



1 **TO:** Governance Committee (GC)
2 **FROM:** Executive Director's Office (EDO)
3 **SUBJECT:** 2019 Vegetation Monitoring Project Sole-Source Justification
4 **DATE:** February 21, 2019

6 **Recommendation**

7 The Executive Director's Office (EDO) requests the Governance Committee approve a sole-source contract
8 with the Prairie Legacy to implement the Program's Grassland Vegetation Monitoring Protocol during
9 2019. Funding for this effort in FY2019 would be covered by Program line item IMRP-2. If approved, the
10 Program would enter into a one-year contract (2019) with the Prairie Legacy with a total Program cost not
11 to exceed **\$67,470**. The Scope of Work consists of implementing the Program's Vegetation Monitoring
12 Protocol that is attached to this memorandum as **Exhibit A** on all Program-owned and managed grasslands.

14 **Background**

15 In 2013, the Program issued an RFP to identify contractors interested in developing and implementing a
16 Grassland Vegetation Monitoring Protocol during 2013. Seven proposals were received and evaluated by
17 the selection committee and Prairie Legacy was selected due to qualifications, an understanding of Program
18 needs, and the fact their proposal was over \$100,000 less than any other proposal received. Prairie Legacy
19 was contracted in 2013 to develop and implement the Program's Grassland Vegetation Monitoring protocol
20 on a vast majority of grasslands owned or managed by the Program. In 2014, Prairie Legacy also
21 implemented the protocol on a few additional properties that were not surveyed in 2013. Prairie Legacy
22 also implemented the Grassland Vegetation Monitoring Protocol on all Program properties during 2016.

24 The EDO believes the Program's Grassland Vegetation Monitoring Protocol would be best implemented
25 by Prairie Legacy due to their understanding of the Program's monitoring protocol, vegetation monitoring
26 needs, locations of all the sites, past data collection efforts and reporting, and the minimal cost they charge
27 to implement the protocol. Prairie Legacy is fully qualified to implement the Program's Grassland
28 Vegetation Monitoring Protocol and have proven to produce high quality work products for several projects
29 they've conducted for the Program.



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Exhibit A

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PRRIP Grassland Vegetation Monitoring Protocol



PRRIP GRASSLAND VEGETATION MONITORING PROTOCOL

I. INTRODUCTION

The Platte River Recovery Implementation Program (PRRIP or Program) has acquired or secured management agreements for parcels of grassland along the Platte River Valley between Lexington and Chapman, Nebraska with the long-term goal of improvement and maintenance of migration and reproductive habitat for least terns, piping plovers, and whooping cranes. Vegetation surveys on native and restored grassland areas are necessary to monitor potential shifts in vegetation communities and/or plant species composition over time.

II. PURPOSE

The grassland vegetation monitoring protocol describes the design, concepts and methods being used as repeatable measures to monitor potential changes in vegetation communities and/or plant species composition over time. Program grassland vegetation monitoring objectives include:

- 1) Provide an inventory of plant species composition on Program owned or managed grassland, wet meadow habitat and cropland areas that have been converted to grassland.
- 2) Identify and locate invasive and noxious plant species and program species of concern. Noxious plant species will be located in order to help with eradication and control. The locations of other species of concern including invasive species and rare or threatened and endangered species will be recorded to inform future management decisions.
- 3) Determine species composition in each sample area in order to track potential shifts in dominant species. Data collected will be used in comparative analyses to determine changes in vegetative communities and dominant species.

III. DESIGN CONSIDERATIONS

III.A. Area of Interest

The area of interest consists of Program owned or managed grassland areas along the Platte River beginning at the junction of U.S. Highway 283 and Interstate 80 near Lexington, Nebraska and extending eastward to Chapman, Nebraska.

III.B. Project Design

Data plots will be used to collect density data. This protocol is designed to use subsamples of the vegetation population as a whole to make inferences about the density of desirable and undesirable species.

III.C. Timing

Surveys will be conducted between June 25 and July 15.

IV. METHODS

IV.A. Definitions

Canopy Cover – Area covered by a plant species as one looks down upon an area of specified size.



Cool-season Species – Plant species characterized by flowering early in the season and sometimes additionally later in the fall. Many of the invasive and non-native species are cool season species.

