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Keystone Pipeline Project

A Field Survey of the Keystone Pipeline Project Construction Corridor in North and South Dakota for Dakota Skipper (*Hesperia dacotae*) Habitat, Western Prairie Fringed Orchid (*Platanthera praeclara*) Habitat, and for Native Grassland

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Executive Summary

A field survey was conducted along the proposed Keystone Pipeline Project construction right-of-way for native grassland habitat and for native grassland species. The target native grassland species were western prairie fringed orchid (*Platanthera praeclara*) and Dakota skipper butterfly (*Hesperia dacotae*). The survey was conducted by a two person team from September 11 to September 16, 2006. Survey sites were determined from aerial photograph and topographic map analysis along the proposed project route, and through consultation with federal and state agencies. A total of 38 sites were visited during the field survey. Of the 38 survey sites, four of the sites were determined not to be grassland. Of the remaining 34 survey areas, 10 were determined to be high quality grasslands, seven were determined to be medium quality grasslands, and 17 were determined to be low quality grasslands. Eight survey sites were identified as potential habitat for the Dakota skipper and eight were identified as potential habitat for the western prairie fringed orchid. It is recommended that these sites be surveyed in 2007 for the presence or absence of the target species. Photographs, detailed survey site summaries, survey location maps, and a species list can be found in the appendices of this report.

1.0 Introduction

The proposed Keystone Mainline enters Cavalier County, North Dakota, from Canada and continues south along the eastern portions of North Dakota, South Dakota, and Nebraska. The proposed pipeline route then turns east crossing Kansas and Missouri, and terminates in Marion County, Illinois. The Mainline objectives of this survey were as follows:

Objective 1. To determine areas along the corridor that are potential habitat for Dakota skipper (*Hesperia dacotae*), a butterfly that is designated as a federal candidate species.

Objective 2. To determine areas along the corridor that are potential habitat for western prairie fringed orchid (*Platanthera praeclara*), a plant that is federally listed as a threatened species.

Objective 3. To identify sections of the corridor with intact or partially intact native grassland.

The western prairie fringed orchid and Dakota skipper butterfly, hereafter referred to as the target species, both occur on native grassland areas. However, they occupy different types of grassland habitat. Therefore, any area designated as potential habitat for either target species also constitutes intact or partially native grassland. In contrast, there may be intact or partially intact native grassland areas that are not potential habitat for either of these two target species. In order to identify which native grassland areas are best suited for the two target species the following, background information on grassland and target species habitats was obtained.

Habitat Requirements for Dakota Skipper (*Hesperia dacotae*)

The literature consulted to determine Dakota skipper habitat included reports or articles by Vaughan and Shepherd (2005), Royer (1996), Schlicht (1997), and Dakota Skipper Conservation Guidelines from the U.S. Fish and Wildlife Service (USFWS 2005) in Bloomington, Minnesota. From these articles the following habitat summary was developed.

Dakota skipper habitat is native tall and mixed-grass prairie or prairie remnants where there are abundant larval and adult food-sources present. The two grassland habitats where this species is known to occur are: 1) low (wet) grassland dominated by bluestem grasses, wood lily, harebell, and smooth camas, and 2) upland (dry) grassland on ridges and hillsides dominated by bluestem grasses, needlegrass, pale purple and upright coneflowers and blanketflower. Since nectar provides the nutrients and carbohydrates for Dakota skippers to meet the energetic demands of flight, one of the best indicators for Dakota skipper habitat is the presence of Dakota skipper food plants for larva and nectar plants for adults. The Dakota skipper larva prefers little blue stem (*Schizachyrium scoparium*) roots as a nutrient source, but the larvae do not use this grass exclusively.

Preferred nectar plants for the adult Dakota skipper are purple coneflowers or black Sampson plants: *Echinacea angustifolia*. Other preferred nectar sources include a vetch (*Astragalus adsurgens*), hoary vervain (*Verbena stricta*), leadplant (*Amorpha canescens*), white prairie clover (*Dalea candida*), fleabane (*Erigeron* spp.), blanketflower (Gaillardia), black-eyed Susans (*Rudbeckia* sp.), yellow sundrops (*Calylophus serrulatus*) and purple locoweed (*Oxytropis lambertii*.) The Dakota skipper also is a generalist in regards to pollen collection, and it also is believed that the larvae can live on roots other than those of the little blue stem. Therefore, if a grassland site had both a diverse mix of native forbs, and only one or two of the known larvae or pollen plants, it was considered Dakota skipper habitat. Another important factor in determining suitable habitat is the proximity of other native grassland areas.

Habitat Requirements for Western Prairie fringed Orchid (*Platanthera praeclara*)

The western prairie fringed orchid occurs on tall-grass calcareous silt loam or sub-irrigated sandy grasslands. The largest known population of this orchid occurs on the Sheyenne National Grasslands in Ransom County, North Dakota. Therefore, all grassland wetland areas in Ransom County were considered to be potential habitat for this orchid. To obtain a better search image for the habitat where this orchid occurs, an area on the Sheyenne National Grassland where this orchid was known to occur about two months prior to this survey was visited. The following photos were taken on September 12, 2006, of the habitat where western prairie fringed orchid (*Platanthera praeclara*) was seen in July 2006. Note the mowing and bailing that has occurred since July.

