Outdoor Heritage Fund Grant Application

Project Name	**Natural Resource Stewardship in North Dakota's Parks, Preserves and Natural Areas II**
Name of Organization	**North Dakota Parks and Recreation Department**
Federal Tax ID#	45-0433249
Contact Person/Title	Kathy Duttenhefner, Coordinator/Biologist II
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MAJOR Directive:

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

O **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;

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

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

Additional Directive:

x **Directive A**.
x **Directive B**.
O**Directive C**.
x **Directive D**.

Type of organization:

X State Agency

O Political Subdivision

O Tribal Entity

O Tax-exempt, nonprofit corporation.

Figure 1 Fort Stevenson State Park Visitor Center Prairie Restoration

Abstract/Executive Summary:

This 4-year Natural Resource Stewardship project involves working together with state park managers across North Dakota to provide hands-on assistance to manage, protect and enhance North Dakota's prairies, woodlands, and natural areas ensuring a healthy environment. Clear and measurable objectives have been identified for the increase in prairie restorations and enhancements, enhancements to existing tree and shrub plantings, and strengthening of existing tree risk management program.

Project Goals:

1. Conserve and enhance existing native and restored prairies, woodlands, tree and shrub plantings, within parklands, preserves and natural areas to maximize biodiversity of plant and animal species and provide healthy ecosystems.
2. Successfully manage trees and shrub plantings within parks, preserves, recreational, interpretive and natural areas to provide safe and enjoyable experiences for park visitors.

Measurable Objectives-Results:

1. Within four years, increase and enhance ***native prairie restoration*** acres on parklands, preserves and natural areas through the use of high diversity native seed mixture obtained from local seed sources.
2. Within four years, increase the percent species composition of native grasses and forbs on prairie restoration sites as determined through systematic monitoring and recorded in restoration plans.
3. Within four years, decrease the percent species composition of noxious and invasive species within prairie restorations as determined through systematic monitoring and recorded in restoration plans.
4. Within four years, enhance existing ***tree and shrub plantings*** on parklands, preserves and natural areas the addition of native trees and shrubs. Maintain a 75% survivability rate.

5. Within four years, decrease ***noxious weeds and invasive species*** within tree and shrub planting in parklands, preserves and natural areas through the use of chemical, mulch, fabric and mechanical removal strategies.
6. Within four years increase ***tree and shrub planting protection*** through the use of tree wrapping, bark protectors, mulching, staking and fencing.
7. Within four years, strengthen ***tree risk management program*** through tree risk assessments at every park to include standard level 1 or 2 assessments, recommendations for appropriate actions and funding for timely remedial actions to ensure safe and healthy tree plantings within high use areas.

Project Duration: 4 years: 2019– 2023.

Total Project Costs: $146,780.00

Participants: ND Parks and Recreation with technical expertise from local Natural Resource Conservation and Soil Conservation offices, North Dakota Forest Service and ND Game and Fish Department.

Schedule for Drawing Down OHF Funds: November 30, 2019, June 15, 2020, November 30, 2020, June 15, 2021, November 30, 2021, June 15, 2022, November 30, 20212, June 15, 2023

Amount of Grant Request: $108,680.00

Total Project Costs: $146,780.00

Amount of Matching Funds: $ 38,100.00

Table 1. Matching Funds

Amount of Match	Funding Source	Type of Match
$ 11,100.00	Special Funds – 398 Mineral Royalties funded materials and supplies	Cash
$ 11,500.00	Special Funds - Minerals Royalties funded Seasonal Staff	In-Kind
$ 11,500.00	Special Funds –OHV Permit Recreational Seasonal Staff	In Kind
$ 4,000.00	Grant Funds – NDFS proposed tree and shrub grant	Cash

Certifications:

X I certify that this application has been made with the support of the governing body and chief executive of my organization.

X I certify that if awarded grant funding none of the funding will be used for any of the exemptions noted in the back of this application.

Narrative

History: In 1921, North Dakota began the process of establishing state parks. By 1963, North Dakota had six parks, seven recreation areas, and fifty-three state historical monuments. In 1965, a North Dakota Park Service was established. In 1977 the Park Service was changed to North Dakota Parks and Recreation Department. Today there are 13 parks, 28 natural and recreational areas totaling over 119,827 owned and leased acres.

Mission Statement: The mission of the North Dakota Parks and Recreation Department is to offer a diversity of recreation opportunities and to sustainably manage resources.

Organization: Four major divisions: administration and finance, recreation and trails, planning and natural resources and parks. The natural resource management coordinator is responsible for administration of State Park Resource Management, Nature Preserves, Natural Heritage Inventory, and Natural Areas Registry. The ***Natural Resource Management Program*** focuses on habitat enhancement projects through noxious weed control, tree and shrub planting, woodland management, prairie enhancement and restorations, streambank activities and conservation education.

Staff and Volunteers**:** Natural resource staff directly involved include 2 – FTE biologists, 1 – FTE GIS Technician, 2- seasonal biological science technicians. The natural resource staff work closely with 2 regional managers, 13 park managers, 13 park rangers, and 12 maintenance staff.

Purpose of Grant

Is this project part of a Comprehensive Conservation Plan? Yes No X

Project Goals:

1. Conserve and enhance existing native and restored prairies, woodlands, tree and shrub plantings, within parklands, preserves and natural areas to maximize biodiversity of plant and animal species and provide healthy ecosystems.
2. Successfully manage trees and shrub plantings within parks, preserves, recreational, interpretive and natural areas to provide safe and enjoyable experiences for park visitors.

