APPENDIX E - NATIVE GRASSLANDS HABITAT REPORT

Sweetland Wind Farm

2018 Grassland Habitat Assessment



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BACKGROUND

Sweetland Wind Farm, LLC (Sweetland) is proposing to develop the Sweetland Wind Energy Project (Project) in Hand County, South Dakota (Figure 1). As currently proposed, the Project would have a generation capacity of approximately 200 megawatts (MW), consisting of up to 71 GE 2.8/1272 wind turbines encompassing approximately 23,642 acres. The location of the Project in Hand County was selected in consultation with the U.S. Fish and Wildlife Service (FWS) and South Dakota Game, Fish, and Parks (GFP) and Scout Clean Energy (Scout). The location of the Project minimizes impacts to FWS Grassland Conservation Easements.

INTRODUCTION

The predominant land use within the Project is dryland farming and rangeland. As part of the wildlife/biological baseline studies of the Project, grasslands were evaluated at the request of Sweetland to assess grassland quality within the Project area. The objective was to provide an assessment of the quality of all Project grasslands based primarily on the presence and abundance of native tallgrass prairie species and introduced species, and based secondarily on grazing pressure, woody plant invasion, and land management (e.g., haying, dryland farming) and their ability to provide quality wildlife habitat (including grassland breeding avian species).

METHODS

To determine the location of potentially undisturbed grasslands (i.e., grasslands that have not previously been tilled) in the Project, the *Quantifying Undisturbed (Native) Lands in Eastern South Dakota: 2013¹* digital data layer (Bauman et al. 2016) was plotted on maps of the study area (Figure 2).

¹ <u>http://openprairie.sdstate.edu/data_land-easternSD/1/</u>



Figure 1. General location of the Sweetland Wind Energy Project, Hand County, South Dakota.



Figure 2. Potentially undisturbed grassland tracts within the Sweetland Wind Energy Project, Hand County, South Dakota (Bauman et al. 2016).

Prior to conducting grassland assessments, each square mile section, with some being expanded to accommodate for an updated project area, within the Project area was assigned a unique identifier (e.g., 1, 2, 3, etc.). While on-site, each section was visited and a subsequent unique identifier was assigned to each individual tract of grassland evaluated (e.g., 1A, 1B, B1, etc.). All grasslands were evaluated, including those not classified as undisturbed by Bauman et al. (2016). Bauman et al. (2016) defines undisturbed as never having been cultivated or mechanically disrupted for agriculture or other uses. Grassland tracts within each section were selected for separate evaluation based on differences in several characteristics such as topography, amount of grazing, plant species composition, adjacent land cover types, etc. Several tracts were separated from adjacent tracts of grassland only by fences, but were treated as separate tracts due to differences in grazing pressure, species composition, differences in the signature on aerial photos, or other factors. A total of 105 tracts of grassland habitat were assessed. The grassland evaluation was conducted on July 17-21, 2018, August 18-19, 2018, September 1, 2018, and September 14, 2018.

Where access had been granted, the evaluator traversed through the grassland tract on foot to obtain relevant information for conducting the assessment. Where no access had been granted, the evaluator recorded information and scored the grassland from public roads, with the aid of binoculars. Similar to those grasslands that were traversed, characteristics such as topography, amount of grazing, plant species composition, and adjacent land cover types were taken into account during the visual assessments, to the extent possible. No evaluations were conducted for grassland tracts that could not be viewed from public roads or areas where access had not been obtained. Based on this combined approach two tracts were not evaluated due to land access restrictions or no visibility from public roads. Whether or not the grassland tract may have been previously disturbed was recorded based on several factors, including topography, presence of wetlands and drainages, and presence of large rocks or rock piles within the grassland.

For each tract the following characteristics were described on a datasheet to help assess the quality of the grasslands: grass height; appearance with respect to grazing, burning, haying, and residual litter; and degree of woody invasion (shrubs and trees). All grass species observed in each tract were recorded and classified as native or introduced. A list of forb species also was recorded, along with notes on relative abundance of native grasses, introduced grasses, and forbs. A list of plant species identified during the survey is provided in Appendix A. Any other pertinent comments also were recorded. Data sheets were completed for each tract (Appendix B) and a photograph was taken to depict characteristics of each tract (Appendix C). Based on this information, each grassland tract was assigned a qualitative value from 1 to 5 that represents the quality of the grassland being evaluated compared to the optimal grassland type for the geographical area in question, with a score of 1 representing optimal conditions. The qualitative thresholds for ratings were: Excellent = 1; Above Average = 2; Average = 3; Fair = 4, and Poor = 5.

The following definitions were used to rate grasslands in the project area based on descriptions of habitat the U.S. Fish and Wildlife Service (USFWS) *Guidance for Interagency Cooperation*

under Section 7(a)(2) of the Endangered Species Act for the Dakota Skipper, Dakota Skipper Critical Habitat, and Poweshiek Skipperling Critical Habitat (USFWS 2016). These definitions are useful for evaluating the quality of grassland habitat, even in areas outside the range of these species, such as is the case for the Project, since the species in question are prairie-obligates dependent on grasslands containing native grass and forb species.