Daubenmire Frame – 20 x 50 centimeter frame placed on the ground to delineate the sampling area. Daubenmire frames are most often used to sample vegetative cover of vegetation or frequency of plant species.

Dominant Species – Most abundant species in a given geographic area.

Introduced Species – Plant species found outside their native range. Synonymous with Non-indigenous.

Macroplot – Large plot within a study area which may or may not include additional smaller plots. In this study the macroplot is 300 meters² and includes smaller plots.

Microplot – Small plot usually included within a larger macroplot. In this study the microplots are 100 cm² and are delineated using a Daubenmire frame.

Native Species – Plants species which are in a certain range as a result of natural processes excluding human introduction.

Parcel – Segment of sampled grasslands delineated by fence lines and/or property boundaries

Rare Species – Less abundant species as compared to other species in a particular area.

Species of Concern – Plant species which are of conservation interest to the Program that include the following rare and/or threatened plant species:

Scientific Name	Common Name
<u><i>Cypripedium candidum</i></u>	Small white lady's slipper
<u><i>Platanthera praeclara</i></u>	Western prairie fringed orchid
<u><i>Salicornia rubra</i></u>	Saltwort

Species of Interest – Plant species which may be indigenous or introduced and which may become invasive to the extent of limiting native species diversity. Species of interest include, but are not limited to the following invasive species:

Scientific Name	Common Name
<u><i>Elaeagnus angustifolia</i> L.</u>	Russian olive
<u><i>Juniperus virginiana</i> L.</u>	Eastern red cedar
<u><i>Phalaris arundinacea</i> L.</u>	Reed canarygrass



96 And the following noxious weeds:

Scientific Name	Common Name
<u><i>Carduus acanthoides</i></u> L.	Plumeless thistle
<u><i>Carduus nutans</i></u> L.	Musk thistle
<u><i>Centaurea diffusa</i></u> Lam.	Diffuse knapweed
<u><i>Centaurea stoebe</i></u> L. ssp. <i>micranthos</i> (Gugler) Hayek	Spotted knapweed
<u><i>Cirsium arvense</i></u> (L.) Scop.	Canada thistle
<u><i>Euphorbia esula</i></u> L.	Leafy spurge
<u><i>Fallopia japonica</i></u> (Houtt.) Ronse Decr.	Japanese knotweed
<u><i>Lespedeza cuneata</i></u> G. Don	Sericea lespedeza
<u><i>Lythrum salicaria</i></u> L.	Purple loosestrife
<u><i>Phragmites australis</i></u> (Cav.) Trin. Ex Steud.	Common reed
<u><i>Tamarix ramosissima</i></u> Ledeb.	Saltcedar

97 Transect – A line following the UTM northing or easting location along which macroplot centerlines
98 will be located.

99 Vegetative Cover – Percent canopy cover within a plot area.

100 Warm-season Species – Plant species characterized by flowering in summer and fall. Many, though not
101 all, native species are warm-season species.

102 IV.B. Vegetation Sampling

103 Each end of the centerline transect of previously sampled locations are marked with a 24-inch long rebar
104 rod buried in the ground. A GPS unit will be used to navigate to the location of the rebar and a metal detector
105 will be used to pinpoint the exact location of the ends of the centerline transect. A total of ten microplots
106 will be located lengthwise along the transect beginning 1 meter from the start (southern or eastern end) of
107 each transect in order to ensure consistency among plots. Microplots will be spaced at 3 meter intervals.
108 Vegetative cover will be estimated using canopy cover for all species within each microplot. The four
109 corners of the macroplot will be located by following a line perpendicular to the centerline and measuring
110 5 meters to each corner.

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112 All species found while sampling and traveling from 1 sample area to the next will be included in a complete
113 species list. The boundary of areas dominated by reed canarygrass will be delineated and other species of
114 interest and species of concern will be marked with GPS waypoints as they are located.

