PRRIP GRASSLAND VEGETATION ASSESSMENT REPORT 2014



DEBOER, LEIH, BLESSING & FOX

Prepared for Headwaters Corporation July 2014



GRASSLAND VEGETATION ASSESSMENT

TABLE OF CONTENTS

1.0 INTRODUCTION AND BACKGROUND	4
PURPOSE	4
LOCATIONS	4
METHODS	5
PLOTS	5
PHOTOS	5
FINDINGS	5
PLANT SPECIES OF CONCERN	5
PLANT SPECIES, DOMINANCE AND ABUNDANCE	5
FQI AND CONDITION	6
VEGETATION COMMUNITIES	7
DEBOER	7
LEIH	8
BLESSING	8
FOX	8
CITATIONS	9
FIGURES	
Figure 1: Comparison of weighted and unweighted FQI values.	
Figure 2. DeBoer northeastern edge	
Figure 3. Leih	
Figure 4. Blessing	14
Figure 5. Fox landscape	
TABLES	
Table 1. Site names	
Table 2. Cool-season grass cover	
Table 3. Warm-season grass cover	
Table 4. Grass-like species	

Table 5. Cove	r of Exotic Forbs	.20
Table 6. Cove	r of Native Forbs	.21
Table 7. Bare	ground, litter and open water	.23
Table 8. Floris	stic Quality Assessment Scores	.23
APPENDICES		.24
APPENDIX A:	PLOT LOCATIONS	.24
APPENDIX B:	LIST OF VASCULAR PLANTS	.25

1.0 INTRODUCTION AND BACKGROUND

The Platte River Recovery Implementation Program (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 whopping cranes. Vegetation surveys on several sites were conducted in 2013 to monitor potential shifts in vegetation communities and/or plant species composition over time. Four additional sites were identified in 2014 for vegetation monitoring

PURPOSE

- 1) Provide an inventory of vegetation communities and plant species composition on four wetland and wet meadow sites.
- 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 identify dominant species and current floristic quality and potential for future management at three of the sites and to assess the success of prior seeding and establishment of species at the Fox site. Data collected will be used in comparative analyses in future years to determine changes in vegetative communities and dominant species.

LOCATIONS

The area of interest consists of Program owned or managed grassland areas along the Platte River. The DeBoer site is located near Lexington, the Leih site near Overton, and the Blessing and Fox sites near Kearney.

A total of 350 wet meadow and wetland acres on 4 sites along the Platte River were surveyed. These sites are managed in a variety of ways, including grazing, burning, and haying. The DeBoer site is a wetland in which several acres of trees had been cleared. The Leih site is a wetland surrounded by agricultural land. Blessing is former CRP land from which cedars had been cleared prior to survey. The Fox tract is former crop land which had been seeded with commercial seed in the fall of 2012. These sites and their acreage are listed in table 1 along with the number of plots that were placed at each site and the management at the time of the survey in June of 2014.

METHODS

Surveys were conducted during the week of June 23, 2014. The survey protocol is the same as used in the 2013 vegetation analysis. Scientific nomenclature for species was taken from the Natural Heritage Database (Steinhauer and Rolfsmeier, 2013). The identification key was Flora of Nebraska Vol. 2 (Kaul, et.al. 2012).

PLOTS

Macroplot sites were chosen by looking at soil maps and choosing an appropriate number of sites spread among soil types in order to get samples from potential differences among vegetation communities caused by soil changes. Plot locations were marked by GPS using UTM NAD 83. These locations are listed in Appendix A. Plots were marked with 2 foot sections of rebar at the Fox and Blessing sites. The other two sites were not marked as per request in case mechanical treatment is used.

PHOTOS

Photos were taken at each macroplot showing the transect and the quadrat and labeled with the site name, plot number, year, and T (transect) or Q (quadrat). These are included in a separate file.

FINDINGS

PLANT SPECIES OF CONCERN

No threatened or endangered plant species were encountered during the surveys. Canada thistle and reed canarygrass were very prevalent in the DeBoer site. Phalaris was found there as well.

PLANT SPECIES, DOMINANCE AND ABUNDANCE

All scientific and common names of plant species found within the plots are listed in Appendix C along with their value of conservatism and wetness indicator status as assigned by Nebraska Natural Heritage Program and the national wetland plant list (Steinhauer and Rolfsmeier, 2013; Lichvar, 2013). This list includes the P-Symbol assigned by the Natural Resource Conservation Service (NRCS National Plant Database, 2013).

Plant species and percent cover were recorded at each site. Cover is a measure of the visual obstruction of each plant speces in a 20x50 cm frame. This measure can exceed 100 percent for the frame as some species overlap each other. Tables 2 through 7 summarize the average percent cover of all species by site. Cover is presented by species and separated by cool and warm season, grasslike species, litter and bare ground, and forb species. Trees are grouped with forbs species as these were rarely more than seedlings in the plots. These data are a summary of the conditions found in 2014, which can be compared to similar measures in subsequent years.

FQI AND CONDITION

These four sites were evaluated using floristic quality indexing, using the same techniques used for other PRRIP sites in 2013. The description of that method of evaluation is reprinted here.

Evaluations based on richness and diversity can be supplemented by weighting or rating species based on their tolerance of disturbance beyond historically normal natural disturbances. This is the idea on which Swink and Wilhelm based their Floristic Quality Index (FQI). Plant species are assigned a coefficient of conservatism (C) by experts in each State. C is a value from 0 to 10 assigned to native plant species, which describes adaptations of each plant species to disturbance. Exotic plant species are not assigned a value. A value of 0-3 indicates species are adapted to disturbance and can be found in a wide variety of conditions. Plants which are consistently found in the native community matrix are given a value of 4-6. Values of 7-10 are reserved for late seral species which are less adapted to disturbance, have a high degree of preference for specific ecological conditions and are therefore usually found in intact plant communities.

An average C value can be calculated to get a quick idea of the vegetative condition of an area. It is calculated by taking the average of all the C values for a list of species within an area. The floristic quality index (FQI) is calculated by the following formula: FQI = $(C/N)^*(\sqrt{N})$, where C is the coefficient of conservatism and N is the total number of species found in an area. Using (\sqrt{N}) adjusts for differences in the area being evaluated. Taft et.al. (1997) promote the use of both exotic and native species in the index computations in order to provide a measure of structural integrity (the self-correcting potential) of a native area. Non-native species are assigned a value of 0 for computational purposes.

The cover percentages of plants found among the sampled plots was used to weight the C values to provide an additonal dimension of floristic quality; that of overall dominance or abundance of the plant. The cover of each species multiplied by its C value gives greater weight to abundant species and less weight to the less abundant species. Weighted FQI is calculated using the following formula: FQI = $(C*pc/N)*(\sqrt{N})$, where pc is the percent cover of each species.