Measurable Objectives-Results:

1. Within four years, increase and enhance ***native prairie restoration*** acres on parklands, preserves and natural areas through the use of high diversity native seed mixture obtained from local seed sources.
2. Within four years, increase the percent species composition of native grasses and forbs on prairie restoration sites as determined through systematic monitoring and recorded in restoration plans.
3. Within four years, decrease the percent species composition of noxious and invasive species within prairie restorations as determined through systematic monitoring and recorded in restoration plans.
4. Within four years, enhance existing ***tree and shrub plantings*** on parklands, preserves and natural areas the addition of native trees and shrubs. Maintain a 75% survivability rate.

5. Within four years, decrease ***noxious weeds and invasive species*** within tree and shrub planting in parklands, preserves and natural areas through the use of chemical, mulch, fabric and mechanical removal strategies.
6. Within four years increase ***tree and shrub planting protection*** through the use of tree wrapping, bark protectors, mulching, staking and fencing.
7. Within four years, strengthen ***tree risk management program*** through tree risk assessments at every park to include standard level 1 or 2 assessments, recommendations for appropriate actions and funding for timely remedial actions to ensure safe and healthy tree plantings within high use areas.

Strategies – Partnerships are Key:

The cornerstone of the Department's Natural Resource Stewardship Initiative is the recognition that in order to have a successful stewardship project, the Department must facilitate a working relationship with the landowners, organizations and agencies such as local NRCS or SCD, local seed companies, ND Department of Agriculture, NDSU, ND Game and Fish, ND Forest Service, tree nurseries, and adjacent landowners. Continued Outdoor Heritage Funding, federal and private partnerships are key to a successful natural resource program as adequate state general funds are not currently available for the purchase of seed, trees, shrubs and other natural resource management services, supplies and materials. Without financial partners, the Department would be limited to noxious weed control and tree and shrub maintenance.

Native Prairie Restoration and Enhancements Strategies and Best Management Practices:

A multi-site, long term, collaborative project with specific goal to restore, enhance, and sustain a healthy, diverse and sustainable native prairie thus enhancing the biodiversity on parklands, preserves and natural areas and provide optimal visitor experiences. Past partnerships and funding made available through Outdoor Heritage, ND Game and Fish and Pheasants Forever has allowed for the restoration of over 160 acres of non-native grasses. The more recent restorations are listed in Table 1. The Department seeks funding to enhance the following restoration sites through interseeding of native forbs. Through the application of prescribed fire, mowing and interseeding of native forbs it is our goal the maximize plant community diversity.

With limited funding, these small prairie restoration and enhancements have taken place over the past 10 years within parklands. With supplemental funding the Department hopes to increase restoration and enhancement acres on parklands, preserves and natural areas. The prairie restoration and enhancement strategies and best management practices will include the use of a variety of practices including fire, haying, grazing, tillage, herbicides, and seeding and planting of native grasses and forbs.

Native Prairie Restoration and Enhancements Benefits:

Prairie restoration enhances the environment. It increases the abundance of native plants, increase ecological diversity, and therefore creates habitats for native animals and insects, in particular pollinators. Prairie restorations improve water quality and reduce erosion. Of the numerous benefits, one of the most obvious is that prairie restoration promote beautiful, natural landscapes. The restoration sites promotes education about the natural heritage and a clear demonstration of the departments desire to protect and restore the Earth's natural resources.

Table 2. Parkland Prairie Restorations

PARK	Management Unit	Restored Native Prairie	Seeded	Acres
BLSP	Entrance Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2017	0.3
CRSP	Cottonwood Meadow South Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2012	0.7
CRSP	Cottonwood Meadow North Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2012	0.8
DLSP	Grahams Island Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2011	11
FALSP	Stables Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2010	1.33
FALSP	Keller A Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2016, 2017	42
FALSP	Keller B Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2016	2.5
FRSP	Entrance Restoration	Northern Cordgrass Wet Prairie	2019	13.8
FSSP	North Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2012	32
FSSP	South Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2011	10
FSSP	Nelson Prairie Restoration	Needle-and-Thread-Western Wheatgrass Prairie	2009	5.6
FSSP	Pollinator Plot Restoration	Needle-and-Thread-Western Wheatgrass Prairie	2017	0.56
FSSP	Visitor Center Prairie Restoration	Needle-and-Thread-Western Wheatgrass Prairie	2016	0.96
ISP	Visitor Center West Tract 1 Prairie Restoration	Sand Bluestem-Prairie Sandreed Sand Prairie Site	2011	10
ISP	Visitor Center North Tract 2 Prairie Restoration	Sand Bluestem-Prairie Sandreed Sand Prairie Site	2011	2.3
ISP	Visitor Center West Tract 3 Prairie Restoration	Sand Bluestem-Little Bluestem Sand Prairie	2011	6.2
LSSP	JT North Prairie Restoration	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2011	11.9
TMRA	Turtle Mountain Recreational Area Prairie Restoration Site	Western Wheatgrass-Green Needlegrass Mixedgrass Prairie	2017	0.42
TRSP	Heritage East Prairie Restoration Site	Big Bluestem Tallgrass Prairie	2015	12.7
TRSP	Heritage West Prairie Restoration Site	Big Bluestem Tallgrass Prairie	2015	5.4
TRSP	Loop Prairie Restoration Site	Big Bluestem Tallgrass Prairie	2011	1.4

Native Prairie Restoration Enhancement Planning and Forb Seed Mix:

Prairie restoration plans have been developed for all restorations. Below is forb seed mix and cost for approximately 300 pls of native forbs to be used for interseeding. Planting objective is to use a high diversity native forb seed mixture obtained form local seed sources following set specifications which include a minimum of 10 forbs for new restorations and minimally 7 forbs for prairie enhancements/interseeding. Forbs may vary depending on availability and restoration site.

