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**Non-Native Plant Species Sampling at Lacreek National Wildlife
Refuge: A Prototype Study for Other Refuges**

**A Report on Proposal FWS R6-08: Inventory Terrestrial Invasive Weed Species and
Distribution on Region 6 Refuges through a Geographic Information System (GIS)
Mapping Initiative**

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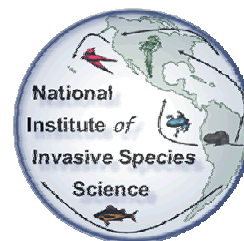
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SUMMARY

This report describes the results and implications of a rapid assessment of non-native plant invasions at the Lacreek National Wildlife Refuge. This effort was a collaborative effort that includes vegetation mapping by the Department of Interior Bureau of Reclamation and the US Geological Survey and the National Wildlife Refuge Invasive Species Survey. The field inventory identified a total of 205 species and 27 non-native species, adding 21 new non-native species to the list reported in the Invasive Species Survey. Steep non-native species-accumulation curves in the mesic woodland, forbland, upland shrubland, and upland grassland vegetation types suggest a vulnerability to invasion that warrants urgent monitoring and control. Current control efforts should continue, and new efforts should also target less common and newly detected non-native species.

The prevention and early detection of non-native plant species will keep the Refuge invasive species list from growing. The Invasive Species Survey information facilitates regional coordination and identifies invasive species in the regional species pool. National datasets suggest that at least 19 non-native plant species of particular concern exist on landscapes surrounding Lacreek. Non-native plant species mapping and rapid inventory techniques described and tested in this effort should be used to reduce establishment of these species at the Refuge. The iterative combination of the Invasive Species Survey and this field inventory could serve as a model for confronting the invasive species problem at Wildlife Refuges across the nation.



1. INTRODUCTION

Invasive species are considered, after habitat loss, the greatest threat to global biological diversity. They are implicated in the listing of at least 42% of all species protected by the Endangered Species Act. The Fish and Wildlife Service mission includes a responsibility to protect wildlife habitat and native plant communities on National Wildlife Refuge lands.

Invasive, non-native plant species maybe displacing native vegetation and damaging wildlife habitat at the Lacreek National Wildlife Refuge in Martin, South Dakota. The refuge staff considers invasive species to be one of the most challenging resource management issues to the refuge. Extensive efforts to mitigate the impact of non-native plant species are in place yet control measures such as mowing, plowing, chemical treatments and biocontrol agents have mixed success. Managers use observational, experimental, and systematic surveys, logged on paper and electronic databases, to track non-native species and control efficacy. However, the current non-native plant species list is limited to the species the Refuge controls and managers have little time to spend on early detection efforts for new invading plant species (Invasive Species Survey 2003).

This report documents the establishment of a set of multi-scale vegetation sampling plots that will assist long-term inventory and monitoring efforts to help quantify the distribution of non-native plant species, what habitats are most vulnerable to invasion, and the detection of newly invading plant species.

1.2 The Invasive Species Survey

The inventory described was completed in collaboration with a larger invasive species effort. The National Wildlife Refuge System collaborated with the US Geological Survey's National Institute of Invasive Species Science to evaluate the invasive species problem in the National Wildlife Refuge system. The National Wildlife Refuge System distributed an electronic survey to determine the extent of current invasions, understanding of the problem, and control efforts at every refuge. Information from the survey will be used to develop priorities for inventory, control, and collaborative efforts to minimize the impact of invasive species to the National Wildlife Refuge System mission. The Lacreek National Wildlife Refuge response to this survey was used to direct the inventory described in this report. This iterative approach to sampling at the Lacreek National Wildlife Refuge will serve as an example of work that could be completed at refuges across the nation.

2. METHODS

This sampling effort follows an impressive, interdisciplinary vegetation mapping effort by the US Geological Survey and the US Fish and Wildlife Service (Lacreek National Wildlife Refuge, South Dakota Mapping Project 2001). The vegetation communities were classified, described, and mapped using the methodologies developed

by the USGS-NPS Vegetation Mapping Program (<http://biology.usgs.gov/npsveg>). The Refuge vegetation was: (1) classified and described using field plot methods and classification methods; and (2) mapped using aerial photo interpretation. The resulting data layers were transferred into a spatial database. The map products provide the foundation for this non-native plant sampling effort. The physiographic description (PHYS; Lacreek National Wildlife Refuge Vegetation Mapping Project 2002) from the vegetation map was used to stratify the refuge into common and rare habitat types (Fig. 1). Nine of the PHYS vegetation types were selected for sampling (Table 1). Random points were established in each type, and sample locations were randomly selected from these points. Some strata were sampled more intensively based on species richness (species accumulations) and according to information provided in the Invasive Species Survey regarding invaded vegetation types. This iterative sampling approach is described in greater detail below.

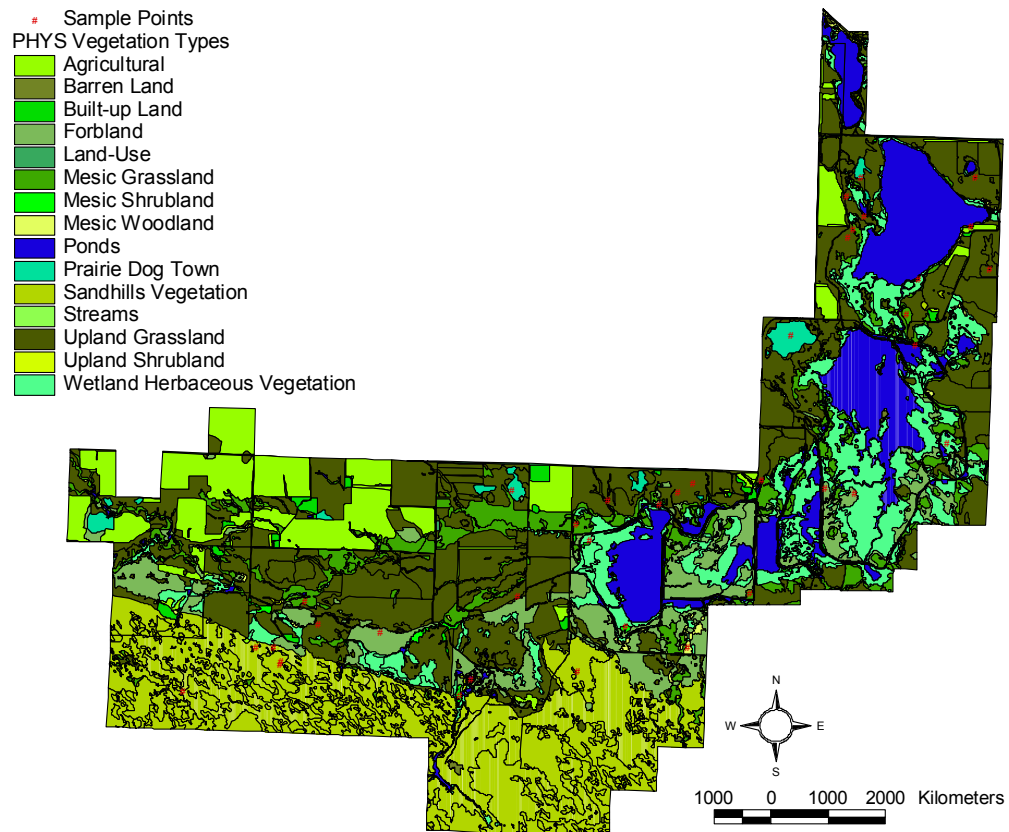


Figure 1. The PHYS vegetation map and the location of the circular multi-scale vegetation plots.

Circular, multi-scale vegetation plots were used to record species richness and cover and cover of abiotic variables at each sampling location (Fig. 2). The plot is 168-m². Three transect lines (T1, T2, T3), each 7.32-m (24-ft) long, radiate from the center of the plot at 30°, 150°, and 270°. A 1-m² (2-m x 0.5-m) subplot is located on each transect at 4.57m (15ft) from the center of the plot. Species richness, cover and average height,

and cover of abiotic variables (soil, duff, wood, water) are recorded to the nearest 1% in each 1-m² subplot. Species richness in the entire 168-m² plot was then recorded. Plant species were recorded with corresponding standardized NRCS PLANTS database codes (USDA, NRCS, 2001). This sample design is directly comparable to the USDA Forest Health Monitoring Program/Forest Inventory and Analysis Program, so comparable data exists across the nation.

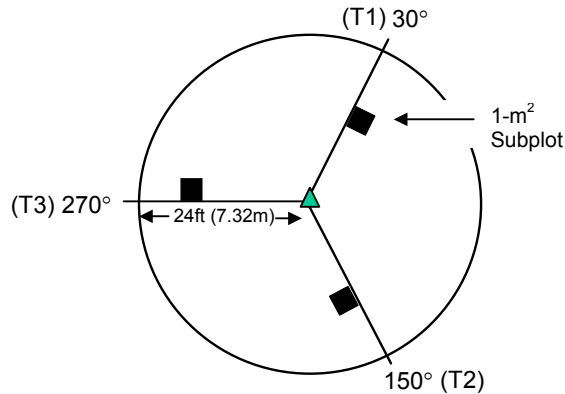


Figure 2. The circular, multi-scale vegetation plot.

Cover was recorded as percent cover of the 1-m² subplot. The percent each plant occupied of the 1-m² subplot, not just the aerial cover, was recorded to the nearest 1%. Because many plants overlap, the cover within a subplot can add to more than 100%.

Soil samples were collected at each plot. Soils were collected in the center of the plot and at the inside corner of each 1-m² subplot. The analysis of the soil samples is currently in progress (texture - % sand, silt, and clay; total C and total N). Ancillary data including slope degree and slope aspect were also recorded.

The sampling plots were not permanently marked on the ground. This decision accounts for wildlife concerns, the potential for stake markers to damage mowers and other control equipment, and the longevity of less durable materials. Each plot can be roughly geo-referenced with associated UTM coordinates to place repeat measurements generally 2 to 5m to the initial plot. Repeat sampling should include an observational search surrounding the area of the plot to account for extant species of concern that the plot may have missed.

Unknown species were collected and/or photographed and subsequently identified by expert botanists in the Colorado State University herbarium. Data was consolidated in a Microsoft Access database, analyzed, and compared to results of the Invasive Species Survey and regional invasive plant species information.

3. RESULTS

Results are summarized in both habitat and species-specific formats. The raw data and location of plots can be found in the Appendices (Appendix 2, 3, 4, 5).

3.1 Habitat Approach

Both economics and the dynamics of natural systems necessitate broad-scale summaries of natural resources. Species simply do not exist in isolation from their surroundings. Control measures such as mowing, burning, or flooding impact many species across large areas. Evaluation of the control should include the target species co-occurring species to justify management decisions.

A total of 205 species were recorded on 38 plots (Appendix 1, 3, 4, 5). Due to missing plant parts, six species could only be identified to Genus so the origin, or nativity, of these species was not determined. The NRCS PLANTS Database (USDA, NRCS. 2001) categorizes 27 of these species as non-native plant species (“introduced” or “native and introduced”; Appendix 2). The highest number of total species per plot (53) was recorded in the mesic woodland vegetation type (Table 1). The plot with the fewest number of species (7) was in a wet herbaceous vegetation type. A plot in the forbland vegetation type was the most invaded (19 non-native species). Three plots were not invaded at all (one each in the sandhills, forbland, and wet herbaceous vegetation types; Table 2).

This distribution of plots was designed to quantify the maximum number of native and non-native plant species. The number of plots sampled in each vegetation type (Table 1) was determined by several factors. First, we considered the results from the Invasive Species Survey and previous experience with inventory efforts in similar biomes. We have found that rare and mesic vegetation types often contribute a disproportionate amount to native and non-native species richness in similar landscapes across the western United States (Stohlgren et al. 2002). Second, we sampled extra plots in the upland grassland and sandhills vegetation types (plots train1 – train6). These plots were part of an exploratory effort to test methods for mapping non-native plant species (www.nawma.org). Finally, upon completion of the initial sampling effort, we evaluated results with species accumulation curves to determine where further sampling should take place. Species accumulation curves describe the number of new species added, on average, with the addition of new plots or where further sampling might return the most new species. We measured extra plots in the forbland, mesic shrub, upland shrub, and mesic woodland vegetation types. A fourth plot (in addition to the three training plots) was added to the upland grassland type, not because of high native species richness, but because of the high number non-native species detected in this vegetation type (Table 1).

Steep species accumulation curves, regions with high cumulative non-native species richness, and high mean non-native plant richness per plot may indicate those vegetation types most vulnerable to invasion by non-native species (Table 1). These types include the mesic woodland, forbland, upland shrubland, upland grassland, and the mesic grassland, which has an intermediate number of non-natives (Fig. 3). It should be noted that these are the same types that tend to have the highest rates of native diversity, and, thus, these potentially sensitive areas may require carefully planned control efforts to minimize damage to native diversity.



Figure 3. The upland shrub (left) and mesic woodland (right) habitats are especially vulnerable to invasion by crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), and Canada thistle (*Cirsium arvense*) and the less common yellow sweetclover (*Melilotus officinalis*) and curly dock (*Rumex crispus*). These vegetation types should be included in control and weed mapping efforts.

3.2 Species Approach

While a habitat perspective can be useful for informing management decisions and identifying vulnerable habitats, a species-specific approach provides crucial information about particular invasive species. This approach conveys how often a particular species appears on the landscape, how much of a species covers the landscape, and what particularly noxious species have invaded.

The number of times a particular species was found on a plot, frequency, provides an idea of how widespread a species is across the landscape. Kentucky bluegrass (*Poa pratensis*) was found on almost half of the plots, while many non-native species were found only on one plot (Table 2). Four of the five most frequently detected species were non-native species controlled at the refuge. Other non-native species controlled at the refuge were not found as often- we only detected downy brome or cheat grass (*Bromus tectorum*) on 4 plots, and common burdock (*Arctium minus*) on two plots (Table 2).

The cover of invasive species tells a story similar to the frequency results. The species found on more plots have relatively high cover values (Kentucky bluegrass, smooth brome (*Bromus inermis*), and crested wheatgrass (*Agropyron cristatum*), suggesting that they are both widespread and exist in large patches. Data recorded on both common kochia (*Kochia scoparia*) and stinging nettle (*Urtica dioica*) suggests that these species have high cover values on individual plots, but are not as common (lower frequency). There are many species with sparse cover values that are found on just a few plots (Table 2).

Canada thistle (*Cirsium arvense*) is different: average cover is quite low (6.5%), but the frequency was high (Table 2). In addition, it was primarily found during the

search of the entire plot, and it was only found on about one-third of the potential subplots. Its highest recorded cover value was 20 percent. These data suggest that the species is widespread but often exists in small patches or in highly localized larger patches.

Some of the widespread species, such as Canada thistle, Kentucky bluegrass, and crested wheatgrass may be difficult to eradicate, but control efforts should continue in hopes that they can be contained. Eradication is clearly most successful when a species is not widely established across a landscape. So, some of the species with low frequency and low cover may be worth focusing a portion of control resources on. For example, yellow sweetclover (*Melilotus officinalis*) is not currently on the refuge control list, but consideration of this species for control could be warranted since it tends to spread and degrade natural grasslands in other areas.

This inventory effort located many species not currently listed on the Lacreek National Wildlife Refuge control list (Table 2). Curly dock (*Rumex crispus*; 5 plots), black bindweed (*Polygonum convolvulus*; 4 plots), and quackgrass (*Elytrigia repens*; 2 plots), are all listed as noxious in several states and noted for displacing native species (Fig. 4). The small number of plots that each species occurred on might suggest that these species are not widely established on the refuge and might be worth consideration for control efforts to prevent their expansion.



Figure 4. Quackgrass (a.) and black bindweed (b.) are two newly detected non-native plant species that managers should include in control efforts. Species with low cover and minimal distribution are ideal for early detection and eradication. Photos courtesy of Wisconsin state herbarium.

a.

While sampling with multi-scale plots in a stratified design increased the number of non-native plants documented on the Refuge, the effort missed two species on the Refuge list (Table 2). The relatively small proportion of the landscape sampled in a quantitative effort such as this explains these exclusions, and may suggest that these two species (leafy spurge, *Euphorbia esula*; and field bindweed, *Convolvulus arvensis*) are not as common as other non-native species found in several plots across the landscape. The US Forest Service considers field bindweed one of the ten worst weeds in the world (<http://www.fs.fed.us/database/feis/plants/forb/conarv/all.html>). Both field bindweed and leafy spurge appear on the South Dakota state noxious weed list. We encourage the

refuge to continue control efforts and obtain quantitative data on the species and treatment effects if possible.

Cheatgrass (*Bromus tectorum*) was found on only four plots, primarily in a localized area of the sandhills vegetation type (see Invasive Species Mapping section). The species is listed on the refuge list and is currently being controlled. We strongly suggest that control efforts persist. Cheatgrass can spread rapidly, dominate natural vegetation and alter many ecosystem processes such as water cycles and fire. Cheatgrass is not widespread on the refuge, and the window to prevent wide-spread establishment may be limited.

4. INVASIVE SPECIES MANAGEMENT

As noted, the refuge has a comprehensive and impressive invasive species control program. In addition to observation, quantitative assessments, and extensive experience, managers employ theoretical ecology to guide invasive species management. Refuge literature reads: “It is believed that grasslands with diverse plant communities are less likely to be invaded by exotic species compared to less diverse degraded communities” (<http://lacreek.fws.gov/weeds.htm>). Suggested by Charles Elton (1958), the notion that diversity promotes community stability and consequently reduces the likelihood of non-native species establishment qualifies as one of the founding ecological theories. This diversity-begets-stability theory is especially pervasive in invasion ecology; innumerable studies both uphold (e.g., Tilman 1999) and provide contradictory evidence (Levine 2000, Sax 2002, Stohlgren et al. 2003). Conflicting evidence stresses the variability associated with ecological systems. The data collected in this study provides an excellent chance to test the applicability of this assumption at Lacreek National Wildlife Refuge.

Multi-scale vegetation assessments allow exploration of non-native and native plant species relationships by cover and species richness at plant neighborhood (1-m²), plot (168-m²), habitat (vegetation type), and landscape (refuge) scales. These relationships were explored statistically in an attempt to discern patterns using correlations. Coincidence of generally higher native and non-native species richness (a positive correlation) would suggest that the theory is not applicable to the Lacreek landscape. Conversely, the occurrence of fewer non-native species in areas of higher native plant species richness (a negative correlation) would support the diversity-stability theory.

At the 1-m² scale, significant-negative correlations were found in two of nine vegetation types (sandhills $r=-0.7$, $N=12$, $p=0.001$; forbland $r=-0.71$, $N=15$, $p=0.003$), and upon examination of all the 1-m² plots on the refuge (all types combined $r=-0.27$, $N=114$, $p=0.004$). While these results support the diversity-stability theory, the variability and minority of significance at the vegetation-type scale suggests that such theory should be applied with some caution. Patterns become inconclusive at larger scales. No significant patterns were found in correlations of native and non-native species at the plot scale within vegetation types or when all plots were combined across

types. Correlations between the total number of native and non-native species in each vegetation type, largest scale possible, were not significant either.

These results suggest that data collected in this study loosely support diversity-stability theory at small scales. Despite the general trend, exceptions exist, and evidence does not support such patterns at larger spatial scales. As managers are responsible for managing the entire landscape we suggest that they consider large-scale analysis, and reconsider invasive species management guided by assumptions associated with Eltonian theory.

5. INVASION PREVENTION

Several of the non-native plant species currently controlled at Lacreek National Wildlife Refuge are widespread, and will be nearly impossible to eradicate (Table 2). This does not mean that attempts to mitigate Canada thistle are not important; only that well established species may be difficult to control without widespread biological control. The prevention, early detection, and eradication of non-native plant species are essential to keep the Refuge control list from growing. Finding a new invasive species on a landscape is also difficult. Not knowing what to look for or where to look further complicates this process. The Invasive Species Survey will help provide solutions to these problems.

5.1 Prevention

The Invasive Species Survey may provide managers with a framework to preempt invasions. Identification of species that are likely to invade the Refuge provides a platform for managers to interact with others dealing with similar problems such as private landowners and county weed managers. Dialogue could establish regional priorities and may lead to collaborations such as the sharing of control efforts and equipment. Such cross-boundary interactions may be easiest within the National Wildlife Refuge System. The final report of the Invasive Species Survey will provide Lacreek National Wildlife Refuge with the names of managers and invasive species lists and issues at nearby Wildlife Refuges; both Fort Niobrara and Valentine National Wildlife Refuges are less than 100 km from Lacreek.

