

Appendix C – Native Prairie Survey

Native Prairie Survey

Ashley Wind Energy Project

McIntosh County, North Dakota

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1.0 INTRODUCTION

CPV Ashley Renewable Energy Company, LLC (CPV) is planning to develop a wind energy conversion facility in McIntosh County, North Dakota. The Ashley Wind Energy Project (WEP) encompasses land that consists of a mix of agricultural crops, rangeland, and native prairie. Much of the native prairie is currently being used for grazing or hay production by private landowners. CPV contracted Tetra Tech EC, Inc. (Tetra Tech) to conduct a native prairie survey of the area currently under agreement for development of the WEP. The purpose of this study was to assess the extent of native prairie in the WEP and identify the potential presence of suitable habitat for the Dakota skipper (*Hesperia dacotae*) which is a candidate species for listing by the United States Fish and Wildlife Service (USFWS). It is important to note that the USFWS has indicated that the Dakota skipper has not been recorded in McIntosh County, North Dakota (http://www.fws.gov/northdakotafieldoffice/county_list.htm); the Dakota skipper has been recorded in 16 counties in North Dakota, the closest being Stutsman County (approximately 30 miles north from its nearest point to McIntosh County).

It is generally understood that the widespread loss of native prairie makes it an ecosystem of conservation concern. Native prairie serves as an important ecological resource by providing habitat for a diverse population of plants and animals, including wildlife species that rely on native prairie plant species. However, due to the prairie's fertile soils and predominantly flat topography, large portions have been converted to agricultural lands over the past 200 years. Additional factors that have altered the ecology of native prairie ecosystems include invasion of non-native plant species, loss of native grazers (e.g., bison [*Bison bison*]), altered fire regimes, and habitat fragmentation. The lack of fire coupled with overgrazing can lead to the conversion of prairie to shrubland or woodland, thereby reducing the value of the converted habitat to wildlife (Belsky and Blumenthal 1997; Johnson 1997; Grant et al. 2003; Reinking 2006).

Native prairie can also provide suitable stopover habitat during migration and upland nesting cover for waterfowl species. The prairie region of the northern Great Plains is one of the most important areas for duck reproduction in North America (Samson et al. 1998, Jones-Farrand et al. 2007). Twelve of the 34 species of North American ducks are common breeders in the region (Samson et al. 1998, Jones-Farrand et al. 2007). The region is also a major migration corridor during fall and spring for other ducks, geese, shorebirds and other waterbirds (Skagen and Knopf 1994, Samson et al. 1998, Jones-Farrand et al. 2007). Although construction of a wind energy facility differs greatly from wholesale conversion of grassland to agricultural croplands (e.g., smaller disturbance footprint than grazing or industrial-scale crops), as is the case on the property being proposed for the WEP, disturbances of native prairies, particularly those that surround permanent or semi-permanent wetlands (prairie potholes), have the potential to affect these breeding and migratory stopover areas.

Native prairie within the Midwest region of the United States is utilized in a few ways. Most native prairie in private holdings is used for cattle ranching and managed as rangelands. On rangelands, the soil has not been tilled and fire is often used to suppress the growth of woody species (Hagen et al. 2005). Other forms of rangeland management, such as seeding, fertilizing, and invasive species control, are less common but both serve to promote the growth of prairie species over woody species. Native prairie may also be placed in conservation easements, held privately or publicly as preserves, or wildlife refuges. Preserves and refuges can be difficult to distinguish visually from rangelands because the same types of management (i.e., fire and grazing) are often applied; however, both forms of utilization or management can promote healthy prairie.

2.0 STUDY AREA AND METHODS

2.1 Ashley Wind Energy Project Study Area

The proposed WEP is located in south-central North Dakota in McIntosh County, 6 miles north of the City of Ashley. The WEP area is characteristic of the upland portion of this region, with the majority of the land surface currently covered by agriculture, rangelands, and native prairie. CPV currently has over 17,400 acres of land under lease agreement with private land owners for development of the WEP. The WEP is planned to generate approximately 200 megawatts (MW) of renewable energy that will be sold to the Tennessee Valley Authority (TVA) through a Power Purchase Agreement (PPA). The study area for this effort is defined by the area under agreement with CPV which is also being considered as part of the 200 MW PPA with TVA.