Photo 1: Search image for western prairie fringed orchid habitat obtained at the Sheyenne National Grassland, Ransom County, North Dakota

Photo 2: Sheyenne National Grassland western prairie fringed orchid habitat located along roadside ditch

Photo 3: Bailing had occurred along the roadside ditch where the western prairie fringed orchid had been sighted in July 2006

Native Grassland Habitat in the Dakotas

Ecologists often divide the Great Plains grasslands into short, mid, and tallgrass prairie regions. These three grasslands are named on the basis of the average height of the dominant, native grass cover. The differences among these three grassland types also correspond to both the amount and seasonal distribution of annual precipitation. The shortgrass steppe area usually receives less than 30 centimeters (cm) of precipitation per year, most of which occurs in summer thunderstorm events. The mixed or mid-grass prairie regions usually receive more than 30 cm of precipitation per year (up to 50 or more), but compared to the shortgrass prairie, the mid-grass prairie receives more annual precipitation during the spring. This early season precipitation encourages more of the "cool-season" or C-3 photosynthetic pathway grass species (*Stipa, Agropyron, Kohleria*). Finally, the tallgrass prairie, sometimes referred to as "true prairie," occurs further east and typically receives over 50 cm of precipitation per year.

The grasslands of interest in this survey are mid-grass prairie and tallgrass prairie areas along the proposed Keystone Pipeline Project construction right-of-way (ROW) in eastern North and South Dakota. The mixed or mid-grass grasslands were once dominated by cool-season grasses such as needle-and-thread (*Stipa*), junegrass (*Kohleria macrantha*), western wheat grass (*Agropyron smithii*) and others. The tallgrass areas have taller species such as Indian grass (*Sorghastrum nutans*), and big blue stem (*Andropogon gerardii*). There is a transition region between mid- and tallgrass prairie that is sometimes evident in the few remaining grasslands in the eastern Dakotas.

The significance of conserving the remaining grassland areas becomes evident when a few statistics are cited regarding the extent to which our native grasslands have been converted to other land uses, especially to cropland and pastures. Sampson and Knoph (1994) reported that over 99 percent of the original tallgrass prairie in Iowa, Minnesota, and North Dakota has been destroyed by settlement and agriculture. It was not indicated how much mixed or mid-grass prairie remains in North Dakota, but it was estimated that in South Dakota, about 85 percent of the original 3 million acres of mixed-grass prairie has been converted to non-grassland uses. Jones and Cushman (2004) site that only 0.3 percent of the original tallgrass prairie and 1.8 percent of the original mixed-grass prairie remains in central North America.

2.0 Methods

Prior to field work, aerial photographs of the entire Keystone Pipeline Project route in North Dakota and South Dakota were studied to identify potential native grassland areas. Survey sites were selected with varying size, geographic location, and hypothesized habitat quality, to capture a wide array of grassland habitat that would be encountered along the pipeline route. Based on the aerial photograph analysis these sites were further categorized as low, medium, or high quality grasslands; categories that were to be verified in the field. Sites identified as high quality grasslands typically were areas that appeared to have native vegetation, steep slopes or hills, or were fairly large, or that were adjacent to larger areas of grassland outside of the pipeline corridor. Sites identified as medium quality grasslands were areas of moderate size, or appeared to be lightly or moderately grazed pastures, or have a mixture of planted and native vegetation. Low quality grasslands were areas of smaller size, or sites that appeared to have a majority of planted grass species, or heavily grazed pastures. This designation helped assure that a large variety of sites would be visited in the field, and that no major grassland areas would be missed during the field survey.

Seventeen sites were pre-selected for ground surveys. A ground survey consisted of walking a majority of the survey site, taking detailed field notes of the site, completing a data sheet outlining the dominant vegetation types, native plant species, invasive plant species, disturbance, and potential threatened and endangered species habitat, taking representative photos of the site, and collecting voucher specimens for further identification. Drive-by reconnaissance was conducted at the remaining grassland sites identified from the aerial photograph exercise. Drive-by reconnaissance also consisted of taking field notes of the site, and completing a data sheet, taking photographs and global positioning system coordinates from the roadside. All sites were analyzed for native grassland habitat quality, and potential target species habitat.

3.0 Results

Field surveys were conducted by Sara Stribley (ENSR biologist) and Don Hazlett (ENSR botanist) from September 11 to September 16, 2006. A total of 38 sites were surveyed during this timeframe. Of the 38 sites visited, detailed documentation was completed for 30 of the sites. A data sheet for each of these 30 sites was completed, which includes a plant species list and other notes that are unique to the site. Photographs were taken of each location that was identified as a "feature" and a unique feature number was assigned to each of 30 these sites. The eight sites that were not recorded as features were either non-grassland areas, or were very low quality grassland sites, similar to previous survey sites visited. Notes were taken on these eight sites, but detailed documentation for these areas was not necessary. Global positioning system (GPS) coordinates also were taken at a majority of the sites to ensure that the surveys were being conducted within the pipeline construction ROW.

A ground survey was conducted at 12 sites. Initially, 17 sites were selected for ground surveys. However, in the field, some of the original 17 sites turned out to be agriculture fields or very low quality pastures, that did not warrant a thorough ground examination.

A summary table was made for the sites that were visited during the field survey (**Table 1**). This table contains information on the feature number, survey date, start and end milepost, county, state, survey type (visit or drive-by), habitat quality designation, target species designation (or not), and a brief description of the site.

Color photographs (one or more for each feature), detailed site summaries, and survey location maps can be found in Appendix I.