In the past FQI had been used for native species only, as exotic species are not given any value of conservatism. Currently the exotic species are often added to the calculation for comparison. This gives a more complete picture of the overall condition of a prairie. The Average C value and the FQI were calculated for each site using only native species, then using both native and exotic species, and finally for the weighted average of both native and exotic species. For reference, sites with native FQI above 30 are considered very good from a conservation standpoint. These FQI values were calculated for each site (Table 8). The best use of these results is as a comparison of species richness and abundance in successional years. DeBoer has a low FQI largely because of the near monoculture of reed canarygrass, interrupted by monocultures of cattails. The FQI at Leih is less than 7 in spite of a native species composition of 90%. This indicates an abundance of native species but a low abundance of high quality native species. The planted Fox site has less than 80% native species, but the average Conservatism (C) value is 3.1, less than the 3.4 average C value at Leih.

It should be noted that FQI is most accurate when a complete list of species is available. This was the impetus behind using macroplots, as there is a greater chance of including more rare species within larger plots. FQI is a good measure for assessing a site over time, especially when weighted measures are used to include species abundance. The higher the FQI values, the better the species composition. Weighted FQI (FQI_w)will vary considerably from site to site. An increase or decrease in this value will be indicative of the increase or decrease in the abundance of exotic species, including exotic cool-season grasses, such as smooth brome or tall wheatgrass.

These differences in Floristic Quality Assessment values indicate that disturbance level, frequency, and duration at some of these sites have exceeded natural levels for which native species can adapt and recover. In such instances, native taxa which cannot adapt are lost allowing non-native taxa to invade (Cohen et.al., 1995), further extirpating native species and diminishing the self-correcting properties, restoration potential, and integrity of the natural community (Taft et.al, 1997). Non-native, adventive species become more prevalent and those native taxa, which can take advantage of disturbance (lower C values), become over-abundant.

All of the sites in this study had exceptionally low FQI values (Figure 1, Table 8). C values were also low indicating a high level of disturbance overall. The percentage of native species is high in three of the sites while DeBoer had a much lower native composition.

VEGETATION COMMUNITIES

These sites in general are within the Western Greatplains Floodplain (Steinhauer and Rolfsmeier, 2010). Disturbance at some of the sites have caused an overgrowth of invasive vegetation to the point that they would no longer be categorized by their original community cover.

DEBOER

This former wetland and mesic meadow is almost entirely covered in reed canarygrass with large population of cattail within it. Very little diversity exists on this site with fewer than 10 species present. Total cover of reed canary grass across all plots was 65% (Figure 2). No exotic cool-season grasses and no warm-season grasses were sampled on the site. Native and exotic forb cover were both near 15%. However, 13% of exotic forb cover was cattail and 13% of native forb cover

was annual sunflower species. Also found on site were large patches of Canada thistle. There were no species of interest which might prevent the widespread removal of all current vegetation and subsequent reseeding.

LEIH

At Leih, 90% of plant species were native. Non-native species such as Japanese brome were abundant, however. Distichlis spicata was the most prevalent native grass species (figure 3). Annual sunflower and annual marshelder were dominant forbs. The high abundance of annual species is indicative of the regular disturbance, either mechanical or from frequent flooding. Native grass-like species had 11% cover and some of the highest C-values on the site. This site, although it has a low floristic quality index, has potential for restoration. Further mechanical disturbance may encourage non-native plant species. Overseeding with a high diversity mix may be a better alternative.

BLESSING

Cool-season introduced grasses were dominant with 53% cover at Blessing (Figure 4). Warmseason grasses were present with 16% cover. Recent removal of tree cover created habitat for adventive exotic forbs such as bindweed, musk thistle and mullein with 18% cover. Native forb cover was 23%.

FOX

The single most dominant species at the Fox site was foxtail, which is often seen in new seedings. This annual invasive species takes advantage of any open spaces. However, it is a warm-season grass that tends to decrease over time as the native species take hold. The single most abundant forb was yellow sweetclover with nearly 25% cover overall. This cover is likely to increase without intervention. All species which were indicated in the original seeding mix were found during the survey. Not all were prevelant and many were only spotted rarely. The early growth and stature of yellow sweetclover caused an overshadowing effect (Figure 5) that shaded warm-season species, which as a group had total cover of 21%; less cover than the cover of yellow sweetclover alone. The battle now will be to remove this species before it further impedes the cover of native species. Fabaceae is the second most common family of native forbs in the tallgrass prairie region. Unfortunately, non-native legume species are more abundant in the seed trade. It would be wise to avoid non-native legumes such as sweet clover in favor of any of the many legumes native to this region. Elymus Canadensis faired well among the sweetclover partially because it is a cool-season species. Tall wheatgrass was also present and should be controlled now before it becomes a problem. Although it was not listed, it may have been included in the mix as a substitute for slender wheatgrass. If possible, tall wheatgrass (Thinopyrum ponticum) should also be avoided in future mixes.

General Recommendations

Very little salvageable vegetation exists at DeBoer. A complete removal and reseeding would be appropriate. Fall application of herbicide followed by scraping and additional herbicide applications have been used to control cattails. An effective three-step method to control reed canarygrass is to first treat it chemically in the fall while it is still physiologically active, then burn the thatch in the following spring. The third step is to treat it chemically again after the seedlings begin to sprout (2006, Jacobson). Seeding can then be done.

The dominant species at Leih is saltgrass, a warm-season native species. Japanese brome is the second most abundant grass species. Brome can be controlled, though not eliminated with fire, mowing, intense grazing, or if necessary herbicide. Musk thistle was also present. Even though diversity is low, 90% of the species are native; therefore, mechanical means of control are less desirable. More disturbance would open areas to non-native invasion. Over-seeding may be a more appropriate means of improving diversity at this site.

Plant species at Blessing include several cool-season non-native grasses, which should respond to fire and grazing. Fire, seeding and resting from cattle grazing may improve the composition of species at this site as well.

The seeding of Fox would be considered a very successful, except for the over-whelming presence of yellow sweetclover. 2014 has been a tremendously favorable year for sweetclover, which tends to find its way into native areas without intervention. This unfortunate inclusion in the mix will be something that has to be dealt with for many years. Sweet clover is a biennial species and it therefore can be battled in a manner similar to musk thistle, although it flowers earlier. Native legumes should be included in seed mixes rather than non-native species. Early mowing or haying before the clover sets seed and before it shades other species will be one way to control it. Early haying unfortunately also reduces native wheatgrass stands, especially Canada wildrye, which tends to be of short duration.

CITATIONS

Cohen, A.L., B.M.P. Singhakumara, and P.S. Ashton. 1995. Releasing rain forest succession: a case study in the *Dicranopteris linearis* fernlands of Sri Lanka. Restoration Ecology 3:261-270.

Jacobson, R.L. 2006. Restoring & Managing Ntive Wetland & Upland Vegetation. Minnesota Board of Soil & Water Rsources, Minnesota Department of Transportation.

Kaul, R.B., D.M. Sutherland, S.B. Rolfsmeier, 2011. The flora of Nebraska. Second Edition. School of Natural Resources. University of Nebraska-Lincoln.

Lichvar, R.W. 2013. *The National Wetland Plant List: 2013 wetland ratings.* <u>*Phytoneuron* 2013-49: 1-241.</u> (See also the <u>official website</u> of the National Wetland Plant List.)