5.2 Early Detection

The results of the electronic Invasive Species Survey are used to compare lists of invasive species reported by the refuge to lists of invasive species in the regional species pool. Invasive species found in a regional pool may be indicative of species likely to invade a particular landscape. A refuge with an invasive species program smaller than Lacreek might use regional lists as a starting point for determining what may already exist on the refuge. Managers at Lacreek National Wildlife might use these lists to develop strategies for early detection; knowing what to look for increases efficiency. The regional invasive species pool could contribute to designs of future inventory and monitoring plans, provide a search image for managers and staff working on the refuge,

and provide volunteers with a watch list - a simple flip book with pictures and descriptions. Finally, an understanding of the ecology of potential invaders could narrow search efforts: a willing volunteer could be instructed to walk roadsides and fence lines or riparian areas with a list and associated pictures of invaders likely to occur in these habitats.

Several sources of regional invasive species information exist. As part of the Invasive Species Survey the National Institute of Invasive Species Science and partners have agreed to provide lists of invasive species that occur in the county or counties surrounding each refuge. The primary source of these data for non-native plant species is the Biota of North America Program under the direction of John Kartesz at the University of North Carolina, Chapel Hill. Lacreek National Wildlife Refuge is located in Bennett County. The county list was compared to the list of non-native plant species known to occur on the refuge (data from field inventory and Lacreek lists) to derive a list of potential invaders (Table 3). Probably the most threatening species on this list is a thistle called musk thistle or nodding plumeless thistle (*Carduus nutans*; Fig. 5). Musk thistle can establish dense stands that inhibit and slow growth of native species and is included as a “regulated non-native species,” on the South Dakota noxious weed state list (South Dakota Code 1997). The species has been found in a wide range of habitats, but would most likely be found in newly cultivated fields, disturbed sites, roadsides, and in association with grasses and forbs on Lacreek National Wildlife Refuge (the USDA PLANTS Database http://plants.usda.gov/cgi_bin/topics.cgi). More information about musk thistle can be found at the PLANTS database (<http://plants.usda.gov/>). While musk thistle may represent the greatest threat on the BONAP list from Bennett County, all non-native species should be considered in management actions.



Figure 5. Nodding plumeless thistle (left) and dalmatian toadflax (right) are two noxious species found in the county surrounding Lacreek National Wildlife Refuge. Identification of non-native plant species in the regional species pool provides managers with a list of potential invaders that can assist prevention and early detection. Photos courtesy of Wisconsin state herbarium.

The USDA PLANTS database was also queried for a list of non-native plant species that occur in Bennett County, South Dakota. This database provided a significantly larger list of non-native plants in the regional pool. Only those species that occur on the South Dakota noxious weed state list (South Dakota Code 1997) are included in this report (Table 4). Some of the noxious species on this list include yellow toadflax (*Linaria vulgaris*), dalmatian toadflax (*Linaria dalmatica*; Fig. 5), yellow star-thistle (*Centaurea solstitialis*), and purple loosestrife (*Lythrum salicaria*). Information about these species and citations for many other sources can be found at the NRCS PLANTS website (<http://plants.usda.gov/>).

5.3 Non-native Plant Species Mapping

The Invasive Species Survey will help managers and other Refuge System personnel develop priorities for inventory, monitoring, and control. Once detected, understanding a species distribution is essential. Techniques should also be adopted to evaluate the spread or reduction of the species over time, and to evaluate the efficacy and location of control efforts. While a good start, casual observations tend to be subjective. Perceptions of measurements and cover estimates may vary, and if a person stops working at the refuge, so does important data.

Many techniques are being developed to map non-native plant distributions. The Montana Noxious Weed Survey and Mapping System (<http://www.montana.edu/places/mtweeds/index.html>) and The California Weed Mapping Handbook (<http://cain.nbio.gov/weedhandbook/>) are both similar to mapping efforts initiated by the Forest Service, the National Park Service, the Bureau of Land Management and the Nature Conservancy. To their credit, many of the systems make an effort to collect data that is comparable across landscapes and methodologies. However, methods put forward by the North American Weed Management Association (NAWMA), include techniques for collecting quantitative data as well as spatially mapping non-native plant species occurrences with points, lines, and polygons. This system, known as Beyond NAWMA, can be found at the NAWMA website (<http://www.nawma.org/>).

In addition to the stratified random sampling described above, a small portion of the sampling effort was spent investigating the applicability of the Beyond NAWMA methodology to the vegetation at Lacreek. We explored the system in two parts of the Refuge: in upland grassland fields containing crested wheatgrass, Kentucky bluegrass, and Canada thistle, and in the southeast part of the refuge in the sandhills vegetation type where cheatgrass has established.

For evenly distributed infestations such as the upland grassland fields, the best solution was to map a polygon the shape of the field, and list the dominant species and estimated cover. In this case the managers are aware of these infestations and treat the fields accordingly. The multi-scale circular plots established to gather quantitative data associated with the infestations provided estimates of species cover and total species richness (plots train1, train2, train3). The plots to quantify the extent of the invasions,

and an associated note may have been sufficient, and eliminated the need to actually walk the perimeter of each field with a GPS. The fields were also searched for isolated non-native plant invasions that would be useful to map with a point, line, or polygon by GPS.

Cheatgrass (*Bromus tectorum*) seems to be a recent arrival or at least a relatively isolated presence on the Refuge. It occurs in small isolated patches (one to several individuals), and large, yet distinct polygons that can be easily mapped. Mapping cheatgrass according to the Beyond NAWMA guidelines creates a snapshot of the current infestation (Fig. 6) that can be compared to similar efforts at a later date, to estimate total amount of cheatgrass infestation, and/or guide control efforts. In addition to the mapping, three multi-scale circular plots were established (train4, train5, train6) to gather quantitative data that is representative of mapped cheatgrass occurrence.

The circular plot is located in the center of an infestation. Cheatgrass occurred in the subplots of only two of the four plots where it occurred, and it had an average cover of 13%; it was detected only in the circular part of the other two plots. This plant data and the ancillary data collected in the plot measurements can be used for long-term quantitative monitoring, understanding other native and non-native species found to co-occur with cheatgrass, and for various spatial modeling applications.

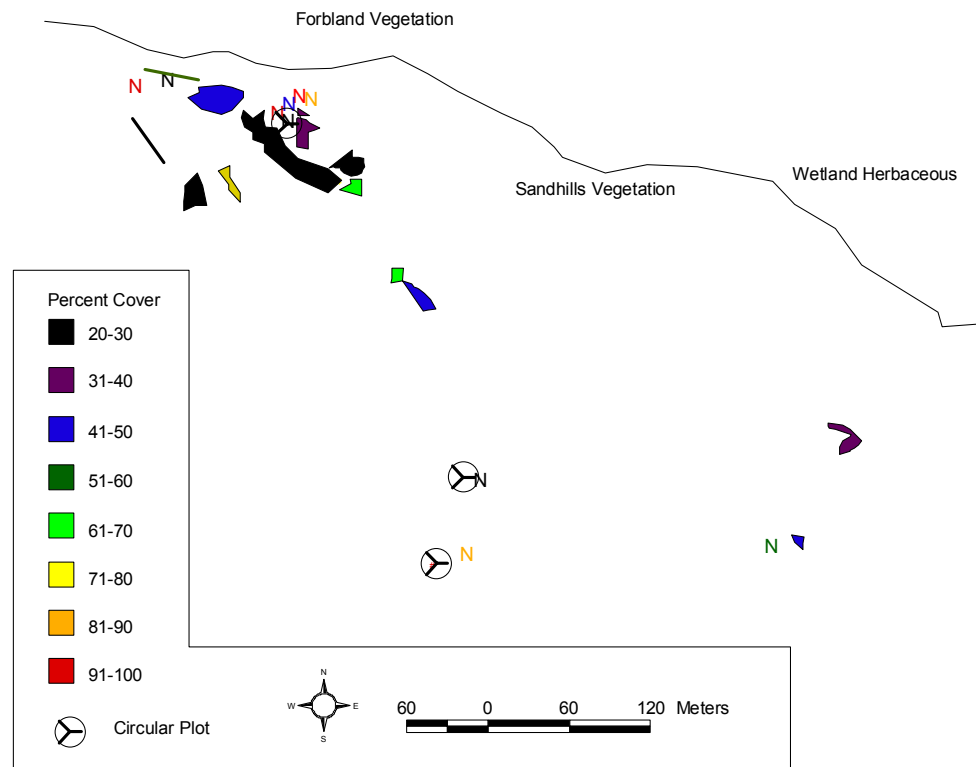


Figure 6. Cheatgrass distribution in the southeast part of the Refuge. Polygons and lines appear to scale, while the “N” represents patches 5-m x 5-m or smaller in size.

6. CONCLUSION and MANAGEMENT IMPLICATIONS

Compared to many National Wildlife Refuges, Lacreek National Wildlife Refuge maintains a very comprehensive invasive species control program. The vegetation map and associated accuracy assessment plots, and the inventory and monitoring work done by the refuge staff suggest that the Refuge is well studied. This vegetation inventory creates a vegetation baseline with a set of high quality, multi-scale vegetation plots that can be used for monitoring and compared to many national datasets. Especially when reviewed in conjunction with the Invasive Species Survey, the data from this inventory provide information useful to management of non-native plant species.

- A habitat approach may be an economically and ecologically sound method for management of non-native plant species. Results suggest that vulnerable and sensitive habitats include mesic woodland, forbland, upland shrubland, upland grassland, mesic grassland, and mesic shrubland. Many of these vegetation types, aside from the upland grassland, tend to cover a smaller area and support larger numbers of native species relative to the other vegetation types. Further inventory and monitoring efforts might focus on these areas.

- Data on individual non-native plant species suggest that the Refuge already controls many of the well established non-native plants that tend to occur in the large upland grassland vegetation type. These control efforts should continue in an effort to prevent further spread, but efforts should also focus on some of the species not yet widespread. Control efforts must be systematically monitored and linked to restoration efforts to make cost-efficient progress on invasive species.

- The current theoretical approach to invasive species management may need to be reevaluated. Small-scale data loosely support the idea that species-poor areas are more invaded. The pattern does not hold at larger spatial scales.

- Managers should consider techniques for the early detection of non-native plant species. They should be acquainted with potential invaders for casual observations, involve volunteers if available, and pursue predictive modeling and mapping procedures if funding is available.

- Plants received our attention here. However, non-indigenous animals and diseases require immediate attention in both terrestrial and aquatic habitats. A “triage” approach to specific plants, animals, and disease is needed on every refuge.

7. REFERENCES

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Table 1. Vegetation types (physiographic description), number of plots sampled, mean richness, mean cover, and cumulative species richness sampled at Lacreek National Wildlife Refuge, SD. The standard error of the mean appears in parentheses.

Vegetation Type	Number of Plots	Mean Richness		Mean Cover		Cumulative Richness	
		Native	Non-Native	Native	Non-native	Native	Non-native
Forbland	5	19.8 (3.15)	8.3 (3.68)	25.6 (6.54)	30.7 (10.85)	60	15
Upland Grassland	7	12.4 (1.31)	7.6 (0.92)	14.6 (4.24)	30.14 (8.49)	36	13
Mesic Shrubland	4	30 (5.81)	7.5 (2.22)	14.4 (5.25)	6.8 (2.26)	71	10
Upland Shrubland	3	11.6 (4.11)	14.33 (2.33)	8.9 (3.99)	24.5 (5.87)	21	15
Mesic Woodland	4	28.3 (4.8)	7.8 (3.97)	20.3 (6.94)	25.1 (13.19)	58	16
Sandhills	6	27 (3.12)	6.6 (2.38)	8.1 (1.48)	10.3 (3.77)	45	8
Prairie Dog Towns	3	17.3 (3.48)	6.6 (2.38)	7.1 (3.25)	24.5 (5.87)	21	8
Mesic Grassland	3	16.7 (4.37)	8.7 (5.17)	22.3 (8.04)	4.7 (1.87)	23	9
Wet Herbaceous Vegetation	3	14 (4.36)	4 (1)	31.5 (10.48)	39.5 (35.5)	21	2

Table 2. Non-native species frequency and cover by plot. Cover values are presented as average cover of the subplots where a species is present^a, and average of the total subplots when a species appears in at least the search portion of the plot^b. The parentheses contain the number of subplots used to average the cover value. The species found by this survey and the species previously recognized at Lacreek National Wildlife Refuge are indicated.

Species	Frequency	Average Cover ^a	Average Cover ^b	Number Veg Types
<i>Poa pratensis</i> , Kentucky bluegrass ¹	19	18.6 (36)	11.6 (57)	7
<i>Cirsium arvense</i> , Canadian thistle ¹	18	6.5 (17)	2.1 (54)	9
<i>Bromus inermis</i> , smooth brome ¹	15	31.7 (19)	13.4 (45)	6
<i>Agropyron cristatum</i> , crested wheatgrass ¹	11	42.4 (17)	21.8 (33)	5
<i>Kochia scoparia</i> , common kochia ²	9	31.7 (6)	6.9 (27)	5
<i>Melilotus officinalis</i> , yellow sweetclover ²	9	0.5 (4)	0.1 (27)	5
<i>Lactuca serriola</i> , prickly lettuce ²	7	8.8 (6)	2.5 (21)	5
<i>Sonchus uliginosus</i> ²	7	6.8 (4)	2.1 (21)	6
<i>Taraxacum officinale</i> , common dandelion ²	7	2 (2)	0.2 (21)	4
<i>Urtica dioica</i> , stinging nettle ²	7	58.3 (4)	11.1 (21)	4
<i>Melilotus albus</i> ²	6	12.8 (2)	1.4 (18)	5
<i>Rumex crispus</i> , curly dock ²	5	3.5 (2)	0.5 (15)	4
<i>Bromus tectorum</i> , cheatgrass ¹	4	4 (6)	3.7 (12)	2
<i>Chenopodium album</i> , labmsquarters ²	4	2 (2)	0.3 (12)	3
<i>Echinochloa crus-galli</i> , barnyardgrass ²	4	no cover value		3
<i>Polygonum convolvulus</i> , black bindweed ²	4	0.5 (1)	0.04 (12)	4
<i>Tragopogon dubius</i> , yellow salsify ²	3	1 (2)	0.2 (9)	3
<i>Arctium minus</i> , lesser burdock ¹	2	no cover value		2
<i>Elytrigia repens</i> , creeping quackgrass ²	2	25.5 (4)	24.8 (6)	2
<i>Humulus lupulus</i> , common hop ²	2	21.2 (5)	20.5 (6)	2
<i>Amaranthus retroflexus</i> , redroot amaranth ²	1	no cover value		1
<i>Artemisia biennis</i> , biennial wormwood ²	1	0.5 (1)	0.2 (3)	1
<i>Nepeta cataria</i> , catnip ²	1	no cover value		1
<i>Phleum pratense</i> , timothy ²	1	no cover value		1
<i>Salix fragilis</i> , crack willow ²	1	100 (1)	33.3 (3)	1
<i>Typha angustifolia</i> , narrowleaf cattail ²	1	0.5 (1)	0.2 (3)	1
<i>Ulmus pumila</i> , Siberian elm ²	1	100 (1)	33.3 (3)	1
<i>Euphorbia esula</i> , leafy spurge ³	0	n/a		1
<i>Convolvulus arvensis</i> , field bindweed ³	0	n/a		1

¹Species recognized and controlled at Lacreek National Wildlife Refuge and found in this survey.

²Species found in this survey.

³Species recognized and controlled at Lacreek National Wildlife Refuge not found in this survey.

Table 3. Non-native plant species on the Biota of North American Program for Bennett county that are not documented on Lacreek National Wildlife Refuge.

NRCS Code	Family	Scientific Name	Common Name
CANU4	Asteraceae	<i>Carduus nutans</i>	nodding plumeless thistle/musk thistle
DESO2	Brassicaceae	<i>Descurainia sophia</i>	flixweed
ERCI	Poaceae	<i>Eragrostis cilianensis</i>	stinkgrass
ERCH9	Brassicaceae	<i>Erysimum cheiranthoides</i>	wormseed wallflower
LOPE	Poaceae	<i>Lolium perenne</i>	perennial ryegrass
RUST4	Polygonaceae	<i>Rumex stenophyllus</i>	narrowleaf dock
TRPR2	Fabaceae	<i>Trifolium pratense</i>	red clover
VIVI	Fabaceae	<i>Vicia villosa</i>	winter vetch

Table 4. Noxious on-native plant species on the NRCS PLANTS list for Bennett county that are not documented on Lacreek National Wildlife Refuge.

NRCS Code	Family	Scientific Name	Common Name
CADR	Brassicaceae	<i>Cardaria draba</i>	whitetop
CAAC	Asteraceae	<i>Carduus acanthoides</i>	spiny plumeless thistle
CESO3	Asteraceae	<i>Centaurea solstitialis</i>	yellow star-thistle
CUEP	Cuscutaceae	<i>Cuscuta epithymum</i>	clover dodder
CUSU	Cuscutaceae	<i>Cuscuta suaveolens</i>	fringed dodder
HYPE	Clusiaceae	<i>Hypericum perforatum</i>	common St. Johnswort
LIDA	Scrophulariaceae	<i>Linaria dalmatica</i>	Dalmatian toadflax
LIVU2	Scrophulariaceae	<i>Linaria vulgaris</i>	butter and eggs
LYSA2	Lythraceae	<i>Lythrum salicaria</i>	purple loosestrife
SOAR2	Asteraceae	<i>Sonchus arvensis</i>	field sowthistle
SOHA	Poaceae	<i>Sorghum halepense</i>	Johnsongrass

Appendix 1. Species List

NRCS Code	Family	Scientific Name	Common Name	Origin
AGCR	Poaceae	<i>Agropyron cristatum</i>	crested wheatgrass	Introduced
AGDA	Poaceae	<i>Agropyron dasystachyum</i>		Native
AGSM	Poaceae	<i>Agropyron smithii</i>		Native
AGST2	Poaceae	<i>Agrostis stolonifera</i>	creeping bentgrass	Native
AMAL	Amaranthaceae	<i>Amaranthus albus</i>	prostrate pigweed	Native
AMAR	Amaranthaceae	<i>Amaranthus arenicola</i>	sandhill amaranth	Native
AMRE	Amaranthaceae	<i>Amaranthus retroflexus</i>	redroot amaranth	Introduced
AMAR2	Asteraceae	<i>Ambrosia artemisiifolia</i>	annual ragweed	Native
AMTR	Asteraceae	<i>Ambrosia trifida</i>	great ragweed	Native
AMFR	Fabaceae	<i>Amorpha fruticosa</i>	desert indigobush	Native
ANGE	Poaceae	<i>Andropogon gerardii</i>	big bluestem	Native
APCA	Apocynaceae	<i>Apocynum cannabinum</i>	Indianhemp	Native
ARMI2	Asteraceae	<i>Arctium minus</i>	lesser burdock	Introduced
ARPO2	Papaveraceae	<i>Argemone polyanthemos</i>	crested pricklypoppy	Native
ARLO3	Poaceae	<i>Aristida longiseta</i>		Native
ARPU9	Poaceae	<i>Aristida purpurea</i>	purple threeawn	Native
ARBI2	Asteraceae	<i>Artemisia biennis</i>	biennial wormwood	Native and Introduced
ARFI2	Asteraceae	<i>Artemisia filifolia</i>	sand sagebrush	Native
ARFR4	Asteraceae	<i>Artemisia frigida</i>	fringed sagewort	Native
ARLU	Asteraceae	<i>Artemisia ludoviciana</i>	Louisiana sagewort	Native
ASER2	Asclepiadaceae	<i>Asclepias erosa</i>	desert milkweed	Native
ASIN	Asclepiadaceae	<i>Asclepias incarnata</i>	swamp milkweed	Native
ASPU	Asclepiadaceae	<i>Asclepias pumila</i>	plains milkweed	Native
ASSP	Asclepiadaceae	<i>Asclepias speciosa</i>	showy milkweed	Native
ASER3	Asteraceae	<i>Aster ericoides</i>	heath aster	Native
ASFA2	Asteraceae	<i>Aster falcatus</i>	cluster aster	Native
ASJU	Asteraceae	<i>Aster junciformis</i>		Native
ASPR2	Asteraceae	<i>Aster praealtus</i>	willowleaf aster	Native
ASDR3	Fabaceae	<i>Astragalus drummondii</i>	Drummond's milkvetch	Native
ASTE5	Fabaceae	<i>Astragalus tenellus</i>	looseflower milkvetch	Native
BICE	Asteraceae	<i>Bidens cernua</i>	nodding beggartick	Native
BICO3	Asteraceae	<i>Bidens comosa</i>		Native
BIFR	Asteraceae	<i>Bidens frondosa</i>	devil's beggartick	Native
BOGR2	Poaceae	<i>Bouteloua gracilis</i>	blue grama	Native
BOHI2	Poaceae	<i>Bouteloua hirsuta</i>	hairy grama	Native
BRIN2	Poaceae	<i>Bromus inermis</i>	smooth brome	Introduced
BRTE	Poaceae	<i>Bromus tectorum</i>	cheatgrass	Introduced
CACA4	Poaceae	<i>Calamagrostis canadensis</i>	bluejoint	Native
CALO	Poaceae	<i>Calamovilfa longifolia</i>	prairie sandreed	Native
CAAP2	Campanulaceae	<i>Campanula aparinoides</i>	marsh bellflower	Native
CAHE5	Cyperaceae	<i>Carex heliophila</i>		Native
CAHY4	Cyperaceae	<i>Carex hystericina</i>	bottlebrush sedge	Native
CALA30	Cyperaceae	<i>Carex lanuginosa</i>	woolly sedge	Native
CAPR5	Cyperaceae	<i>Carex praegracilis</i>	clustered field sedge	Native
CAPR7	Cyperaceae	<i>Carex praticola</i>	meadow sedge	Native
CASA8	Cyperaceae	<i>Carex sartwellii</i>	Sartwell's sedge	Native
CAST5	Cyperaceae	<i>Carex stipata</i>	owlfruit sedge	Native
CEFE	Rhamnaceae	<i>Ceanothus fendleri</i>	Fendler's ceanothus	Native
CEOC	Ulmaceae	<i>Celtis occidentalis</i>	common hackberry	Native