North Dakota is broken up into four distinct ecoregions. The WEP resides in the Northwestern Glaciated Plain ecoregion. Native prairie, an ecological system dominated by grasses where there is not enough rainfall to support trees, is found throughout North Dakota. The WEP falls within a mixed-grass prairie. Native prairie still persists in areas but they have been largely replaced by wheat, alfalfa and other commercial crops over most of the ecoregion (Bryce et al. 1998, Samson et al. 1998). Other types of grasslands found in North Dakota include tame grasslands (i.e., pasturelands mostly used for cattle grazing), which are comprised primarily of non-native species. Native prairie differs from tame grasslands in that native prairie is found on unbroken soil whereas tame grasslands occur on tilled soil and have been planted. There is a USFWS grassland easement covering 169 acres within the WEP but no known prairie preserves or wildlife refuges.

2.2 Prairie Assessment Methodology

Prior to field surveys, Tetra Tech Geographic Information System (GIS) specialists performed a desktop analysis of prairie and crop land cover within the study area for the WEP. A range biologist conducted field surveys from July 27 to August 14, 2009 to verify the desktop-generated land cover estimates within the WEP. Summer is an appropriate time to conduct these surveys because many native grassland plants are in bloom and easy to identify. In order to identify areas of native prairie, the biologist systematically assessed the habitat by making roadside stops and verifying the habitats identified on the field maps. In many areas, one square-mile sections of land were bordered by county roads and were easily evaluated. For most sections of land, each habitat patch was viewed from several points to better estimate patch boundaries.

Identification or elimination of the potential of native prairie was based on several visual cues: 1) the presence of native grassland grass species, including big bluestem, switchgrass, and little bluestem; 2) the presence of non-native species in core areas away from fence lines, including smooth brome and wheatgrass; 3) rolling topography that renders land less feasible for tilling; 4) the presence of rock piles which indicate clearing of rock from an area in preparation for cultivation; and 5) crop vegetation growing in obvious rows. Details and scientific names for the species encountered in tame grasslands and native prairie areas can be found in Table 3 and 4, respectively.

In addition to identifying native prairie, the range biologist also made determinations as to the suitability of the native prairie for the Dakota skipper. The Dakota skipper is a butterfly species that is currently a candidate species for listing under the Endangered Species Act (ESA). The Dakota skipper is classified as a candidate species because, although its historic range once consisted of vast unbroken native prairies in north-central United States and south-central Canada, its current range is now limited to scattered remnants of high quality native prairies in Minnesota, North and South Dakota, and southern Manitoba (USFWS 2002). The Dakota skipper population has declined due to sensitivity to disturbance and the loss of native prairie habitat. The Dakota skipper's classification as a federal candidate species does not entitle it to legal protection under the ESA; however, if a candidate species becomes listed as threatened or endangered, then protection for that species becomes mandated under the ESA. Further reduction of

native prairie habitat within the range of the Dakota skipper could impact existing populations of this candidate species, which may result in its listing as threatened or endangered. According to the USFWS, the Dakota skipper has not been recorded in McIntosh County.

The range biologist also evaluated grasslands to determine their suitability as habitat for the Dakota skipper. The criteria used during classification were the current grazing intensity, the overall quality and diversity of the native prairie within the grassland, and the presence of key plant species which the Dakota skipper depends upon (e.g., bluestem, coneflower). Based on information contained within the USFWS status assessment for this species (USFWS 2002), three categories of habitat quality were developed. Excellent habitat was defined as areas of native prairie where only light grazing had occurred and at least 1 key plant species was observed to be present. Good habitat was defined as areas of native prairie with low to moderate grazing where the range biologist inferred from landscape characteristics that key plant species were likely to be present. Poor habitat was defined as areas where heavy grazing had occurred and key plant species were unlikely to be present. The methodology did not include an exhaustive inventory and delineation of all potential habitat; hence, the presence or absence of key species could not be verified in all locations. In addition, the field biologist recorded grazing intensity by estimating the percentage of vegetation grazed in broad classes: 0-25 percent (light), 25-50 percent (moderate), 50-75 percent (heavy), and 75-100 percent (overgrazed).

