemosa*), pleated gentian (*Gentiana affinis*), rough foxglove (*Agalinis aspera*), and common goldstar (*Hypoxis hirsuta*).

Meadow and marsh: Meadows are characterized by a mix of grass and sedge species. Northern reedgrass (*Calamagrostis inexpansa*) is one of the most common species. Other common species include: common rivergrass (*Scolochloa festucacea*), American mannagrass (*Glyceria grandis*), American sloughgrass (*Beckmannia syzigachne*), and prairie cordgrass (*Spartina pectinata*). The most common emergent species in marshes are broadleaf cattail (*Typha latifolia*), common reed (*Phragmites australis*), and hardstem bulrush (*Scirpus acutus*). In the shallow water one finds rooted aquatics such as bladderwort (*Utricularia vulgaris*) and yellow water buttercup (*Ranunculus flabellaris*).

Other plant communities: Occasional spring seepage areas occur on the hillsides bordering the river valleys along the margins of ponds and lakes. The waters are alkaline so these areas can best be termed fens. Fens include many species characteristic of meadows and marshes but in addition to that component 47 additional species have been found only in the fen zones. Woodland communities occasionally occupy north and east slopes. American elm (*Ulmus Americana*), box elder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), and cottonwood (*Populus tremuloides*) comprise the overstory of woodlands. Chokecherry (*Prunus virginiana*) and hawthorne (*Crataegus rotundifolia*) are the most common components of the shrub layer.

Species diversity: A total of about 450 species have been found associated with the previously mentioned communities after excluding species most typical of wooded and disturbed areas. High, mid, and low prairies together have 244 associated species. About 100 species occur in meadows. Of this 100, about 20 also occur in the low prairie. Eighty species are typical of the marsh and open water zones. Approximately 30 of these occasionally appear in the meadow also. Woody communities of the river valleys with their associated understory add about 240 species. Woody communities of the area have about 60 species, all of which may be found in river valleys.

The climate of the area is characterized by extremes of heat and cold and drought and rain. The grasslands of the state receive an annual precipitation regime ranging from a low of 330-356 mm in the extreme western part of the state to a high of a little over 508 mm in the extreme eastern part. About 75% of the rainfall occurs during the growing season (April-September).

The Sanctuary is located within the Central Flyway, an administrative unit based on the routes used by migratory birds and managed by the U.S. Fish and Wildlife Service and its partners (Fig. x).



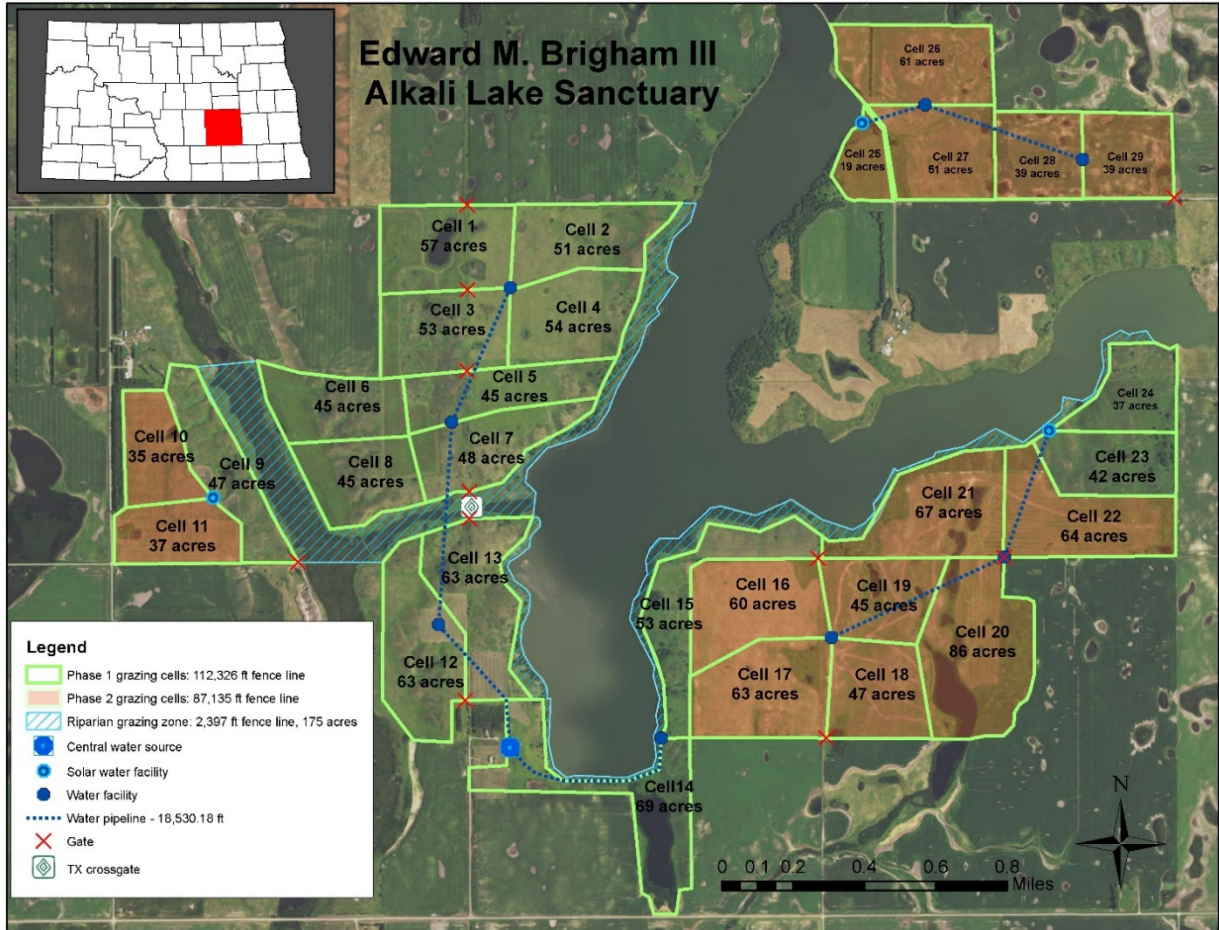
Figure 1. Migratory bird flyway map (Fish and Wildlife Service, 2016)