CHMA15	Euphorbiaceae	<i>Chamaesyce maculata</i>	spotted sandmat	Native
CHENO	Chenopodiaceae	<i>Chenopodium</i>	goosefoot	Not known
CHAL7	Chenopodiaceae	<i>Chenopodium album</i>	lambsquarters	Native and Introduced
CHBE4	Chenopodiaceae	<i>Chenopodium berlandieri</i>	pitseed goosefoot	Native
CHDE	Chenopodiaceae	<i>Chenopodium desiccatum</i>	aridland goosefoot	Native
CHFR3	Chenopodiaceae	<i>Chenopodium fremontii</i>	Fremont's goosefoot	Native
CHLE4	Chenopodiaceae	<i>Chenopodium leptophyllum</i>	narrowleaf goosefoot	Native
CHRU	Chenopodiaceae	<i>Chenopodium rubrum</i>	red goosefoot	Native
CHVI10	Asteraceae	<i>Chrysopsis villosa</i>		Native
CHLI3	Asteraceae	<i>Chrysothamnus linifolius</i>	spearleaf rabbitbrush	Native
CIAR4	Asteraceae	<i>Cirsium arvense</i>	Canadian thistle	Introduced
CIFL	Asteraceae	<i>Cirsium flodmanii</i>	Flodman's thistle	Native
COCA5	Asteraceae	<i>Conyza canadensis</i>	Canadian horseweed	Native
CYOD	Cyperaceae	<i>Cyperus odoratus</i>	fragrant flatsedge	Native
CYSC3	Cyperaceae	<i>Cyperus schweinitzii</i>	Schweinitz's flatsedge	Native
CYFR2	Dryopteridaceae	<i>Cystopteris fragilis</i>	brittle bladderfern	Native
DAPU5	Fabaceae	<i>Dalea purpurea</i>	purple prairieclover	Native
DEPI	Brassicaceae	<i>Descurainia pinnata</i>	western tansymustard	Native
DECA7	Fabaceae	<i>Desmodium canadense</i>	showy ticktrefoil	Native
DIOL	Poaceae	<i>Dichanthelium oligoanthes</i>	Heller's rosette grass	Native
DISP	Poaceae	<i>Distichlis spicata</i>	inland saltgrass	Native
ECCR	Poaceae	<i>Echinochloa crus-galli</i>	barnyardgrass	Introduced
ELPA3	Cyperaceae	<i>Eleocharis palustris</i>	common spikerush	Native
ELCA4	Poaceae	<i>Elymus canadensis</i>	Canada wildrye	Native
ELTR7	Poaceae	<i>Elymus trachycaulus</i>	slender wheatgrass	Native
ELRE3	Poaceae	<i>Elytrigia repens</i>	creeping quackgrass	Introduced
EPCI	Onagraceae	<i>Epilobium ciliatum</i>	hairy willowherb	Native
EQHY	Equisetaceae	<i>Equisetum hyemale</i>	scouringrush horsetail	Native
EREF	Polygonaceae	<i>Eriogonum effusum</i>	spreading buckwheat	Native
EUMA6	Asteraceae	<i>Eupatorium maculatum</i>	spotted joepyeweed	Native
EUMI5	Euphorbiaceae	<i>Euphorbia missurica</i>		Native
FRAGA	Rosaceae	<i>Fragaria</i>	strawberry	Not known
FRPE	Oleaceae	<i>Fraxinus pennsylvanica</i>	green ash	Native
GATR2	Rubiaceae	<i>Galium trifidum</i>	threepetal bedstraw	Native
GATR3	Rubiaceae	<i>Galium triflorum</i>	fragrant bedstraw	Native
GEAL3	Rosaceae	<i>Geum aleppicum</i>	yellow avens	Native
GLLE3	Fabaceae	<i>Glycyrrhiza lepidota</i>	American licorice	Native
HASP3	Asteraceae	<i>Haplopappus spinulosus</i>		Native
HEAN3	Asteraceae	<i>Helianthus annuus</i>	common sunflower	Native
HEPE	Asteraceae	<i>Helianthus petiolaris</i>	prairie sunflower	Native
HETU	Asteraceae	<i>Helianthus tuberosus</i>	Jerusalem artichoke	Native
HOJU	Poaceae	<i>Hordeum jubatum</i>	foxtail barley	Native
HULU	Cannabaceae	<i>Humulus lupulus</i>	common hop	Native and Introduced
HYMA2	Clusiaceae	<i>Hypericum majus</i>	large St. Johnswort	Native
IMCA	Balsaminaceae	<i>Impatiens capensis</i>	jewelweed	Native
IPCO5	Polemoniaceae	<i>Ipomopsis congesta</i>	ballhead gilia	Native
IPL02	Polemoniaceae	<i>Ipomopsis longiflora</i>	flaxflowered gilia	Native
IVXA	Asteraceae	<i>Iva xanthifolia</i>	giant sumpweed	Native
JUBA	Juncaceae	<i>Juncus balticus</i>	Baltic rush	Native
JUSC2	Cupressaceae	<i>Juniperus scopulorum</i>	Rocky Mountain juniper	Native

KOSC	Chenopodiaceae	<i>Kochia scoparia</i>	common kochia	Introduced
KOPY	Poaceae	<i>Koeleria pyramidata</i>		Native
KUEU	Asteraceae	<i>Kuhnia eupatorioides</i>		Native
LASE	Asteraceae	<i>Lactuca serriola</i>	prickly lettuce	Introduced
LEOR	Poaceae	<i>Leersia oryzoides</i>	rice cutgrass	Native
LIPU	Asteraceae	<i>Liatris punctata</i>	dotted gayfeather	Native
LIIN2	Boraginaceae	<i>Lithospermum incisum</i>	narrowleaf gromwell	Native
LYAM	Lamiaceae	<i>Lycopus americanus</i>	American waterhorehound	Native
LYAS	Lamiaceae	<i>Lycopus asper</i>	rough bugleweed	Native
LYJU	Asteraceae	<i>Lygodesmia juncea</i>	rush skeletonplant	Native
LYTH2	Primulaceae	<i>Lysimachia thyrsoiflora</i>	tufted loosestrife	Native
MELIL	Fabaceae	<i>Melilotus</i>	sweetclover	Not known
MEAL2	Fabaceae	<i>Melilotus albus</i>		Introduced
MEOF	Fabaceae	<i>Melilotus officinalis</i>	yellow sweetclover	Introduced
MEAR4	Lamiaceae	<i>Mentha arvensis</i>	wild mint	Native
MIHI	Nyctaginaceae	<i>Mirabilis hirsuta</i>	hairy four o'clock	Native
MIL3	Nyctaginaceae	<i>Mirabilis linearis</i>	narrowleaf four o'clock	Native
MUAS	Poaceae	<i>Muhlenbergia asperifolia</i>	alkali muhly	Native
MUPU2	Poaceae	<i>Muhlenbergia pungens</i>	sandhill muhly	Native
MURA	Poaceae	<i>Muhlenbergia racemosa</i>	marsh muhly	Native
NAVI4	Poaceae	<i>Nassella viridula</i>	green needlegrass	Native
NECA2	Lamiaceae	<i>Nepeta cataria</i>	catnip	Introduced
OENOT	Onagraceae	<i>Oenothera</i>	eveningprimrose	Not known
OEBI	Onagraceae	<i>Oenothera biennis</i>	common eveningprimrose	Native
OEVI	Onagraceae	<i>Oenothera villosa</i>	hairy eveningprimrose	Native
OPFR	Cactaceae	<i>Opuntia fragilis</i>	brittle pricklypear	Native
OPPO	Cactaceae	<i>Opuntia polyacantha</i>	plains pricklypear	Native
ORHY	Poaceae	<i>Oryzopsis hymenoides</i>		Native
OXCO	Oxalidaceae	<i>Oxalis corniculata</i>	creeping woodsorrel	Native
OXST	Oxalidaceae	<i>Oxalis stricta</i>	common yellow oxalis	Native
PACA6	Poaceae	<i>Panicum capillare</i>	witchgrass	Native
PAVI2	Poaceae	<i>Panicum virgatum</i>	switchgrass	Native
PAPE5	Urticaceae	<i>Parietaria pensylvanica</i>	Pennsylvania pellitory	Native
PAQU2	Vitaceae	<i>Parthenocissus quinquefolia</i>	Virginia creeper	Native
PASM	Poaceae	<i>Pascopyrum smithii</i>	western wheatgrass	Native
PHAR3	Poaceae	<i>Phalaris arundinacea</i>	reed canarygrass	Native
PHPR3	Poaceae	<i>Phleum pratense</i>	timothy	Introduced
PHLO4	Solanaceae	<i>Physalis longifolia</i>	longleaf groundcherry	Native
POPR	Poaceae	<i>Poa pratensis</i>	Kentucky bluegrass	Native and Introduced
POAM8	Polygonaceae	<i>Polygonum amphibium</i>	water knotweed	Native
POCO10	Polygonaceae	<i>Polygonum convolvulus</i>	black bindweed	Introduced
POPE2	Polygonaceae	<i>Polygonum pensylvanicum</i>	Pennsylvania smartweed	Native
POPU5	Polygonaceae	<i>Polygonum punctatum</i>	dotted smartweed	Native
PORA3	Polygonaceae	<i>Polygonum ramosissimum</i>	bushy knotweed	Native
POSA5	Polygonaceae	<i>Polygonum sagittatum</i>	arrowleaf tearthumb	Native
PODE3	Salicaceae	<i>Populus deltoides</i>	eastern cottonwood	Native
POOL	Portulacaceae	<i>Portulaca oleracea</i>	little hogweed	Native
PONO3	Rosaceae	<i>Potentilla norvegica</i>	Norwegian cinquefoil	Native
PRAM	Rosaceae	<i>Prunus americana</i>	American plum	Native

PRVI	Rosaceae	<i>Prunus virginiana</i>	common chokecherry	Native
PSTE3	Fabaceae	<i>Psoralea tenuiflora</i>		Native
PSTE5	Fabaceae	<i>Psoralea tenuiflora</i>	slimflower scurfpea	Native
RAMA2	Ranunculaceae	<i>Ranunculus macounii</i>	Macoun's buttercup	Native
REFL	Poaceae	<i>Redfieldia flexuosa</i>	blowout grass	Native
RIOD	Grossulariaceae	<i>Ribes odoratum</i>		Native
ROTR3	Brassicaceae	<i>Rorippa truncata</i>		Not known
ROSA5	Rosaceae	<i>Rosa</i>	rose	Not known
ROAR3	Rosaceae	<i>Rosa arkansana</i>	prairie rose	Native
RUAL4	Polygonaceae	<i>Rumex altissimus</i>	pale dock	Native
RUCR	Polygonaceae	<i>Rumex crispus</i>	curly dock	Introduced
SACU	Alismataceae	<i>Sagittaria cuneata</i>	arumleaf arrowhead	Native
SAAM2	Salicaceae	<i>Salix amygdaloides</i>	peachleaf willow	Native
SAEX	Salicaceae	<i>Salix exigua</i>	sandbar willow	Native
SAFR	Salicaceae	<i>Salix fragilis</i>	crack willow	Introduced
SALU2	Salicaceae	<i>Salix lutea</i>	yellow willow	Native
SCAC	Cyperaceae	<i>Scirpus acutus</i>		Native
SCAT2	Cyperaceae	<i>Scirpus atrovirens</i>	green bulrush	Native
SCFL	Cyperaceae	<i>Scirpus fluviatilis</i>		Native
SCGA	Lamiaceae	<i>Scutellaria galericulata</i>	marsh skullcap	Native
SCLA2	Lamiaceae	<i>Scutellaria lateriflora</i>	blue skullcap	Native
SESP3	Asteraceae	<i>Senecio spartioides</i>	broom groundsel	Native
SMST	Liliaceae	<i>Smilacina stellata</i>		Native
SONI4	Solanaceae	<i>Solanum nigrum</i>		Native
SOGI	Asteraceae	<i>Solidago gigantea</i>	giant goldenrod	Native
SOSP2	Asteraceae	<i>Solidago speciosa</i>	showy goldenrod	Native
SOUL5	Asteraceae	<i>Sonchus uliginosus</i>		Introduced
SPEU	Sparganiaceae	<i>Sparganium eurycarpum</i>	broadfruit burreed	Native
SPGR	Poaceae	<i>Spartina gracilis</i>	alkali cordgrass	Native
SPPE	Poaceae	<i>Spartina pectinata</i>	prairie cordgrass	Native
SPCR	Poaceae	<i>Sporobolus cryptandrus</i>	sand dropseed	Native
STPA	Lamiaceae	<i>Stachys palustris</i>	marsh hedgenettle	Native
STCO4	Poaceae	<i>Stipa comata</i>		Native
SYAL	Caprifoliaceae	<i>Symphoricarpos albus</i>	common snowberry	Native
SYOC	Caprifoliaceae	<i>Symphoricarpos occidentalis</i>	western snowberry	Native
TAOF	Asteraceae	<i>Taraxacum officinale</i>	common dandelion	Native and Introduced
TECA3	Lamiaceae	<i>Teucrium canadense</i>	Canada germander	Native
THIN	Brassicaceae	<i>Thelypodium integrifolium</i>	entireleaved thelypody	Native
TORY	Anacardiaceae	<i>Toxicodendron rydbergii</i>	western poison ivy	Native
TRDU	Asteraceae	<i>Tragopogon dubius</i>	yellow salsify	Introduced
TRFR	Clusiaceae	<i>Triadenum fraseri</i>	Fraser's marsh St. Johnswort	Native
TYAN	Typhaceae	<i>Typha angustifolia</i>	narrowleaf cattail	Introduced
TYLA	Typhaceae	<i>Typha latifolia</i>	broadleaf cattail	Native
ULPU	Ulmaceae	<i>Ulmus pumila</i>	Siberian elm	Introduced
URDI	Urticaceae	<i>Urtica dioica</i>	stinging nettle	Native and Introduced
VEST	Verbenaceae	<i>Verbena stricta</i>	hoary verbena	Native
VINE	Violaceae	<i>Viola nephrophylla</i>		Native
VIVU	Vitaceae	<i>Vitis vulpina</i>	frost grape	Native
XAST	Asteraceae	<i>Xanthium strumarium</i>	rough cocklebur	Native

Appendix 2. Non-native species list.

NRCS Code	Family	Scientific Name	Common Name	Origin
AGCR	Poaceae	<i>Agropyron cristatum</i>	crested wheatgrass	Introduced
AMRE	Amaranthaceae	<i>Amaranthus retroflexus</i>	redroot amaranth	Introduced
ARBI2	Asteraceae	<i>Artemisia biennis</i>	biennial wormwood	Native and Introduced
ARM12	Asteraceae	<i>Arctium minus</i>	lesser burdock	Introduced
BRIN2	Poaceae	<i>Bromus inermis</i>	smooth brome	Introduced
BRTE	Poaceae	<i>Bromus tectorum</i>	cheatgrass	Introduced
CHAL7	Chenopodiaceae	<i>Chenopodium album</i>	lambsquarters	Native and Introduced
CIAR4	Asteraceae	<i>Cirsium arvense</i>	Canadian thistle	Introduced
ECCR	Poaceae	<i>Echinochloa crus-galli</i>	barnyardgrass	Introduced
ELRE3	Poaceae	<i>Elytrigia repens</i>	creeping quackgrass	Introduced
HULU	Cannabaceae	<i>Humulus lupulus</i>	common hop	Native and Introduced
KOSC	Chenopodiaceae	<i>Kochia scoparia</i>	common kochia	Introduced
LASE	Asteraceae	<i>Lactuca serriola</i>	prickly lettuce	Introduced
MEAL2	Fabaceae	<i>Melilotus albus</i>		Introduced
MEOF	Fabaceae	<i>Melilotus officinalis</i>	yellow sweetclover	Introduced
NECA2	Lamiaceae	<i>Nepeta cataria</i>	catnip	Introduced
PHPR3	Poaceae	<i>Phleum pratense</i>	timothy	Introduced
POCO10	Polygonaceae	<i>Polygonum convolvulus</i>	black bindweed	Introduced
POPR	Poaceae	<i>Poa pratensis</i>	Kentucky bluegrass	Native and Introduced
RUCR	Polygonaceae	<i>Rumex crispus</i>	curly dock	Introduced
SAFR	Salicaceae	<i>Salix fragilis</i>	crack willow	Introduced
SOUL5	Asteraceae	<i>Sonchus uliginosus</i>		Introduced
TAOF	Asteraceae	<i>Taraxacum officinale</i>	common dandelion	Native and Introduced
TRDU	Asteraceae	<i>Tragopogon dubius</i>	yellow salsify	Introduced
TYAN	Typhaceae	<i>Typha angustifolia</i>	narrowleaf cattail	Introduced
ULPU	Ulmaceae	<i>Ulmus pumila</i>	Siberian elm	Introduced
URDI	Urticaceae	<i>Urtica dioica</i>	stinging nettle	Native and Introduced

Appendix 3. Plot Location

Plot Name	Date Sampled	GPS Region	GPS Easting	GPS Northing
frb19	8/27/2002	14t	287144	4773347
upgra15	8/28/2002	14t	290207	4775335
meisshrub20	8/28/2002	14t	289033	4772827
meisshrub3	8/28/2002	14t	289613	4774961
upgra16	8/28/2002	14t	289936	4775179
upshrub16	8/29/2002	14t	288725	4775053
meswood26	8/29/2002	14t	290120	4772482
sand8	8/29/2002	14t	288194	4772046
meswood29	8/29/2002	14t	286325	4771896
dog18	8/29/2002	14t	287046	4775215
megra1	8/29/2002	14t	283424	4773283
upgra29	8/29/2002	14t	283662	4772882
mesgra3	8/30/2002	14t	293954	4778292
herb5	8/30/2002	14t	294153	4778900
dog0	9/1/2002	14t	293139	4780690
dog12	9/1/2002	14t	291917	4777923
megra2	9/1/2002	14t	288175	4774607
sand12	8/30/2002	14t	281297	4771691
upgra3	9/1/2002	14t	292896	4780339
herb12	9/1/2002	14t	294640	4776040
meswood2	9/1/2002	14t	295074	4779831
train1	9/1/2002	14t	293201	4779991
upshrub11	9/1/2002	14n	295385	4779073
upshrub3	9/1/2002	14n	295139	4780684
sand5	8/30/2002	14t	282566	4772467
frb11	9/2/2002	14t	291201	4773399
frb4	9/2/2002	14t	293040	4775161
herbwet24	9/2/2002	14t	288403	4774340
mesicshrub25	9/2/2002	14t	286133	4771643
train2	9/2/2002	14t	292920	4779634
train3	9/2/2002	14t	293014	4779762
train4	9/2/2002	14t	282889	4772474
train5	9/2/2002	14t	283012	4772227
train6	9/2/2002	14t	282989	4772163
forb ab	9/3/2002	14t	284754	4772724
forb c	9/3/2002	14t	292519	4775257
meswooda	9/3/2002	14t	291403	4775384
messhruba	9/3/2002	14t	294095	4777752

Appendix 4. The number of species identified at each plot at the Lacreek National Wildlife Refuge, SD. The mean and standard error in parentheses are included.