NRCS National Plant Database, 2013. Online http://plants.usda.gov/about_plants.html

Steinhauer, Gerry and S. Rolfsmeier, 2010. Terrestrial Ecological Systems and Natural Communities of Nebraska, Version IV. Nebraska Natural Heritage Program. Nebraska Game and Parks Commission.

Steinhauer, Gerry and S. Rolfsmeier, 2013. Natural Heritage Plant Database, Nebraska Game and Parks Commission.

Taft, J. B., G.S. Wilhelm, D.M. Ladd, and L.A. Masters, 1997. Floristic quality assessment for vegetation in Illinois: A method for assessing vegetation integrity. Illinois Native Plant Society. Assessed from http:// <u>http://conservationtools.org/libraries/1/library items/588-Floristic-Quality-Assessment-For-Vegetation-in-Illinois-a-Method-for-Assessing-Vegetation-Integrity</u>

FIGURES

Figure 1: Comparison of weighted and unweighted FQI values. A weighted FQI will increase the value of floristic quality based on the abundance of each type of species. Lower values indicate abundances of lower valued species. This chart demonstrates the additional information provided by the abundance data as well as a visual illustration of which sites may need intervention.



Figure 2. DeBoer northeastern edge. Reed canarygrass is the most prevalent species at DeBoer.



Figure 3. Leih. Saltgrass is a dominant species at Leih.



Figure 4. Blessing. Cool-season grasses are dominant at the Blessing site.



Figure 5. Fox landscape. Early cool-season Canada wildrye can be seed among the yellow sweetclover. Later warm-season grasses were less prominent.



TABLES

Table 1. Site names, acres, management at the time of survey in 2014 and the number of plots placed at each location.

SITE NAME	ACRES	MANAGEMENT	# PLOTS
DeBoer	68	Cattails/Graze	3
Leih	33		3
Fox	181	Seeded 2012	6
Blessing	68	Grazed	3

Table 2. Cool-season grass cover. Cover of individual cool-season grass species listed by site. Exotic cool-season grasses are listed first with a total cover followed by natives and a total of all cool-season cover. Cover is given as canopy cover therefore, the total cover may exceed 100%.

SPECIES	COMMON NAME	DB	LEIH	BLESS	FOX
AGROSTIS GIGANTEA	redtop				1.00
AGROSTIS STOLONIFERA	creeping bentgrass				0.50
BROMUS INERMIS	smooth brome			11.08	3.00
BROMUS JAPONICUS	Japenese brome		9.75	10.58	17.00
BROMUS TECTORUM	downy brome		0.62	7.00	2.47
PHLEUM PRATENSE	timothy				1.08
POA COMPRESSA	Canada bluegrass			17.67	1.00
POA PRATENSIS	Kentucky bluegrass		0.75	7.03	
POLYPOGON MONSPELIENSIS	rabbitfoot grass				0.50
THINOPYRUM PONTICUM	tall wheatgrass				0.50
TOTAL EXOTIC COOL-SEASON		0.00	11.12	53.37	27.05
SPECIES	COMMON NAME	DB	LEIH	BLESS	FOX
Elymus canadensis	Canada wild-rye				11.57
Elymus trachycaulus	slender wheatgrass				5.55
Elymus virginicus	Virginia wild-rye				1.73
Festuca octoflora	six-weeks fescue				0.08
Hordeum jubatum	foxtail barley		3.47		1.00
Panicum dichotomiflorum	fall panicum				1.08
Pascopyrum smithii	western wheatgrass				0.50
Phalaris arundinacea	reed canary grass	64.58	4.30		
TOTAL NATIVE COOL-SEASON		64.58	7.77	0.00	21.52
		64 59	10.00	F2 27	40.57

Table 3. Warm-season grass cover. Cover of individual cool-season grass species listed by site. Exotic cool-season grasses are listed first with a total cover followed by natives and a total of all warm-season cover. Cover is given as canopy cover therefore, the total cover may exceed 100%.

SPECIES	COMMON NAME	DB	LEIH	BLESS	FOX
ECHINOCHLOA CRUS-GALLI	barnyard grass				5.82
PHRAGMITES AUSTRALIS ssp. AUSTRALIS	phragmites				0.17
SETARIA VERTICILLATA	bristly foxtail			0.17	2.55
SETARIA VIRIDIS var. VIRIDIS	green foxtail			1.50	52.35
Zea mays	field corn		0.50		
TOTAL EXOTIC WARM-SEASON		0.00	0.50	1.67	60.88
SPECIES	COMMON NAME	DB	LEIH	BLESS	FOX
Andropogon gerardii	big bluestem			6.97	5.98
Bouteloua curtipendula var. curtipendula	sideoats grama				2.32
Bouteloua gracilis	blue grama				1.08
Distichlis spicata	saltgrass		14.78		0.08
Eragrostic trichodes	sand lovegrass				0.50
Eragrostis pectinacea var. pectinacea	tufted lovegrass				0.53
Hesperostipa comata var. comata	needle-and-thread				0.58
Panicum virgatum	switchgrass				1.00
Schizachyrium scoparium var. scoparium	little bluestem			2.12	0.17
Sorghastrum nutans	Indian grass			1.50	1.40
Sporobolus compositus var. compositus	tall dropseed			0.62	3.83
Sporobolus cryptandrus	sand dropseed			3.00	5.38
TOTAL NATIVE WARM-SEASON		0.00	14.78	14.20	22.87
TOTAL ALL WARM-SEASON		0.00	15.28	15.87	83.75

Table 4. Grass-like species. These species are predominantly cool-season and may influence overall management decisions if they are large components of any one site. Cover is given as canopy cover therefore, the total cover may exceed 100%.

SPECIES	Common	DB	LEIH	BLESS	FOX
CYPERUS FUSCUS	brown flatsedge				2.88
TOTAL EXOTIC GRASSLIKE		0.00	0.00	0.00	2.88
SPECIES	Common	DB	LEIH	BLESS	FOX
Bolboschoenus fluviatilis	river bulrush	1.68	0.53		
Bolboschoenus maritimus	salt-marsh bulrush				3.70
Carex brevior	short-beak sedge				1.50
Carex pellita	woolly sedge		1.32		
Carex scoparia	broom sedge			1.32	
Carex vulpinoidea	fox sedge				1.32
Eleocharis palustris	marsh spikerush		7.65		
Juncus balticus	Baltic rush				0.50
Juncus dudleyi	Dudley's rush		0.50		0.08
Juncus torreyi	Torrey's rush				0.78
Schoenoplectus acutus	hardstem bulrush		1.15		
Schoenoplectus pungens	three-square bulrush				2.47
TOTAL NATIVE GRASSLIKE		1.68	11.15	1.32	10.35
TOTAL GRASSLIKE SPECIES		0.00	11.15	1.32	13.23

Table 5. Cover of Exotic Forbs.