- a) Current condition – The Brigham Alkali Lake Sanctuary is within the mixed grass/drift prairie of North Dakota. The plant community is dominated by native grass species such as prairie junegrass, green needlegrass, needle-and-thread, little bluestem, big sandgrass, porcupine grass, mat muly, side-oats grama, and native forb species such as lead plant, purple prairie clover, gaura,

hairy puccoon, harebell, stiff goldenrod, purple coneflower, dotted blazingstar, pasque flower, and prairie rose.

In 2014, around 250 acres were burned by Audubon and Prairie Restorations, Inc. - the first land management event in 20 years. Due to historical management neglect, the remnant and restored acres of the Sanctuary have experienced degradation by invasive species such as crested wheat, Kentucky bluegrass, smooth brome grass, and thistles (Canada, plumeless, bull). Additionally, since no consistent fire or grazing regime has been practiced (up to 2017), woody vegetation has widely encroached into the naturally grassland acres – species such as snowberry and Russian olive. Therefore, a major goal for the Sanctuary is invasive and woody vegetation reduction throughout, while increasing overall vegetative diversity.

(3) Maps –



Species of Conservation Priority

Identification of Sanctuary resources of concern.

a. North Dakota Species of Conservation Priority (Dyke et al., 2015)

*Federally listed as threatened or endangered

i. Birds

1. Level I (High level conservation priority)

- Horned grebe
- American bittern
- Swainson's hawk
- Ferruginous hawk
- Yellow rail
- Marbled godwit
- Wilson's phalarope
- Franklin's gull
- Black tern
- Sprague's pipit
- Grasshopper sparrow
- Baird's sparrow
- Nelson's sparrow
- Chestnut-collared longspur

2. Level II (Moderate conservation priority)

- American white pelican
- Northern pintail
- Canvasback
- Lesser scaup
- Northern harrier
- Bald eagle
- American kestrel
- Prairie falcon
- Sharp-tailed grouse
- Piping plover*
- American avocet
- Willet
- Upland sandpiper
- Short-eared owl
- Loggerhead shrike
- LeConte's sparrow
- Bobolink
- Western meadowlark

3. Level III (Moderate conservation priority but are believed to be peripheral or non-breeding in ND)
 - Peregrine falcon
- ii. Mammals
 1. Level I
 - Townsend's big-eared bat
 - Big brown bat
 - Little brown bat
 - Northern long-eared bat*
 2. Level II
 - Pygmy shrew
 - Richardson's ground squirrel
 3. Level III
 - Arctic shrew
 - Merriam's shrew
 - Western small-footed bat
 - Long-eared bat
 - Long-legged bat
 - Hispid pocket mouse
 - Plains pocket mouse
- iii. Amphibians & Reptiles
 1. Level I
 - Canadian toad
 - Smooth green snake
 - Plains hog-nosed snake
 2. Level II
 - Snapping turtle
 3. Level III
 - Northern prairie skink
- iv. Pollinators
 1. Level I
 - Monarch butterfly
 - Regal fritillary
 2. Level II
 - Dakota skipper*
 - Poweshiek skipperling*

Identification of habitat requirements

(1) Size, configuration, and juxtaposition of different habitats or seral stages;

The sanctuary is dominated by grassland (1,475 acres). Approximately 750 acres of the sanctuary is currently being cropped. Much of the sanctuary is covered by wetlands; of which 80 acres is open water, 8 acres woody wetlands, and 80 acres emergent herbaceous wetlands. There is about 80 acres of developed land on the sanctuary, which is comprised of a house, pole barn, and access roads. There is also 8 acres of deciduous forests; mainly confined to the lake shore and a small plot of planted trees near the caretaker's house. See appendix figure x for a map of sanctuary land types. Also see appendix figure x for acreages of each land type.