Table 3. Native Forb Seeding for Enhancements Estimate (Spring 2019)

Common Name	***Scientific Name***	***pls.***	***Cost per pls.***	***Total***
Black eyed Susan	*Rudbeckia hirta*	35	$22.77	$819.72
Blanket flower	*Gaillardia aristata*	30	$54.20	$1,626.00
Blue flax	*Linum lewisii*	60	$25.64	$1,538.40
Canada milkvetch	*Astragalus canadensis*	20	$123.48	$2,222.64
Golden alexander	*Zizia aurea*	25	$79.81	$1,915.44
Hoary vervain	*Verbena stricta*	15	$94.34	$1,415.10
Leadplant	*Amorpha canescens*	15	$60.52	$907.80
Plains coreopsis	*Coreopsis tinctoria*	20	$36.19	$759.99
Purple prairie clover	*Dalea purpurea*	25	$31.21	$749.04
Stiff Goldenrod	*Solidago rigida*	15	$108.14	$1,622.10
White prairie clover	*Dalea candida*	25	$45.44	$1,090.56
Wild bergamot	*Monarda fistulosa*	15	$163.55	$2,453.25
Purple coneflower	*Echinacea angustifolia*	35	$26.83	$885.39
		300		$18,403.55

Native Prairie Restoration Planning and Grass and Forb Seed Mix:

The project proposes one new restoration. The proposed sites at Fort Abraham Lincoln are currently being cropped with leases expiring at the end of 2019. Since this site is active cropland, the land is relatively weed free which will be an advantage when transitioning to a native mixed grass prairie.

Table 4. Fort Abraham Lincoln State Park New Prairie Restoration

Park Site	***Native Prairie Proposed***	***Proposed Prairie Restoration - (Acres)***
Fort Abraham Lincoln State Park	*Western Wheatgrass-Green Needlegrass Mixedgrass Prairie*	*35.18 acres*

Table 5. Proposed native grass and forb seed mix estimate

Common Name	**Scientific Name**	**pls. lbs Total**	**Cost per pls. lb.**	**TOTALS**
Western wheatgrass	*Pascopyrum smithii*	117	$3.20	$374.40
Green needlegrass	*Nassella viridula*	204	$5.90	$1203.60
Little bluestem	*Schizachyrium scoparium*	131	$10.60	$1388.60
Blue grama	*Bouteloua gracilis*	55	$9.30	$511.50
Sideoats grama	*Bouteloua curtipendula*	153	$5.35	$818.55
Big bluestem	*Andropogon gerardii*	204	$8.55	$1734.00
Showy Milkweed	*Asclepias speciosa*	1.5	$285.36	$428.04
Butterfly Milkweed	*Asclepias tuberosa*	1.5	$193.66	$290.49
Purple coneflower	*Echinacea angustifolia*	3	$26.83	$80.49
Black eyed susan	*Rudbeckia hirta*	3.65	$22.77	$83.11
Blanket flower	*Gaillardia aristata*	11	$54.20	$596.20
Purple prairie clover	*Dalea purpurea*	7.3	$31.22	$227.90
White prairie clover	*Dalea candidum*	7.3	$45.45	$331.78
Stiff Goldenrod	*Solidago rigida*	1.5	$108.14	$162.21
Blue flax	*Linum lewisii*	22	$25.64	$564.08
Wild bergamot	*Monarda fistulosa*	3.65	$163.55	$596.96
Canada milkvetch	*Astragalus canadensis*	11	$123.48	$1358.28
False sunflower	*Helianthus pauciflorus*	3	$150.00	$450.00
Yellow coneflower	*Ratibida columnifera*	7.3	$28.00	$204.40
Plains coreopsis	*Coreopsis tinctoria*	2	$36.19	$72.38
Totals		**832.70**		**$11,487.19**

General Prairie Restoration and Enhancement Related Tasks:

1. Develop/update **Prairie Restoration Plans**
2. Order **seed mix and sources**. Native seed mix selection will be based on individual site characteristics. Only high diversity native seed that represents the typical native grassland community will be selected.

Figure 2 Proposed FALSP Restoration Sites

3. Restoration establishment and seeding will be accomplished through **broadcasting/drill seeding** according to the full seeding rate. Specific seeding strategies are addressed in each restoration plan.
4. **Pre and Post-seeding weed control is** an important part of successful prairie reestablishment. Mechanical and chemical methods will be used.
5. **Monitoring** and collecting data will be necessary to follow long-term changes. Monitoring will be conducted during the first three growing seasons and again at years 5 and 10.
6. **Interseeding process**: Suppress highly competitive vegetation and litter management techniques to include burning, haying or mowing.
7. **Interseeding methods**: Require a seed be without much litter, when conditions are met seeds may be planted using broadcast seeders either tractors mounted or hand cranked.
8. **Record keeping** and maintaining a written record of observations and management activities is important in order for future management to be informed by the past – avoid repeating mistakes, evaluating effects of management, plan future management actions.
9. **Budget record** keeping will be maintained throughout the restoration process and is compiled in the restoration plans.