SPECIES	Common	DB	LEIH	BLESS	FOX
ATRIPLEX PATULA	common spearscale		0.78		
BASSIA SCOPARIA (Kochia scoparia)	kochia		0.78		
CANNABIS SATIVA	hemp			1.67	4.33
CARDUUS NUTANS	musk thistle		2.23	1.67	
CHENOPODIUM ALBUM	lamb's-quarters	0.08		0.08	7.95
CONVOLVULUS ARVENSIS	field bindweed			5.88	1.93
GLYCINE MAX	soybean				0.08
KALI TRAGUS (Salsola tragus)	prickly Russian-thistle				5.77
LACTUCA SERRIOLA	prickly lettuce	0.08	1.82		1.50
MEDICAGO LUPULINA	black medick				0.58
MEDICAGO SATIVA ssp. SATIVA	alfalfa				1.08
MELILOTUS ALBUS	white sweet-clover			1.50	0.50
MELILOTUS OFFICINALIS	yellow sweet-clover				24.47
NEPETA CATARIA	catnip			1.50	
PERSICARIA MACULOSA	lady's-thumb smartweed		4.72	1.50	
RUMEX CRISPUS	curly dock	0.50	4.48		0.50
Salix exigua	sandbar willow				0.50
THLASPI ARVENSE	field penny cress		0.50		0.50
TRAGOPOGON DUBIUS	yellow goat's-beard				0.50
TRIFOLIUM FRAGIFERUM	strawberry clover				0.08
TRIFOLIUM REPENS	white clover				0.53
TRIPLEUROSPERMUM INODORUM	scentless chamomile				0.50
TYPHA ANGUSTIFOLIA	narrow-leaf cattail		2.88		1.00
Typha latifolia	broad-leaved cattail	13.22			
ULMUS PUMILA	Siberian elm			1.50	
VERBASCUM THAPSUS	common mullein			4.58	
TOTAL EXOTIC FORBS		13.88	18.20	19.88	52.32

Table 6. Cover of Native Forbs.

SPECIES	Common	DB	LEIH	BLESS	FOX
Amaranthus retroflexus	redroot pigweed				0.75
Amaranthus spinulosus	spiny pigweed				0.08
Ambrosia artemisiifolia	common ragweed		4.47	0.17	0.83
Ambrosia psilostachya	western ragweed		0.17	4.83	1.68
Ambrosia trifida	giant ragweed		0.50		0.08
Apocynum cannabinum	hemp dogbane			3.00	
Asclepias speciosa	showy milkweed	3.00			
Asclepias syriaca	common milkweed		0.50	3.00	
Bidens cernua	bur-marigold				0.17
Callirhoe involucrata	purple poppy-mallow			3.08	
Chenopodium pratericola	desert goosefoot		0.50		1.57
Cirsium altissimum	tall thistle		0.08	1.50	
Conyza canadensis	horseweed		0.50	0.17	18.00
Coreopsis tinctoria	plains coreopsis		0.50		
Desmanthus illinoensis	Illinois bundleflower				1.00
Erechtites hieraciifolius	burnweed	0.42			
Euphorbia serpyllifolia	thyme-leaf spurge				0.08
Eustoma russellianum	prairie-gentian				0.08
Fallopia scandens	climbing false-buckwheat				0.50
Hackelia virginiana	virginia stickseed		0.50		
Helianthus annuus	common sunflower	6.75	3.32		2.82
Helianthus petiolaris	plains sunflower	4.20	5.73		0.50
Heterotheca latifolia	camphor-weed			0.33	1.50
lva annua	annual marsh-elder		6.25		
Mirabilis linearis	narrow-leaf four-o'clock			1.50	
Oxalis stricta	yellow wood-sorrel				0.08
Persicaria amphibia	water smartweed		3.42		
Persicaria pensylvanica	Pennsylvania smartweed		0.08		
Physalis heterophylla	clammy ground-cherry				
Physalis longifolia	common ground-cherry			3.08	0.08
Populus deltoides	plains cottonwood	0.08			0.58
Rumex altissimus	pale doc		0.50		0.62
Salix amygdaloides	peach-leaf willow				0.50
Solanum interius	plains black nightshade	1.32			1.57
Solanum rostratum	buffalo-bur				0.58
Symphyotrichum lanceolatum	tall white aster		0.50		
Verbena hastata	blue vervain		0.17	1.50	

SPECIES	COMMON	DB	LEIH	BLESS	FOX
Verbena stricta	hoary vervain			1.50	0.50
Vernonia fasciculata	prairie ironweed		0.50		
Veronica peregrina	purslane speedwell				0.08
TOTAL NATIVE FORBS	· · ·	15.77	28.18	23.67	34.25
TOTAL FORB SPECIES		29.65	46.38	43.55	86.57

Table 7.	Bare ground,	litter and	open water.
----------	--------------	------------	-------------

SYMBOL	DB	LEIH	BLESS	FOX
BAREGROUND	45.25	1.53	3.30	58.20
LITTER	17.70	91.25	77.90	36.82
WATER	2.87			41.37

Table 8. Floristic Quality Assessment Scores. Species composition is presented as the percent of exotic (non-native) species and the percent of native species. N= total number of species in the plots. Average C is the average of the conservation value assigned to each species. Non-native species have no value and are assigned a value of 0 in calculations. Weighted values include abundance as an additional parameter in calculations.

Code	Site Name	Spe	Native only				Both	Native ar	nd Exotic		
		Comp	osition							Wei	ghted
Site		% Exotic	% Native	Ν	Ave. C	FQI	Ν	Ave. C	FQI	Ave. C	FQI
DB	DeBoer	0.38	0.62	8	0.75	2.12	13	0.46	1.66	2.11	7.61
LEIH	Leih	0.10	0.90	35	1.17	6.93	39	1.05	6.57	3.40	21.21
BLESS	Blessing	0.17	0.83	29	1.07	5.76	35	0.89	5.24	2.93	17.31
FOX	Fox	0.19	0.81	68	1.44	11.88	84	1.17	10.69	2.97	27.25