A list of over 150 plant species that were identified during this field survey, including several noxious weed species can be found in Appendix II.

For each of the 38 locations, a determination was made if the site consisted of native grassland. If the site contained some or all native grassland, the next determination was made in regards to the quality of the grassland. The following summarizes the determinants used in the field to classify grassland quality at each site:

High Quality Grassland. This category was assigned only to large areas dominated by native grass, with special attention given to corridor areas that were adjacent to large tracts of native grassland. Further criteria required to obtain a high quality status was the presence of a relatively high diversity of native grasses (three or more) and of native forbs (four or more that were relatively common). Also, there must be few exotic, weedy plants to be ranked as high. Only 10 of the 38 sites that were viewed or visited obtained the rank of high quality grassland (**Table 1**).

Medium Quality Grassland. This rank was given to grassland that had a matrix vegetation of native plants, but that also had significant disturbance, such as moderate to high grazing or pockets of exotic weeds or pasture grass invasion. Of the 38 sites that were viewed or visited, 7 obtained the rank of medium quality grassland (**Table 1**).

Low Quality Grassland. Plowed cropland was not considered grassland. In addition, unplowed pastures that have been heavily grazed for a long period of time, or that have been planted with exotic pasture grasses to the extent that no native grasses can be found, were not considered grassland, even though some of these sites contained several weedy, native forbs (ex: Grindelia). The low quality grassland rank was given to sites with a few upland or sometimes ridge top areas with recognizable areas of native grasses and forbs. An area could be considered low quality grassland despite the dominance in some areas of the corridor by smooth brome or by other pasture grasses. Of the 38 areas that were viewed, 17 (nearly half) were given a rank of low quality grassland (**Table 1**).

None. In the field it was discovered that 4 of the 38 areas designated from the aerial photographs as grassland were actually grass-filled wetlands or croplands (grazed hayfield, etc.).

Dakota skipper habitat. After an area was categorized as a high, medium, or low quality grassland, it was then determined if this area also was suitable habitat for the Dakota skipper butterfly. Factors that were considered in this determination were: 1) if there was little blue stem present, a known larval food for the Dakota skipper; 2) if at least two of the known pollen source plants for the Dakota skipper were present; 3) if there was a diverse mix of native grasses and forbs; 4) if there was a large area of native prairie adjacent to the pipeline corridor; and 5) if the site was in the range of where this species could potentially occur.

Based on the above criteria 8 of the 34 grassland areas were designated as potential Dakota skipper habitat sites (**Table 2**). Seven of these potential Dakota skipper habitat locations were on areas designated as high quality prairie, and one was on an area designated as medium quality grassland.

Western prairie fringed orchid habitat. After an area was categorized as a high, medium, or low quality grassland, it was then determined if this area also was habitat for the western prairie fringed orchid. Factors that were considered in this determination were: 1) if it was possible for a grassland (of any quality) to be subirrigated, 2) subirrigation meant that there needed to be a wetland area nearby, 3) if the wetland area had upland inclusions, and 4) if the site was in the range of where this orchid could potentially occur.

Based on these criteria, 8 of the 34 grassland areas were potential habitat for this orchid (**Table 2**). Of these selected locations, one was high quality grassland, three were medium quality grassland, and two were low quality grassland.

4.0 Discussion

Dakota skipper (*Hesperia dacotae*)

Most of the locations designated as potential habitat for the Dakota skipper were located on ridges or hilly areas containing native prairie with at least one Dakota skipper pollen plant, and little blue stem, the preferred food for Dakota skipper larvae.

The threats to Dakota skipper habitat identified by the USFWS Guidelines include burning, haying, grazing, pesticide use, and invasion by non-native plants, including exotic pasture grasses. During this survey there were few signs of burning or pesticide use, but grazing and exotic plants were present. The most severe threat to the few remaining sections of high and moderate quality grassland (potential Dakota skipper sites) was grazing coupled with exotic pasture grass invasion and/or planting. On several occasions, especially at the only site in Kingsbury County, there was clear evidence that grazing facilitated the invasion of exotic pasture grasses.

Pipeline construction reduces native grassland areas by destroying the prairie sod. Once disturbed, this sod is extremely slow (over 100 years) at redeveloping. A second threat is that disturbing soil along the construction ROW encourages the establishment of exotic pasture grasses, especially smooth brome (*Bromus inermis*) and the establishment of noxious weeds. The most aggressive weeds in this area are the plumeless thistle (*Carduus ancanthoides*) toward the south, Canadian thistle (*Cirsium arvense*) and wormwood (*Artemisia absinthimim*) in wetlands and mesic pastures, and in some areas the invasion of sweet clover (Melilotus), bindweed (*Convolvulus arvense*), and leafy spurge (*Euphorbia esula*).