Tree and Shrub Plantings Strategies and Best Management Practices:

A multi-site, long term, collaborative project with a specific goal to enhance existing tree and shrub planting habitat acres and biodiversity on parklands, preserves and natural areas. The project purpose is to enhance the existing mosaic of tree and shrub complex habitats through the planting of a diverse selection of native trees and shrubs. The diverse plantings of trees and shrubs will provide food, living space, and cover for a variety of wildlife species. Woody complex plantings will provide nesting habitats for many songbirds. Tree and shrub planting enhancements will not only provide benefits to wildlife but in turn will provide visitors quality outdoor recreational experiences.

Tree and shrub plantings have been a primary focus since parks were established. With limited funding over the years, the majority of the plantings were specifically designed as windbreaks, visual buffers or barriers, shade trees within parkland use areas. With supplemental funding the Department can enhance trees and shrubs planting and woodland habitats acres on natural areas, preserves and parks. Volunteers, seasonal staff and park visitors will be integral to the success of this event. Potential funding partners and match for these tree and shrub plantings projects are ND Forest Service and the Donate a Tree Program.

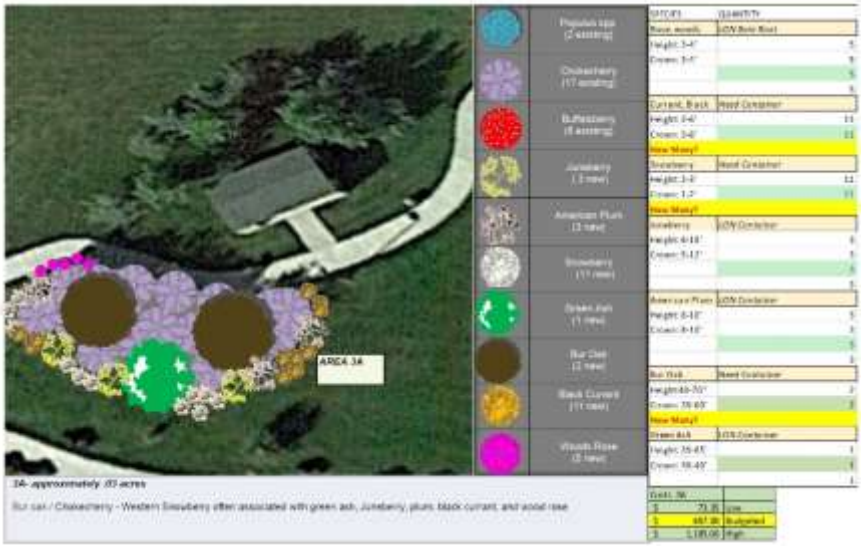

Figure 3 Sample Tree and Shrub Planting Plan using Smart Draw

Tree and shrub plantings strategies and best management practices will include the use of a variety of practices ranging from site preparation, planting and monitoring.

Tree and Shrub Planting and Management Tasks:

1. Identify and map potential tree planting sites utilizing resources such as natural areas site summaries and existing natural resource plans and assessments.
2. Develop Tree planting site plan. GPS/GIS, SmartDraw Landscape Design software or AutoCad will be used to design and layout each woodland planting site. These designs will not only guide the planting process but will aid in the site monitoring and replacement process.
3. Site preparation will be used to create favorable growing conditions where needed. Site preparation will vary from site to site and may include plowing, disking, mowing, burning, and herbicide application.
4. Select and order appropriate native trees and shrubs including bare root and containerized stock.
5. Planting stock according to NDFS and NRCS standards and guidelines. In order to pass on our enthusiasm for the environment we will entice the local schools, boy and girls scouts, park visitors and natural area landowners to lend a hand in the planting process.
6. Manage weeds in planting sites. Sites will also be mulched or will have fabric installed.
7. Tree tubes and deer fencing installed where needed.

Tree and Shrub Planting Specifications (NRCS Tree and Shrub Establishment):

Plantings will adhere to the Natural Resources Conservation Service Tree and Shrub Establishment specification guide sheet. Plant material types to purchase include both bare-root stock and larger container stock. Preference will be given to taller, bare root North Dakota native tree and shrub species. Grant funding will allow for the purchase of over 8,000 bare root stock, with average heights 3-5' and almost 500 containerized tree stock average heights 7-8' tall. On the average 16 parks, interpretive and recreational areas would receive approximately a total of over 2000 trees and shrubs each year to plant in high uses areas. Sites to be planted fall within campground areas.