115
116 For sites not previously sampled, a minimum of one macroplot will be placed for every 30 acres of sampled
117 grassland and a minimum of 3 plots will be sampled per site. Macroplots will be located from south to north
118 along easting lines for consistency, ease of relocation, and to cover as many soil types as possible. If
119 possible, macroplots will be located within each soil type of each parcel, but if not, the soil types with the



largest area in the parcel will be sampled. Prior to field excursions, approximate locations of transects and macroplots will be marked on aerial maps in locations that appear to cover potential differences in vegetation communities within each parcel. Biologists will make visual judgments when placing and orienting transects and macroplots in the field to ensure sampling captures the vegetative diversity within each parcel. Each end of transects will be marked with a 24 inch long rebar and GPS locations will be recorded at both ends of the transect using a survey-grade RTK GPS unit. For sampling purposes and to ensure consistency in future resampling, the “starting end” of each transect should be the southern or eastern end of the transect and the “far end” of the transect should be the northern or western end. The midline of each macroplot will be located along a 30 meter (approx. 100 ft.) transect running north to south. The four corners of the macroplot will be located by following the easting line perpendicular to the centerline and measuring 5 meters to each corner. A total of ten microplots will be located lengthwise along the transect beginning 1 meter from the start of each transect in order to ensure consistency among plots. Microplots will be spaced at 3-meter intervals. Vegetative cover will be estimated using canopy cover for all species within each microplot.

IV.C. Data Collection

The following information will be recorded at each microplot:

Surveyor(s) Name – Name or initials of the surveyor(s) who collect data within the macroplot.

Date (Month/Day/Year) – Date of the observations, e.g. 06/24/2013.

GPS Waypoint – Geographical location of the point of interest. UTM's are preferred (record easting and northing – e.g. 0309161 and 5226923). Points will be located in UTM Zone 14.

Parcel Id – Name of the parcel in which the plot is located.

Plot # – Number of plot in the parcel

Transect Heading – The compass direction the transect is oriented. Transects will all be oriented north to south unless conditions on the ground indicate that an east to west orientation is more appropriate.

Soil Type – Soil type where the plot is located

Forb Species Markers – Location of the base of 3 perennial shrubs or forbs along the centerline (preferably touching the centerline) of the plot and indicate their exact location. For example *Amorpha canescens* located at the 9 meter mark touching centerline on the west side, *Vernonia baldwinii* touching centerline on the east side at 20.5 meters and *Solidago missouriensis* located 0.5 meters east of centerline at the 21.5 meter mark.

Location of Plots

Both ends of transects should be marked with a waypoint and 24 inch long rebar markers. In order to reposition microplots as closely as possible, relocate the base of previously identified perennial shrubs or forbs located along the centerline and position microplot sampling areas accordingly.

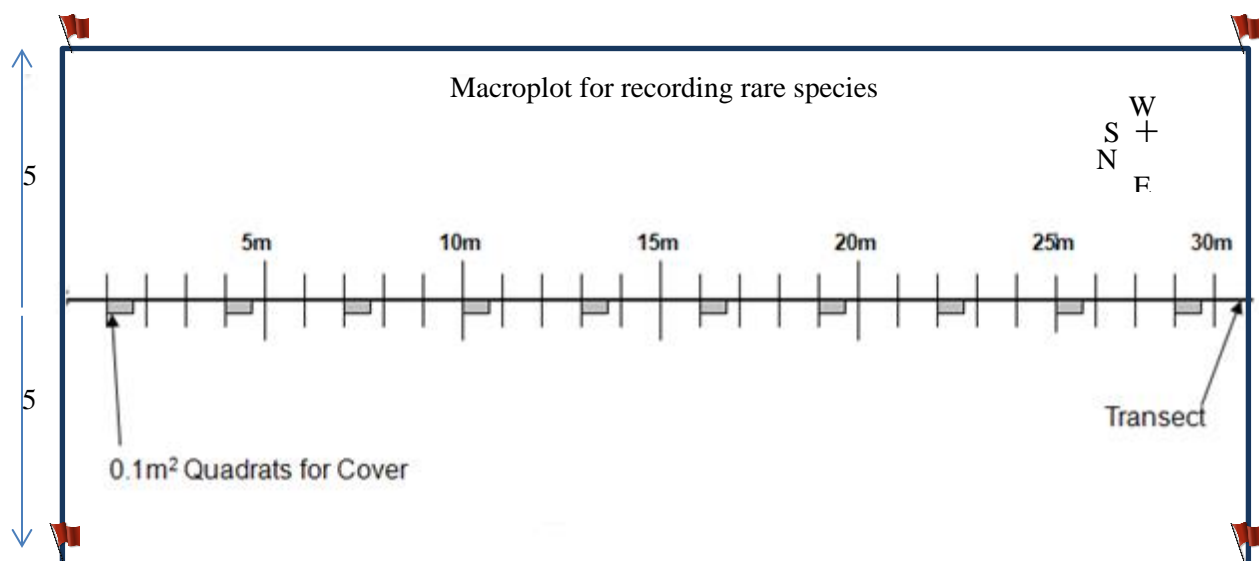
For sites not previously sampled, orient the midline transects along easting lines unless soil maps and vegetation indicate an east to west orientation may better represent the vegetative diversity present in the area. Mark the ends of the centerline transect with 24 inch rebar and GPS the location of each rebar. Note the orientation as indicated on the data form. Locate the base of 3 perennial forbs or shrubs located near the centerline (preferably touching the centerline) of the plot and indicate their exact location. For example