APPENDICES

APPENDIX A: PLOT LOCATIONS

Site Name	GPS label	Plot Num	Latitude	Longitude	y_proj	x_proj
DeBoer	DB3FF	G151N	40.676659	-99.690618	4503092.652	441635.5805
DeBoer	DB3FFB	G151S	40.676925	-99.690622	4503122.182	441635.4744
DeBoer	DB2F	G152N	40.675331	-99.689184	4502944.287	441755.615
DeBoer	DB2FB	G152S	40.675603	-99.689185	4502974.481	441755.7672
DeBoer	DB1F	G153N	40.67549	-99.68559	4502959.562	442059.4952
DeBoer	DB1FB	G153S	40.675757	-99.685603	4502989.208	442058.6277
Leih	LEIH1	G154N	40.703974	-99.517597	4506024.239	456275.771
Leih	LEIH1B	G154S	40.704244	-99.5176	4506054.212	456275.6942
Leih	LEIH2FEAST	G155E	40.706179	-99.517261	4506268.837	456305.5965
Leih	LEIH2BWEST	G155W	40.706172	-99.517624	4506268.241	456274.9277
Leih	LEIH3F	G156N	40.705101	-99.516421	4506148.757	456375.8516
Leih	LEIH3FB	G156S	40.705372	-99.516429	4506178.843	456375.3526
Blessing	BLESS1	G157N	40.66616	-99.050991	4501699.205	495690.746
Blessing	BLESS1B	G157S	40.666434	-99.050993	4501729.62	495690.5946
Blessing	BLESS2	G158N	40.665215	-99.048506	4501594.189	495900.7313
Blessing	BLESS2B	G158S	40.665486	-99.048504	4501624.27	495900.917
Blessing	BLESS3	G159N	40.664226	-99.044956	4501484.247	496200.7412
Blessing	BLESS3B	G159S	40.664495	-99.044955	4501514.107	496200.841
Fox	FOX2	G160N	40.671126	-98.987281	4502249.275	501075.7175
Fox	FOX2B	G160S	40.671393	-98.98728	4502278.913	501075.7977
Fox	FOX3	G161N	40.666171	-98.986986	4501699.258	501100.7318
Fox	FOX3B	G161S	40.66644	-98.986985	4501729.118	501100.8119
Fox	FOX6	G162N	40.67111	-98.982044	4502247.576	501518.3394
Fox	FOX6B	G162S	40.671353	-98.982036	4502274.55	501519.0101
Fox	FOX7	G163N	40.672656	-98.981069	4502419.204	501600.7077
Fox	FOX7B	G163S	40.67293	-98.981074	4502449.619	501600.2786
Fox	FOX4	G164N	40.672927	-98.98592	4502449.209	501190.7147
Fox	FOX4B	G164S	40.673195	-98.985923	4502478.958	501190.4564
Fox	FOX5FB	G165E	40.667797	-98.982233	4501879.819	501502.4398
Fox	FOX5F	G165W	40.667864	-98.982584	4501887.251	501472.771
Fox	FOX1	G166N	40.670495	-98.988168	4502179.221	501000.7593
Fox	FOX1B	G166S	40.670492	-98.987812	4502178.892	501030.8481

APPENDIX B: LIST OF VASCULAR PLANTS

P-SYM	SPECIES	Common	FAMILY	PHYSIOG	WETNESS	С
AGGI2	POACEAE	AGROSTIS GIGANTEA (A. stolonifera var. major)	redtop	P-HERB	FACW	
AGSTP	POACEAE	AGROSTIS STOLONIFERA var. PALUSTRIS	creeping bentgrass	P-HERB	FACW	
AMRE	AMARANTHACEAE	Amaranthus retroflexus	redroot pigweed	A-HERB	FACU	0
AMSP	AMARANTHACEAE	Amaranthus spinulosus	spiny pigweed	A-HERB	FACU	0
AMAR2	ASTERACEAE	Ambrosia artemisiifolia	common ragweed	A-HERB	FACU	0
AMPS	ASTERACEAE	Ambrosia psilostachya	western ragweed	P-HERB	FACU	1
AMTR	ASTERACEAE	Ambrosia trifida	giant ragweed	A-HERB	FAC	0
ANGE	POACEAE	Andropogon gerardii	big bluestem	P-HERB	FACU	5
APCA	APOCYNACEAE	Apocynum cannabinum	hemp dogbane	P-HERB	FAC	2
ASSP	APOCYNACEAE	Asclepias speciosa	showy milkweed	P-HERB	FAC	1
ASSY	APOCYNACEAE	Asclepias syriaca	common milkweed	P-HERB	UPL/FACU	1
ATPA4	CHENOPODIACEAE	ATRIPLEX PATULA	common spearscale	A-HERB	FACW	
BASC5	CHENOPODIACEAE	BASSIA SCOPARIA (Kochia scoparia)	kochia	A-HERB	FACU	
BICE	ASTERACEAE	Bidens cernua	bur-marigold	A-HERB	OBL	3
BOFL3	CYPERACEAE	Bolboschoenus fluviatilis	river bulrush	P-HERB	OBL	3
BOMAP2	CYPERACEAE	Bolboschoenus maritimus var. paludosus	salt-marsh bulrush	P-HERB	OBL	5
BOCUC2	POACEAE	Bouteloua curtipendula var. curtipendula	sideoats grama	P-HERB	FACU	5
BOGR2	POACEAE	Bouteloua gracilis	blue grama	P-HERB		4
BRIN2	POACEAE	BROMUS INERMIS	smooth brome	P-HERB	UPL/FACU	
BRJA	POACEAE	BROMUS JAPONICUS	Japenese brome	A-HERB		
BRTE	POACEAE	BROMUS TECTORUM	downy brome	A-HERB		
CAINI4	MALVACEAE	Callirhoe involucrata var. involucrata	purple poppy-mallow	P-HERB		2
CASA3	CANNABACEAE	CANNABIS SATIVA	hemp	A-HERB	FACU	
CANU4	ASTERACEAE	CARDUUS NUTANS	musk thistle	B-HERB	FACU	
CABR10	CYPERACEAE	Carex brevior	short-beak sedge	P-HERB	FAC	4
CAPE42	CYPERACEAE	Carex pellita	woolly sedge	P-HERB	OBL	4
CASCS	CYPERACEAE	Carex scoparia	broom sedge	P-HERB	FACW	5
CAVU2	CYPERACEAE	Carex vulpinoidea	fox sedge	P-HERB	FACW	4
CHAL7	CHENOPODIACEAE	CHENOPODIUM ALBUM	lamb's-quarters	A-HERB	FACU	
CHPR5	CHENOPODIACEAE	Chenopodium pratericola	desert goosefoot	A-HERB		1
CIAL2	ASTERACEAE	Cirsium altissimum	tall thistle	P-HERB		1
COAR4	CONVOLVULACEAE	CONVOLVULUS ARVENSIS	field bindweed	P-HERB		
COCA5	ASTERACEAE	Conyza canadensis	horseweed	A-HERB	FACU	0
COTI3	ASTERACEAE	Coreopsis tinctoria	plains ocresopsis		FAC	1
CYFU3	CYPERACEAE	CYPERUS FUSCUS	brown flatsedge	A-HERB	FACW	
DEIL	FABACEAE	Desmanthus illinoensis	Illinois bundleflower	P-HERB	FACU	5
			aaltaraaa			С