Excellent (1) – Dominated entirely by native tallgrass species such as big bluestem (*Andropogon gerardi*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*) or sideoats grama (*Bouteloua curtipendula*), with numerous native forbs such as purple coneflower (*Echinacea purpurea*), prairie clover (*Dalea* spp.), blanket flower (*Gaillardia* sp.), and leadplant (*Amorpha canescens*). No significant invasion by woody species, not cut for hay and no to moderate grazing by livestock.

Above Average (2) – Native grasses and forbs as described above are common, but introduced grasses and forbs are also prevalent. No significant invasion by woody species, not cut for hay and no to moderate grazing by livestock.

Average (3) – Some native grasses and forbs are present, but not common, and tract is dominated by introduced grasses. Minor to no invasion by woody species, not cut for hay and no to moderate grazing by livestock.

Fair (4) – No native grasses present. Dominated entirely by introduced grasses, although native forbs may be present. Woody species invasion may occur in portions. Not cut for hay and no to moderate grazing by livestock.

Poor (5) – Grasslands classified as poor included all those classified as hayfields as well as any grassland severely overgrazed by livestock. These grasslands were also completely dominated by introduced grasses with few native forbs present. Hayfields were classified as Poor because they have little value to wildlife once they have been cut, although their value would increase if haying were not conducted in any given year.

RESULTS

A map showing locations of grasslands evaluated during the study along with their classification is provided in Figure 3. No evaluations were done for grassland tracts where access had not been obtained, and were not visible from public roads (i.e. Figure 3 – unscored areas, 1.3% of total area scored, Table 1). No Excellent (1) level grasslands were located in the Project area. The vast majority (61 of 105; 49.9%; Table 1) of the grassland tracts evaluated were rated Fair (4), of which two were scored from public roads: 5B, and 15F. These tracts had no native grasses identified and almost all were dominated entirely by smooth brome (*Bromus inermis*), although a few were dominated by mixtures of crested wheatgrass (*Agropyron cristatum*) and smooth brome. Other introduced grasses occurring in these tracts included Kentucky bluegrass (*Poa pratensis*) and fescue (*Festuca* spp.). Some native forbs were present, but not common.

These tracts were not hayed and also were typically either not grazed or grazed lightly to moderately. A few of these tracts appeared to have previously been disturbed (i.e., previously tilled) and currently enrolled in the Conservation Reserve Program (CRP), but most appeared to have never been disturbed. Only three parcels in the Project area had big bluestem observations, with two of those parcels being apparent CRP tracts; the third tract with big bluestem was one Above Average (2) tract located along steep slopes. In all three of these cases only a few individual big bluestem plants were observed and the dominant species were introduced species such as smooth brome. Minor invasion by woody plants, especially western snowberry (*Symphoricarpus occidentalis*) has occurred in some of the tracts.



Figure 3. Locations of evaluated grasslands and their quality classification for the Sweetland Wind Energy Project, Hand County, South Dakota. White areas on map represent non-grassland habitat types.

Twenty-nine grasslands (28.4%; Table 1) were rated Poor (5), 10 of which were evaluated and scored from public roads: 5C, 12C, 13A, 22C, 23E, 25C, 31C, 33B, 37B, 40C. Thirteen of these were hayfields that had recently been cut at the time of the site visit. No native grasses were observed and all were dominated by smooth brome.

Thirteen grasslands (17.1%; Table 1) were rated Average (3), two of which were evaluated and scored from public roads: 43C and 47C. All of these grasslands had native grasses present, but the native grasses were not prevalent and the tracts were dominated by smooth brome. Some native forbs were present, but not common. These tracts were not hayed and also were typically either not grazed or grazed lightly to moderately. Minor invasion by woody plants, especially western snowberry has occurred in some.

Eight grasslands (3.3%; Table 1) were either entirely or partially rated Above Average (2). These included two entire but relatively small grassland tracts and portions of six additional tracts. All of these grasslands occurred on slopes leading up from ravines, and only occurred in the relatively hilly portion of the Project area. In those cases where only portions of the grassland were rated Above Average, the remainder of the grassland that occurred in the valley bottom or on flatter terrain away from ravines was rated Poor in four cases and Average in two cases. Grasslands rated as Above Average had substantial components of native grasses, especially sideoats grama, along with minor amounts of other native grasses such as green needlegrass (*Nassella viridula*), needle-and-thread (*Heterostipa comata*) or blue grama (*Bouteloua gracilis*). Native forbs were conspicuous and included purple coneflower, prairie coneflower (*Ratibida columnifera*), leadplant, daisy fleabane (*Erigeron annuus*), and purple and white prairie clover. Although native grasses were abundant, introduced grasses were also prevalent, which prevented any of these sites from receiving an Excellent classification. A photograph depicting a typical example of an Above Average Grassland is provided in Figure 4.