Table 1 **Summary of the 38 Sites Along the Keystone Pipeline Route in North and South Dakota that were Surveyed from September 11 to September 16, 2006 for: 1) Potential Habitat for the Prairie Fringed Orchid (*Platanthera praeclara*), 2) Potential Habitat for the Dakota Skipper Butterfly (*Hesperia dacotae*), and 3) for the Presence of Quality Native Grassland**

	Feature Number	Survey Date	Start MP	End MP	County	State	Survey Type	Quality of Grassland Habitat	Suitable Dakota Skipper or Western Prairie Fringed Orchid Habitat?	Site Summary
1	None Designated	9/12/2006	200.4	202.0	Sargent	ND	Drive-by	None	No	Agriculture.
2	TDH1NDSA003	9/12/2006	202.0	202.5	Sargent	ND	Drive-by	Low	No	Wet lowland, few prairie plants, BRIN dominated.
3	None Designated	9/12/2006	202.4	203.6	Sargent	ND	Drive-by	None	No	Agriculture.
4	TDH1NDSA002	9/12/2006	203.6	203.9	Sargent	ND	Drive-by	High	Yes, Dakota skipper	Appears to be high quality native prairie from road.
5	TDH1NDSA001	9/12/2006	204.1	205.0	Sargent	ND	Site Visit	High	Yes, Dakota skipper	Very high quality, Government land.
6	None Designated	9/12/2006	205.0	205.6	Sargent	ND	Drive-by	Low	No	BRIN Pasture and wetland mosaic.
7	TDH1NDDI003	9/12/2006	207.8	208.3	Dickey	ND	Drive-by	Medium	Yes, prairie fringed orchid	Wetland meadow with upland inclusions.
8	TDH1NDDI002	9/12/2006	210.8	211.9	Dickey	ND	Site Visit	High	Yes, prairie fringed orchid	Grazed, wetland meadow with upland inclusions.
9	None Designated	9/12/2006	211.9	212.4	Dickey	ND	Drive-by	None	No	Agriculture.
10	TDH1NDDI001	9/12/2006	212.9	214.0	Dickey	ND	Drive-by	None	Yes, prairie fringed orchid	Large, high quality wetland with few upland areas.
11	TDH1SDMA001	9/13/2006	228.5	228.9	Marshall	SD	Site Visit	None	No	Large, wetland meadow on State land.
12	None Designated	9/11/2006	258.6	258.8	Day	SD	Drive-by	Low	Yes, prairie fringed orchid	Appeared to be heavily grazed from the road.
13	TDHISDDA005	9/11/2006	260.0	260.8	Day	SD	Drive-by	Low	No	Heavily grazed, with only a few native grasses and forbs.
14	TDH1SDDA004	9/11/2006	261.4	262.6	Day	SD	Drive-by	Low	No	Wheatgrass pasture with few native grasses and forbs.
15	TDH1SDDA003	9/11/2006	264.5	264.8	Day	SD	Site Visit	Low	No	Heavily grazed BRIN ridge near a meandering creek.
16	TDH1SDDA002	9/11/2006	265.2	266.2	Day	SD	Site Visit	High	Yes, Dakota skipper	Native prairie adjacent to a hilly, high quality prairie.

Table 1 Summary of the 38 Sites Along the Keystone Pipeline Route in North and South Dakota that were Surveyed from September 11 to September 16, 2006 for: 1) Potential Habitat for the Prairie Fringed Orchid (*Platanthera praeclara*), 2) Potential Habitat for the Dakota Skipper Butterfly (*Hesperia dacotae*), and 3) for the Presence of Quality Native Grassland

	Feature Number	Survey Date	Start MP	End MP	County	State	Survey Type	Quality of Grassland Habitat	Suitable Dakota Skipper or Western Prairie Fringed Orchid Habitat?	Site Summary
17	None Designated	9/11/2006	267.2	267.7	Day	SD	Drive-by	Low	No	Pasture with introduced grasses.
18	TDH1SDDA001	9/11/2006	270.6	271.6	Day	SD	Drive-by	Low	No	Heavily grazed riparian area in corridor.
19	None Designated	9/11/2006	272.3	273.3	Clark	SD	Drive-by	Low	No	Pasture with introduced grasses.
20	TDH1SDCL005	9/13/2006	277.2	277.9	Clark	SD	Drive-by	Medium	Yes, prairie fringed orchid	A mosaic of pasture/wetland and grassland.
21	TDH1SDCL006	9/13/2006	278.4	279.2	Clark	SD	Drive-by	Medium	Yes, prairie fringed orchid	A mosaic of pasture/wetland and grassland.
22	TDH1SDCL004	9/11/2006	280.1	280.5	Clark	SD	Drive-by	Low	No	BRIN dominated alkaline pasture.
23	None Designated	9/11/2006	280.8	281.1	Clark	SD	Drive-by	Low	No	Pasture with introduced grasses.
24	TDH1SDCL003	9/11/2006	285.3	285.7	Clark	SD	Drive-by	Low	No	Heavily grazed, BRIN dominated riparian/meadow.
25	TDH1SDCL002	9/11/2006	293.7	294.1	Clark	SD	Drive-by	Low	No	Heavily grazed, BRIN dominated riparian/meadow.
26	TDH1SDCL001	9/11/2006	296.9	297.9	Clark	SD	Site Visit	Medium	Yes, Dakota skipper	Wetland swale with upland (blue grama) inclusions.
27	TDH1SDKI001	9/16/2006	325.1	326.4	Kingsbury	SD	Drive-by	High/North Medium/ South	No	Road dissects High (N) and Medium (S) quality grasslands.
28	TDH1SDMI001	9/16/2006	342.9	344.0	Miner	SD	Drive-by	Low	No	Redstone Creek with BRIN, *Poa* and AGCR pasture grasses.
29	TDH1SDMI002	9/16/2006	358.5	359.9	Miner	SD	Drive-by	Low	No	BRIN pasture with wetland spots.
30	TDH1SDMC001	9/16/2006	383.9	384.5	McCook	SD	Drive-by	Medium to High	Yes, prairie fringed orchid	BRIN pasture with wetlands and native grassland on hills.