Amorpha canescens located at the 9 meter mark touching centerline on the west side, *Vernonia baldwinii* touching centerline on the east side at 20.5 meters and *Solidago missouriensis* located 0.5 meters east of centerline at the 21.5 meter mark. The location of shrubs and forbs will serve as additional markers to relocate plots in the future.

Plot Layout

- Locate the rebar stakes that mark the centerline of the macroplot first and lay out a 30 meter tape from rebar to rebar. This will be the centerline of the sampling area, bisecting the macroplot.
- Stake the ends of the tape firmly in the ground and do not allow vegetation to deflect the alignment of the tape. The tape should be aligned as close to the ground as possible.
- After setting up the transect, use a second tape to establish the macroplot by temporarily flagging the corners 5 meters perpendicular from the transect centerline on either side.



Photographs

Before sampling begins, take 2 photographs, minimum, at each sample location, using the following criteria:

- One photograph should be taken looking in the direction of the transect line showing the starting-point marker and the tape.
- The second photograph should be taken looking down on a representative quadrat from above.
- When the photographs are downloaded, label them with parcel, date, and transect or quadrat. If sampling plot 1, the photos would be labeled (ParcelName13_001_T; ParcelName13_001_Q) 13=year, T=Transect, Q=Quadrat



Example Transect Photo

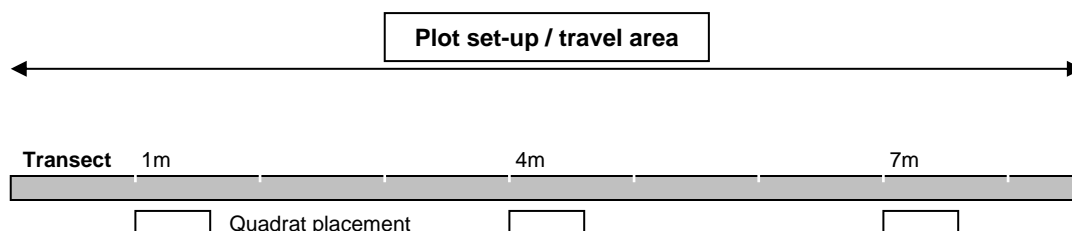


Example Quadrat or Microplot Photo

*Take additional photographs of the site or site conditions if you believe the photograph will add valuable information. Label additional photos by parcel, year and plot number (e.g. ParcelName_13_001).

Sampling Along Transects

- Beginning at 1 m from the start of the transect, place 0.1m² quadrats (20 cm x 50 cm) every 3 m (i.e., 1m, 4m, 7m, etc.) along the transect for a total of 10 samples. Reduce disturbance (i.e., trampling) to the area that you are going sample by walking along one side of the transect when setting up the initial plot and placing quadrats on the opposite side (see below).