3.0 RESULTS

The field survey identified 8,520 acres (50 percent of WEP) of native prairie, 1,662 acres (10 percent) of tame grassland, and the remainder of the WEP (6,836 acres; 40 percent) is comprised of crops, hay, and other non-prairie land cover types (Tables 1-2; Figure 1). The largest parcels of non-invaded prairie occur in the northwestern section of the WEP (Figure 1). Within the WEP, four noxious weeds (absinthe wormwood, Canada thistle, leafy spurge, butter-and-eggs [yellow toadflax]; Tables 3 and 4) were located in native prairie and tame grasslands

Of the land classified as native prairie, 2,586 acres (30 percent of native prairie; 15 percent of WEP) were classified as potentially excellent Dakota skipper habitat and 1,919 acres (22 percent of native prairie; 11 percent of WEP) were classified as potentially good habitat (Figure 1). The remainder of the WEP is likely unsuitable for Dakota skippers.

4.0 CONCLUSIONS

Native prairie is an ecosystem of conservation concern (Samson et al. 2004). Native prairie comprises 50 percent of the WEP. Maintaining unfragmented areas of native prairie of the largest practicable size in the WEP may be of benefit to wildlife. Areas of native prairie that also contain prairie potholes within the WEP could provide important breeding and stopover habitat for various waterfowl and shorebird species (Klett et al. 1988). Approximately 26 percent of the WEP is potential Dakota skipper habitat. There is one area of contiguous, excellent potential skipper habitat in the northwest portion of the WEP. Although no legal protection is currently provided to the Dakota skipper as a candidate species under the ESA and the species has not been recorded within McIntosh County to date, efforts should be made to minimize impacts to this species.

North Dakota law (NDCC § 63-01.1-01) requires North Dakota landowners and other persons in charge of or in possession of land to eradicate or control the spread of noxious weeds. County and city weed boards enforce the existing statute through inspections, issuance of notice to control and follow-up re-inspections. If unhandled by the landowner or other persons in charge of or in possession of infested land, the weed boards have the authority to control weeds on the land in question (North Dakota Weed Control Association 2008). Depending upon their management goals, landowners are responsible for invasive species management. Compliance with preventative best management practices during construction will minimize the potential for the spread of weeds within the WEP.

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TABLES

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Table 1. Distribution of habitat types surveyed during native prairie assessment at the Ashley WEP. Total area assessed is less than total WEP as wetlands and waterways were not surveyed.

Land Cover Class	Total Acres	Percent Cover
Native Prairie	8,520	50
<i>Excellent skipper habitat</i>	2,586*	15 (30 of prairie)
<i>Good skipper habitat</i>	1,919*	11 (22 of prairie)
Tame Grassland	1,662	10
Crop	3,209	19
Crop and Hay	2,408	14
Hay	1,160	7
Other	59	1
Total	17,018	100

* Skipper habitat is a subset of native prairie

Table 2. Patch characteristics for native prairie, tame grassland, and potential Dakota skipper habitat at the Ashley WEP.

	Native Prairie	Tame Grassland	Excellent Potential Skipper Habitat	Good Potential Skipper Habitat
Number of patches	10	10	10	10
Average patch size (mean acres \pm SE*)	852 \pm 590	155 \pm 43	258 \pm 133	191 \pm 76
Largest patch (acres)	6,412	440	1,468	846

* SE = standard error; included as a measure of variability in patch size.