ECCR	POACEAE	ECHINOCHLOA CRUS-GALLI	barnyard grass	A-HERB	FAC/FACW	
ELPA3	CYPERACEAE	Eleocharis palustris	marsh spikerush	P-HERB	OBL	4
[ELCA4]	POACEAE	Elymus canadensis var. canadensis	Canada wild-rye	P-HERB	FACU	5
[ELTRT]	POACEAE	Elymus trachycaulus	slender wheatgrass	P-HERB	FACU	5
ELVIV	POACEAE	Elymus virginicus var. virginicus	Virginia wild-rye	P-HERB	FAC/FACW	4
ERTR3	POACEAE	Eragrostic trichodes	sand lovegrass	P-HERB	UPL	5
ERPEP2	POACEAE	Eragrostis pectinacea var. pectinacea	tufted lovegrass	A-HERB	FAC	0
ERHIH	ASTERACEAE	Erechtites hieraciifolius var. hieraciifolius	burnweed	A-HERB	FACU	1
[CHSES]	EUPHORBIACEAE	Euphorbia serpyllifolia var. serpyllifolia	thyme-leaf spurge	A-HERB		2
EURU4	GENTIANACEAE	Eustoma russellianum	prairie-gentian	A-HERB	FACW	4
FASC	POLYGONACEAE	Fallopia scandens	climbing false-buckwheat	P-VINE	FACU/FAC	1
FEOC3	POACEAE	Festuca octoflora	six-weeks fescue	A-HERB	FACU	3
GLMA4	FABACEAE	GLYCINE MAX	soybean	A-HERB		
HAVI2	BORAGINACEAE	Hackelia virginiana	virginia stickseed	B-HERB	FACU	2
HEAN3	ASTERACEAE	Helianthus annuus	common sunflower	A-HERB	FACU	0
[HEPEP]	ASTERACEAE	Helianthus petiolaris var. petiolaris	plains sunflower	A-HERB		1
HECOC9	POACEAE	Hesperostipa comata var. comata	needle-and-thread	P-HERB		6
HELA5	ASTERACEAE	Heterotheca latifolia	camphor-weed	A-HERB		2
[HOJUJ]	POACEAE	Hordeum jubatum var. jubatum	foxtail barley	P-HERB	FACW/FAC	1
IVAN2	ASTERACEAE	lva annua	annual marsh-elder	A-HERB	FAC	1
JUBAL	JUNCACEAE	Juncus balticus var. littoralis	Baltic rush	P-HERB	FACW/OBL	6
JUDU2	JUNCACEAE	Juncus dudleyi	Dudley's rush	P-HERB	FACW	5
JUTO	JUNCACEAE	Juncus torreyi	Torrey's rush	P-HERB	FACW	4
[SATR12]	CHENOPODIACEAE	KALI TRAGUS	prickly Russian-thistle	A-HERB	FACU	
LASE	ASTERACEAE	LACTUCA SERRIOLA	prickly lettuce	A-HERB	FAC/FACU	
MELU	FABACEAE	MEDICAGO LUPULINA	black medick	A-HERB	FACU	
MESAS	FABACEAE	MEDICAGO SATIVA ssp. SATIVA	alfalfa	P-HERB	UPL/FACU	
MEAL2	FABACEAE	MELILOTUS ALBUS	white sweet-clover	B-HERB	FACU	
MEOF	FABACEAE	MELILOTUS OFFICINALIS	yellow sweet-clover	B-HERB	FACU	
MILIL	NYCTAGINACEAE	Mirabilis linearis var. linearis	narrow-leaf four-o'clock	P-HERB		4
NECA2	LAMIACEAE	NEPETA CATARIA	catnip	P-HERB	FACU	
OXST	OXALIDACEAE	Oxalis stricta	yellow wood-sorrel	A-HERB	FACU	0
PADID	POACEAE	Panicum dichotomiflorum	fall panicum	A-HERB	FAC/FACW	0
PAVI2	POACEAE	Panicum virgatum	switchgrass	P-HERB	FAC	4
PASM	POACEAE	Pascopyrum smithii	western wheatgrass	P-HERB	FACU	3
PEAM8	POLYGONACEAE	Persicaria amphibia	water smartweed	P-HERB	OBL	6
PEMA24	POLYGONACEAE	PERSICARIA MACULOSA	lady's-thumb smartweed	A-HERB	FACW	
PEPE19	POLYGONACEAE	Persicaria pensylvanica	Pennsylvania smartweed	A-HERB	FACW	0
PHAR3	POACEAE	Phalaris arundinacea	reed canary grass	P-HERB	FACW	0
PHPR3	POACEAE	PHLEUM PRATENSE	timothy	P-HERB	FACU	
[PHAU7]	POACEAE	PHRAGMITES AUSTRALIS	phragmites	P-HERB	FACW	

PHHE5	SOLANACEAE	Physalis heterophylla	clammy ground-cherry	P-HERB		4
PHLO4	SOLANACEAE	Physalis longifolia	common ground-cherry	P-HERB		0
РОСО	POACEAE	POA COMPRESSA	Canada bluegrass	P-HERB	FACU	
POPR	POACEAE	POA PRATENSIS	Kentucky bluegrass	P-HERB	FACU	
POMO5	POACEAE	POLYPOGON MONSPELIENSIS	rabbitfoot grass	A-HERB	FACW	
PODEO	SALICACEAE	Populus deltoides var. occidentalis	plains cottonwood	TREE	FAC	3
RUHIP	ASTERACEAE	Rudbeckia hirta var. pulcherrima	black-eyed Susan	B-HERB	FACU	4
RUAL4	POLYGONACEAE	Rumex altissimus	pale doc	P-HERB	FAC	0
RUCR	POLYGONACEAE	RUMEX CRISPUS	curly dock	P-HERB	FACW	
SAAM2	SALICACEAE	Salix amygdaloides	peach-leaf willow	TREE	FACW	4
[SAEX]	SALICACEAE	Salix exigua	sandbar willow	SHRUB	FACW	
SCPR4	POACEAE	SCHEDONORUS PRATENSIS (Lolium pratense)	meadow fescue	P-GRASS	FACU	
SCSCS	POACEAE	Schizachyrium scoparium var. scoparium	little bluestem	P-HERB	FACU	4
SCACA	CYPERACEAE	Schoenoplectus acutus var. acutus	hardstem bulrush	P-HERB	OBL	5
SEPUP2	POACEAE	SETARIA PUMILA ssp. PUMILA	yellow foxtail	A-HERB	FACU/FAC	
SEVE3	POACEAE	SETARIA VERTICILLATA	bristly foxtail	A-HERB	FAC	
SEVIV	POACEAE	SETARIA VIRIDIS var. VIRIDIS	green foxtail	A-HERB		
SIMOM	IRIDACEAE	Sisyrinchium montanum var. montanum	strict blue-eyed-grass	P-HERB	FAC	5
SOIN2	SOLANACEAE	Solanum interius	plains black nightshade	P-HERB		1
SORO	SOLANACEAE	Solanum rostratum	buffalo-bur	A-HERB		0
SOAS	ASTERACEAE	SONCHUS ASPER	prickly sow-thistle	A-HERB	FAC/FACU	
SONU2	POACEAE	Sorghastrum nutans	Indian grass	P-HERB	FACU	5
SPAI	POACEAE	Sporobolus airoides	alkali sacaton	P-HERB	FAC	5
SPCOC2	POACEAE	Sporobolus compositus var. compositus	tall dropseed	P-HERB	FACU	3
SPCR	POACEAE	Sporobolus cryptandrus	sand dropseed	P-HERB	FACU	2
SYLAL4	ASTERACEAE	Symphyotrichum lanceolatum var. lanceolatum	tall white aster	P-HERB	FACW/FAC	2
THPO7	POACEAE	THINOPYRUM PONTICUM (Elymus elongatus)	tall wheatgrass	P-HERB		
THAR5	BRASSICACEAE	THLASPI ARVENSE	field penny cress	A-HERB	FACU	
TRDU	ASTERACEAE	TRAGOPOGON DUBIUS	yellow goat's-beard	B-HERB		
TRPR2	FABACEAE	TRIFOLIUM PRATENSE	red clover	P-HERB	FACU	
TRIN11	ASTERACEAE	TRIPLEUROSPERMUM INODORUM	scentless chamomile	A-HERB	FAC	
TYAN	TYPHACEAE	TYPHA ANGUSTIFOLIA	narrow-leaf cattail	P-HERB	OBL	
TYLA1	TYPHACEAE	Typha latifolia	broad-leaved cattail	P-HERB	OBL	
ULPU	ULMACEAE	ULMUS PUMILA	Siberian elm	TREE	UPL	
VETH	SCROPHULARIACEAE	VERBASCUM THAPSUS	common mullein	B-HERB	UPL	
VEHA2	VERBENACEAE	Verbena hastata	blue vervain	P-HERB	FACW	4
VEST	VERBENACEAE	Verbena stricta	hoary vervain	P-HERB		2
[VEFAF]	ASTERACEAE	Vernonia fasciculata var. fasciculata	prairie ironweed	P-HERB	FAC/FACW	4
ZEMA	POACEAE	Zea mays	field corn	A-HERB		