Table 6. Proposed Tree and Shrub Order

2020-2023 Tree and Shrub Order						
DECIDUOUS TREES/SHRUBS BAREROOT:						
Category		**Tree Size**	**Bundle Size**	**Cost Per Seedling 250+**	**# Number**	**Total Cost**
Ash, Green	*Fraxiunus pennsylvanica*					
Ash, Green		3+	10	$ 1.35	140	189
Aspen, Quaking	*Populus tremuloides*					
Aspen, Quaking		CG	25	$ 1.05	140	141.05
Birch, Paper	*Betula, papyifera*					
Birch, Paper		CG	25	$ 0.85	100	85
Boxelder	*Ace negundo*					
Boxelder		CG	25	$ 0.75	400	300
Buffaloberry,	*Shepherdia argentea*					
Buffalobery		CG	25	$ 0.75	400	300
Cherry, Common	*Prunus virginia*					
Cherry, Common		2-3'	25	$ 0.95	800	760
Cottonwood, Native	*Populus deltoides*					
Cottonwood, Native		5'+	10	$ 3.00	640	1920
Currant, Black	*Ribes americanum 'Riverview'*					
Currant, Black		2-3'	25	$ 0.95	800	760
Currant, Golden	*Ribes odoratum*					
Currant, Golden		2-3'	25	$ 0.95	400	380
Dogwood, Redosier	*Cornus sericea*					
Dogwood, Redosier		3+	10	$ 1.35	840	1134
Elm, American	*Ulmus americana*					
Elm, American		CG	25	$ 0.75	400	300
Hackberry, Northern	*Cetis occidentalis*					
Hackberry, Northern		CG	25	$ 0.75	100	75
Linden, American *(Only Eastern parks)*	*Tilia americana*					
Linden, American		3+	10	$ 1.80	150	270
Oak, Bur	*Quercus macrocarpa*					
Oak, Bur		2-3'	25	$ 1.05	800	840
Plum, American	*Prunus americana*					
Plum, American		3+	10	$ 1.35	440	594
Rose, Woods	*Roasa woodsii*					
Rose, Woods		3+	10	$ 1.35	800	1080
Sumac, Smooth	*Rhus glabra*					
Sumac, Smooth		2-3'	25	$ 0.95	125	118.75
Willow, Peachleaf	*Salix amygdaloides*					
Willow, Peachleaf		5+	10	$ 3.00	80	240
Willow, Sandbar	*Salix exigua*					
Willow, Sandbar		5+	10	$ 3.00	60	180
Wolfberry (Silverberry)	*Elaeagnus commutata*					
Wolfberry (Silverberry)		2-3'	25	$ 0.95	100	95
POTTED STOCK						
Juneberry	*Amelanchier alnifolia*	1 gal pot	1	$ 7.00	220	1540
Juniper, Rocky Mountain	*Juniperus scapulorum*	1 gal pot	1	$ 7.00	140	980
					8075	**$ 12,281.80**

CONTAINERIZED STOCK						
Common Name	**Scientific Name**	**Height**	**# Trees**	**Cost/**	**Total**
Ash, Green	*Fraxiunus pennsylvanica*				
Ash, Green		6-7'	50	$ 139.95	$ 6,997.50
Aspen, Quaking	*Populus tremuloides*				
Aspen, Quaking		6-7'	50	$ 139.95	$ 6,997.50
Birch, Paper	*Betula, papyifera*				
Birch, Paper		6-7'	50	$ 107.96	$ 5,398.00
Boxelder	*Ace negundo*				
Boxelder		5-6'	50	$ 49.97	$ 2,498.50
Cottonwood, Native	*Populus deltoides*				
Cottonwood, Native		8-10'	50	$ 139.90	$ 6,995.00
Elm, American	*Ulmus americana*				
Elm, American		8-10'	50	$ 159.90	$ 7,995.00
Hackberry, Northern	*Cetis occidentalis*				
Hackberry, Northern		8-10'	50	$ 169.00	$ 8,450.00
Linden, American *(Only Eastern parks)*	*Tilia americana*				
Linden, American		8-10'	50	$ 169.00	$ 8,450.00
Oak, Bur	*Quercus macrocarpa*				
Oak, Bur		6-7'	50	$ 119.50	$ 5,975.00
			490		**$ 52,759.00**

Tree and Shrub 3 Years Planting Plan:

FIRST YEAR

Pre-planting:

- Determine area of planting space; refer to your community's Tree ordinance.
- Is the soil suited for tree planting? Are other trees growing well in adjacent area? Take soil samples if needed. (pH, organic matter, soil type [sandy, loam, clay] mineral content, etc.
- Locate underground and above utility lines (Call 1-800-795-0555 at least 48 hours before digging)
- Determine size and type of tree for planting site (B&B, Container, bare-root, small growing vs. large growing, columnar vs. spreading form).
- Consider the future maintenance needs of the plant material before planting (Water accessibility, mulching, etc.).

Planting Day:

- Keep roots moist; **do not** allow the roots to dry out.
- Remove turf from planting area.
- Dig planting hole wide and shallow. The hole should be 2-3 times wider in all directions than the rood spread.
- Prune only dead or broken branches.
- Remove all twine or rope from trunk and branches.
- Remove planting container and burlap (Any material that would constrict growth of roots; wire, plastic, wooden basket).
- Make sure that root flare is at soil level. (Rule of thumb first root closest to soil should be an inch below soil surface).
- Do not use peat or other soil amendments in the planting hole.
- Water tree at planting to remove air pockets. After backfilling gently firm soil, do not pack soil. Heavy packing will compact the soil, which can damage roots.

- Do not mound soil against trunk of tree.
- Apply mulch to the surface of the entire rooting area. Use 2-4" of mulch (wood chips, shredded bark, etc.) Keep mulch 2-4" from trunk of tree since this could create a favorable environment for fungi.
- Staking is seldom necessary and can even be detrimental to young trees. (Exceptions: an extremely windy site, a tree with an unusually small root system, an unusually large canopy relative to a tree's root system, a tree whose trunk is seriously bowed, sandy sites or to protect trees in high traffic areas where vandalism is feared).
- Fertilizer is not recommended for newly planted trees. (If fertilizer must be applied, use minimum amounts of time-released fertilizer).