Table 1 Summary of the 38 Sites Along the Keystone Pipeline Route in North and South Dakota that were Surveyed from September 11 to September 16, 2006 for: 1) Potential Habitat for the Prairie Fringed Orchid (*Platanthera praeclara*), 2) Potential Habitat for the Dakota Skipper Butterfly (*Hesperia dacotae*), and 3) for the Presence of Quality Native Grassland

	Feature Number	Survey Date	Start MP	End MP	County	State	Survey Type	Quality of Grassland Habitat	Suitable Dakota Skipper or Western Prairie Fringed Orchid Habitat?	Site Summary
31	TDH1SDHU001	9/16/2006	389.7	390.6	Hutchinson	SD	Drive-by	Low	No	BRIN / *Poa* dominated pasture.
32	TDH1SDHU002	9/16/2006	390.9	391.7	Hutchinson	SD	Site Visit	High	Yes, Dakota skipper, prairie fringed orchid	By Wolf Creek, rolling, native prairie hills.
33	TDH1SDYA006	9/15/2006	418.7	419.2	Yankton	SD	Site Visit	Medium	No	Grassland on ridges. BRIN / *Poa* pasture & weeds in wet spots.
34	TDH1SDYA005	9/15/2006	419.6	420	Yankton	SD	Site Visit	High	Yes, Dakota Skipper	Mosaic of BRIN pasture with quality BOGR prairie spots.
35	TDH1SDYA004	9/15/2006	420.6	420.8	Yankton	SD	Drive-by	High	Yes, Dakota Skipper	Moderately grazed hills with native grassland.
36	TDH1SDYA003	9/15/2006	421.8	422.1	Yankton	SD	Site Visit	High	Yes, Dakota Skipper	By James River, native prairie ridges between cedar/broadleaf tree-filled ravines.
37	TDH1SDYA002	9/15/2006	423.5	423.8	Yankton	SD	Site Visit	Medium	No	Heavily grazed, but BOGR dominated.
38	TDH1SDYA001	9/14/2006	426.7	428.9	Yankton	SD	Site Visit	Low	No	BRIN and *Carduus acanthoides* in swales: few native plants.

ND – North Dakota

SD – South Dakota

BRIN – *Bromus inermis*

AGCR – *Agropyron cristatum*

BOGR – *Bouteloua gracilis*

Table 2 Summary Sites that Contain Suitable Dakota Skipper and Western Prairie Fringed Orchid Habitat

Feature Number	Start MP	End MP	County	State	Quality of Grassland Habitat	Survey Type	Site Summary
TDH1NDSA002	203.6	203.9	Sargent	ND	High	Dakota skipper	Appears to be high quality native prairie from road.
TDH1NDSA001	204.1	205.0	Sargent	ND	High	Dakota skipper	Very high quality, Government land.
TDH1NDDI003	207.8	208.3	Dickey	ND	Medium	western prairie fringed orchid	Wetland meadow with upland inclusions.
TDH1NDDI002	210.8	211.9	Dickey	ND	High	western prairie fringed orchid	Grazed, wetland meadow with upland inclusions.
TDH1NDDI001	212.9	214.0	Dickey	ND	None	western prairie fringed orchid	Large, high quality wetland with few upland areas.
None Designated	258.6	258.8	Day	SD	Low	western prairie fringed orchid	Appeared to be heavily grazed from the road.
TDH1SDDA002	265.2	266.2	Day	SD	High	Dakota skipper	Native prairie adjacent to a hilly, high quality prairie.
TDH1SDCL005	277.2	277.9	Clark	SD	Medium	western prairie fringed orchid	Mosaic of pasture/wetland and grassland.
TDH1SDCL006	278.4	279.2	Clark	SD	Medium	western prairie fringed orchid	Mosaic of pasture/wetland and grassland.
TDH1SDCL001	296.9	297.9	Clark	SD	Medium	Dakota skipper	Wetland swale with upland (blue grama) inclusions.
TDH1SDMC001	383.9	384.5	McCook	SD	Medium to High	western prairie fringed orchid	BRIN pasture with wetlands and native grassland on hills.
TDH1SDHU002	390.9	391.7	Hutchinson	SD	High	Dakota skipper, western prairie fringed orchid	By Wolf Creek, rolling, native prairie hills.
TDH1SDYA005	419.6	420	Yankton	SD	High	Dakota skipper	Mosaic of BRIN pasture with quality BOGR prairie spots.

Table 2 Summary Sites that Contain Suitable Dakota Skipper and Western Prairie Fringed Orchid Habitat

Feature Number	Start MP	End MP	County	State	Quality of Grassland Habitat	Survey Type	Site Summary
TDH1SDYA004	420.6	420.8	Yankton	SD	High	Dakota skipper	Moderately grazed hills with native grassland.
TDH1SDYA003	421.8	422.1	Yankton	SD	High	Dakota skipper	By James River, native prairie ridges between cedar/broadleaf tree-filled ravines.