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Table 3. Species Observed in Tame Grasslands.*

Scientific Name	English Name
Graminoids	
<i>Agropyron cristatum</i> (L.) Gaertn.	crested wheatgrass
<i>Agropyron dasystachyum</i> (Hook.) Scribn.	thickspike wheatgrass
<i>Agropyron elongatum</i> (Host) Beauv.	tall wheatgrass
<i>Agropyron intermedium</i> (Host) Beauv.	intermediate wheatgrass
<i>Andropogon scoparius</i> Michx.	little bluestem
<i>Bouteloua gracilis</i> (H.B.K.) Lag. ex. Griffiths	blue grama
<i>Bromus inermis</i> Leyss.	smooth brome
<i>Koeleria pyramidata</i> (Lam.) Beauv.	Junegrass
<i>Poa pratensis</i> L.	Kentucky bluegrass
<i>Stipa spartea</i> Trin.	porcupine-grass
<i>Stipa viridula</i> Trin.	green needlegrass
Forbs	
<i>Achillea millefolium</i> L.	yarrow
<i>Ambrosia psilostachya</i> DC.	western ragweed
<i>Artemisia absinthium</i> L.	absinthe wormwood
<i>Artemisia frigida</i> Willd.	fringed sagewort
<i>Artemisia ludoviciana</i> Nutt.	white sagewort
<i>Chrysopsis villosa</i> (Pursh) Nutt.	hairy gold aster
<i>Cirsium</i> sp.	thistle species
<i>Cirsium arvense</i> (L.) Scop.	Canada thistle
<i>Cirsium</i> cf. <i>vulgare</i> (Savi) Ten.	bull thistle
<i>Dalea candida</i> Michx. ex Willd.	white prairie clover
<i>Dalea purpurea</i> Vent.	purple prairie clover
<i>Echinacea angustifolia</i> DC.	purple coneflower
<i>Erigeron strigosus</i> Muhl. Ex Willd.	daisy fleabane
<i>Grindelia squarrosa</i> (Pursh) Dun.	curly-top gumweed
<i>Gutierrezia sarothrae</i> (Pursh) Britt. & Rusby	broom snakeweed
<i>Helianthus annuus</i> L.	common sunflower
<i>Helianthus rigidus</i> (Cass.) Desf.	stiff sunflower
<i>Liatris punctata</i> Hook.	dotted blazing star
<i>Lygodesmia juncea</i> (Pursh) Hook.	skeleton weed
<i>Medicago lupulina</i> L.	black medic
<i>Medicago sativa</i> L.	alfalfa
<i>Melilotus alba</i> Medic.	white sweet clover
<i>Melilotus officinalis</i> (L.) Pall.	yellow sweet clover
<i>Polygala alba</i> Nutt.	white milkwort
<i>Psoralea argophylla</i> Pursh	silver-leaf scurf pea
<i>Ratibida columnifera</i> (Nutt.) Woot. & Standl.	prairie coneflower
<i>Solidago mollis</i> Bartl.	soft goldenrod
<i>Solidago rigida</i> L.	rigid goldenrod
<i>Sonchus arvensis</i> L.	field sow thistle
<i>Tragopogon dubius</i> Scop.	goat's beard

* Nomenclature follows Great Plains Flora Association. 1986. [Flora of the Great Plains](#). University Press of Kansas, Lawrence, KS.
Bold – exotic species

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Table 4. Species Observed in Native Prairie.*