Vegetation Type	Plot Name	Number of Species	Number of Native Species	Number of Non-native species
Prairie Dog	dog0	26	18	8
Prairie Dog	dog12	19	11	8
Prairie Dog	dog18	27	23	4
Forbland	forbab	37	30	7
Forbland	forbc	15	15	0
Forbland	frb11	16	12	4
Forbland	frb19	42	23	19
Forbland	Frb4	22	19	2
Herbaceous	herb12	7	7	0
Herbaceous	herb5	18	13	4
Herbaceous	Herbwet24	25	22	3
Mesic Grassland	Megra1	23	20	3
Mesic Grassland	Megra2	41	22	19
Mesic Grassland	Mesgra3	12	8	4
Mesic Shrubland	Meisshrub20	42	40	2
Mesic Shrubland	Meisshrub3	52	40	12
Mesic Shrubland	Mesicshrub25	27	21	6
Mesic Shrubland	Messhruba	29	19	6
Mesic Woodland	Mewood2	34	32	2
Mesic Woodland	Meswood26	33	32	1
Mesic Woodland	Meswood29	24	14	10
Mesic Woodland	meswooda	53	35	18
Sandhills	Sand12	35	34	1
Sandhills	Sand5	30	30	0
Sandhills	Sand8	29	24	5
Upland Grassland	Train1	24	13	11
Upland Grassland	Train2	19	10	8
Upland Grassland	Train3	28	19	9
Sandhills	Train4	28	13	14
Sandhills	Train5	37	29	7
Sandhills	Train6	36	32	3
Upland Grassland	Upgra15	20	13	7
Upland Grassland	Upgra16	18	13	5
Upland Grassland	Upgra29	15	11	4
Upland Grassland	Upgra3	16	8	8
Upland Shrubland	Upshrub11	20	5	6
Upland Shrubland	Upshrub16	37	19	18
Upland Shrubland	Upshrub3	21	11	7
Mean (Standard Error)		27.3 (1.71)	20 (1.55)	6 (0.87)

Appendix 5. Plot Data.

Vegetation Type (PHYS)	Plot Name	Subplot Name	NRCS Code	Name	Cover	Height	Origin
forbland	frb19	30° quad	ciar4	<i>cirsium arvense</i> , canadian thistle	14	20	Introduced
forbland	frb19	30° quad	taof	<i>taraxacum officinale</i> , common dandelion	3	5	Native and Introduced
forbland	frb19	30° quad	lase	<i>lactuca serriola</i> , prickly lettuce	1	28	Introduced
forbland	frb19	30° quad	elre3	<i>elytrigia repens</i> , creeping quackgrass	55	26	Introduced
forbland	frb19	30° quad	popr	<i>poa pratensis</i> , kentucky bluegrass	12	25	Native and Introduced
forbland	frb19	30° quad	soul5	<i>sonchus uliginosus</i>	15	22	Introduced
forbland	frb19	30° quad	asfa2	<i>aster falcatus</i> , cluster aster	1	18	Native
forbland	frb19	150° quad	elre3	<i>elytrigia repens</i> , creeping quackgrass	85	48	Introduced
forbland	frb19	150° quad	popr	<i>poa pratensis</i> , kentucky bluegrass	9	22	Native and Introduced
forbland	frb19	150° quad	ciar4	<i>cirsium arvense</i> , canadian thistle	3	42	Introduced
forbland	frb19	150° quad	depi	<i>descurainia pinnata</i> , western tansymustard	0.5	80	Native
forbland	frb19	270° quad	elre3	<i>elytrigia repens</i> , creeping quackgrass	7	50	Introduced
forbland	frb19	270° quad	popr	<i>poa pratensis</i> , kentucky bluegrass	30	28	Native and Introduced
forbland	frb19	270° quad	ciar4	<i>cirsium arvense</i> , canadian thistle	13	16	Introduced
forbland	frb19	270° quad	rucr	<i>rumex crispus</i> , curly dock	1	5	Introduced
forbland	frb19	Search	pono3	<i>potentilla norvegica</i> , norwegian cinquefoil			Native
forbland	frb19	Search	hetu	<i>helianthus tuberosus</i> , jerusalem artichoke			Native
forbland	frb19	Search	phpr3	<i>phleum pratense</i> , timothy			Introduced
forbland	frb19	Search	trdu	<i>tragopogon dubius</i> , yellow salsify			Introduced
forbland	frb19	Search	assp	<i>asclepias speciosa</i> , showy milkweed			Native
forbland	frb19	Search	meal2	<i>melilotus albus</i>			Introduced
forbland	frb19	Search	hean3	<i>helianthus annuus</i> , common sunflower			Native
forbland	frb19	Search	agst2	<i>agrostis stolonifera</i> , creeping bentgrass			Native
forbland	frb19	Search	coca5	<i>conyza canadensis</i> , canadian horseweed			Native
forbland	frb19	Search	chal7	<i>chenopodium album</i> , lambsquarters			Native and Introduced
forbland	frb19	Search	oebi	<i>oenothera biennis</i> , common eveningprimrose			Native
forbland	frb19	Search	cala30	<i>carex lanuginosa</i> , woolly sedge			Native
forbland	frb19	Search	amfr	<i>amorpha fruticosa</i> , desert indigobush			Native

forbland	frb19	Search	pope2	polygonum pensylvanicum, pennsylvania smartweed			Native
forbland	frb19	Search	sogi	solidago gigantea, giant goldenrod			Native
forbland	frb19	Search	bifr	bidens frondosa, devil's beggartick			Native
forbland	frb19	Search	bice	bidens cernua, nodding beggartick			Native
forbland	frb19	Search	caca4	calamagrostis canadensis, bluejoint			Native
forbland	frb19	Search	caap2	campanula aparinoides, marsh bellflower			Native
forbland	frb19	Search	oxst	oxalis stricta, common yellow oxalis			Native
forbland	frb19	Search	mear4	mentha arvensis, wild mint			Native
forbland	frb19	Search	poco10	polygonum convolvulus, black bindweed			Introduced
forbland	frb19	Search	lyam	lycopus americanus, american waterhorehound			Native
forbland	frb19	Search	eccr	echinochloa crus-galli, barnyardgrass			Introduced
forbland	frb19	Search	euma6	eupatorium maculatum, spotted joeypyweed			Native
forbland	frb19	Search	sacu	sagittaria cuneata, arumleaf arrowhead			Native
forbland	frb19	Search	deca7	desmodium canadense, showy ticktrefoil			Native
uplandgrassland	upgra15	30° quad	agcr	agropyron cristatum, crested wheatgrass	60	15	Introduced
uplandgrassland	upgra15	30° quad	chma15	chamaesyce maculata, spotted sandmat	0.5	1	Native
uplandgrassland	upgra15	150° quad	agcr	agropyron cristatum, crested wheatgrass	75	15	Introduced
uplandgrassland	upgra15	150° quad	mili3	mirabilis linearis, narrowleaf four o'clock	1	20	Native
uplandgrassland	upgra15	270° quad	agcr	agropyron cristatum, crested wheatgrass	40	15	Introduced
uplandgrassland	upgra15	270° quad	spr	sporobolus cryptandrus, sand dropseed	5	15	Native
uplandgrassland	upgra15	Search	agcr	agropyron cristatum, crested wheatgrass			Introduced
uplandgrassland	upgra15	Search	chma15	chamaesyce maculata, spotted sandmat			Native
uplandgrassland	upgra15	Search	mili3	mirabilis linearis, narrowleaf four o'clock			Native
uplandgrassland	upgra15	Search	spr	sporobolus cryptandrus, sand dropseed			Native
uplandgrassland	upgra15	Search	asfa2	aster falcatus, cluster aster			Native
uplandgrassland	upgra15	Search	pste3	psoralea tenuiflora			Native
uplandgrassland	upgra15	Search	sosp2	solidago speciosa, showy goldenrod			Native
uplandgrassland	upgra15	Search	poco10	polygonum convolvulus, black bindweed			Introduced
uplandgrassland	upgra15	Search	amal	amaranthus albus, prostrate pigweed			Native
uplandgrassland	upgra15	Search	taof	taraxacum officinale, common dandelion			Native and Introduced
uplandgrassland	upgra15	Search	meof	melilotus officinalis, yellow sweetclover			Introduced
uplandgrassland	upgra15	Search	mili3	mirabilis linearis, narrowleaf four o'clock			Native

uplandgrassland	upgra15	Search	capr5	carex praegracilis, clustered field sedge			Native
uplandgrassland	upgra15	Search	aser2	asclepias erosa, desert milkweed			Native
mesicshrub	meisshrub20	30° quad	salu2	salix lutea, yellow willow	30	120	Native
mesicshrub	meisshrub20	30° quad	caca4	calamagrostis canadensis, bluejoint	35	56	Native
mesicshrub	meisshrub20	30° quad	sacu	sagittaria cuneata, arumleaf arrowhead	45	45	Native
mesicshrub	meisshrub20	30° quad	lyth2	lysimachia thyrsoflora, tufted loosestrife	30	40	Native
mesicshrub	meisshrub20	30° quad	cyfr2	cystopteris fragilis, brittle bladderfern	20	34	Native
mesicshrub	meisshrub20	30° quad	lyam	lycopus americanus, american waterhorehound	2	32	Native
mesicshrub	meisshrub20	30° quad	scfl	scirpus fluviatilis	7	62	Native
mesicshrub	meisshrub20	150° quad	caca4	calamagrostis canadensis, bluejoint	80	54	Native
mesicshrub	meisshrub20	150° quad	tyla	typha latifolia, broadleaf cattail	7	180	Native
mesicshrub	meisshrub20	150° quad	sacu	sagittaria cuneata, arumleaf arrowhead	90	54	Native
mesicshrub	meisshrub20	150° quad	cyfr2	cystopteris fragilis, brittle bladderfern	8	30	Native
mesicshrub	meisshrub20	150° quad	rucr	rumex crispus, curly dock	6	60	Introduced
mesicshrub	meisshrub20	150° quad	posa5	polygonum sagittatum, arrowleaf tearthumb	4	48	Native
mesicshrub	meisshrub20	150° quad	gatr2	galium trifidum, threepetal bedstraw	0.5	5	Native
mesicshrub	meisshrub20	270° quad	salu2	salix lutea, yellow willow	12	140	Native
mesicshrub	meisshrub20	270° quad	sogi	solidago gigantea, giant goldenrod	50	65	Native
mesicshrub	meisshrub20	270° quad	lyam	lycopus americanus, american waterhorehound	4	30	Native
mesicshrub	meisshrub20	270° quad	lyth2	lysimachia thyrsoflora, tufted loosestrife	8	28	Native
mesicshrub	meisshrub20	270° quad	caca4	calamagrostis canadensis, bluejoint	8	48	Native
mesicshrub	meisshrub20	270° quad	mear4	mentha arvensis, wild mint	6	35	Native
mesicshrub	meisshrub20	270° quad	tory	toxicodendron rydbergii, western poison ivy	15	28	Native
mesicshrub	meisshrub20	270° quad	paqu2	parthenocissus quinquefolia, virginia creeper	5	30	Native
mesicshrub	meisshrub20	270° quad	posa5	polygonum sagittatum, arrowleaf tearthumb	12	40	Native
mesicshrub	meisshrub20	270° quad	trfr	triadenum fraseri, fraser's marsh st. johnswort	2	30	Native
mesicshrub	meisshrub20	270° quad	tyla	typha latifolia, broadleaf cattail	4	120	Native
mesicshrub	meisshrub20	270° quad	sacu	sagittaria cuneata, arumleaf arrowhead	5	35	Native
mesicshrub	meisshrub20	270° quad	scga	scutellaria galericulata, marsh skullcap	1	35	Native
mesicshrub	meisshrub20	270° quad	cyfr2	cystopteris fragilis, brittle bladderfern	7	30	Native
mesicshrub	meisshrub20	270° quad	imca	impatiens capensis, jewelweed	0.5	25	Native
mesicshrub	meisshrub20	Search	euma6	eupatorium maculatum, spotted joepeyweed			Native
mesicshrub	meisshrub20	Search	popu5	polygonum punctatum, dotted smartweed			Native
mesicshrub	meisshrub20	Search	caap2	campanula aparinoides, marsh bellflower			Native

mesicshrub	meisshrub20	Search	epci	epilobium ciliatum, hairy willowherb			Native
mesicshrub	meisshrub20	Search	stpa	stachys palustris, marsh hedgenettle			Native
mesicshrub	meisshrub20	Search	scla2	scutellaria lateriflora, blue skullcap			Native
mesicshrub	meisshrub20	Search	mura	muhlenbergia racemosa, marsh muhly			Native
mesicshrub	meisshrub20	Search	vest	verbena stricta, hoary verbena			Native
mesicshrub	meisshrub20	Search	hetu	helianthus tuberosus, jerusalem artichoke			Native
mesicshrub	meisshrub20	Search	rual4	rumex altissimus, pale dock			Native
mesicshrub	meisshrub20	Search	asju	aster junciformis			Native
mesicshrub	meisshrub20	Search	ciar4	cirsium arvense, canadian thistle			Introduced
mesicshrub	meisshrub20	Search	leor	leersia oryzoides, rice cutgrass			Native
mesicshrub	meisshrub3	30° quad	scfl	scirpus fluviatilis	15	105	Native
mesicshrub	meisshrub3	30° quad	scac	scirpus acutus	1	60	Native
mesicshrub	meisshrub3	150° quad	saam2	salix amygdaloides, peachleaf willow	70	210	Native
mesicshrub	meisshrub3	150° quad	soul5	sonchus uliginosus	6	55	Introduced
mesicshrub	meisshrub3	150° quad	ciar4	cirsium arvense, canadian thistle	20	38	Introduced
mesicshrub	meisshrub3	150° quad	spgr	spartina gracilis, alkali cordgrass	90	60	Native
mesicshrub	meisshrub3	150° quad	mura	muhlenbergia racemosa, marsh muhly	2	18	Native
mesicshrub	meisshrub3	150° quad	popr	poa pratensis, kentucky bluegrass	8	12	Native and Introduced
mesicshrub	meisshrub3	150° quad	meof	melilotus officinalis, yellow sweetclover	0.5	10	Introduced
mesicshrub	meisshrub3	150° quad	lyth2	lysimachia thyrsoflora, tufted loosestrife	2	15	Native
mesicshrub	meisshrub3	270° quad	saam2	salix amygdaloides, peachleaf willow	90	230	Native
mesicshrub	meisshrub3	270° quad	saex	salix exigua, sandbar willow	20	110	Native
mesicshrub	meisshrub3	270° quad	spgr	spartina gracilis, alkali cordgrass	12	40	Native
mesicshrub	meisshrub3	270° quad	asfa2	aster falcatus, cluster aster	0.5	8	Native
mesicshrub	meisshrub3	270° quad	soul5	sonchus uliginosus	6	12	Introduced
mesicshrub	meisshrub3	270° quad	amfr	amorpha fruticosa, desert indigobush	0.5	2	Native
mesicshrub	meisshrub3	Search	asfa2	aster falcatus, cluster aster			Native
mesicshrub	meisshrub3	Search	ciar4	cirsium arvense, canadian thistle			Introduced
mesicshrub	meisshrub3	Search	lyth2	lysimachia thyrsoflora, tufted loosestrife			Native
mesicshrub	meisshrub3	Search	meof	melilotus officinalis, yellow sweetclover			Introduced
mesicshrub	meisshrub3	Search	mura	muhlenbergia racemosa, marsh muhly			Native
mesicshrub	meisshrub3	Search	popr	poa pratensis, kentucky bluegrass			Native and Introduced

mesicshrub	meisshrub3	Search	amfr	amorpha fruticosa, desert indigobush			Native
mesicshrub	meisshrub3	Search	saex	salix exigua, sandbar willow			Native
mesicshrub	meisshrub3	Search	scac	scirpus acutus			Native
mesicshrub	meisshrub3	Search	scfl	scirpus fluviatilis			Native
mesicshrub	meisshrub3	Search	saam2	salix amygdaloides, peachleaf willow			Native
mesicshrub	meisshrub3	Search	soul5	sonchus uliginosus			Introduced
mesicshrub	meisshrub3	Search	spgr	spartina gracilis, alkali cordgrass			Native
mesicshrub	meisshrub3	Search	capr7	carex praticola, meadow sedge			Native
mesicshrub	meisshrub3	Search	pape5	parietaria pensylvanica, pennsylvania pellitory			Native
mesicshrub	meisshrub3	Search	sogi	solidago gigantea, giant goldenrod			Native
mesicshrub	meisshrub3	Search	lyam	lycopus americanus, american waterhorehound			Native
mesicshrub	meisshrub3	Search	pode3	populus deltoides, eastern cottonwood			Native
mesicshrub	meisshrub3	Search	stpa	stachys palustris, marsh hedgenettle			Native
mesicshrub	meisshrub3	Search	tyla	typha latifolia, broadleaf cattail			Native
mesicshrub	meisshrub3	Search	speu	sparganium eurycarpum, broadfruit burreed			Native
mesicshrub	meisshrub3	Search	mear4	mentha arvensis, wild mint			Native
mesicshrub	meisshrub3	Search	casa8	carex sartwellii, sartwell's sedge			Native
mesicshrub	meisshrub3	Search	agcr	agropyron cristatum, crested wheatgrass			Introduced
mesicshrub	meisshrub3	Search	disp	distichlis spicata, inland saltgrass			Native
mesicshrub	meisshrub3	Search	brin2	bromus inermis, smooth brome			Introduced
mesicshrub	meisshrub3	Search	pasm	pascopyrum smithii, western wheatgrass			Native
mesicshrub	meisshrub3	Search	assp	asclepias speciosa, showy milkweed			Native
mesicshrub	meisshrub3	Search	elca4	elymus canadensis, canada wildrye			Native
mesicshrub	meisshrub3	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
mesicshrub	meisshrub3	Search	urdi	urtica dioica, stinging nettle			Native and Introduced
mesicshrub	meisshrub3	Search	scla2	scutellaria lateriflora, blue skullcap			Native
mesicshrub	meisshrub3	Search	vest	verbena stricta, hoary verbena			Native
mesicshrub	meisshrub3	Search	gll3	glycyrrhiza lepidota, american licorice			Native
mesicshrub	meisshrub3	Search	salu2	salix lutea, yellow willow			Native
uplandgrassland	upgra16	30° quad	agcr	agropyron cristatum, crested wheatgrass	45	20	Introduced
uplandgrassland	upgra16	30° quad	lyju	lygodesmia juncea, rush skeletonplant	1	22	Native
uplandgrassland	upgra16	30° quad	capr5	carex praegracilis, clustered field sedge	5	6	Native
uplandgrassland	upgra16	30° quad	chma15	chamaesyce maculata, spotted sandmat	0.5	4	Native

uplandgrassland	upgra16	150° quad	agcr	agropyron cristatum, crested wheatgrass	38	22	Introduced
uplandgrassland	upgra16	150° quad	pste5	psoralidium tenuiflorum, slimflower scurfpea	6	23	Native
uplandgrassland	upgra16	150° quad	lyju	lygodesmia juncea, rush skeletonplant	1	23	Native
uplandgrassland	upgra16	270° quad	agcr	agropyron cristatum, crested wheatgrass	50	25	Introduced
uplandgrassland	upgra16	270° quad	capr5	carex praegracilis, clustered field sedge	1	5	Native
uplandgrassland	upgra16	Search	meof	melilotus officinalis, yellow sweetclover			Introduced
uplandgrassland	upgra16	Search	asfa2	aster falcatus, cluster aster			Native
uplandgrassland	upgra16	Search	amre	amaranthus retroflexus, redroot amaranth			Introduced
uplandgrassland	upgra16	Search	mili3	mirabilis linearis, narrowleaf four o'clock			Native
uplandgrassland	upgra16	Search	pool	portulaca oleracea, little hogweed			Native
uplandgrassland	upgra16	Search	amal	amaranthus albus, prostrate pigweed			Native
uplandgrassland	upgra16	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
uplandgrassland	upgra16	Search	assp	asclepias speciosa, showy milkweed			Native
uplandgrassland	upgra16	Search	vest	verbena stricta, hoary verbena			Native
uplandshrub	upshrub16	30° quad	syoc	symphoricarpos occidentalis, western snowberry	40	38	Native
uplandshrub	upshrub16	30° quad	brin2	bromus inermis, smooth brome	60	28	Introduced
uplandshrub	upshrub16	30° quad	hetu	helianthus tuberosus, jerusalem artichoke	40	25	Native
uplandshrub	upshrub16	30° quad	prvi	prunus virginiana, common chokecherry	2	22	Native
uplandshrub	upshrub16	30° quad	pram	prunus americana, american plum	4	26	Native
uplandshrub	upshrub16	30° quad	hulu	humulus lupulus, common hop	2	24	Native and Introduced
uplandshrub	upshrub16	150° quad	syoc	symphoricarpos occidentalis, western snowberry	20	48	Native
uplandshrub	upshrub16	150° quad	roar3	rosa arkansana, prairie rose	6	50	Native
uplandshrub	upshrub16	150° quad	tory	toxicodendron rydbergii, western poison ivy	12	23	Native
uplandshrub	upshrub16	150° quad	popr	poa pratensis, kentucky bluegrass	54	23	Native and Introduced
uplandshrub	upshrub16	150° quad	hulu	humulus lupulus, common hop	6	19	Native and Introduced
uplandshrub	upshrub16	150° quad	ciar4	cirsium arvense, canadian thistle	8	32	Introduced
uplandshrub	upshrub16	150° quad	cala30	carex lanuginosa, woolly sedge	1	29	Native
uplandshrub	upshrub16	270° quad	syoc	symphoricarpos occidentalis, western snowberry	15	46	Native
uplandshrub	upshrub16	270° quad	popr	poa pratensis, kentucky bluegrass	52	23	Native and Introduced
uplandshrub	upshrub16	270° quad	pasm	pascopyrum smithii, western wheatgrass	5	28	Native
uplandshrub	upshrub16	270° quad	ciar4	cirsium arvense, canadian thistle	10	33	Introduced