ND – North Dakota

SD – South Dakota

BRIN – *Bromus inermis*

AGCR – *Agropyron cristatum*

BOGR – *Bouteloua gracilis*

Western prairie fringed orchid (*Plantanthera praeclara*)

Declines in the western prairie fringed orchid populations, as identified by the USFWS Guidelines, have been caused by the drainage and conversion of its habitats to agricultural production, channelization, siltation, road and bridge construction, grazing, haying, and the application of herbicides. The most apparent threats to the orchid along the proposed Keystone Pipeline Project construction ROW include conversion of its habitat to agriculture, haying, and heavy grazing.

5.0 Grassland Survey Sites in Nebraska

The Nebraska Game and Park Commission (NGPC) indicated that it has identified and mapped remnant native grasslands in Nebraska. To date, Keystone has not received the NGPC data to determine whether any of these remnant grasslands would be crossed by the project.

ENSR identified as potential native grassland or high quality grassland areas from aerial photograph interpretation. These areas are very limited in number, and therefore, all of these areas should be included in the 2007 surveys for native grassland species. **Table 3** details the locality information for these additional survey areas in Nebraska. Aerial photographs of these survey areas are presented in Appendix III.

Table 3 Additional Grassland Survey Sites in Nebraska for the 2007 Grassland Species Surveys

Start MP	End MP	County	Grassland Species
436.0	436.1	Cedar	Western prairie fringed orchid, small white lady's slipper
503.4	503.5	Stanton	Western prairie fringed orchid, small white lady's slipper
540.9	541.2	Colfax	Western prairie fringed orchid, small white lady's slipper
548.1	548.2	Butler	Western prairie fringed orchid, small white lady's slipper
564.4	564.7	Butler	Western prairie fringed orchid, small white lady's slipper
594.8	595.1	Saline	Western prairie fringed orchid, small white lady's slipper
606.4	606.5	Saline	Western prairie fringed orchid, small white lady's slipper
622.2	622.4	Jefferson	Western prairie fringed orchid, small white lady's slipper
635.1	636.8	Jefferson	Western prairie fringed orchid, small white lady's slipper
637.0	637.4	Jefferson	Western prairie fringed orchid, small white lady's slipper

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Appendix I

Photos, Site Summaries, and Survey Location Maps

Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Grassland Habitat Quality	Suitable T&E Habitat?
TDH1NDSA003	9/12/2006	202.0	202.5	Sargent	ND	Drive By	Low	No

Site Summary: Over 90% smooth brome (*Bromus inermis*) pasture with weedy wormwood (*Artemisia absinthimum*) in spots. A railroad dissects this pasture (to the left of this photograph). This pasture area is not suitable habitat for any of the target species.

Feature TDH1SDSA003: Overview of this smooth brome (*Bromus inermis*) dominated pasture.

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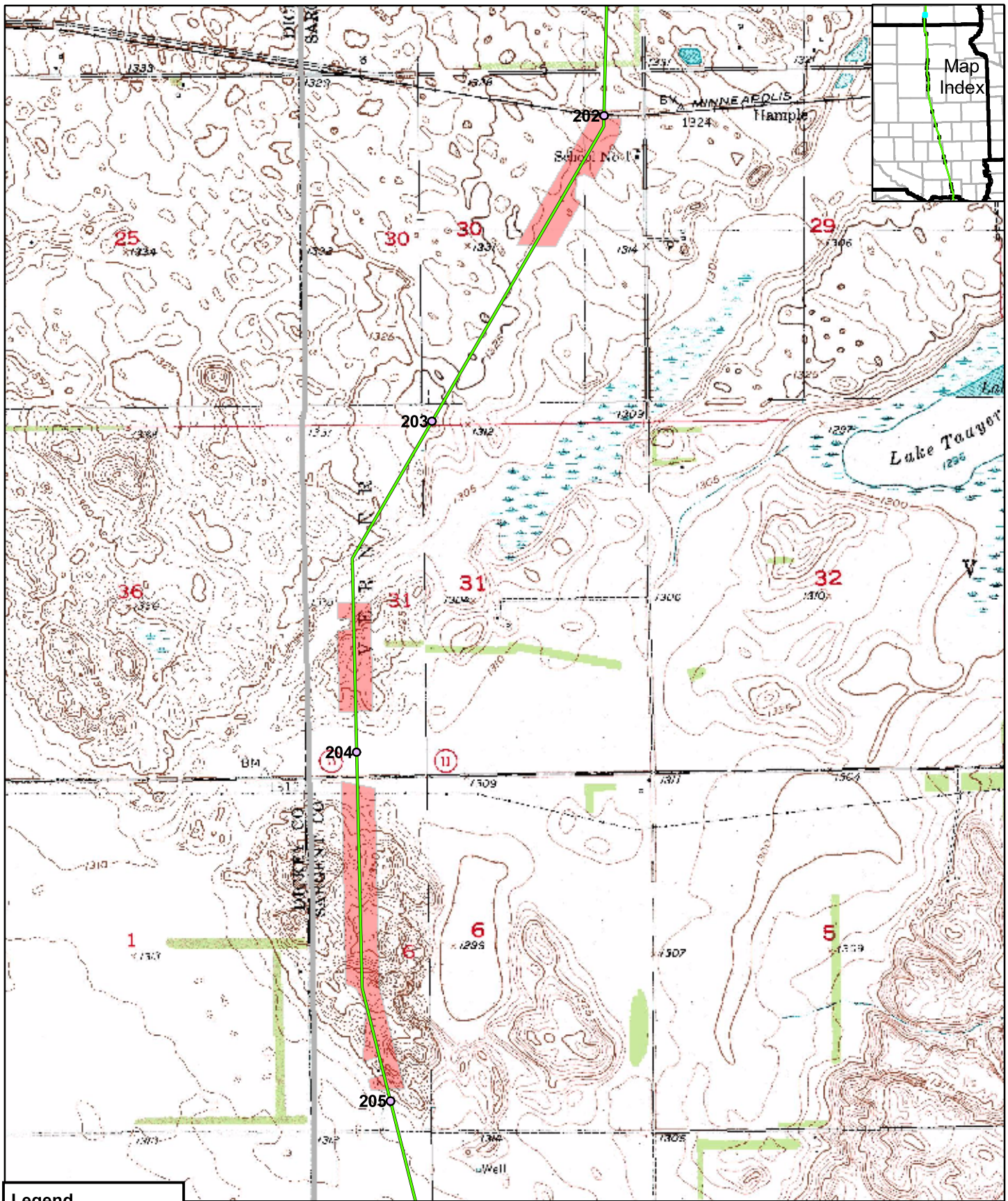