The dominant soil of the sanctuary is loamy upland sites and loamy overflow (Figure Ax.). A loamy reference plant community includes green needlegrass, western wheatgrass, porcupine grass, prairie junegrass, big bluestem, heath aster, prairie coneflower, stiff sunflower, and lead plant. Reference plant community production ranges from 2,600 to 3,200 pounds per acre. Phase 2 of this plant community results from long-term, heavy, continuous grazing and may be compounded by moderate to severe drought. Overgrazing of this site will shift the plant community to one dominated by blue grama, western wheatgrass, sedges, western yarrow, goldenrods, and fringed sagewort. If present, Kentucky bluegrass also will increase. On the other hand, extended periods of nonuse will shift any plant community to one dominated by Kentucky bluegrass, smooth brome, cudweed sagewort, scurfpea, goldenrods, and western snowberry. The lack of disturbance (i.e., fire or grazing) allows dead plant material to increase and shift to plant community phase 3. Due to the loss of the dominant native grass species, this community has crossed a threshold and a simple change in management will not return it to the reference plant community (Sedivec and Printz, 2012).

Due to decades of nonuse the majority of the sanctuaries plant community is in phase 3. This is evidenced by the abundance of cool-season invasive grasses (e.g., Kentucky bluegrass), western snowberry, chokecherry, and green ash. However, there is about 493 acres of remnant prairie—mainly confined to unbroken hilltops—that is close to the reference plant community.

(2) Presence or absence of edge habitats;

There is an abundance of edge habitat on the sanctuary. The entire sanctuary is surrounded by agricultural land. The woody riparian area around Alkali Lake also

creates edge habitat in the sanctuaries interior. There also is a woodlot on the south side of the sanctuary that has been encroaching on the adjacent grassland. See appendix figure for visual representation of edge habitat.

(3) Temporal distribution of required habitat elements or conditions based on cyclic life history needs of a species or species group;

Grassland – Grassland birds prefer a wide range of grass heights and densities, with some species preferring short sparse vegetation, and other preferring taller, denser vegetation. A mosaic of grass structure provides suitable habitat for birds at either end of the grassland management spectrum, and also would provide habitat for birds whose preferences lie between these extremes. However, most grassland birds decline in the presence of woody encroachment. Much of the grassland on the sanctuary is very shrubby. The south and northwest corners of the sanctuary contain the least amount of shrubs and small trees. See appendix figure x for a more accurate representation of the temporal distribution of grassland on the sanctuary.

The sanctuaries' grassland also provides habitat for small mammals, such as mice, shrews, and voles. Much like birds, small mammals prefer a heterogeneous landscape. Homogenized vegetation structure alters resource availability across the landscape, redistributing resources in a way that appears to benefit some species while imposing a cost on others (Heisler et al. 2013). For example, the sanctuary likely has a high population of deer mice due to the surrounding agricultural areas high seed productivity and ephemeral burrows for nesting and reproduction (White et al. 2012). Soil texture is perhaps the most important predictor of small mammal species composition due to its indirect influence on primary productivity and vegetation structure (Heisler et al. 2013). In general, granivorous small mammals—such as mice—were associated with coarse-textured soils (i.e., sandy). Whereas litter-dwelling species, like voles or shrews, prefer fine-textured soils (i.e., clay).

Appropriate roosts, available surface water, and food are essential components of suitable bat habitat on the Great Plains. The sanctuary meets all of these needs. There is a woodlot and trees along the lake that are good roosting habitat. Alkali Lake provides both water and food. The abundance of aquatic insects that hatch from the lake during the summer provide an excellent source of food for foraging bats. One North Dakota study found that areas with large cottonwood trees and open space for foraging are important (Gilliam and Barnhart 2011).

Woodland – There is are 8 acres of riparian woodlands along Alkali Lake, which provide breeding and roosting habitat for a variety of woodland species such as orchard and northern orioles, flycatchers, eastern bluebird, warblers, great horned owl, woodpecker spp, bald eagle, and duck species such as hooded merganser and wood duck.