Scientific Name	English Name
Graminoids	
<i>Agropyron caninum</i> (L.) Beauv. subsp. <i>majus</i> (Vasey) C.L.Hitchc.	slender wheatgrass
<i>Agropyron cristatum</i> (L.) Gaertn.	crested wheatgrass
<i>Agropyron dasystachyum</i> (Hook.) Scribn.	thickspike wheatgrass
<i>Agropyron elongatum</i> (Host) Beauv.	tall wheatgrass
<i>Agropyron smithii</i> Rydb.	western wheatgrass
<i>Andropogon gerardii</i> Vitman	big bluestem
<i>Andropogon scoparius</i> Michx.	little bluestem
<i>Avena fatua</i> L.	wild oats
<i>Bouteloua curtipendula</i> (Michx.) Torr.	sideoats grama
<i>Bouteloua gracilis</i> (H.B.K.) Lag. ex. Griffiths	blue grama
<i>Bromus inermis</i> Leyss.	smooth brome
<i>Buchloe dactyloides</i> (Nutt.) Engelm.	buffalo grass
<i>Calamovilfa longifolia</i> (Hook.) Scribn.	prairie sandreed
<i>Dichanthelium</i> cf. <i>oligosanthes</i> (Schult.) Gould var. <i>scribnerianum</i> (Nash) Gould	Scribner's rosette grass
<i>Elymus canadensis</i> L.	Canada wild rye
<i>Eragrostis spectabilis</i> (Pursh) Steud.	purple lovegrass
<i>Koeleria pyramidata</i> (Lam.) Beauv.	Junegrass
<i>Muhlenbergia cuspidata</i> (Torr.) Rydb.	plains muhly
<i>Panicum virgatum</i> L.	switchgrass
<i>Poa pratensis</i> L.	Kentucky bluegrass
<i>Stipa comata</i> Trin. & Rupr.	needle-and-thread
<i>Stipa spartea</i> Trin.	porcupine-grass
<i>Stipa viridula</i> Trin.	green needlegrass
Forbs	
<i>Achillea millefolium</i> L.	yarrow
<i>Agoseris glauca</i> (Pursh) Dietr.	false dandelion
<i>Allium</i> sp. (likely <i>A. stellatum</i> or <i>A. textile</i>)	wild onion
<i>Allium stellatum</i>	pink wild onion
<i>Ambrosia psilostachya</i> DC.	western ragweed
<i>Anemone cylindrica</i> A. Gray	candle anemone
<i>Anemone patens</i> L.	pasque flower
<i>Antennaria</i> species	pussy-toes
<i>Antennaria neglecta</i> Green	field pussy-toes
<i>Antennaria parviflora</i> Nutt	pussy-toes
<i>Arabis glabra</i> (L.) Bernh.	tower mustard
<i>Artemisia absinthium</i> L.	absinthe wormwood
<i>Artemisia campestris</i> L. subsp. <i>caudata</i> (Michx.) Hall & Clem.	western sagewort
<i>Artemisia frigida</i> Willd.	fringed sagewort
<i>Artemisia ludoviciana</i> Nutt.	white sagewort
<i>Asclepias syriaca</i> L.	common milkweed
<i>Asclepias viridiflora</i> Raf.	green milkweed
<i>Aster ericoides</i> L.	heath aster

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Table 4. Species Observed in Native Prairie.*