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1NDSA002	9/12/2006	203.6	203.9	Sargent	ND	Drive By	High	Yes, Dakota skipper

Site Summary: This agriculture field is by a paved road. However, on the hills in the background of this photograph is grassland ca. 0.25 mile north that was ranked as high quality (we hand no access). This grassland is similar to feature TDH1NDSA001 and is designated as Dakota skipper habitat.

Feature TDH1NDSA002: This high quality grassland is in the distance, past the agriculture field.

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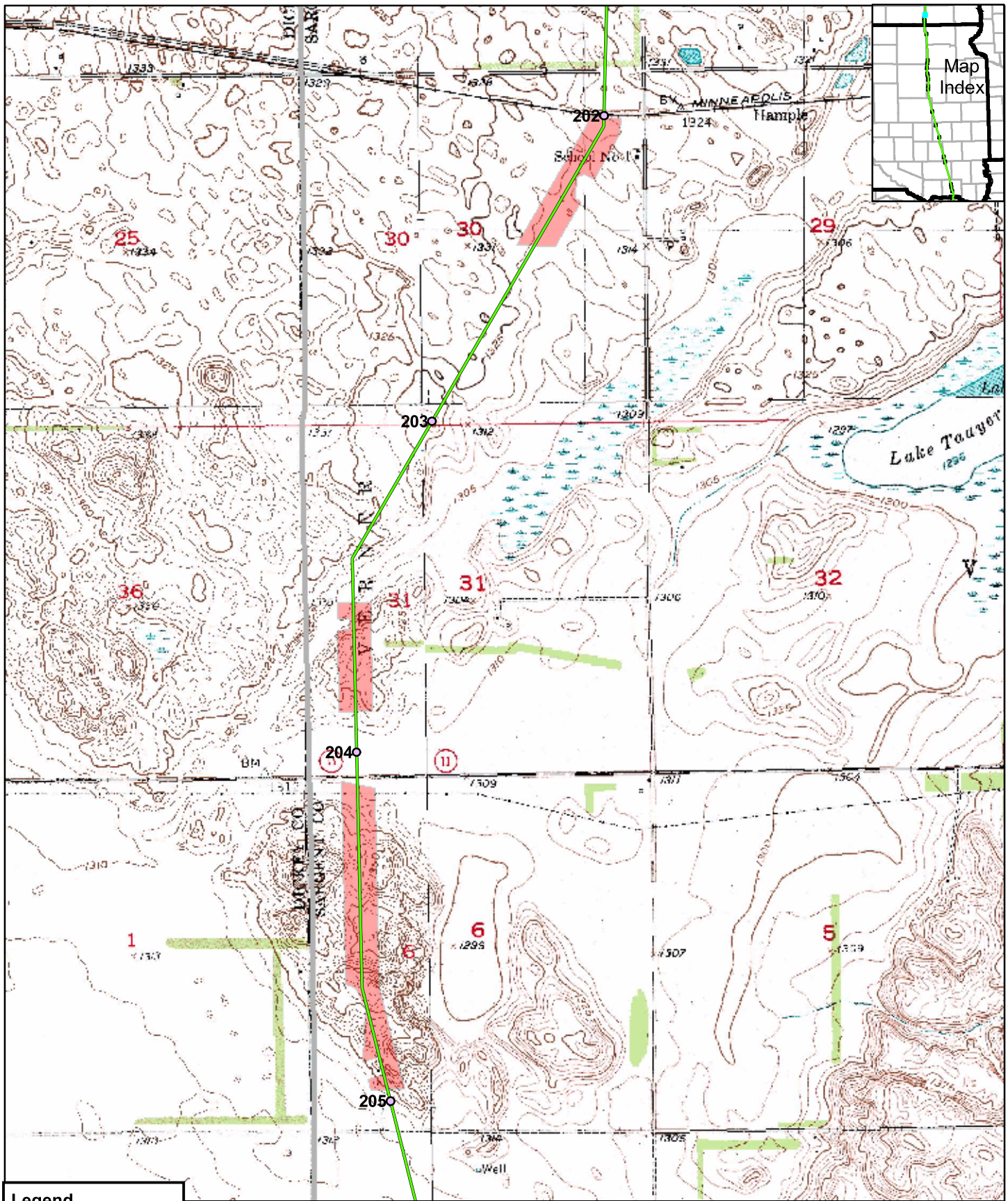

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1NDSA001	9/12/2006	204.1	205.0	Sargent	ND	Site Visit	High	Yes, Dakota skipper

Site Summary: This is a very high quality grassland site. The site contains rolling hills of rock grass (*Kohleria macrantha*), little blue stem (*Schizachyrium scoparium*), and big blue stem (*Andropogon gerardii*). Native forbs include white sage (A*rtemisia ludoviciana*) on rocky hillsides, and Dakota skipper pollen plants such as black Sampson (*Echinacea*) and leadplant (*Amopha*). Other pollen plants for the Dakota skipper, such as fleabane (*Erigeron*), are likely to be present, but were not seen in mid-September. This site also has animal burrows and access to water for wildlife. A re-route to the west of this high quality area (along a road) deserves consideration.