Wetland – Depressional wetlands, known as “potholes” are of utmost importance to nesting waterfowl, shorebirds, and grasslands birds. The approximately 80 acres of wetland habitat at the Sanctuary provide migratory, breeding, and brooding habitat for all known waterfowl species in North Dakota. Wetlands that are located within crop fields lack native vegetation and are subject to major sedimentation and pollution. Protection and enhancement of existing wetlands on the Sanctuary is critical for the area’s wildlife since much of the surrounding landscape is agriculturally dominated. To protect riparian areas, Audubon will need to ensure that cattle are not allowed to graze acres surrounding wetlands and Alkali Lake. The Sanctuary’s wetlands and Alkali Lake provide habitat for species such as sora, marsh wren, American bittern, black crowned night heron, Wilson’s phalarope, spotted sandpiper, and terns.

VI. Appendices.

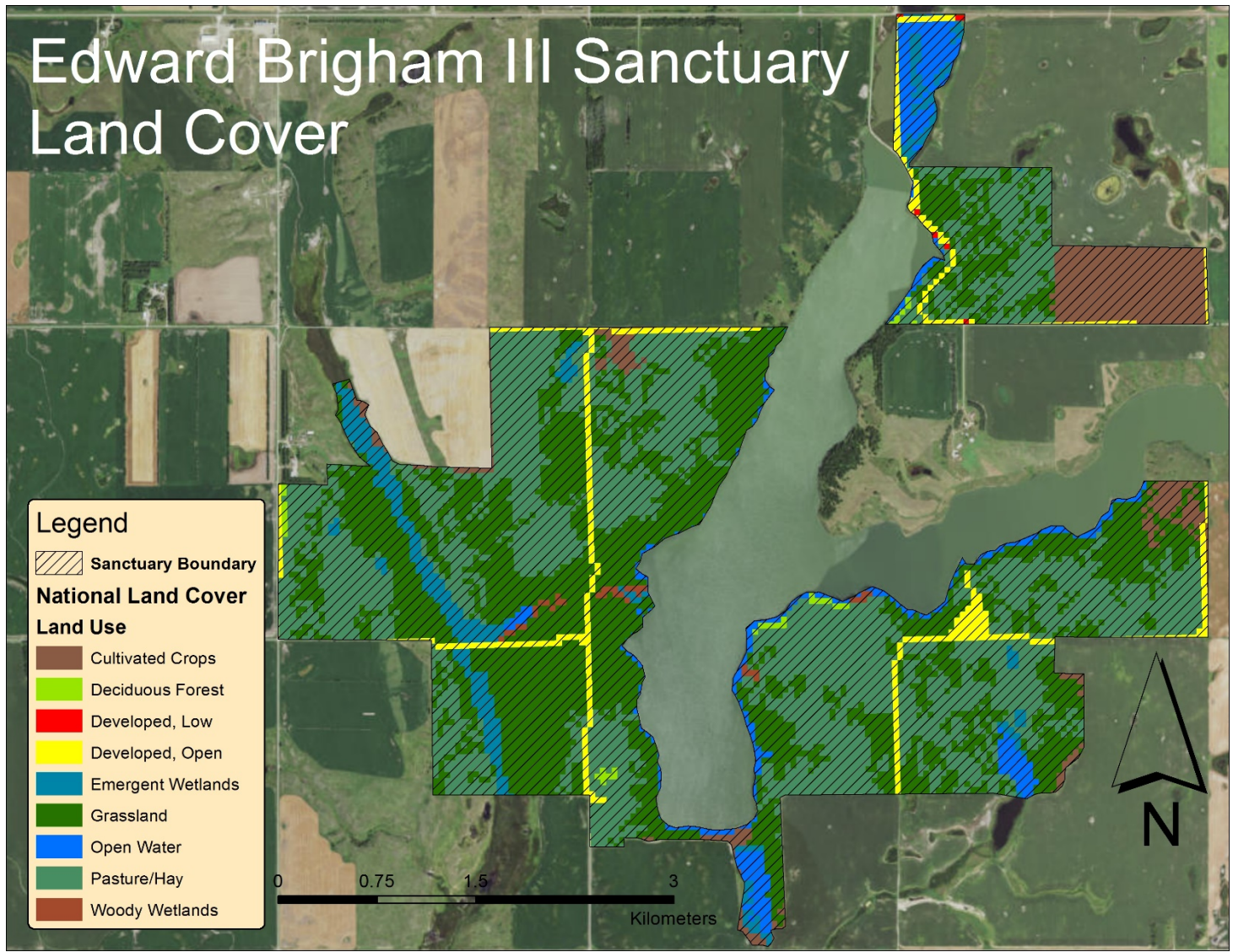


Figure A1.

Edward Brigham III Sanctuary Ecological Site Descriptions