After Planting:

- Water tree during dry periods. (Rule of thumb, water every 7-10 days during dry periods. Another rule of thumb is to get your fingers dirty, if the soil is dry a week after watering, it needs to be watered). Continue watering right up till the ground freezes.
- Inspect trees for disease or insect problems.
- Monitor health and vigor of trees.
- In fall wrap thin barked trees with tree wrap (e.g. lindens, mountain ash, silver maples).
- Avoid tree injury, such as mechanical or herbicide injury.
- Avoid soil compaction or depositing de-icing salts around trees.
- Install deer fence where needed.

SECOND YEAR

- Continue to monitor trees health and vigor. Inspect for disease and insect problems. Inspect evergreen trees for winter injury and fruit trees for rodent damage.
- Remove tree wrap in spring.
- Remove stakes from tree planted previous year.
- Add more mulch if needed.
- Begin corrective pruning trees one year after trees are planted (General rule of thumb is to remove no more than ¼ of the foliage at one time).
- Continue watering trees when needed during spring, summer and fall.
- If trees have died in first year notify nursery that planted trees. They should guarantee trees for at least one year. After guarantee period city or responsible entity for the care of trees should replace dead trees.
- In late fall, wrap trunks of thin bark trees with tree wrap.
- Avoid tree injury, such as mechanical or herbicide injury.
- Avoid soil compaction or depositing de-icing salts around trees.
- Install deer fence where needed.

THIRD YEAR

- Continue to monitor trees health and vigor. Inspect for disease and insect problems. Inspect evergreen trees for winter injury and fruit trees for rodent damage.
- Remove tree wrap in spring.
- Add more mulch if needed.
- Replace dead trees as needed.
- Continue watering trees when needed. (Wet entire soil profile to provide water to deep roots).
- Avoid tree injury, such as mechanical or herbicide injury.
- Avoid trenching, soil compaction, or depositing de-icing salts around trees.
- If needed a fertilizing schedule may begin during third or fourth year
- Install deer fence where needed.

Tree Risk Assessments:

The Department has an active policy to maintain the safety of people and public lands from potentially high-risk trees. The Department strives to eliminate, in a timely fashion, any tree or shrub deemed as high risk. Natural Resource biologist conducts systematic, examinations of trees, assessing defects and estimating the degree of risk to public health. The majority of the high risk trees can be removed through department staff but vary large trees that offer a high risk of damage to infrastructure and more importantly safety risk to staff require professional tree removal equipment and services. Limited budgets and equipment have limited the department to efficiently and safely remove these very large high-risk trees. Supplemental grant funding is needed to leverage existing resources so that high-risk trees can be removed in a safe and timely fashion.

The basic format of tree risk assessments are the different Levels of risk assessment. These are:

Level 1 – This is a limited visual assessment of an individual tree or population of trees. It is performed as a walk-by assessment in the case of many trees or even as a limited assessment as might be performed during an estimating request. Tree risk assessments forms are completed.

Level 2 – The Level 2 assessment is a 360-degree visual evaluation of a tree where the crown, trunk, trunk flare, above-ground roots, and site conditions are evaluated in regard to targets. Level 2 assessment is often carried out using the ISA Basic Tree Risk Assessment form.

Figure 4 Hazardous Tree

Figure 6 Past Tree Inventory Tag

Table 8. Timetable

	Task	Output	2020	2021	2022	2023
Objective 1	**Increase and Enhance Native Prairie Restoration Acres**					
Task 1	Develop/update Prairie Restoration Plans	Updated Restoration Plan for each site				
Task 2	Site Preparations mowing, chemical, disking	Prepared sites documented by photo(s)				
Task 3	Select seed mixes for interseeding enhancements and restoration	Seed mix order. Updated plan.				
Task 4	Establishment & seeding/interseeding	Seeded site documented by photo(s). Updated plans.				
Task 6	Monitoring – see below Obj. 2	Monitoring forms. Updated plan.				
Task 7	Record all maintenance and management activities.	Update plan annually.				
Task 8	Budget record keeping	Tracked expenses and time. Updated plan.				
Objective 2	**Increase the % species composition of native grasses and forbs with in prairie restorations**					
Task 1	Conduct monitoring during first 3 growing years then again at 5 and 10 years.	Monitoring forms. Field season summaries. Updated plans.				
Objective 3	**Decrease the % species composition of noxious weeds within prairie restorations**					
Task 1	Pre and post noxious weed spraying	Pesticide records. Updated plan.				
Objective 4	**Increase woodland habitat and tree and shrub planting acres**					

Task 1	Conduct initial tree planting assessments to determine specific species and site locations.	Tree and shrub survival report.				
Task 2	Develop tree planting plan with designs.	Tree planting plan.				
Task 3	Site Preparation	Prepared site documented by photo(s) Updated plan.				
Task 4	Select and order tree and shrub stock.	Tree order. Updated plan.				
Task 5	Plant tree and shrub stock as per NRCS specifications and ND Forest Service 3 planting plan.	Planted site documented by photo(s). Updated plan				
Objective 5	**Decrease noxious weeds and invasive species within tree and shrub planting.**					
Task 1	Weed control. Chemical, mechanical means, Installation of fabric or application of mulch. Protection from herbivores.	Weeds controlled within planting. Documented by photo(s). Updated plan.				
Objective 6	**Increase tree health and % survivability.**					
Task 1	Protect tree and shrub plantings from herbivory and mechanical damage	Install deer fences, bark protections, and support devices.				
Task 2	Conduct tree health assessment - % survivability.	Completed tree assessment form. Tree survival numbers and re-re-plant numbers. Updated plan.				
Objective 7	**Restore approximately 10 acres of aspen woodlands.**	Aspen thinning project summary and photos.				