Feature:TDH1NDSA001: View to the east of this high quality grassland area.

Feature TDH1NDSA001: Overview of this very high quality grassland area. This is the largest tract of native grassland seen during this survey.

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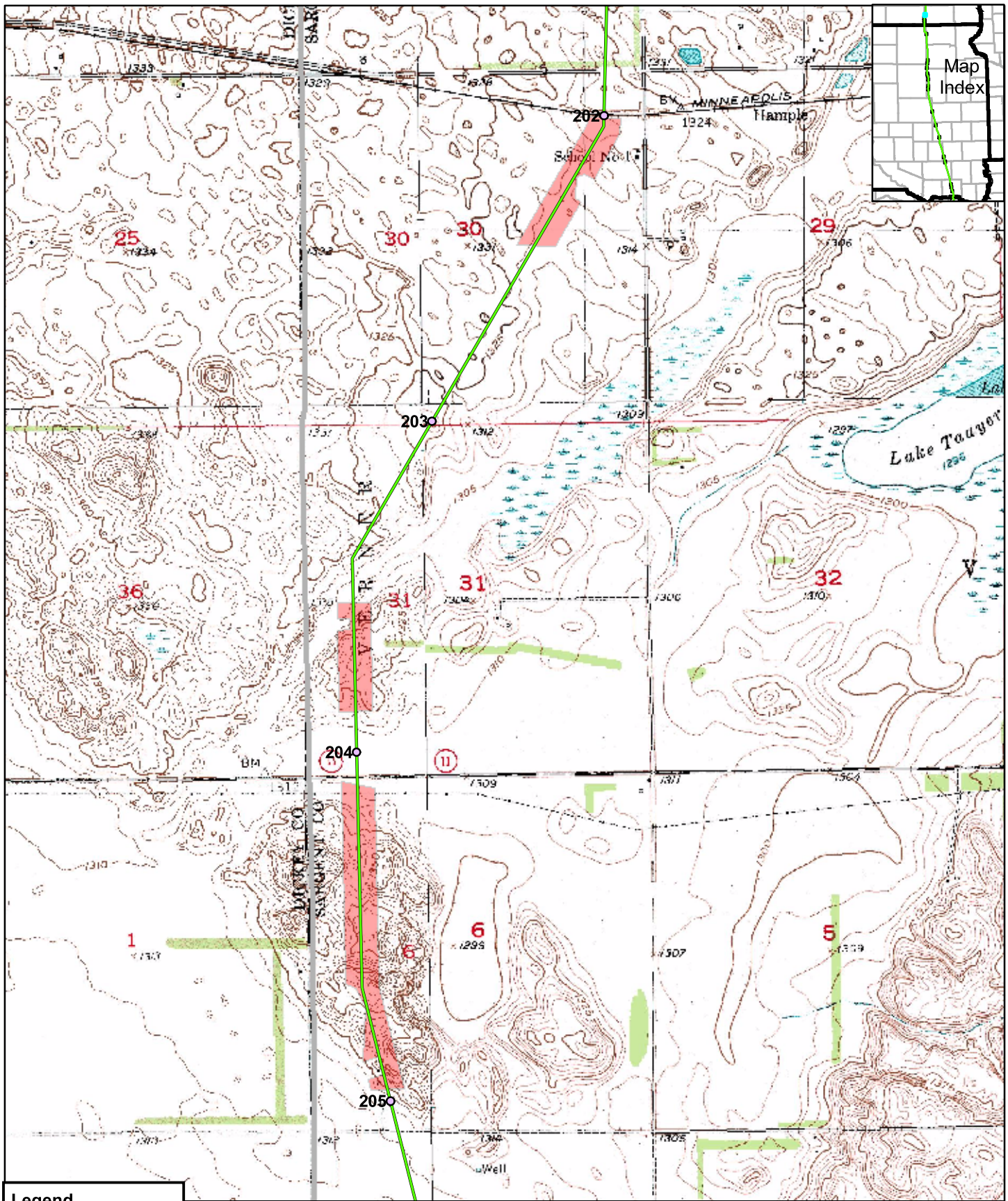

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1NDDI003	9/12/2006	207.8	208.3	Dickey	ND	Drive By	Medium	Yes, prairie fringed orchid

Site Summary: This lowland meadow has a mosaic of wetlands (*Typha*, *Scholenopectus*, *Hordeum jubatum*, *Spartina pectinata*, etc.), with upland inclusions. Despite weeds and grazing this is potential habitat for the prairie fringed orchid. This location is visually similar to TDH1NDDI002.

Feature TDH1NDDI003: Overview of wet meadow with upland inclusions.