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Ranking [®]	Percentage			
1	0.0%			
2	3.3%			
3	17.1%			
4	49.9%			
5	28.4%			
Unscored	1.3%			

 Table 1. Proportion of grasslands within each ranking for the

 Sweetland Wind Energy Project, Hand County, South Dakota

^aRankings: 1 = Excellent; 2 = Above Average; 3 = Average; 4 = Fair; 5 = Poor, Unscored



Figure 4. Slopes in Project area rated as Above Average due to prevalence of native grasses and forbs. Sideoats grama is prevalent here, but note that smooth brome is still a common component of these sites.

DISCUSSION

Native tall and mixed-grass prairies once covered a majority of the central and eastern Great Plains region of the United States, but less than 4% of the original tallgrass prairie remains. Smooth brome is an introduced cool-season perennial, sod-forming grass that invades both native cool- and warm-season grasslands throughout North America (Sundall et al. 2015). Smooth brome has been largely ignored as an invasive species due to its economic value as a forage plant through both livestock grazing and hay production (Dillemuth 2012). All grasslands evaluated in the Sweetland Project area had substantial components of smooth brome. The only sites found in the Project area not dominated by smooth brome and with relatively abundant native grasses and forbs all occurred on steeper slopes above ravines. These sites typically have shallow soils and do not maintain as much moisture as deeper soils in areas of relatively flat topography. Smooth brome is most commonly found in areas with abundant soil moisture and is mostly associated with wetter soils or low-lying areas (Sundall et al. 2015, Thompson and Salesman 2011); therefore it likely does not compete well with native grasses on these slopes.

From an ecological perspective, grasslands in the Project area dominated by smooth brome (i.e., Average, Fair, and Poor) do provide some wildlife habitat, but they are abundant throughout the region. The Above Average grasslands also provide wildlife habitat and have native species more commonly present although not dominant; these grasslands only occur in smaller isolated areas on the steeper slopes in the Project.

REFERENCES

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Appendix A. Plant Species Observed During the Grassland Assessment at the Sweetland Wind Energy Project in 2018

0	
	Scientific name
Native Grasses	
big bluestem	Andropogon gerardi
blue grama	Bouteloua gracilis
foxtail barley	Hordeum jubatum
green needlegrass	Nassella viridula
needle-and-thread	Heterostipa comata
prairie cordorass	Spartina pectinata
porcupine grass	Hesperostipa spartea
prairie iunegrass	Koeleria macrantha
prairie sandreed	Calamovilfa longifolia
prairie threeawn	Aristida oligantha
sideoats grama	Bouteloua curtipendula
tall dropseed	Sporobolus compositus
Introduced Grasses	
barnvard grass	Echinochlosa crus-gali
crested weatgrass	Agropyron cristatum
fescue	Festuca sp
intermediate wheatgrass	Thinopyrum intermedium
Japanese brome	Bromus ianonicas
Kentucky bluegrass	Poa pratensis
setaria	Setaria sp
smooth broome	Bromus inermis
	Phalaris arundinacea
tell wheetgree	Thinonyrum ponticum
timothy	Phloum protonco
_ unioury	r nieum pratense
	Artomicio obcinthium
absintn wormwood	
beeblossom	Gaura coccinea Convolvuluo envensio
bindweed	
Dullaio Dul	
	Potentilla sp.
common mullein	verbascum thapsis
common saisity	I ragopogon dubius
common sunflower	Helianthus annuus Askillas asilla falis a
common yarrow	Achillea millefollum
curlycup gumweed	Grindella squarrosa
curly dock	Rumes crispus
daisy fleabane	Erigeron annuus
dandelion	Taraxacum officinale
fringed sage	Artemisia trigida
goldenrod	Solidago sp.
horsemint	Monarda sp.
horseweed	Erigeron canadensis
kochia	Bassia scoparia
leadplant	Amorpha canescens
leafy spurge	Euphorbia esula
Maximilian sunflower	Helianthus maximilina
musk thistle	Carduus nutans
pennycress	Thlaspi arvense
poison ivy	Toxicodendron sp.

Appendix A. Plant species observed during the grassland assessment at Sweetland Wind Resource Area.

Common Name	Scientific name
prairie coneflower H	Ratibida columnifera
prickly lettuce L	Lactuca serriola
purple coneflower B	Echinacea purpurea
purple prairie clover L	Dalea purpurea
western ragweed	Ambrosia psilostachya
rose	Rosa sp.
rush skeletonweed (Chondrilla juncea
scarlet globemallow	Sphaeralcea coccinea
showy milkweed	Asclepias speciose
silverleaf scurfpea H	Pediomelum argophyllum
smartweed H	Polygonum sp.
smooth camas	Zygadenus elegans
wavyleaf thistle	Cirsium undulatum
white clover	Trifolium repens
white prairie clover L	Dalea candida
white sage	Artemisia ludoviciana
white sweetclover /	Melilotus alba
wild licorice d	Glycyrrhiza lepidota
wooly verbena	Verbena stricta
yellow sweetclover /	Melilotus officinalis
Shrubs and Trees	
eastern red cedar	Juniperus virginiana
Russian olive	Eleagnus angustifolia
western snowberry	Symphoricarpos occidentalis

Appendix A. Plant species observed during the grassland assessment at Sweetland Wind Resource Area.

DATA FORMS EXCLUDED