Task 1	Thin approximately 10 acres of aspen woodland at Lake Metigoshe State Park	Annual project summary with photos.				
Task 2	Aspen woodland monitoring.	Monitoring reports with estimated new stem counts.				
Objective 8	**Continue and strengthen existing tree risk management program**	.				
Task 1	Conduct assessments and identify trees for removal	Park specific tree risk assessment reports followed with strategies for removal.				

Figure 7 High Risk Tree

Management of Project

The Department's Natural Resource Division manager and coordinator take any natural resource project from concept to reality. From deciding to plant a tree row or woodland habitats, to large landscape level land registry of natural areas, to implementing an effective and efficient noxious weed control program, to converting non-native grasslands to native prairies, they make natural resource stewardship a reality. The Department's natural resource team works with federal, state, local and private partners determine the goals and objectives of each project, then builds the appropriate solution from the ground up.

The natural resource project planning protocols include the following elements:

1. *Conceptualization* - working with the land managers to identify goals to conceptualize a sustainable solution.
2. *Design* - with the concept in hand, they design the project based on the land manager's needs, the composition of the resource in question, and how it all fits into the larger landscape.
3. *Development* - they use not only in-house expertise but look to state, federal and private agencies and organizations for expertise to add value to the project and prepare it for implementation.
4. *Implementation* - with the concept and design phases complete, they work to implement the project in the most environmentally and economically fashion possible.
5. *Administration* - natural resource projects have a lot of people and tasks being accomplished behind the scenes. These can include writing grant reports, budget summaries, coding costs, and keeping up to date on the latest training requirements.

- ***Kathy Duttenhefner*** *- Coordinator/Biologist - FTE*
  ND Parks and Recreation Department – Natural Resource Division/Natural Heritage Inventory/Nature Preserves and Registered Natural Areas Programs

  Kathy has been with the Department for over 28 years with work experience in the areas natural resource education and outreach, and natural resource inventory, monitoring and management. Kathy will serve as both the project administrator and task content manager. She will supervise two FTE employees, a biologist and GIS Technician and part-time seasonal employees including data managers and biological technicians who will be completing associated tasks.

  Kathy will serve as the contact with state, federal, and private landowners and managers. Kathy will take the lead on overall project administration, work plans, drafting cooperative agreements, hiring and training of seasonal staff, budget and annual reporting requirements, performance and project evaluations. Specifically, Kathy will lead in tree and shrub planting projects, writing and reviewing restoration, noxious weed and tree planting plans, and natural resource assessments and stewardship plans.

- ***Chris Dirk*** *– GIS Technician/Data Manager - FTE*
  ND Parks and Recreation Department – Natural Resource Division

  Chris Dirk has been with the Department working as a data manager and GIS Technician for 20 years. Chris's role will be in the development of any GIS spatial layers and products. Chris will work

closely with Department botanist and biological technician/ecologist on several tasks including data entry, quality and integrity control checks, environmental reviews, noxious weed, prairie restoration, tree planting project maps and GIS and GPS training.

- ***Alex Dohman –*** *Biologist/Botanist - FTE*
  ND Parks and Recreation Department – Natural Resource Division

  Alex has spent the last 2 years as a biologist with the Department. Alex's role with the project will be in providing technical assistance in areas on native prairie restoration, noxious weed control, Natural Heritage Inventory projects, monitoring and data management. Justin will work closely with land managers in the field. The role will also involve the compiling of field data and writing natural areas assessment reports/natural resource stewardship plans.

- **2-Biological Technicians –** Seasonal Employees

  The biological technician's primary role is in noxious weed control and tree and shrub planting and maintenance. Technicians are typically work on parklands and natural areas from May - September. Additional funding will allow us to extend their seasonal work by at least two months. Biological technicians are funded through Special Funds.

- ***State Park Field staff*** (managers, rangers and maintenance staff)

  Park staff will assist with the tree and shrub plantings as well as regular maintenance of the plantings, noxious weed control and prairie restoration maintenance. State Park managers will also work with department public relations staff in setting up 50th anniversary commemorative tree planting event.

Monitoring and Evaluation

Monitoring and evaluation is an essential tool for managing natural resources. It is used for accountability, decision making and program improvement and involves looking at the appropriateness, efficiency and effectiveness of a program. Monitoring and evaluation can identify where a program is heading, how it will get there, whether it is heading in the right direction and whether it is using resources in the most cost effective manner. Over the years the Department has developed monitoring and evaluation protocol for prairie restoration, noxious weed control, tree and shrub plantings, and natural heritage elements.

Prairie Restoration Monitoring & Evaluation:

Native prairie restoration monitoring and evaluations determine the status of the condition of native prairie restoration to allow managers to make better-informed decisions regarding corrective measures needed to alleviate problems and/or improve the quality of the site. The standard if to complete monitoring the first three years and then again every 5 years. All results are detailed a monitoring report with restoration plan updated on a regular basis.