P-SYMBL	SPECIES	Common	FAMILY	PHYSIOG	WETNESS	С
AGGI2	AGROSTIS GIGANTEA	redtop	POACEAE	P-HERB	FACW	
AGSTP	AGROSTIS STOLONIFERA var. PALUSTRIS	creeping bentgrass	POACEAE	P-HERB	FACW	
AMRE	Amaranthus retroflexus	redroot pigweed	AMARANTHACEAE	A-HERB	FACU	0
AMSP	Amaranthus spinulosus	spiny pigweed	AMARANTHACEAE	A-HERB	FACU	0
AMAR2	Ambrosia artemisiifolia	common ragweed	ASTERACEAE	A-HERB	FACU	0
AMPS	Ambrosia psilostachya	western ragweed	ASTERACEAE	P-HERB	FACU	1
AMTR	Ambrosia trifida	giant ragweed	ASTERACEAE	A-HERB	FAC	0
ANGE	Andropogon gerardii	big bluestem	POACEAE	P-HERB	FACU	5
APCA	Apocynum cannabinum	hemp dogbane	APOCYNACEAE	P-HERB	FAC	2
ASSP	Asclepias speciosa	showy milkweed	APOCYNACEAE	P-HERB	FAC	1
ASSY	Asclepias syriaca	common milkweed	APOCYNACEAE	P-HERB	UPL	1
ATPA4	ATRIPLEX PATULA	common spearscale	CHENOPODIACEAE	A-HERB	FACW	
BASC5	BASSIA SCOPARIA	kochia	CHENOPODIACEAE	A-HERB	FACU	
BICE	Bidens cernua	bur-marigold	ASTERACEAE	A-HERB	OBL	3
BOFL3	Bolboschoenus fluviatilis	river bulrush	CYPERACEAE	P-HERB	OBL	3
BOMAP2	Bolboschoenus maritimus var. paludosus	salt-marsh bulrush	CYPERACEAE	P-HFRB	OBI	5
00111112	Bouteloua curtipendula var.	Suit marsh Suitush		THEND	OBL	<u> </u>
BOCUC2	curtipendula	sideoats grama	POACEAE	P-HERB	FACU	5
BOGR2	Bouteloua gracilis	blue grama	POACEAE	P-HERB		4
BRIN2	BROMUS INERMIS	smooth brome	POACEAE	P-HERB	UPL	
BRJA	BROMUS JAPONICUS	Japenese brome	POACEAE	A-HERB		
BRTE	BROMUS TECTORUM	downy brome	POACEAE	A-HERB		
CAINI4	Callirhoe involucrata var. involucrata	purple poppy-mallow	MALVACEAE	P-HERB		2
CASA3	CANNABIS SATIVA	hemp	CANNABACEAE	A-HERB	FACU	
CABR10	Carex brevior	short-beak sedge	CYPERACEAE	P-HERB	FAC	4
CAPE42	Carex pellita	woolly sedge	CYPERACEAE	P-HERB	OBL	4
CASCS	Carex scoparia	broom sedge	CYPERACEAE	P-HERB	FACW	5
CAVU2	Carex vulpinoidea	fox sedge	CYPERACEAE	P-HERB	FACW	4
CHAL7	CHENOPODIUM ALBUM	lamb's-quarters	CHENOPODIACEAE	A-HERB	FACU	
CHPR5	Chenopodium pratericola	desert goosefoot	CHENOPODIACEAE	A-HERB		1
CIAL2	Cirsium altissimum	tall thistle	ASTERACEAE	P-HERB		1
COAR4	CONVOLVULUS ARVENSIS	field bindweed	CONVOLVULACEAE	P-HERB		
COCA5	Conyza canadensis	horseweed	ASTERACEAE	A-HERB	FACU	0
COTI3	Coreopsis tinctoria	plains ocresopsis	ASTERACEAE		FAC	1
CYFU3	CYPERUS FUSCUS	brown flatsedge	CYPERACEAE	A-HERB	FACW	
DEIL	Desmanthus illinoensis	Illinois bundleflower	FABACEAE	P-HERB	FACU	5
DISP	Distichlis spicata	saltgrass	POACEAE	P-HERB	FACW	3
ECCR	ECHINOCHLOA CRUS-GALLI	barnyard grass	POACEAE	A-HERB	FAC	
ELPA3	Eleocharis palustris	marsh spikerush	CYPERACEAE	P-HERB	OBL	4