Scientific Name	English Name
<i>Astragalus crassicaarpus</i> Nutt.	groundplum
<i>Astragalus gilviflorus</i> Sheld.	plains orophaca
<i>Calylophus serrulatus</i> (Nutt.) Raven	plains yellow primrose
<i>Chrysopsis villosa</i> (Pursh) Nutt.	hairy gold aster
Cirsium spp.	thistle species
<i>Cirsium arvense</i> (L.) Scop.	Canada thistle
<i>Cirsium flodmanii</i> (Rydb.) Arthur	Flodman's thistle
<i>Cirsium undulatum</i> (Nutt.) Spreng.	wavy-leaf thistle
<i>Cirsium cf. vulgare</i> (Savi) Ten.	bull thistle
<i>Comandra umbellata</i> (L.) Nutt.	bastard toadflax
<i>Conyza canadensis</i> (L.) Cronq.	horseweed
<i>Dalea candida</i> Michx. ex Willd.	white prairie clover
<i>Dalea purpurea</i> Vent.	purple prairie clover
<i>Echinacea angustifolia</i> DC.	purple coneflower
<i>Erigeron strigosus</i> Muhl. Ex Willd.	daisy fleabane
<i>Erysimum asperum</i> (Nutt.) DC.	western wallflower
<i>Gaillardia aristata</i> Pursh	blanket flower
<i>Galium boreale</i> L.	northern bedstraw
<i>Gaura coccinea</i> Pursh	scarlet gaura
<i>Glycyrrhiza lepidota</i> Pursh.	wild licorice
<i>Grindelia squarrosa</i> (Pursh) Dun.	curly-top gumweed
<i>Gutierrezia sarothrae</i> (Pursh) Britt. & Rusby	broom snakeweed
<i>Haplopappus spinulosus</i> (Pursh) DC.	cutleaf ironplant
<i>Helianthus grosseserratus</i> Martens	sawtooth sunflower
<i>Helianthus maximiliani</i> Schrad.	Maximilian sunflower
<i>Helianthus rigidus</i> (Cass.) Desf.	stiff sunflower
<i>Heuchera richardsonii</i> R. Br.	alumroot
<i>Kuhnia eupatorioides</i> L.	false boneset
<i>Lactuca oblongifolia</i> Nutt.	blue lettuce
<i>Liatris punctata</i> Hook.	dotted blazing star
<i>Linum rigidum</i> Pursh.	stiffstem flax
<i>Linum sulcatum</i> Riddell	grooved flax
<i>Linaria vulgaris</i> Hill	butter-and-eggs
<i>Lobelia kalmia</i> L.	Kalm's lobelia
<i>Lotus purshianus</i> (Benth.) Clem. & Clem.	deer vetch
<i>Lygodesmia juncea</i> (Pursh) Hook.	skeleton weed
<i>Medicago lupulina</i> L.	black medic
<i>Medicago sativa</i> L.	alfalfa
<i>Melilotus alba</i> Medic.	white sweet clover
<i>Melilotus officinalis</i> (L.) Pall.	yellow sweet clover
<i>Mirabilis hirsuta</i> (Pursh) MacM.	hairy four-o'clock
<i>Oenothera nuttallii</i> Sweet	white-stemmed evening primrose
<i>Oenothera villosa</i> Thunb.	common evening primrose
<i>Onosmodium molle</i> Michx.	false gromwell

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Table 4. Species Observed in Native Prairie.*

Scientific Name	English Name
<i>Orthocarpus luteus</i> Nutt.	owl clover
<i>Penstemon gracilis</i> Nutt.	slender beardtongue
<i>Physalis virginiana</i>	groundcherry
<i>Polygala alba</i> Nutt.	white milkwort
<i>Polygala verticillata</i> L.	whorled milkwort
<i>Polygonum pennsylvanicum</i> L.	Pennsylvania smartweed
<i>Potentilla arguta</i> Pursh	tall cinquefoil
<i>Potentilla pennsylvanica</i> L.	Pennsylvania cinquefoil
<i>Psoralea argophylla</i> Pursh	silver-leaf scurf pea
<i>Psoralea esculenta</i> Pursh	breadroot scurf pea
<i>Ratibida columnifera</i> (Nutt.) Woot. & Standl.	prairie coneflower
<i>Rudbeckia hirta</i> L.	black-eyed susan
<i>Solidago canadensis</i> L.	Canada goldenrod
<i>Solidago missouriensis</i> Nutt.	prairie goldenrod
<i>Solidago mollis</i> Bartl.	soft goldenrod
<i>Solidago ptarmicoides</i> (Nees) Boivin	sneezewort aster
<i>Solidago rigida</i> L.	rigid goldenrod
<i>Sonchus arvensis</i> L.	field sow thistle
<i>Sphaeralcea coccinea</i> (Pursh) Rydb.	red false mallow
<i>Teucrium candense</i> L.	American germander
<i>Tragopogon dubius</i> Scop.	goat's beard
<i>Vernonia fasciculata</i> Michx.	ironweed
<i>Viola pedatifida</i> G. Don	prairie violet
Trees & Shrubs	
<i>Amorpha canescens</i> Pursh	leadplant
<i>Amorpha nana</i> Nutt.	dwarf wild indigo
<i>Artemisia cana</i> Pursh	silver sagebrush
<i>Rosa arkansana</i> Porter	prairie wildrose
<i>Symphoricarpos occidentalis</i> L.	western snowberry

* Nomenclature follows Great Plains Flora Association. 1986. [Flora of the Great Plains](#). University Press of Kansas, Lawrence, KS.

Bold – exotic species

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FIGURE