uplandshrub	upshrub16	270° quad	soul5	sonchus uliginosus	0.5	5	Introduced
uplandshrub	upshrub16	270° quad	chal7	chenopodium album, lambsquarters	1	18	Native and Introduced
uplandshrub	upshrub16	270° quad	eltr7	elymus trachycaulus, slender wheatgrass	2	30	Native
uplandshrub	upshrub16	Search	assp	asclepias speciosa, showy milkweed			Native
uplandshrub	upshrub16	Search	disp	distichlis spicata, inland saltgrass			Native
uplandshrub	upshrub16	Search	brin2	bromus inermis, smooth brome			Introduced
uplandshrub	upshrub16	Search	agcr	agropyron cristatum, crested wheatgrass			Introduced
uplandshrub	upshrub16	Search	lase	lactuca serriola, prickly lettuce			Introduced
uplandshrub	upshrub16	Search	gll3	glycyrrhiza lepidota, american licorice			Native
uplandshrub	upshrub16	Search	riod	ribes odoratum			Native
uplandshrub	upshrub16	Search	poam8	polygonum amphibium, water knotweed			Native
uplandshrub	upshrub16	Search	armi2	arctium minus, lesser burdock			Introduced
uplandshrub	upshrub16	Search	urdi	urtica dioica, stinging nettle			Native and Introduced
uplandshrub	upshrub16	Search	neca2	nepeta cataria, catnip			Introduced
uplandshrub	upshrub16	Search	spgr	spartina gracilis, alkali cordgrass			Native
uplandshrub	upshrub16	Search	meal2	melilotus albus			Introduced
uplandshrub	upshrub16	Search	phlo4	physalis longifolia, longleaf groundcherry			Native
uplandshrub	upshrub16	Search	meof	melilotus officinalis, yellow sweetclover			Introduced
uplandshrub	upshrub16	Search	rucr	rumex crispus, curly dock			Introduced
uplandshrub	upshrub16	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
mesicwoodland	meswood26	30° quad	caca4	calamagrostis canadensis, bluejoint	95	45	Native
mesicwoodland	meswood26	30° quad	capr7	carex praticola, meadow sedge	5	30	Native
mesicwoodland	meswood26	30° quad	saam2	salix amygdaloides, peachleaf willow	100	800	Native
mesicwoodland	meswood26	30° quad	imca	impatiens capensis, jewelweed	0.5	10	Native
mesicwoodland	meswood26	150° quad	cast5	carex stipata, owlfruit sedge	15	45	Native
mesicwoodland	meswood26	150° quad	caca4	calamagrostis canadensis, bluejoint	50	40	Native
mesicwoodland	meswood26	150° quad	capr7	carex praticola, meadow sedge	8	28	Native
mesicwoodland	meswood26	150° quad	imca	impatiens capensis, jewelweed	16	43	Native
mesicwoodland	meswood26	150° quad	posa5	polygonum sagittatum, arrowleaf tearthumb	3	34	Native
mesicwoodland	meswood26	150° quad	leor	leersia oryzoides, rice cutgrass	0.5	8	Native
mesicwoodland	meswood26	150° quad	speu	sparganium eurycarpum, broadfruit burreed	1	50	Native
mesicwoodland	meswood26	150° quad	mear4	mentha arvensis, wild mint	2	12	Native

mesicwoodland	meswood26	150° quad	mura	muhlenbergia racemosa, marsh muhly	1	20	Native
mesicwoodland	meswood26	270° quad	caca4	calamagrostis canadensis, bluejoint	90	35	Native
mesicwoodland	meswood26	270° quad	imca	impatiens capensis, jewelweed	14	34	Native
mesicwoodland	meswood26	270° quad	saam2	salix amygdaloides, peachleaf willow	80	1500	Native
mesicwoodland	meswood26	270° quad	capr7	carex praticola, meadow sedge	1	30	Native
mesicwoodland	meswood26	Search	scla2	scutellaria lateriflora, blue skullcap			Native
mesicwoodland	meswood26	Search	popu5	polygonum punctatum, dotted smartweed			Native
mesicwoodland	meswood26	Search	rucr	rumex crispus, curly dock			Introduced
mesicwoodland	meswood26	Search	scfl	scirpus fluviatilis			Native
mesicwoodland	meswood26	Search	spgr	spartina gracilis, alkali cordgrass			Native
mesicwoodland	meswood26	Search	lyas	lycopus asper, rough bugleweed			Native
mesicwoodland	meswood26	Search	poam8	polygonum amphibium, water knotweed			Native
mesicwoodland	meswood26	Search	rual4	rumex altissimus, pale dock			Native
mesicwoodland	meswood26	Search	asju	aster junciformis			Native
mesicwoodland	meswood26	Search	cyod	cyperus odoratus, fragrant flatsedge			Native
mesicwoodland	meswood26	Search	agst2	agrostis stolonifera, creeping bentgrass			Native
mesicwoodland	meswood26	Search	lyam	lycopus americanus, american waterhorehound			Native
mesicwoodland	meswood26	Search	coca5	conyza canadensis, canadian horseweed			Native
mesicwoodland	meswood26	Search	xast	xanthium strumarium, rough cocklebur			Native
mesicwoodland	meswood26	Search	cahy4	carex hystericina, bottlebrush sedge			Native
mesicwoodland	meswood26	Search	hetu	helianthus tuberosus, jerusalem artichoke			Native
sandhills	sand8	30° quad	bogr2	bouteloua gracilis, blue grama	6	28	Native
sandhills	sand8	30° quad	stco4	stipa comata	10	45	Native
sandhills	sand8	30° quad	capr5	carex praegracilis, clustered field sedge	2	12	Native
sandhills	sand8	30° quad	spr	sporobolus cryptandrus, sand dropseed	12	40	Native
sandhills	sand8	30° quad	phlo4	physalis longifolia, longleaf groundcherry	3	14	Native
sandhills	sand8	30° quad	arlu	artemisia ludoviciana, louisiana sagewort	1	9	Native
sandhills	sand8	30° quad	kueu	kuhnia eupatorioides, false boneset	6	27	Native
sandhills	sand8	30° quad	elre3	elytrigia repens, creeping quackgrass	2	40	Introduced
sandhills	sand8	150° quad	calo	calamovilfa longifolia, prairie sandreed	20	30	Native
sandhills	sand8	150° quad	bogr2	bouteloua gracilis, blue grama	3	12	Native
sandhills	sand8	150° quad	capr5	carex praegracilis, clustered field sedge	2	10	Native
sandhills	sand8	150° quad	popr	poa pratensis, kentucky bluegrass	1	14	Native and Introduced

sandhills	sand8	150° quad	brte	bromus tectorum, cheatgrass	3	22	Introduced
sandhills	sand8	270° quad	stco4	stipa comata	8	40	Native
sandhills	sand8	270° quad	kueu	kuhnia eupatorioides, false boneset	12	28	Native
sandhills	sand8	270° quad	trdu	tragopogon dubius, yellow salsify	1	21	Introduced
sandhills	sand8	270° quad	bogr2	bouteloua gracilis, blue grama	5	32	Native
sandhills	sand8	270° quad	spr	sporobolus cryptandrus, sand dropseed	7	26	Native
sandhills	sand8	270° quad	capr5	carex praegracilis, clustered field sedge	2	10	Native
sandhills	sand8	270° quad	brte	bromus tectorum, cheatgrass	1	15	Introduced
sandhills	sand8	Search	asfa2	aster falcatus, cluster aster			Native
sandhills	sand8	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
sandhills	sand8	Search	dapu5	dalea purpurea, purple prairieclover			Native
sandhills	sand8	Search	mihi	mirabilis hirsuta, hairy four o'clock			Native
sandhills	sand8	Search	cifl	cirsium flodmanii, flodman's thistle			Native
sandhills	sand8	Search	opfr	opuntia fragilis, brittle pricklypear			Native
sandhills	sand8	Search	diol	dichanthelium oligosanthos, heller's rosette grass			Native
sandhills	sand8	Search	chle4	chenopodium leptophyllum, narrowleaf goosefoot			Native
sandhills	sand8	Search	oppo	opuntia polyacantha, plains pricklypear			Native
mesicwoodland	meswood29	30° quad	brin2	bromus inermis, smooth brome	25	42	Introduced
mesicwoodland	meswood29	150° quad	brin2	bromus inermis, smooth brome	60	46	Introduced
mesicwoodland	meswood29	150° quad	popr	poa pratensis, kentucky bluegrass	4	12	Native and Introduced
mesicwoodland	meswood29	150° quad	ulpu	ulmus pumila, siberian elm	100	1000	Introduced
mesicwoodland	meswood29	150° quad	phlo4	physalis longifolia, longleaf groundcherry	2	12	Native
mesicwoodland	meswood29	150° quad	lase	lactuca serriola, prickly lettuce	0.5	10	Introduced
mesicwoodland	meswood29	270° quad	brin2	bromus inermis, smooth brome	30	45	Introduced
mesicwoodland	meswood29	270° quad	safr	salix fragilis, crack willow	100	1200	Introduced
mesicwoodland	meswood29	Search	ciar4	cirsium arvense, canadian thistle			Introduced
mesicwoodland	meswood29	Search	ceoc	celtis occidentalis, common hackberry			Native
mesicwoodland	meswood29	Search	paqu2	parthenocissus quinquefolia, virginia creeper			Native
mesicwoodland	meswood29	Search	sogi	solidago gigantea, giant goldenrod			Native
mesicwoodland	meswood29	Search	taof	taraxacum officinale, common dandelion			Native and Introduced
mesicwoodland	meswood29	Search	asju	aster junciformis			Native
mesicwoodland	meswood29	Search	imca	impatiens capensis, jewelweed			Native

mesicwoodland	meswood29	Search	lyam	lycopus americanus, american waterhorehound			Native
mesicwoodland	meswood29	Search	mear4	mentha arvensis, wild mint			Native
mesicwoodland	meswood29	Search	chfr3	chenopodium fremontii, fremont's goosefoot			Native
mesicwoodland	meswood29	Search	pape5	parietaria pennsylvanica, pennsylvania pellitory			Native
mesicwoodland	meswood29	Search	frpe	fraxinus pennsylvanica, green ash			Native
mesicwoodland	meswood29	Search	mihi	mirabilis hirsuta, hairy four o`clock			Native
mesicwoodland	meswood29	Search	chli3	chrysothamnus linifolius, spearleaf rabbitbrush			Native
mesicwoodland	meswood29	Search	soul5	sonchus uliginosus			Introduced
mesicwoodland	meswood29	Search	tory	toxicodendron rydbergii, western poison ivy			Native
mesicshrub	meisshrub3	Search	asin	asclepias incarnata, swamp milkweed			Native
dogtowns	dog18	150° quad	arlu	artemisia ludoviciana, louisiana sagewort	1	1	Native
dogtowns	dog18	150° quad	asfa2	aster falcatus, cluster aster	3	1	Native
dogtowns	dog18	150° quad	sosp2	solidago speciosa, showy goldenrod	1	1	Native
dogtowns	dog18	150° quad	disp	distichlis spicata, inland saltgrass	10	3	Native
dogtowns	dog18	150° quad	arlo3	aristida longiseta	3	3	Native
dogtowns	dog18	150° quad	cifl	cirsium flodmanii, flodman's thistle	0.5	1	Native
dogtowns	dog18	270° quad	arlu	artemisia ludoviciana, louisiana sagewort	10	3	Native
dogtowns	dog18	270° quad	asfa2	aster falcatus, cluster aster	10	2	Native
dogtowns	dog18	270° quad	disp	distichlis spicata, inland saltgrass	3	3	Native
dogtowns	dog18	270° quad	capr5	carex praegracilis, clustered field sedge	80	7	Native
dogtowns	dog18	270° quad	navi4	nassella viridula, green needlegrass	5	4	Native
dogtowns	dog18	Search	ciar4	cirsium arvense, canadian thistle			Introduced
dogtowns	dog18	Search	pste3	psoralea tenuiflora			Native
dogtowns	dog18	Search	mili3	mirabilis linearis, narrowleaf four o`clock			Native
dogtowns	dog18	Search	oxco	oxalis corniculata, creeping woodsorrel			Native
dogtowns	dog18	Search	sosp2	solidago speciosa, showy goldenrod			Native
dogtowns	dog18	Search	aspu	asclepias pumila, plains milkweed			Native
dogtowns	dog18	Search	meof	melilotus officinalis, yellow sweetclover			Introduced
dogtowns	dog18	Search	chal7	chenopodium album, lambsquarters			Native and Introduced
dogtowns	dog18	30° quad	lyju	lygodesmia juncea, rush skeletonplant	1	5	Native
dogtowns	dog18	30° quad	arlo3	aristida longiseta	1	1	Native
dogtowns	dog18	30° quad	disp	distichlis spicata, inland saltgrass	100	5	Native
dogtowns	dog18	30° quad	agsm	agropyron smithii	1	5	Native

dogtowns	dog18	30° quad	asfa2	aster falcatus, cluster aster	5	1	Native
dogtowns	dog18	30° quad	arlu	artemisia ludoviciana, louisiana sagewort	1	3	Native
dogtowns	dog18	30° quad	asdr3	astragalus drummondii, drummond's milkvetch	1	1	Native
dogtowns	dog18	30° quad	meal2	melilotus albus	0.5	2	Introduced
mesicgrass	megra1	30° quad	pavi2	panicum virgatum, switchgrass	6	24	Native
mesicgrass	megra1	30° quad	elca4	elymus canadensis, canada wildrye	2	10	Native
mesicgrass	megra1	30° quad	sogi	solidago gigantea, giant goldenrod	5	6	Native
mesicgrass	megra1	30° quad	cysc3	cyperus schweinitzii, schweinitz's flatsedge	30	6	Native
mesicgrass	megra1	150° quad	pavi2	panicum virgatum, switchgrass	15	12	Native
mesicgrass	megra1	150° quad	elca4	elymus canadensis, canada wildrye	2	8	Native
mesicgrass	megra1	150° quad	eqhy	equisetum hyemale, scouringrush horsetail	2	13	Native
mesicgrass	megra1	150° quad	cysc3	cyperus schweinitzii, schweinitz's flatsedge	5	6	Native
mesicgrass	megra1	270° quad	sogi	solidago gigantea, giant goldenrod	10	9	Native
mesicgrass	megra1	270° quad	glla3	glycyrrhiza lepidota, american licorice	15	12	Native
mesicgrass	megra1	270° quad	pavi2	panicum virgatum, switchgrass	60	24	Native
mesicgrass	megra1	270° quad	cysc3	cyperus schweinitzii, schweinitz's flatsedge	5	6	Native
mesicgrass	megra1	Search	chbe4	chenopodium berlandieri, pitseed goosefoot			Native
mesicgrass	megra1	Search	kosc	kochia scoparia, common kochia			Introduced
mesicgrass	megra1	Search	chle4	chenopodium leptophyllum, narrowleaf goosefoot			Native
mesicgrass	megra1	Search	hetu	helianthus tuberosus, jerusalem artichoke			Native
mesicgrass	megra1	Search	hean3	helianthus annuus, common sunflower			Native
mesicgrass	megra1	Search	assp	asclepias speciosa, showy milkweed			Native
mesicgrass	megra1	Search	taof	taraxacum officinale, common dandelion			Native and Introduced
mesicgrass	megra1	Search	poco10	polygonum convolvulus, black bindweed			Introduced
mesicgrass	megra1	Search	vest	verbena stricta, hoary verbena			Native
mesicgrass	megra1	Search	spe	spartina pectinata, prairie cordgrass			Native
mesicgrass	megra1	Search	oevi	oenothera villosa, hairy eveningprimrose			Native
uplandgrassland	upgra29	30° quad	brin2	bromus inermis, smooth brome	60	18	Introduced
uplandgrassland	upgra29	30° quad	poam8	polygonum amphibium, water knotweed	30	16	Native
uplandgrassland	upgra29	150° quad	brin2	bromus inermis, smooth brome	15	20	Introduced
uplandgrassland	upgra29	150° quad	poam8	polygonum amphibium, water knotweed	15	22	Native
uplandgrassland	upgra29	150° quad	eltr7	elymus trachycaulus, slender wheatgrass	1	9	Native
uplandgrassland	upgra29	270° quad	brin2	bromus inermis, smooth brome	25	8	Introduced

uplandgrassland	upgra29	270° quad	poam8	polygonum amphibium, water knotweed	15	9	Native
uplandgrassland	upgra29	270° quad	eltr7	elymus trachycaulus, slender wheatgrass	10	5	Native
uplandgrassland	upgra29	270° quad	cahe5	carex heliophila	2	6	Native
uplandgrassland	upgra29	Search	glle3	glycyrrhiza lepidota, american licorice			Native
uplandgrassland	upgra29	Search	sogi	solidago gigantea, giant goldenrod			Native
uplandgrassland	upgra29	Search	cahe5	carex heliophila			Native
uplandgrassland	upgra29	Search	poam8	polygonum amphibium, water knotweed			Native
uplandgrassland	upgra29	Search	eltr7	elymus trachycaulus, slender wheatgrass			Native
uplandgrassland	upgra29	Search	brin2	bromus inermis, smooth brome			Introduced
mesicgrass	mesgra3	30° quad	disp	distichlis spicata, inland saltgrass	70	22	Native
mesicgrass	mesgra3	30° quad	popr	poa pratensis, kentucky bluegrass	0.5	12	Native and Introduced
mesicgrass	mesgra3	150° quad	disp	distichlis spicata, inland saltgrass	75	24	Native
mesicgrass	mesgra3	150° quad	popr	poa pratensis, kentucky bluegrass	10	16	Native and Introduced
mesicgrass	mesgra3	270° quad	disp	distichlis spicata, inland saltgrass	45	23	Native
mesicgrass	mesgra3	270° quad	chle4	chenopodium leptophyllum, narrowleaf goosefoot	1	18	Native
mesicgrass	mesgra3	270° quad	popr	poa pratensis, kentucky bluegrass	0.5	20	Native and Introduced
mesicgrass	mesgra3	270° quad	pasm	pascopyrum smithii, western wheatgrass	0.5	35	Native
mesicgrass	mesgra3	270° quad	brte	bromus tectorum, cheatgrass	0.5	6	Introduced
mesicgrass	mesgra3	Search	bogr2	bouteloua gracilis, blue grama			Native
mesicgrass	mesgra3	Search	hoju	hordeum jubatum, foxtail barley			Native
mesicgrass	mesgra3	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
herbaceous	herb5	30° quad	urdi	urtica dioica, stinging nettle	80	56	Native and Introduced
herbaceous	herb5	30° quad	tyla	typha latifolia, broadleaf cattail	10	110	Native
herbaceous	herb5	150° quad	urdi	urtica dioica, stinging nettle	65	38	Native and Introduced
herbaceous	herb5	150° quad	tyla	typha latifolia, broadleaf cattail	15	98	Native
herbaceous	herb5	270° quad	urdi	urtica dioica, stinging nettle	80	42	Native and Introduced
herbaceous	herb5	270° quad	tyla	typha latifolia, broadleaf cattail	18	140	Native
herbaceous	herb5	Search	scfl	scirpus fluviatilis			Native
herbaceous	herb5	Search	scla2	scutellaria lateriflora, blue skullcap			Native

herbaceous	herb5	Search	chru	chenopodium rubrum, red goosefoot			Native
herbaceous	herb5	Search	mear4	mentha arvensis, wild mint			Native
herbaceous	herb5	Search	epci	epilobium ciliatum, hairy willowherb			Native
herbaceous	herb5	Search	rotr3	rorippa truncata			Not known
herbaceous	herb5	Search	teca3	teucrium canadense, candad germander			Native
herbaceous	herb5	Search	ciar4	cirsium arvense, canadian thistle			Introduced
herbaceous	herb5	Search	scac	scirpus acutus			Native
herbaceous	herb5	Search	lyas	lycopus asper, rough bugleweed			Native
herbaceous	herb5	Search	soni4	solanum nigrum			Native
herbaceous	herb5	Search	asju	aster junciformis			Native
dogtowns	dog0	30° quad	agcr	agropyron cristatum, crested wheatgrass	60	22	Introduced
dogtowns	dog0	30° quad	spr	sporobolus cryptandrus, sand dropseed	4	25	Native
dogtowns	dog0	30° quad	eltr7	elymus trachycaulus, slender wheatgrass	20	12	Native
dogtowns	dog0	30° quad	mili3	mirabilis linearis, narrowleaf four o`clock	3	25	Native
dogtowns	dog0	150° quad	agcr	agropyron cristatum, crested wheatgrass	30	15	Introduced
dogtowns	dog0	150° quad	spr	sporobolus cryptandrus, sand dropseed	2	12	Native
dogtowns	dog0	150° quad	eltr7	elymus trachycaulus, slender wheatgrass	10	8	Native
dogtowns	dog0	150° quad	lyju	lygodesmia juncea, rush skeletonplant	0.5	5	Native
dogtowns	dog0	150° quad	mili3	mirabilis linearis, narrowleaf four o`clock	3	20	Native
dogtowns	dog0	270° quad	agcr	agropyron cristatum, crested wheatgrass	30	25	Introduced
dogtowns	dog0	270° quad	eltr7	elymus trachycaulus, slender wheatgrass	7	8	Native
dogtowns	dog0	Search	agcr	agropyron cristatum, crested wheatgrass			Introduced
dogtowns	dog0	Search	lyju	lygodesmia juncea, rush skeletonplant			Native
dogtowns	dog0	Search	mili3	mirabilis linearis, narrowleaf four o`clock			Native
dogtowns	dog0	Search	eltr7	elymus trachycaulus, slender wheatgrass			Native
dogtowns	dog0	Search	spr	sporobolus cryptandrus, sand dropseed			Native
dogtowns	dog0	Search	pste3	psoralea tenuiflora			Native
dogtowns	dog0	Search	assp	asclepias speciosa, showy milkweed			Native
dogtowns	dog0	Search	arfr4	artemisia frigida, fringed sagewort			Native
dogtowns	dog0	Search	vest	verbena stricta, hoary verbena			Native
dogtowns	dog0	Search	brin2	bromus inermis, smooth brome			Introduced
dogtowns	dog0	Search	meof	melilotus officinalis, yellow sweetclover			Introduced
dogtowns	dog0	Search	ciar4	cirsium arvense, canadian thistle			Introduced
dogtowns	dog0	Search	asfa2	aster falcatus, cluster aster			Native