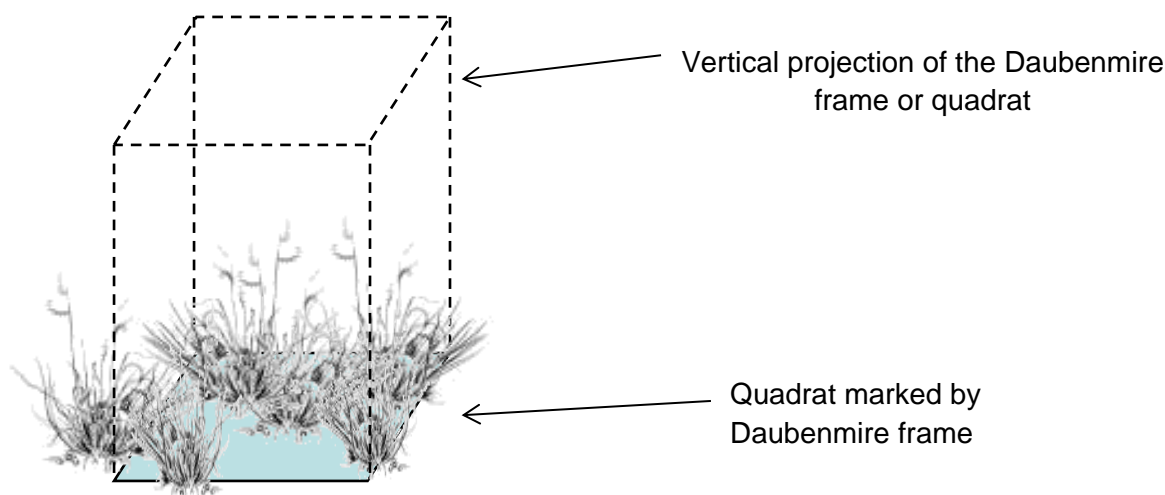
Canopy Cover (Daubenmire Method) Microplot Sampling Protocol

As the Daubenmire frame is placed along the tape at the specified intervals, estimate the canopy coverage of each plant species. Record the data by microplot and species using the cover classes listed below.

- Observe the microplot frame from directly above and estimate the cover class for all individuals of a plant species in the microplot as a unit. All other kinds of plants are ignored as each plant species is considered separately.
- Imagine a line drawn about the leaf tips of undisturbed canopies and project these polygonal images onto the ground. This projection is considered “canopy coverage”. Decide which Cover Class the species falls into and record it on the form.
- Canopies extending over the microplot are estimated even if the plants are not rooted in the microplot.
- Overlapping canopy cover is included in the cover estimates by species therefore, total cover may exceed 100 percent. Total cover will not reflect actual ground cover.



Cover Class	Cover Range	Cover Midpoint
1	<5%	2.5%
2	5-25%	15%
3	25-50%	37.5%
4	50-75%	62.5%
5	75-95%	85%
6	95-100%	97.5%



Other Cover Estimates (to include when measuring Daubenmire plots)

As the microplot frame is placed along the tape at the specified intervals, estimate the ground coverage of bare ground, litter, rocks, woody debris (dead), lichen, and moss. Bare ground and litter are often difficult to estimate because they are generally interspersed with live vegetation. With all cover estimates, be as consistent as possible.

Rare Species – Microplot Sampling

Using a 300 m² rectangular macroplot (10 x 30 m), record the presence of additional species and cover not identified in the microplots. Find and estimate the cover of additional plant species by systematically proceeding through the macroplot in 1-meter wide swaths looking for species not identified in the microplots. For each species found, estimate how much cover it occupies in the macroplot: <1%, 1-5%, or >5%.

V. ANALYSIS

Basic data analysis will be performed and reported for data collected. A summary of the Daubenmire cover data will include percent cover by species for each parcel and the percent frequency for each plant species. A brief summary will be provided that indicates increases or decreases in species of concern and noxious weeds, and potential changes in vegetation community for all parcels surveyed since 2013.



VI. QUALITY ASSUARANCE

All observers will be trained in the sampling procedures and in identification of species expected within the sampling areas prior to beginning sampling. Data forms will be completed and inspected by the recorder and the location team leader each day. The team leader will insure completeness and consistency among forms.

VII. REPORTS

Deliverables for this project include:

- Data sheets
- Data analysis
- Plant species list
- Table of plot locations
- Table of waypoints
- Shapefiles of plot locations
- Summary report

VIII. DATA SHEETS

248 **Macroplot sheet**

Date: _____ **Plot #:** _____ **Observers:** _____

GIS ID: _____ **Parcel Name:** _____ **County:** _____

Easting: _____ **Soil Type:** _____ **Transect Heading:** _____

Northing: _____ **Shrub/Forb 1:** _____ **S/F 1 location:** _____

_____ **Shrub/Forb 2:** _____ **S/F 2 location:** _____

_____ **Shrub/Forb 3:** _____ **S/F 3 location:** _____

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**Macroplot
Cover
Class****Species Codes**

<1%	
1-5%	
>5%	

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