Tree Planting Monitoring and Evaluation:

Once trees and shrubs are planted, it is important to annually monitor their survival rate. This gives the Department an indication of the health and vigor of the planting, if replacement tree and shrubs are needed or if additional protection and weed control actions are needed. Planting sites are monitored for new tree and shrub plantings and take corrective action are noted and corrective actions are identified. The standard for emulations is annually for the first 3-5 years with a goal of maintaining a 75% survivability rate. Tree planting assessment report are generated and shared with park staff.

Financial Information

Table 9. Expenses and Matches

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
Native Prairie Restoration & Enhancements: **Native forb and grass seed** [1]	$25,000.00	$3,000.00	$8,000.00[5]	$0.00	$0.00	$36,000.00
Tree and shrub Planting Enhancements: **Tree and shrub stock** [2]	$60,000.00	$5,000.00	$9,000.00[5]	$0.00	$4,000.00	$78,000.00
Tree and shrub Planting Enhancements **Deer fence –3000'**[3] **fence and rebar posts**[4]	$4,500.00	$1,000.00	$0.00	$0.00	$0.00	$5,500.00
Tree and shrub Planting Enhancements **Mulch. tubes (500), stakes (400)**	$4,180.00	$100.00	$0.00	$0.00	$0.00	$4,280.00
Native Prairie Restorations & Enhancements: **Chemical for restorations**	$0.00	$2,000.00	$0.00	$0.00	$0.00	$2,000.00
Hazardous Tree removal services	$15,000.00	$0.00	$6,000.00	$0.00	$0.00	$21,000.00
Total Costs	$108,680.00	$11,100.00	$23,000.00	$0.00	$4,000.00	$146,780.00

Budget Narrative

[1]Chesak Seed estimate from spring of 2019
[2]Lincoln Oaks Nursery 2018-19 costs and local nurseries estimates
[3]Deerbusters 5' x 100' C Flex Pro Deer Fence $166.74
[4]Pahlke Steel estimate rebar - #4X20'-1/2: each $ 4.50

The majority of mulch is provided through park chipping own down trees and branches but in some remote areas bagged mulch must be provided. Menards usually carries 2.0 cubic feet of mulch for about $2.00/bag.

Solid wall tree guards are installed on all plantings where deer and rabbits damage is likely. Plantra carries a variety of different heights. Typically, these are installed in the fall and removed in the spring in areas of high use. Cost for 47" height – 10 pack is $49.00. Plantra trunk builder reinforced stakes 47" are $35.90 for a 10 pack. 59" trunk builder reinforced stakes in 10-pack are $49.90 each.

[5]Seasonal Biological Science Technicians are funded through Special Funds – Mineral Royalties and through OHV Special funds. Technicians are responsible for noxious weed spraying, tree and shrub planting and maintenance, and assist with tree risk removals.

Sustainability:

Sustainability for this project will be through Department natural resource funding, Special funds through minerals royalties and OHV funding, and continued aggressive grant writing and partnership. The Natural Resource Program will continue to achieve goals and objectives through limited Department funding and state, federal and private partnerships.

The Program has a long history of successful partnerships with state, federal and private agencies and organizations and will continue to develop and strengthen these partnerships. Partnership projects in the past have been funded prairie restorations tree plantings, streambank enhancements, streambank restoration and stabilizations, education outreach, inventory and monitoring, noxious weed and pest control and training.

The majority of Department natural resource funds are used to purchase noxious weed chemical and spray equipment. Funding through grants such as Outdoor Heritage Fund make it possible for the purchase of native forb and grass seed, large tree stock, and contract professional services for the removal of large high risk trees. Grant funding sources vary widely from year and year but securing supplemental grant funding will always be a priority. When funds are limited restoration and plantings are decreased but inventory, monitoring, and assessments always remain in work plans. Sustainability of the Natural Resource Program will be in the form of Department grant writing and partnership developments and existing natural resource budget.

Partial Funding

If the Natural Resource Stewardship in North Dakota Parks, Preserve and Natural Areas is partially funded we would respectfully request that the length of the project in years be decreased. A budget breakdown by years follows.

Table 10. Budget Breakdown by Year

Project Expense	**OHF Request**	**2019-2020**	**2020-2021**	**2021-2022**	**2022-2023**
Native Prairie Restoration & Enhancements: **Native forb and grass seed [1]**	$25,000.00	$6,250.00	$6,250.00	$6,250.00	$6,250.00
Tree and shrub Planting Enhancements: **Tree and shrub stock [2]**	$60,000.00	$15,000.00	$15,000.00	$15,000.00	$15,000.00
Tree and shrub Planting Enhancements **Deer fence –3000'[3] fence and rebar posts[4]**	$4,500.00	$2,250.00	$2,250.00	$2,250.00	$2,250.00
Tree and shrub Planting Enhancements **Mulch. tubes (500), stakes (400)**	$4,180.00	$1,045.00	$1,045.00	$1,045.00	$1,045.00
Native Prairie Restorations & Enhancements: **Chemical for restorations**	$0.00	$0.00	$0.00	$0.00	$0.00
Hazardous Tree removal services	$15,000.00	$3,750.00	$3,750.00	$3,750.00	$3,750.00
Total Costs	$108,680.00	$27,170.00	$27,170.00	$27,170.00	$27,170.00

Partnership Recognition

If project is funded we would be honored to have the North Dakota Outdoor Heritage Emblem displayed on park billboards, on website and/or any interpretive panels that may be placed by prairie restoration sites.

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

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