dogtowns	dog0	Search	kosc	kochia scoparia, common kochia			Introduced
dogtowns	dog0	Search	sosp2	solidago speciosa, showy goldenrod			Native
dogtowns	dog12	30° quad	kosc	kochia scoparia, common kochia	85	12	Introduced
dogtowns	dog12	150° quad	kosc	kochia scoparia, common kochia	70	15	Introduced
dogtowns	dog12	150° quad	vest	verbena stricta, hoary verbena	0.5	4	Native
dogtowns	dog12	150° quad	oxst	oxalis stricta, common yellow oxalis	0.5	3	Native
dogtowns	dog12	150° quad	poco10	polygonum convolvulus, black bindweed	0.5	12	Introduced
dogtowns	dog12	150° quad	chal7	chenopodium album, lambsquarters	3	5	Native and Introduced
dogtowns	dog12	150° quad	arlo3	aristida longiseta	5	3	Native
dogtowns	dog12	270° quad	kosc	kochia scoparia, common kochia	30	12	Introduced
dogtowns	dog12	270° quad	oxst	oxalis stricta, common yellow oxalis	2	4	Native
dogtowns	dog12	270° quad	arlo3	aristida longiseta	3	3	Native
dogtowns	dog12	270° quad	disp	distichlis spicata, inland saltgrass	1	2	Native
dogtowns	dog12	Search	arlo3	aristida longiseta			Native
dogtowns	dog12	Search	chal7	chenopodium album, lambsquarters			Native and Introduced
dogtowns	dog12	Search	vest	verbena stricta, hoary verbena			Native
dogtowns	dog12	Search	poco10	polygonum convolvulus, black bindweed			Introduced
dogtowns	dog12	Search	kosc	kochia scoparia, common kochia			Introduced
dogtowns	dog12	Search	oxst	oxalis stricta, common yellow oxalis			Native
dogtowns	dog12	Search	aspu	asclepias pumila, plains milkweed			Native
dogtowns	dog12	Search	disp	distichlis spicata, inland saltgrass			Native
mesicgrass	megra2	30° quad	ciar4	cirsium arvense, canadian thistle	1	10	Introduced
mesicgrass	megra2	30° quad	disp	distichlis spicata, inland saltgrass	80	15	Native
mesicgrass	megra2	30° quad	lase	lactuca serriola, prickly lettuce	25	30	Introduced
mesicgrass	megra2	30° quad	chbe4	chenopodium berlandieri, pitseed goosefoot	10	30	Native
mesicgrass	megra2	30° quad	soul5	sonchus uliginosus	5	10	Introduced
mesicgrass	megra2	30° quad	calo	calamovilfa longifolia, prairie sandreed	10	36	Native
mesicgrass	megra2	150° quad	ciar4	cirsium arvense, canadian thistle	10	17	Introduced
mesicgrass	megra2	150° quad	vest	verbena stricta, hoary verbena	1	10	Native
mesicgrass	megra2	150° quad	lase	lactuca serriola, prickly lettuce	15	30	Introduced
mesicgrass	megra2	150° quad	calo	calamovilfa longifolia, prairie sandreed	15	30	Native
mesicgrass	megra2	150° quad	soul5	sonchus uliginosus	2	10	Introduced

mesicgrass	megra2	150° quad	disp	distichlis spicata, inland saltgrass	10	8	Native
mesicgrass	megra2	150° quad	kosc	kochia scoparia, common kochia	1	12	Introduced
mesicgrass	megra2	150° quad	coca5	conyza canadensis, canadian horseweed	0.5	15	Native
mesicgrass	megra2	150° quad	orhy	oryzopsis hymenoides	2	10	Native
mesicgrass	megra2	150° quad	taof	taraxacum officinale, common dandelion	1	4	Native and Introduced
mesicgrass	megra2	150° quad	chbe4	chenopodium berlandieri, pitseed goosefoot	1	25	Native
mesicgrass	megra2	150° quad	arbi2	artemisia biennis, biennial wormwood	0.5	18	Native and Introduced
mesicgrass	megra2	270° quad	disp	distichlis spicata, inland saltgrass	60	15	Native
mesicgrass	megra2	270° quad	ciar4	cirsium arvense, canadian thistle	5	10	Introduced
mesicgrass	megra2	270° quad	coca5	conyza canadensis, canadian horseweed	5	10	Native
mesicgrass	megra2	270° quad	lase	lactuca serriola, prickly lettuce	10	20	Introduced
mesicgrass	megra2	270° quad	kosc	kochia scoparia, common kochia	0.5	15	Introduced
mesicgrass	megra2	270° quad	soul5	sonchus uliginosus	10	4	Introduced
mesicgrass	megra2	270° quad	calo	calamovilfa longifolia, prairie sandreed	5	20	Native
mesicgrass	megra2	270° quad	chbe4	chenopodium berlandieri, pitseed goosefoot	1	25	Native
mesicgrass	megra2	Search	arbi2	artemisia biennis, biennial wormwood			Native and Introduced
mesicgrass	megra2	Search	calo	calamovilfa longifolia, prairie sandreed			Native
mesicgrass	megra2	Search	chbe4	chenopodium berlandieri, pitseed goosefoot			Native
mesicgrass	megra2	Search	ciar4	cirsium arvense, canadian thistle			Introduced
mesicgrass	megra2	Search	coca5	conyza canadensis, canadian horseweed			Native
mesicgrass	megra2	Search	disp	distichlis spicata, inland saltgrass			Native
mesicgrass	megra2	Search	kosc	kochia scoparia, common kochia			Introduced
mesicgrass	megra2	Search	lase	lactuca serriola, prickly lettuce			Introduced
mesicgrass	megra2	Search	orhy	oryzopsis hymenoides			Native
mesicgrass	megra2	Search	soul5	sonchus uliginosus			Introduced
mesicgrass	megra2	Search	taof	taraxacum officinale, common dandelion			Native and Introduced
mesicgrass	megra2	Search	vest	verbena stricta, hoary verbena			Native
mesicgrass	megra2	Search	hoju	hordeum jubatum, foxtail barley			Native
mesicgrass	megra2	Search	hean3	helianthus annuus, common sunflower			Native
mesicgrass	megra2	Search	pora3	polygonum ramosissimum, bushy knotweed			Native
sandhills	sand12	30° quad	bohi2	bouteloua hirsuta, hairy grama	10	5	Native

sandhills	sand12	30° quad	yuan	yucca angustifolia	2	6	Native
sandhills	sand12	30° quad	spr	sporobolus cryptandrus, sand dropseed	7	6	Native
sandhills	sand12	30° quad	calo	calamovilfa longifolia, prairie sandreed	7	8	Native
sandhills	sand12	30° quad	refl	redfieldia flexuosa, blowout grass	5	6	Native
sandhills	sand12	30° quad	kopy	koeleria pyramidata	2	8	Native
sandhills	sand12	30° quad	arfi2	artemisia filifolia, sand sagebrush	1	7	Native
sandhills	sand12	30° quad	aste5	astragalus tenellus, looseflower milkvetch	2	5	Native
sandhills	sand12	150° quad	amar2	ambrosia artemisiifolia, annual ragweed	6	5	Native
sandhills	sand12	150° quad	yugl	yucca glauca, small soapweed	8	22	Native
sandhills	sand12	150° quad	kopy	koeleria pyramidata	1	8	Native
sandhills	sand12	150° quad	spr	sporobolus cryptandrus, sand dropseed	3	11	Native
sandhills	sand12	150° quad	bohi2	bouteloua hirsuta, hairy grama	2	7	Native
sandhills	sand12	150° quad	mupu2	muhlenbergia pungens, sandhill muhly	8	9	Native
sandhills	sand12	150° quad	cefe	ceanothus fendleri, fendler's ceanothus	2	8	Native
sandhills	sand12	150° quad	arpu9	aristida purpurea, purple threeawn	2	6	Native
sandhills	sand12	150° quad	lyju	lygodesmia juncea, rush skeletonplant	1	10	Native
sandhills	sand12	150° quad	saex	salix exigua, sandbar willow	3	18	Native
sandhills	sand12	270° quad	bohi2	bouteloua hirsuta, hairy grama	8	8	Native
sandhills	sand12	270° quad	lyju	lygodesmia juncea, rush skeletonplant	1	4	Native
sandhills	sand12	270° quad	spr	sporobolus cryptandrus, sand dropseed	1	6	Native
sandhills	sand12	270° quad	refl	redfieldia flexuosa, blowout grass	2	3	Native
sandhills	sand12	270° quad	calo	calamovilfa longifolia, prairie sandreed	2	7	Native
sandhills	sand12	270° quad	yugl	yucca glauca, small soapweed	12	28	Native
sandhills	sand12	270° quad	opfr	opuntia fragilis, brittle pricklypear	1	2	Native
sandhills	sand12	270° quad	oebi	oenothera biennis, common eveningprimrose	2	10	Native
sandhills	sand12	Search	hean3	helianthus annuus, common sunflower			Native
sandhills	sand12	Search	eumi5	euphorbia missurica			Native
sandhills	sand12	Search	oppo	opuntia polyacantha, plains pricklypear			Native
sandhills	sand12	Search	ipco5	ipomopsis congesta, ballhead gilia			Native
sandhills	sand12	Search	cysc3	cyperus schweinitzii, schweinitz's flatsedge			Native
sandhills	sand12	Search	eref	erigonum effusum, spreading buckwheat			Native
sandhills	sand12	Search	chvi10	chrysopsis villosa			Native
sandhills	sand12	Search	sesp3	senecio spartioides, broom groundsel			Native
sandhills	sand12	Search	ciar4	cirsium arvense, canadian thistle			Introduced

uplandgrassland	upgra3	30° quad	agcr	agropyron cristatum, crested wheatgrass	75	25	Introduced
uplandgrassland	upgra3	30° quad	brin2	bromus inermis, smooth brome	10	18	Introduced
uplandgrassland	upgra3	150° quad	agcr	agropyron cristatum, crested wheatgrass	70	17	Introduced
uplandgrassland	upgra3	150° quad	eltr7	elymus trachycaulus, slender wheatgrass	15	8	Native
uplandgrassland	upgra3	270° quad	agcr	agropyron cristatum, crested wheatgrass	50	17	Introduced
uplandgrassland	upgra3	270° quad	eltr7	elymus trachycaulus, slender wheatgrass	10	8	Native
uplandgrassland	upgra3	Search	agcr	agropyron cristatum, crested wheatgrass			Introduced
uplandgrassland	upgra3	Search	brin2	bromus inermis, smooth brome			Introduced
uplandgrassland	upgra3	Search	eltr7	elymus trachycaulus, slender wheatgrass			Native
uplandgrassland	upgra3	Search	pste3	psoralea tenuiflora			Native
uplandgrassland	upgra3	Search	opfr	opuntia fragilis, brittle pricklypear			Native
uplandgrassland	upgra3	Search	kosc	kochia scoparia, common kochia			Introduced
uplandgrassland	upgra3	Search	lyju	lygodesmia juncea, rush skeletonplant			Native
uplandgrassland	upgra3	Search	mili3	mirabilis linearis, narrowleaf four o'clock			Native
uplandgrassland	upgra3	Search	spr	sporobolus cryptandrus, sand dropseed			Native
uplandgrassland	upgra3	Search	taof	taraxacum officinale, common dandelion			Native and Introduced
herbaceous	herb12	30° quad	tyla	typha latifolia, broadleaf cattail	70	190	Native
herbaceous	herb12	30° quad	scac	scirpus acutus	65	170	Native
herbaceous	herb12	150° quad	scac	scirpus acutus	60	210	Native
herbaceous	herb12	150° quad	speu	sparganium eurycarpum, broadfruit burreed	8	80	Native
herbaceous	herb12	270° quad	tyla	typha latifolia, broadleaf cattail	80	200	Native
herbaceous	herb12	270° quad	scac	scirpus acutus	20	110	Native
herbaceous	herb12	Search	chru	chenopodium rubrum, red goosefoot			Native
mesicwoodland	meswood2	30° quad	tory	toxicodendron rydbergii, western poison ivy	80	50	Native
mesicwoodland	meswood2	30° quad	syoc	symphoricarpos occidentalis, western snowberry	55	78	Native
mesicwoodland	meswood2	30° quad	prvi	prunus virginiana, common chokecherry	3	48	Native
mesicwoodland	meswood2	30° quad	pram	prunus americana, american plum	12	56	Native
mesicwoodland	meswood2	30° quad	saex	salix exigua, sandbar willow	19	123	Native
mesicwoodland	meswood2	30° quad	roar3	rosa arkansana, prairie rose	5	38	Native
mesicwoodland	meswood2	30° quad	elca4	elymus canadensis, canada wildrye	3	60	Native
mesicwoodland	meswood2	30° quad	mura	muhlenbergia racemosa, marsh muhly	1	52	Native
mesicwoodland	meswood2	150° quad	tory	toxicodendron rydbergii, western poison ivy	20	40	Native
mesicwoodland	meswood2	150° quad	glle3	glycyrrhiza lepidota, american licorice	16	46	Native

mesicwoodland	meswood2	150° quad	syoc	symphoricarpos occidentalis, western snowberry	25	38	Native
mesicwoodland	meswood2	150° quad	prvi	prunus virginiana, common chokecherry	27	220	Native
mesicwoodland	meswood2	150° quad	pram	prunus americana, american plum	28	180	Native
mesicwoodland	meswood2	150° quad	cala30	carex lanuginosa, woolly sedge	4	27	Native
mesicwoodland	meswood2	150° quad	mura	muhlenbergia racemosa, marsh muhly	2	50	Native
mesicwoodland	meswood2	270° quad	tory	toxicodendron rydbergii, western poison ivy	50	34	Native
mesicwoodland	meswood2	270° quad	mura	muhlenbergia racemosa, marsh muhly	3	26	Native
mesicwoodland	meswood2	270° quad	cala30	carex lanuginosa, woolly sedge	2	28	Native
mesicwoodland	meswood2	270° quad	syoc	symphoricarpos occidentalis, western snowberry	14	47	Native
mesicwoodland	meswood2	270° quad	pram	prunus americana, american plum	38	230	Native
mesicwoodland	meswood2	270° quad	smst	smilacina stellata	2	23	Native
mesicwoodland	meswood2	270° quad	roar3	rosa arkansana, prairie rose	5	48	Native
mesicwoodland	meswood2	270° quad	meof	melilotus officinalis, yellow sweetclover	0.5	40	Introduced
mesicwoodland	meswood2	270° quad	elca4	elymus canadensis, canada wildrye	3	38	Native
mesicwoodland	meswood2	270° quad	assp	asclepias speciosa, showy milkweed	0.5	23	Native
mesicwoodland	meswood2	Search	sogi	solidago gigantea, giant goldenrod			Native
mesicwoodland	meswood2	Search	saam2	salix amygdaloides, peachleaf willow			Native
mesicwoodland	meswood2	Search	paqu2	parthenocissus quinquefolia, virginia creeper			Native
mesicwoodland	meswood2	Search	arlu	artemisia ludoviciana, louisiana sagewort			Native
mesicwoodland	meswood2	Search	riod	ribes odoratum			Native
mesicwoodland	meswood2	Search	amtr	ambrosia trifida, great ragweed			Native
mesicwoodland	meswood2	Search	jusc2	juniperus scopulorum, rocky mountain juniper			Native
mesicwoodland	meswood2	Search	popr	poa pratensis, kentucky bluegrass			Native and Introduced
mesicwoodland	meswood2	Search	asfa2	aster falcatus, cluster aster			Native
uplandgrassland	train1	30° quad	popr	poa pratensis, kentucky bluegrass	1	25	Native and Introduced
uplandgrassland	train1	30° quad	disp	distichlis spicata, inland saltgrass	50	12	Native
uplandgrassland	train1	30° quad	pasm	pascopyrum smithii, western wheatgrass	0.5	20	Native
uplandgrassland	train1	150° quad	popr	poa pratensis, kentucky bluegrass	6	30	Native and Introduced
uplandgrassland	train1	150° quad	disp	distichlis spicata, inland saltgrass	28	15	Native
uplandgrassland	train1	150° quad	pasm	pascopyrum smithii, western wheatgrass	0.5	25	Native
uplandgrassland	train1	150° quad	meof	melilotus officinalis, yellow sweetclover	0.5	38	Introduced

uplandgrassland	train1	270° quad	popr	poa pratensis, kentucky bluegrass	7	35	Native and Introduced
uplandgrassland	train1	270° quad	disp	distichlis spicata, inland saltgrass	28	15	Native
uplandgrassland	train1	270° quad	pasm	pascopyrum smithii, western wheatgrass	1	30	Native
uplandgrassland	train1	270° quad	ciar4	cirsium arvense, canadian thistle	1	25	Introduced
uplandgrassland	train1	Search	brin2	bromus inermis, smooth brome	5	35	Introduced
uplandgrassland	train1	Search	popr	poa pratensis, kentucky bluegrass	40	40	Native and Introduced
uplandgrassland	train1	Search	ciar4	cirsium arvense, canadian thistle	3	45	Introduced
uplandgrassland	train1	Search	lipu	liatris punctata, dotted gayfeather	0.5	12	Native
uplandgrassland	train1	Search	meof	melilotus officinalis, yellow sweetclover	0.5	48	Introduced
uplandgrassland	train1	Search	pasm	pascopyrum smithii, western wheatgrass	15	30	Native
uplandgrassland	train1	Search	disp	distichlis spicata, inland saltgrass	60	24	Native
uplandgrassland	train1	Search	agcr	agropyron cristatum, crested wheatgrass	0.5	30	Introduced
uplandgrassland	train1	Search	kosc	kochia scoparia, common kochia	0.5	40	Introduced
uplandgrassland	train1	Search	syoc	symphoricarpos occidentalis, western snowberry	0.5	40	Native
uplandgrassland	train1	Search	stco4	stipa comata	0.5	50	Native
uplandgrassland	train1	Search	assp	asclepias speciosa, showy milkweed	0.5	23	Native
uplandgrassland	train1	Search	bogr2	bouteloua gracilis, blue grama	0.5	30	Native
uplandshrub	upshrub11	30° quad	popr	poa pratensis, kentucky bluegrass	55	40	Native and Introduced
uplandshrub	upshrub11	30° quad	multisun	several headed sun flower, most common weedy one	45	120	Not known
uplandshrub	upshrub11	150° quad	agcr	agropyron cristatum, crested wheatgrass	70	35	Introduced
uplandshrub	upshrub11	150° quad	popr	poa pratensis, kentucky bluegrass	15	20	Native and Introduced
uplandshrub	upshrub11	270° quad	popr	poa pratensis, kentucky bluegrass	50	20	Native and Introduced
uplandshrub	upshrub11	270° quad	multisun	several headed sun flower, most common weedy one	15	110	Not known
uplandshrub	upshrub11	270° quad	assp	asclepias speciosa, showy milkweed	1	20	Native
uplandshrub	upshrub11	270° quad	trifolium	trifolium	1	18	Not known
uplandshrub	upshrub11	Search	agcr	agropyron cristatum, crested wheatgrass			Introduced
uplandshrub	upshrub11	Search	assp	asclepias speciosa, showy milkweed			Native
uplandshrub	upshrub11	Search	multisun	several headed sun flower, most common weedy			Not known