	[ELCA4]	Elymus canadensis	Canada wild-rye	POACEAE	P-HERB	FACU	5
	[ELTRT]	Elymus trachycaulus	slender wheatgrass	POACEAE	P-HERB	FACU	5
	ELVIV	Elymus virginicus	Virginia wild-rye	POACEAE	P-HERB	FAC	4
	ERTR3	Eragrostic trichodes	sand lovegrass	POACEAE	P-HERB	UPL	5
	ERPEP2	Eragrostis pectinacea	tufted lovegrass	POACEAE	A-HERB	FAC	0
	ERHIH	Erechtites hieraciifolius	burnweed	ASTERACEAE	A-HERB	FACU	1
	[CHSES]	Euphorbia serpyllifolia	thyme-leaf spurge	EUPHORBIACEAE	A-HERB		2
	EURU4	Eustoma russellianum	prairie-gentian	GENTIANACEAE	A-HERB	FACW	4
	FASC	Fallopia scandens	climbing false-buckwheat	POLYGONACEAE	P-VINE	FACU	1
	FEOC3	Festuca octoflora	six-weeks fescue	POACEAE	A-HERB	FACU	3
	GLMA4	GLYCINE MAX	soybean	FABACEAE	A-HERB		
	HAVI2	Hackelia virginiana	virginia stickseed	BORAGINACEAE	B-HERB	FACU	2
	HEAN3	Helianthus annuus	common sunflower	ASTERACEAE	A-HERB	FACU	0
	[HEPEP]	Helianthus petiolaris	plains sunflower	ASTERACEAE	A-HERB		1
	HECOC9	Hesperostipa comata	needle-and-thread	POACEAE	P-HERB		6
	HELA5	Heterotheca latifolia	camphor-weed	ASTERACEAE	A-HERB		2
	[HOJUJ]	Hordeum jubatum	foxtail barley	POACEAE	P-HERB	FACW	1
	IVAN2	Iva annua	annual marsh-elder	ASTERACEAE	A-HERB	FAC	1
	JUBAL	Juncus balticus var. littoralis	Baltic rush	JUNCACEAE	P-HERB	FACW	6
	JUDU2	Juncus dudleyi	Dudley's rush	JUNCACEAE	P-HERB	FACW	5
	JUTO	Juncus torreyi	Torrey's rush	JUNCACEAE	P-HERB	FACW	4
	[[]	KALI TRAGUS (Salsola	prickly Duccion thistle			FACU	
						FACU	
			prickly lettuce			FAC	
1	MELU			FABACEAE	A-HERB	FACU	
	MESAS	MEDICAGO SATIVA		FABACEAE	P-HERB		
	MEAL2	MELILOTUS ALBUS	white sweet-clover	FABACEAE	B-HERB	FACU	
	MEOF	MELILOTUS OFFICINALIS	yellow sweet-clover	FABACEAE	B-HERB	FACU	
	MILIL	Mirabilis linearis var. linearis	narrow-leaf four-o'clock	NYCTAGINACEAE	P-HERB		4
	NECA2	NEPETA CATARIA	catnip	LAMIACEAE	P-HERB	FACU	
	OXST	Oxalis stricta	yellow wood-sorrel	OXALIDACEAE	A-HERB	FACU	0
	PADID	Panicum dichotomiflorum	fall panicum	POACEAE	A-HERB	FAC	0
	PAVI2	Panicum virgatum	switchgrass	POACEAE	P-HERB	FAC	4
	PASM	Pascopyrum smithii	western wheatgrass	POACEAE	P-HERB	FACU	3
	PEAM8	(Polygonum amphibium)	water smartweed	POLYGONACEAE	P-HERB	OBL	6
		PERSICARIA MACULOSA					
	PEMA24	(Polygonum persicaria)	lady's-thumb smartweed	POLYGONACEAE	A-HERB	FACW	
	PEPE19	(Polygonum pensylvanicum)	Pennsylvania smartweed	POLYGONACEAE		FACW	0
	PHAR3	Phalaris arundinacea	reed canary grass	POACEAE	P-HERB	FACW	0
	PHPR3	PHLEUM PRATENSE	timothy	POACEAE	P-HERB	FACU	
	[PHAU7]	PHRAGMITES AUSTRALIS	phragmites	POACEAE	P-HERB	FACW	

PHHE5	Physalis heterophylla	clammy ground-cherry	SOLANACEAE	P-HERB		4
PHLO4	Physalis longifolia	common ground-cherry	SOLANACEAE	P-HERB		0
РОСО	POA COMPRESSA	Canada bluegrass	POACEAE	P-HERB	FACU	
POPR	POA PRATENSIS	Kentucky bluegrass	POACEAE	P-HERB	FACU	
	POLYPOGON	,				
POMO5	MONSPELIENSIS	rabbitfoot grass	POACEAE	A-HERB	FACW	
PODEO	Populus deitoldes var. occidentalis	plains cottonwood	SALICACEAE	TRFF	FAC	3
	Rudbeckia hirta var.					0
RUHIP	pulcherrima	black-eyed Susan	ASTERACEAE	B-HERB	FACU	4
RUAL4	Rumex altissimus	pale doc	POLYGONACEAE	P-HERB	FAC	0
RUCR	RUMEX CRISPUS	curly dock	POLYGONACEAE	P-HERB	FACW	
SAAM2	Salix amygdaloides	peach-leaf willow	SALICACEAE	TREE	FACW	4
[SAEX]	Salix exigua	sandbar willow	SALICACEAE	SHRUB	FACW	
60004	SCHEDONORUS PRATENSIS				54.011	
SCPR4	(Lolium pratense)	meadow fescue	POACEAE	P-GRASS	FACU	
SCSCS	Schizachyrium scoparium	little bluestem	POACEAE	P-HERB	FACU	4
SCACA	Schoenoplectus acutus	hardstem bulrush	CYPERACEAE	P-HERB	OBL	5
SEPUP2	SETARIA PUMILA	yellow foxtail	POACEAE	A-HERB	FACU	
SEVE3	SETARIA VERTICILLATA	bristly foxtail	POACEAE	A-HERB	FAC	
SEVIV	SETARIA VIRIDIS var. VIRIDIS	green foxtail	POACEAE	A-HERB		
SIMOM	Sisyrinchium montanum	strict blue-eyed-grass	IRIDACEAE	P-HERB	FAC	5
SOIN2	Solanum interius	plains black nightshade	SOLANACEAE	P-HERB		1
SORO	Solanum rostratum	buffalo-bur	SOLANACEAE	A-HERB		0
SOAS	SONCHUS ASPER	prickly sow-thistle	ASTERACEAE	A-HERB	FAC	
SONU2	Sorghastrum nutans	Indian grass	POACEAE	P-HERB	FACU	5
SPAI	Sporobolus airoides	alkali sacaton	POACEAE	P-HERB	FAC	5
SPCOC2	Sporobolus compositus	tall dropseed	POACEAE	P-HFRB	FACU	3
SPCR	Sporobolus cryntandrus	sand dropseed	ΡΟΑΓΕΑΕ	P-HFRB	FACU	2
	Symphyotrichum					_
SYLAL4	lanceolatum	tall white aster	ASTERACEAE	P-HERB	FACW	2
	THINOPYRUM PONTICUM	tall wheatgrass	ΡΟΛΓΕΛΕ			
		field poppy cross	PRASSICACEAE		EACU	
		vellow goat's board			FACU	
		yellow goat s-beard	ASTERACEAE		54.011	
TRPR2	TRIFULIUM PRATENSE	red clover	FABACEAE	P-HEKB	FACU	
TRIN11	INODORUM	scentless chamomile	ASTERACEAE	A-HERB	FAC	
TYAN	TYPHA ANGUSTIFOLIA	narrow-leaf cattail	TYPHACEAE	P-HERB	OBL	
ULPU	ULMUS PUMILA	Siberian elm	ULMACEAE	TREE	UPL	
VETH	VERBASCUM THAPSUS	common mullein	SCROPHULARIACEAE	B-HERB	UPL	
VEHA2	Verbena hastata	blue vervain	VERBENACEAE	P-HFRR	FACW	4
VEST	Verhena stricta	hoary vervain	VERBENACEAE	P-HFRR		2
	Vernonia fasciculata	nrairie ironweed		D_HERR	FAC	<u>_</u>
		field corp			IAC	4
ZEIVIA	zeu muys		PUACEAE	A-HEKB		