				one				
uplandshrub	upshrub11	Search	popr	poa pratensis, kentucky bluegrass				Native and Introduced
uplandshrub	upshrub11	Search	trifolium	trifolium				Not known
uplandshrub	upshrub11	Search	cheno	chenopodium, goosefoot				Not known
uplandshrub	upshrub11	Search	mustpale	white/yellow fls, ext. dissected lvs				Not known
uplandshrub	upshrub11	Search	hairybadi	reminds me of badi, very hairy				Not known
uplandshrub	upshrub11	Search	phlo4	physalis longifolia, longleaf groundcherry				Native
uplandshrub	upshrub11	Search	aser3	aster ericoides, heath aster				Native
uplandshrub	upshrub11	Search	syal	symphoricarpos albus, common snowberry				Native
uplandshrub	upshrub11	Search	tinylfmust	the name				Not known
uplandshrub	upshrub3	30° quad	syal	symphoricarpos albus, common snowberry	4	25		Native
uplandshrub	upshrub3	30° quad	popr	poa pratensis, kentucky bluegrass	20	50		Native and Introduced
uplandshrub	upshrub3	30° quad	pasm	pascopyrum smithii, western wheatgrass	15	20		Native
uplandshrub	upshrub3	150° quad	pasm	pascopyrum smithii, western wheatgrass	3	28		Native
uplandshrub	upshrub3	150° quad	popr	poa pratensis, kentucky bluegrass	10	33		Native and Introduced
uplandshrub	upshrub3	150° quad	cheno	chenopodium, goosefoot	35	90		Not known
uplandshrub	upshrub3	270° quad	syal	symphoricarpos albus, common snowberry	40	50		Native
uplandshrub	upshrub3	270° quad	brin2	bromus inermis, smooth brome	4	60		Introduced
uplandshrub	upshrub3	270° quad	popr	poa pratensis, kentucky bluegrass	12	45		Native and Introduced
uplandshrub	upshrub3	270° quad	chde	chenopodium desiccatum, aridland goosefoot	0.5	20		Native
uplandshrub	upshrub3	Search	brin2	bromus inermis, smooth brome				Introduced
uplandshrub	upshrub3	Search	chde	chenopodium desiccatum, aridland goosefoot				Native
uplandshrub	upshrub3	Search	cheno	chenopodium, goosefoot				Not known
uplandshrub	upshrub3	Search	pasm	pascopyrum smithii, western wheatgrass				Native
uplandshrub	upshrub3	Search	popr	poa pratensis, kentucky bluegrass				Native and Introduced
uplandshrub	upshrub3	Search	syal	symphoricarpos albus, common snowberry				Native
uplandshrub	upshrub3	Search	aser3	aster ericoides, heath aster				Native
uplandshrub	upshrub3	Search	kosc	kochia scoparia, common kochia				Introduced
uplandshrub	upshrub3	Search	phlo4	physalis longifolia, longleaf groundcherry				Native
uplandshrub	upshrub3	Search	ivxa	iva xanthifolia, giant sumpweed				Native

uplandshrub	upshrub3	Search	legume	nitrogen fixer, leaves in threes, tiny pods			Not known
sandhills	sand5	30° quad	arlu	artemisia ludoviciana, louisiana sagewort	2	5	Native
sandhills	sand5	30° quad	calo	calamovilfa longifolia, prairie sandreed	50	10	Native
sandhills	sand5	30° quad	spr	sporobolus cryptandrus, sand dropseed	10	12	Native
sandhills	sand5	30° quad	refl	redfieldia flexuosa, blowout grass	10	8	Native
sandhills	sand5	30° quad	cysc3	cyperus schweinitzii, schweinitz's flatsedge	5	6	Native
sandhills	sand5	30° quad	hepe	helianthus petiolaris, prairie sunflower	1	6	Native
sandhills	sand5	150° quad	spr	sporobolus cryptandrus, sand dropseed	10	13	Native
sandhills	sand5	150° quad	calo	calamovilfa longifolia, prairie sandreed	70	10	Native
sandhills	sand5	150° quad	arlu	artemisia ludoviciana, louisiana sagewort	1	3	Native
sandhills	sand5	270° quad	yugl	yucca glauca, small soapweed	10	32	Native
sandhills	sand5	270° quad	hean3	helianthus annuus, common sunflower	2	10	Native
sandhills	sand5	270° quad	spr	sporobolus cryptandrus, sand dropseed	10	12	Native
sandhills	sand5	270° quad	refl	redfieldia flexuosa, blowout grass	20	9	Native
sandhills	sand5	270° quad	cysc3	cyperus schweinitzii, schweinitz's flatsedge	10	6	Native
sandhills	sand5	270° quad	amar2	ambrosia artemisiifolia, annual ragweed	0.5	4	Native
sandhills	sand5	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
sandhills	sand5	Search	arlu	artemisia ludoviciana, louisiana sagewort			Native
sandhills	sand5	Search	cysc3	cyperus schweinitzii, schweinitz's flatsedge			Native
sandhills	sand5	Search	hean3	helianthus annuus, common sunflower			Native
sandhills	sand5	Search	hepe	helianthus petiolaris, prairie sunflower			Native
sandhills	sand5	Search	calo	calamovilfa longifolia, prairie sandreed			Native
sandhills	sand5	Search	calo	calamovilfa longifolia, prairie sandreed			Native
sandhills	sand5	Search	refl	redfieldia flexuosa, blowout grass			Native
sandhills	sand5	Search	spr	sporobolus cryptandrus, sand dropseed			Native
sandhills	sand5	Search	yugl	yucca glauca, small soapweed			Native
sandhills	sand5	Search	assp	asclepias speciosa, showy milkweed			Native
sandhills	sand5	Search	oebi	oenothera biennis, common eveningprimrose			Native
sandhills	sand5	Search	oppo	opuntia polyacantha, plains pricklypear			Native
sandhills	sand5	Search	saex	salix exigua, sandbar willow			Native
sandhills	sand5	Search	iplo2	ipomopsis longiflora, flaxflowered gilia			Native
forbland	frb11	30° quad	disp	distichlis spicata, inland saltgrass	70	28	Native
forbland	frb11	30° quad	popr	poa pratensis, kentucky bluegrass	14	41	Native and Introduced

forbland	frb11	30° quad	pasm	pascopyrum smithii, western wheatgrass	3	25	Native
forbland	frb11	150° quad	disp	distichlis spicata, inland saltgrass	30	27	Native
forbland	frb11	150° quad	popr	poa pratensis, kentucky bluegrass	26	38	Native and Introduced
forbland	frb11	150° quad	pasm	pascopyrum smithii, western wheatgrass	46	26	Native
forbland	frb11	270° quad	disp	distichlis spicata, inland saltgrass	10	22	Native
forbland	frb11	270° quad	popr	poa pratensis, kentucky bluegrass	22	46	Native and Introduced
forbland	frb11	270° quad	pasm	pascopyrum smithii, western wheatgrass	58	32	Native
forbland	frb11	Search	rucr	rumex crispus, curly dock			Introduced
forbland	frb11	Search	opfr	opuntia fragilis, brittle pricklypear			Native
forbland	frb11	Search	hoju	hordeum jubatum, foxtail barley			Native
forbland	frb11	Search	assp	asclepias speciosa, showy milkweed			Native
forbland	frb11	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
forbland	frb11	Search	asfa2	aster falcatus, cluster aster			Native
forbland	frb11	Search	chle4	chenopodium leptophyllum, narrowleaf goosefoot			Native
forbland	frb4	30° quad	phar3	phalaris arundinacea, reed canarygrass	90	25	Native
forbland	frb4	30° quad	tyla	typha latifolia, broadleaf cattail	1	56	Native
forbland	frb4	30° quad	scfl	scirpus fluviatilis	0.5	30	Native
forbland	frb4	150° quad	tyla	typha latifolia, broadleaf cattail	24	92	Native
forbland	frb4	150° quad	chru	chenopodium rubrum, red goosefoot	35	76	Native
forbland	frb4	150° quad	paca6	panicum capillare, witchgrass	7	16	Native
forbland	frb4	270° quad	phar3	phalaris arundinacea, reed canarygrass	90	45	Native
forbland	frb4	Search	urdi	urtica dioica, stinging nettle			Native and Introduced
forbland	frb4	Search	teca3	teucrium canadense, candad germander			Native
forbland	frb4	Search	mear4	mentha arvensis, wild mint			Native
forbland	frb4	Search	scac	scirpus acutus			Native
forbland	frb4	Search	poam8	polygonum amphibium, water knotweed			Native
forbland	frb4	Search	rotr3	rorippa truncata			Not known
forbland	frb4	Search	rual4	rumex altissimus, pale dock			Native
forbland	frb4	Search	popu5	polygonum punctatum, dotted smartweed			Native
forbland	frb4	Search	epci	epilobium ciliatum, hairy willowherb			Native
forbland	frb4	Search	asin	asclepias incarnata, swamp milkweed			Native

forbland	frb4	Search	vest	verbena stricta, hoary verbena			Native
forbland	frb4	Search	ciar4	cirsium arvense, canadian thistle			Introduced
forbland	frb4	Search	caca4	calamagrostis canadensis, bluejoint			Native
forbland	frb4	Search	lyas	lycopus asper, rough bugleweed			Native
herbaceous	herbwet24	30° quad	caca4	calamagrostis canadensis, bluejoint	100	46	Native
herbaceous	herbwet24	30° quad	poam8	polygonum amphibium, water knotweed	12	54	Native
herbaceous	herbwet24	30° quad	tyla	typha latifolia, broadleaf cattail	9	160	Native
herbaceous	herbwet24	30° quad	lyas	lycopus asper, rough bugleweed	3	70	Native
herbaceous	herbwet24	30° quad	ciar4	cirsium arvense, canadian thistle	4	48	Introduced
herbaceous	herbwet24	150° quad	caca4	calamagrostis canadensis, bluejoint	80	52	Native
herbaceous	herbwet24	150° quad	scfl	scirpus fluviatilis	45	61	Native
herbaceous	herbwet24	150° quad	lyas	lycopus asper, rough bugleweed	1	48	Native
herbaceous	herbwet24	150° quad	tyla	typha latifolia, broadleaf cattail	9	170	Native
herbaceous	herbwet24	150° quad	ciar4	cirsium arvense, canadian thistle	4	45	Introduced
herbaceous	herbwet24	150° quad	lyth2	lysimachia thyriflora, tufted loosestrife	0.5	30	Native
herbaceous	herbwet24	270° quad	scfl	scirpus fluviatilis	100	110	Native
herbaceous	herbwet24	270° quad	tyla	typha latifolia, broadleaf cattail	20	160	Native
herbaceous	herbwet24	270° quad	poam8	polygonum amphibium, water knotweed	18	96	Native
herbaceous	herbwet24	270° quad	lyas	lycopus asper, rough bugleweed	2	80	Native
herbaceous	herbwet24	270° quad	speu	sparganium eurycarpum, broadfruit burreed	15	90	Native
herbaceous	herbwet24	Search	mear4	mentha arvensis, wild mint			Native
herbaceous	herbwet24	Search	hetu	helianthus tuberosus, jerusalem artichoke			Native
herbaceous	herbwet24	Search	urdi	urtica dioica, stinging nettle			Native and Introduced
herbaceous	herbwet24	Search	sacu	sagittaria cuneata, arrowleaf arrowhead			Native
herbaceous	herbwet24	Search	cyod	cyperus odoratus, fragrant flatsedge			Native
herbaceous	herbwet24	Search	chru	chenopodium rubrum, red goosefoot			Native
herbaceous	herbwet24	Search	popu5	polygonum punctatum, dotted smartweed			Native
herbaceous	herbwet24	Search	sogi	solidago gigantea, giant goldenrod			Native
herbaceous	herbwet24	Search	euma6	eupatorium maculatum, spotted joeypyeweed			Native
mesicshrub	mesicshrub25	30° quad	brin2	bromus inermis, smooth brome	20	45	Introduced
mesicshrub	mesicshrub25	30° quad	popr	poa pratensis, kentucky bluegrass	21	18	Native and Introduced
mesicshrub	mesicshrub25	30° quad	calo	calamovilfa longifolia, prairie sandreed	30	28	Native

mesicshrub	mesicshrub25	30° quad	gll3	glycyrrhiza lepidota, american licorice	5	32	Native
mesicshrub	mesicshrub25	30° quad	phlo4	physalis longifolia, longleaf groundcherry	2	21	Native
mesicshrub	mesicshrub25	30° quad	arlu	artemisia ludoviciana, louisiana sagewort	1	18	Native
mesicshrub	mesicshrub25	30° quad	bogr2	bouteloua gracilis, blue grama	4	28	Native
mesicshrub	mesicshrub25	30° quad	trdu	tragopogon dubius, yellow salsify	1	30	Introduced
mesicshrub	mesicshrub25	30° quad	pste5	psoralidium tenuiflorum, slimflower scurfpea	0.5	20	Native
mesicshrub	mesicshrub25	150° quad	capr5	carex praegracilis, clustered field sedge	3	16	Native
mesicshrub	mesicshrub25	150° quad	pavi2	panicum virgatum, switchgrass	36	38	Native
mesicshrub	mesicshrub25	150° quad	lyju	lygodesmia juncea, rush skeletonplant	5	36	Native
mesicshrub	mesicshrub25	150° quad	phlo4	physalis longifolia, longleaf groundcherry	8	14	Native
mesicshrub	mesicshrub25	150° quad	ager	agropyron cristatum, crested wheatgrass	5	32	Introduced
mesicshrub	mesicshrub25	150° quad	popr	poa pratensis, kentucky bluegrass	10	16	Native and Introduced
mesicshrub	mesicshrub25	270° quad	phlo4	physalis longifolia, longleaf groundcherry	2	14	Native
mesicshrub	mesicshrub25	270° quad	arlu	artemisia ludoviciana, louisiana sagewort	1	18	Native
mesicshrub	mesicshrub25	270° quad	popr	poa pratensis, kentucky bluegrass	15	22	Native and Introduced
mesicshrub	mesicshrub25	270° quad	calo	calamovilfa longifolia, prairie sandreed	25	30	Native
mesicshrub	mesicshrub25	270° quad	capr5	carex praegracilis, clustered field sedge	1	9	Native
mesicshrub	mesicshrub25	270° quad	liin2	lithospermum incisum, narrowleaf gromwell	2	24	Native
mesicshrub	mesicshrub25	Search	spr	sporobolus cryptandrus, sand dropseed			Native
mesicshrub	mesicshrub25	Search	hean3	helianthus annuus, common sunflower			Native
mesicshrub	mesicshrub25	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
mesicshrub	mesicshrub25	Search	arpo2	argemone polyanthemus, crested pricklypoppy			Native
mesicshrub	mesicshrub25	Search	mihi	mirabilis hirsuta, hairy four o'clock			Native
mesicshrub	mesicshrub25	Search	roar3	rosa arkansana, prairie rose			Native
forbland	frb4	Search	elpa3	eleocharis palustris, common spikerush			Native
uplandgrassland	train2	30° quad	popr	poa pratensis, kentucky bluegrass	20	12	Native and Introduced
uplandgrassland	train2	30° quad	disp	distichlis spicata, inland saltgrass	60	15	Native
uplandgrassland	train2	30° quad	agsm	agropyron smithii	10	17	Native
uplandgrassland	train2	150° quad	disp	distichlis spicata, inland saltgrass	40	15	Native
uplandgrassland	train2	150° quad	brin2	bromus inermis, smooth brome	12	25	Introduced
uplandgrassland	train2	150° quad	popr	poa pratensis, kentucky bluegrass	10	12	Native and Introduced

uplandgrassland	train2	150° quad	agsm	agropyron smithii	10	15	Native
uplandgrassland	train2	270° quad	agsm	agropyron smithii	10	15	Native
uplandgrassland	train2	270° quad	disp	distichlis spicata, inland saltgrass	40	15	Native
uplandgrassland	train2	270° quad	popr	poa pratensis, kentucky bluegrass	20	12	Native and Introduced
uplandgrassland	train2	Search	agsm	agropyron smithii			Native
uplandgrassland	train2	Search	brin2	bromus inermis, smooth brome			Introduced
uplandgrassland	train2	Search	disp	distichlis spicata, inland saltgrass			Native
uplandgrassland	train2	Search	popr	poa pratensis, kentucky bluegrass			Native and Introduced
uplandgrassland	train2	Search	ciar4	cirsium arvense, canadian thistle			Introduced
uplandgrassland	train2	Search	arlu	artemisia ludoviciana, louisiana sagewort			Native
uplandgrassland	train2	Search	chle4	chenopodium leptophyllum, narrowleaf goosefoot			Native
uplandgrassland	train2	Search	melil	melilotus, sweetclover			Not known
uplandgrassland	train2	Search	soul5	sonchus uliginosus			Introduced
uplandgrassland	train3	150° quad	ciar4	cirsium arvense, canadian thistle	1	10	Introduced
uplandgrassland	train3	150° quad	disp	distichlis spicata, inland saltgrass	65	17	Native
uplandgrassland	train3	150° quad	hoju	hordeum jubatum, foxtail barley	2	15	Native
uplandgrassland	train3	150° quad	popr	poa pratensis, kentucky bluegrass	5	10	Native and Introduced
uplandgrassland	train3	150° quad	lase	lactuca serriola, prickly lettuce	1	10	Introduced
uplandgrassland	train3	150° quad	cysc3	cyperus schweinitzii, schweinitz's flatsedge	5	12	Native
uplandgrassland	train3	150° quad	aspr2	aster praealtus, willowleaf aster	2	7	Native
uplandgrassland	train3	270° quad	cysc3	cyperus schweinitzii, schweinitz's flatsedge	10	25	Native
uplandgrassland	train3	270° quad	disp	distichlis spicata, inland saltgrass	80	17	Native
uplandgrassland	train3	270° quad	hoju	hordeum jubatum, foxtail barley	10	15	Native
uplandgrassland	train3	270° quad	aspr2	aster praealtus, willowleaf aster	0.5	1	Native
uplandgrassland	train3	Search	aspr2	aster praealtus, willowleaf aster			Native
uplandgrassland	train3	Search	ciar4	cirsium arvense, canadian thistle			Introduced
uplandgrassland	train3	Search	disp	distichlis spicata, inland saltgrass			Native
uplandgrassland	train3	Search	cysc3	cyperus schweinitzii, schweinitz's flatsedge			Native
uplandgrassland	train3	Search	hoju	hordeum jubatum, foxtail barley			Native
uplandgrassland	train3	Search	lase	lactuca serriola, prickly lettuce			Introduced
uplandgrassland	train3	Search	popr	poa pratensis, kentucky bluegrass			Native and Introduced

uplandgrassland	train3	Search	sppe	spartina pectinata, prairie cordgrass			Native
uplandgrassland	train3	Search	agsm	agropyron smithii			Native
uplandgrassland	train3	Search	brin2	bromus inermis, smooth brome			Introduced
uplandgrassland	train3	Search	assp	asclepias speciosa, showy milkweed			Native
uplandgrassland	train3	Search	vest	verbena stricta, hoary verbena			Native
uplandgrassland	train3	Search	orhy	oryzopsis hymenoides			Native
uplandgrassland	train3	Search	eccr	echinochloa crus-galli, barnyardgrass			Introduced
uplandgrassland	train3	Search	rual4	rumex altissimus, pale dock			Native
uplandgrassland	train3	Search	kosc	kochia scoparia, common kochia			Introduced
uplandgrassland	train3	30° quad	sppe	spartina pectinata, prairie cordgrass	100	70	Native
uplandgrassland	train4	30° quad	brin2	bromus inermis, smooth brome	15	15	Introduced
uplandgrassland	train4	30° quad	brte	bromus tectorum, cheatgrass	20	15	Introduced
uplandgrassland	train4	30° quad	bogr2	bouteloua gracilis, blue grama	3	10	Native
uplandgrassland	train4	30° quad	popr	poa pratensis, kentucky bluegrass	40	7	Native and Introduced
uplandgrassland	train4	150° quad	brin2	bromus inermis, smooth brome	10	20	Introduced
uplandgrassland	train4	150° quad	bogr2	bouteloua gracilis, blue grama	25	15	Native
uplandgrassland	train4	150° quad	spr	sporobolus cryptandrus, sand dropseed	6	25	Native
uplandgrassland	train4	150° quad	agcr	agropyron cristatum, crested wheatgrass	20	18	Introduced
uplandgrassland	train4	150° quad	brte	bromus tectorum, cheatgrass	5	10	Introduced
uplandgrassland	train4	150° quad	mili3	mirabilis linearis, narrowleaf four o'clock	5	7	Native
uplandgrassland	train4	150° quad	hean3	helianthus annuus, common sunflower	2	12	Native
uplandgrassland	train4	270° quad	brte	bromus tectorum, cheatgrass	15	10	Introduced
uplandgrassland	train4	270° quad	spr	sporobolus cryptandrus, sand dropseed	2	35	Native
uplandgrassland	train4	270° quad	brin2	bromus inermis, smooth brome	10	17	Introduced
uplandgrassland	train4	270° quad	bogr2	bouteloua gracilis, blue grama	10	25	Native
uplandgrassland	train4	270° quad	mili3	mirabilis linearis, narrowleaf four o'clock	1	10	Native
uplandgrassland	train4	270° quad	popr	poa pratensis, kentucky bluegrass	3	10	Native and Introduced
uplandgrassland	train4	270° quad	agcr	agropyron cristatum, crested wheatgrass	2	12	Introduced
uplandgrassland	train4	Search	agcr	agropyron cristatum, crested wheatgrass			Introduced
uplandgrassland	train4	Search	bogr2	bouteloua gracilis, blue grama			Native
uplandgrassland	train4	Search	brin2	bromus inermis, smooth brome			Introduced
uplandgrassland	train4	Search	brte	bromus tectorum, cheatgrass			Introduced

uplandgrassland	train4	Search	hean3	helianthus annuus, common sunflower			Native
uplandgrassland	train4	Search	mili3	mirabilis linearis, narrowleaf four o'clock			Native
uplandgrassland	train4	Search	popr	poa pratensis, kentucky bluegrass			Native and Introduced
uplandgrassland	train4	Search	spr	sporobolus cryptandrus, sand dropseed			Native
uplandgrassland	train4	Search	rosa5	rosa, rose			Not known
uplandgrassland	train4	Search	oppo	opuntia polyacantha, plains pricklypear			Native
uplandgrassland	train5	30° quad	oppo	opuntia polyacantha, plains pricklypear	2	7	Native
uplandgrassland	train5	30° quad	brin2	bromus inermis, smooth brome	50	25	Introduced
uplandgrassland	train5	30° quad	capr5	carex praegracilis, clustered field sedge	2	10	Native
uplandgrassland	train5	30° quad	yugl	yucca glauca, small soapweed	25	60	Native
uplandgrassland	train5	150° quad	brin2	bromus inermis, smooth brome	5	20	Introduced
uplandgrassland	train5	150° quad	capr5	carex praegracilis, clustered field sedge	15	10	Native
uplandgrassland	train5	150° quad	spr	sporobolus cryptandrus, sand dropseed	2	22	Native
uplandgrassland	train5	150° quad	mili3	mirabilis linearis, narrowleaf four o'clock	1	10	Native
uplandgrassland	train5	150° quad	popr	poa pratensis, kentucky bluegrass	1	15	Native and Introduced
uplandgrassland	train5	270° quad	oppo	opuntia polyacantha, plains pricklypear	7	10	Native
uplandgrassland	train5	270° quad	arlu	artemisia ludoviciana, louisiana sagewort	7	10	Native
uplandgrassland	train5	270° quad	eref	erigonum effusum, spreading buckwheat	1	20	Native
uplandgrassland	train5	270° quad	cyse3	cyperus schweinitzii, schweinitz's flatsedge	5	15	Native
uplandgrassland	train5	270° quad	spr	sporobolus cryptandrus, sand dropseed	2	20	Native
uplandgrassland	train5	270° quad	capr5	carex praegracilis, clustered field sedge	10	12	Native
uplandgrassland	train5	270° quad	ange	andropogon gerardii, big bluestem	10	20	Native
uplandgrassland	train5	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
uplandgrassland	train5	Search	ange	andropogon gerardii, big bluestem			Native
uplandgrassland	train5	Search	arlu	artemisia ludoviciana, louisiana sagewort			Native
uplandgrassland	train5	Search	asfa2	aster falcatus, cluster aster			Native
uplandgrassland	train5	Search	brin2	bromus inermis, smooth brome			Introduced
uplandgrassland	train5	Search	brte	bromus tectorum, cheatgrass			Introduced
uplandgrassland	train5	Search	cefe	ceanothus fendleri, fendler's ceanothus			Native
uplandgrassland	train5	Search	capr5	carex praegracilis, clustered field sedge			Native
uplandgrassland	train5	Search	eref	erigonum effusum, spreading buckwheat			Native
uplandgrassland	train5	Search	cyse3	cyperus schweinitzii, schweinitz's flatsedge			Native

uplandgrassland	train5	Search	aste5	astragalus tenellus, looseflower milkvetch			Native
uplandgrassland	train5	Search	hean3	helianthus annuus, common sunflower			Native
uplandgrassland	train5	Search	mili3	mirabilis linearis, narrowleaf four o'clock			Native
uplandgrassland	train5	Search	meal2	melilotus albus			Introduced
uplandgrassland	train5	Search	oppo	opuntia polyacantha, plains pricklypear			Native
uplandgrassland	train5	Search	popr	poa pratensis, kentucky bluegrass			Native and Introduced
uplandgrassland	train5	Search	rosa5	rosa, rose			Not known
uplandgrassland	train5	Search	spr	sporobolus cryptandrus, sand dropseed			Native
uplandgrassland	train5	Search	hasp3	haplopappus spinulosus			Native
uplandgrassland	train5	Search	yugl	yucca glauca, small soapweed			Native
uplandgrassland	train5	Search	kopy	koeleria pyramidata			Native
uplandgrassland	train6	150° quad	calo	calamovilfa longifolia, prairie sandreed	15	35	Native
uplandgrassland	train6	150° quad	spr	sporobolus cryptandrus, sand dropseed	5	25	Native
uplandgrassland	train6	150° quad	cefe	ceanothus fendleri, fendler's ceanothus	25	20	Native
uplandgrassland	train6	150° quad	capr5	carex praegracilis, clustered field sedge	15	10	Native
uplandgrassland	train6	150° quad	popr	poa pratensis, kentucky bluegrass	7	10	Native and Introduced
uplandgrassland	train6	30° quad	hean3	helianthus annuus, common sunflower	20	55	Native
uplandgrassland	train6	30° quad	calo	calamovilfa longifolia, prairie sandreed	7	20	Native
uplandgrassland	train6	30° quad	spr	sporobolus cryptandrus, sand dropseed	2	20	Native
uplandgrassland	train6	30° quad	capr5	carex praegracilis, clustered field sedge	5	10	Native
uplandgrassland	train6	30° quad	cysc3	cyperus schweinitzii, schweinitz's flatsedge	20	12	Native
uplandgrassland	train6	270° quad	hean3	helianthus annuus, common sunflower	5	22	Native
uplandgrassland	train6	270° quad	spr	sporobolus cryptandrus, sand dropseed	10	25	Native
uplandgrassland	train6	270° quad	calo	calamovilfa longifolia, prairie sandreed	5	20	Native
uplandgrassland	train6	270° quad	cysc3	cyperus schweinitzii, schweinitz's flatsedge	10	20	Native
uplandgrassland	train6	270° quad	kopy	koeleria pyramidata	15	15	Native
uplandgrassland	train6	270° quad	capr5	carex praegracilis, clustered field sedge	1	10	Native
uplandgrassland	train6	Search	cefe	ceanothus fendleri, fendler's ceanothus			Native
uplandgrassland	train6	Search	capr5	carex praegracilis, clustered field sedge			Native
uplandgrassland	train6	Search	cysc3	cyperus schweinitzii, schweinitz's flatsedge			Native
uplandgrassland	train6	Search	hean3	helianthus annuus, common sunflower			Native
uplandgrassland	train6	Search	kopy	koeleria pyramidata			Native

uplandgrassland	train6	Search	popr	poa pratensis, kentucky bluegrass			Native and Introduced
uplandgrassland	train6	Search	calo	calamovilfa longifolia, prairie sandreed			Native
uplandgrassland	train6	Search	spr	sporobolus cryptandrus, sand dropseed			Native
uplandgrassland	train6	Search	oppo	opuntia polyacantha, plains pricklypear			Native
uplandgrassland	train6	Search	yugl	yucca glauca, small soapweed			Native
uplandgrassland	train6	Search	assp	asclepias speciosa, showy milkweed			Native
uplandgrassland	train6	Search	ange	andropogon gerardii, big bluestem			Native
uplandgrassland	train6	Search	asfa2	aster falcatus, cluster aster			Native
uplandgrassland	train6	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
uplandgrassland	train6	Search	eref	erigonum effusum, spreading buckwheat			Native
uplandgrassland	train6	Search	lipu	liatris punctata, dotted gayfeather			Native
uplandgrassland	train6	Search	meal2	melilotus albus			Introduced
uplandgrassland	train6	Search	oenot	oenothera, eveningprimrose			Not known
uplandgrassland	train6	Search	eumi5	euphorbia missurica			Native
uplandgrassland	train6	Search	orhy	oryzopsis hymenoides			Native
forbland	forb ab	30° quad	salu2	salix lutea, yellow willow	10	35	Native
forbland	forb ab	30° quad	caca4	calamagrostis canadensis, bluejoint	75	39	Native
forbland	forb ab	30° quad	poam8	polygonum amphibium, water knotweed	3	32	Native
forbland	forb ab	30° quad	euma6	eupatorium maculatum, spotted joeypyeweed	11	48	Native
forbland	forb ab	30° quad	urdi	urtica dioica, stinging nettle	8	56	Native and Introduced
forbland	forb ab	150° quad	brin2	bromus inermis, smooth brome	95	52	Introduced
forbland	forb ab	150° quad	ciar4	cirsium arvense, canadian thistle	7	38	Introduced
forbland	forb ab	270° quad	brin2	bromus inermis, smooth brome	92	32	Introduced
forbland	forb ab	270° quad	popr	poa pratensis, kentucky bluegrass	60	26	Native and Introduced
forbland	forb ab	Search	hetu	helianthus tuberosus, jerusalem artichoke			Native
forbland	forb ab	Search	mear4	mentha arvensis, wild mint			Native
forbland	forb ab	Search	hyma2	hypericum majus, large st. johnswort			Native
forbland	forb ab	Search	popu5	polygonum punctatum, dotted smartweed			Native
forbland	forb ab	Search	lyam	lycopus americanus, american waterhorehound			Native
forbland	forb ab	Search	asju	aster junciformis			Native
forbland	forb ab	Search	leor	leersia oryzoides, rice cutgrass			Native

forbland	forb ab	Search	scfl	scirpus fluviatilis			Native
forbland	forb ab	Search	vest	verbena stricta, hoary verbena			Native
forbland	forb ab	Search	paca6	panicum capillare, witchgrass			Native
forbland	forb ab	Search	cyod	cyperus odoratus, fragrant flatsedge			Native
forbland	forb ab	Search	lyth2	lysimachia thyriflora, tufted loosestrife			Native
forbland	forb ab	Search	rual4	rumex altissimus, pale dock			Native
forbland	forb ab	Search	sogi	solidago gigantea, giant goldenrod			Native
forbland	forb ab	Search	asin	asclepias incarnata, swamp milkweed			Native
forbland	forb ab	Search	coca5	conyza canadensis, canadian horseweed			Native
forbland	forb ab	Search	agst2	agrostis stolonifera, creeping bentgrass			Native
forbland	forb ab	Search	gatr2	galium trifidum, threepetal bedstraw			Native
forbland	forb ab	Search	vine	viola nephrophylla			Native
forbland	forb ab	Search	caap2	campanula aparinoides, marsh bellflower			Native
forbland	forb ab	Search	bifr	bidens frondosa, devil's beggartick			Native
forbland	forb ab	Search	geal3	geum aleppicum, yellow avens			Native
forbland	forb ab	Search	oevi	oenothera villosa, hairy eveningprimrose			Native
forbland	forb ab	Search	amfr	amorpha fruticosa, desert indigobush			Native
forbland	forb ab	Search	rama2	ranunculus macounii, macoun's buttercup			Native
forbland	forb ab	Search	lase	lactuca serriola, prickly lettuce			Introduced
forbland	forb ab	Search	eccr	echinochloa crus-galli, barnyardgrass			Introduced
forbland	forb ab	Search	capr7	carex praticola, meadow sedge			Native
forbland	forb c	30° quad	casa8	carex sartwellii, sartwell's sedge	40	42	Native
forbland	forb c	30° quad	hetu	helianthus tuberosus, jerusalem artichoke	60	56	Native
forbland	forb c	30° quad	spgr	spartina gracilis, alkali cordgrass	50	50	Native
forbland	forb c	30° quad	muas	muhlenbergia asperifolia, alkali muhly	12	28	Native
forbland	forb c	150° quad	muas	muhlenbergia asperifolia, alkali muhly	0.5	23	Native
forbland	forb c	150° quad	casa8	carex sartwellii, sartwell's sedge	30	28	Native
forbland	forb c	150° quad	spgr	spartina gracilis, alkali cordgrass	5	35	Native
forbland	forb c	150° quad	hetu	helianthus tuberosus, jerusalem artichoke	80	96	Native
forbland	forb c	270° quad	casa8	carex sartwellii, sartwell's sedge	35	28	Native
forbland	forb c	270° quad	spgr	spartina gracilis, alkali cordgrass	6	32	Native
forbland	forb c	270° quad	muas	muhlenbergia asperifolia, alkali muhly	1	16	Native
forbland	forb c	270° quad	sogi	solidago gigantea, giant goldenrod	11	26	Native
forbland	forb c	270° quad	hetu	helianthus tuberosus, jerusalem artichoke	75	62	Native

forbland	forb c	Search	scac	scirpus acutus			Native
forbland	forb c	Search	juba	juncus balticus, baltic rush			Native
mesicwoodland	meswooda	30° quad	pode3	populus deltoides, eastern cottonwood	90	3000	Native
mesicwoodland	meswooda	30° quad	prvi	prunus virginiana, common chokecherry	0.5	200	Native
mesicwoodland	meswooda	30° quad	syoc	symphoricarpos occidentalis, western snowberry	48	140	Native
mesicwoodland	meswooda	30° quad	hulu	humulus lupulus, common hop	30	92	Native and Introduced
mesicwoodland	meswooda	30° quad	smst	smilacina stellata	50	30	Native
mesicwoodland	meswooda	150° quad	agda	agropyron dasystachyum	4	38	Native
mesicwoodland	meswooda	150° quad	pode3	populus deltoides, eastern cottonwood	100	3000	Native
mesicwoodland	meswooda	150° quad	cala30	carex lanuginosa, woolly sedge	20	42	Native
mesicwoodland	meswooda	150° quad	paqu2	parthenocissus quinquefolia, virginia creeper	8	28	Native
mesicwoodland	meswooda	150° quad	meal2	melilotus albus	25	56	Introduced
mesicwoodland	meswooda	150° quad	ciar4	cirsium arvense, canadian thistle	6	42	Introduced
mesicwoodland	meswooda	150° quad	hulu	humulus lupulus, common hop	65	51	Native and Introduced
mesicwoodland	meswooda	150° quad	smst	smilacina stellata	10	25	Native
mesicwoodland	meswooda	270° quad	pode3	populus deltoides, eastern cottonwood	100	3000	Native
mesicwoodland	meswooda	270° quad	prvi	prunus virginiana, common chokecherry	18	65	Native
mesicwoodland	meswooda	270° quad	smst	smilacina stellata	10	28	Native
mesicwoodland	meswooda	270° quad	hulu	humulus lupulus, common hop	20	180	Native and Introduced
mesicwoodland	meswooda	270° quad	syoc	symphoricarpos occidentalis, western snowberry	5	48	Native
mesicwoodland	meswooda	270° quad	paqu2	parthenocissus quinquefolia, virginia creeper	3	20	Native
mesicwoodland	meswooda	Search	saam2	salix amygdaloides, peachleaf willow			Native
mesicwoodland	meswooda	Search	agcr	agropyron cristatum, crested wheatgrass			Introduced
mesicwoodland	meswooda	Search	soul5	sonchus uliginosus			Introduced
mesicwoodland	meswooda	Search	brin2	bromus inermis, smooth brome			Introduced
mesicwoodland	meswooda	Search	popr	poa pratensis, kentucky bluegrass			Native and Introduced
mesicwoodland	meswooda	Search	ceoc	celtis occidentalis, common hackberry			Native
mesicwoodland	meswooda	Search	meof	melilotus officinalis, yellow sweetclover			Introduced
mesicwoodland	meswooda	Search	vivu	vitis vulpina, frost grape			Native
mesicwoodland	meswooda	Search	taof	taraxacum officinale, common dandelion			Native and Introduced

mesicwoodland	meswooda	Search	tory	toxicodendron rydbergii, western poison ivy			Native
mesicwoodland	meswooda	Search	sogi	solidago gigantea, giant goldenrod			Native
mesicwoodland	meswooda	Search	amar2	ambrosia artemisiifolia, annual ragweed			Native
mesicwoodland	meswooda	Search	apca	apocynum cannabinum, indianhemp			Native
mesicwoodland	meswooda	Search	asju	aster junciformis			Native
mesicwoodland	meswooda	Search	gll3	glycyrrhiza lepidota, american licorice			Native
mesicwoodland	meswooda	Search	armi2	arctium minus, lesser burdock			Introduced
mesicwoodland	meswooda	Search	riod	ribes odoratum			Native
mesicwoodland	meswooda	Search	lase	lactuca serriola, prickly lettuce			Introduced
mesicwoodland	meswooda	Search	kosc	kochia scoparia, common kochia			Introduced
mesicwoodland	meswooda	Search	gatr3	galium triflorum, fragrant bedstraw			Native
mesicwoodland	meswooda	Search	assp	asclepias speciosa, showy milkweed			Native
mesicwoodland	meswooda	Search	eccr	echinochloa crus-galli, barnyardgrass			Introduced
mesicwoodland	meswooda	Search	el3	eleocharis palustris, common spikerush			Native
mesicwoodland	meswooda	Search	hean3	helianthus annuus, common sunflower			Native
mesicshrub	messhruba	30° quad	tyan	typha angustifolia, narrowleaf cattail	0.5	25	Introduced
mesicshrub	messhruba	30° quad	melil	melilotus, sweetclover	1	10	Not known
mesicshrub	messhruba	30° quad	paca6	panicum capillare, witchgrass	8	20	Native
mesicshrub	messhruba	30° quad	cyod	cyperus odoratus, fragrant flatsedge	13	4	Native
mesicshrub	messhruba	30° quad	ciar4	cirsium arvense, canadian thistle	2	4	Introduced
mesicshrub	messhruba	30° quad	aspr2	aster praealtus, willowleaf aster	0.5	5	Native
mesicshrub	messhruba	30° quad	mear4	mentha arvensis, wild mint	0.5	4	Native
mesicshrub	messhruba	30° quad	pode3	populus deltoides, eastern cottonwood	1	7	Native
mesicshrub	messhruba	30° quad	thin	thelypodium integrifolium, entireleaved thelypody	0.5	5	Native
mesicshrub	messhruba	Search	ciar4	cirsium arvense, canadian thistle			Introduced
mesicshrub	messhruba	Search	cyod	cyperus odoratus, fragrant flatsedge			Native
mesicshrub	messhruba	Search	aspr2	aster praealtus, willowleaf aster			Native
mesicshrub	messhruba	Search	melil	melilotus, sweetclover			Not known
mesicshrub	messhruba	Search	pode3	populus deltoides, eastern cottonwood			Native
mesicshrub	messhruba	Search	paca6	panicum capillare, witchgrass			Native
mesicshrub	messhruba	Search	mear4	mentha arvensis, wild mint			Native
mesicshrub	messhruba	Search	thin	thelypodium integrifolium, entireleaved thelypody			Native
mesicshrub	messhruba	Search	tyan	typha angustifolia, narrowleaf cattail			Introduced
mesicshrub	messhruba	Search	chru	chenopodium rubrum, red goosefoot			Native

mesicshrub	messhrub	Search	scat2	scirpus atrovirens, green bulrush		Native
mesicshrub	messhrub	Search	fraga	fragaria, strawberry		Not known
mesicshrub	messhrub	Search	rotr3	rorippa truncata		Not known
mesicshrub	messhrub	Search	ciar4	cirsium arvense, canadian thistle		Introduced
mesicshrub	messhrub	Search	amar	amaranthus arenicola, sandhill amaranth		Native
mesicshrub	messhrub	Search	bico3	bidens comosa		Native
mesicshrub	messhrub	Search	poam8	polygonum amphibium, water knotweed		Native
mesicshrub	messhrub	Search	urdi	urtica dioica, stinging nettle		Native and Introduced
mesicshrub	messhrub	Search	amar2	ambrosia artemisiifolia, annual ragweed		Native
mesicshrub	messhrub	Search	pope2	polygonum pensylvanicum, pennsylvania smartweed		Native
mesicwoodland	meswooda	Search	agda	agropyron dasystachyum		Native
mesicwoodland	meswooda	Search	ciar4	cirsium arvense, canadian thistle		Introduced
mesicwoodland	meswooda	Search	cala30	carex lanuginosa, woolly sedge		Native
mesicwoodland	meswooda	Search	hulu	humulus lupulus, common hop		Native and Introduced
mesicwoodland	meswooda	Search	meal2	melilotus albus		Introduced
mesicwoodland	meswooda	Search	paqu2	parthenocissus quinquefolia, virginia creeper		Native
mesicwoodland	meswooda	Search	pode3	populus deltoides, eastern cottonwood		Native
mesicwoodland	meswooda	Search	prvi	prunus virginiana, common chokecherry		Native
mesicwoodland	meswooda	Search	smst	smilacina stellata		Native
mesicwoodland	meswooda	Search	syoc	symphoricarpos occidentalis, western snowberry		Native