



SANDPIPER PIPELINE PROJECT
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Enbridge

2013 Piping Plover Habitat Assessment Report (Rev 0)

PRESENTED BY MERJENT, INC.
January 22, 2014

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EXECUTIVE SUMMARY

Western Ecosystems Technologies, Inc. ("WEST"), on behalf of Merjent, Inc. ("Merjent") and Enbridge, conducted piping plover (*Charadrius melodus*) habitat assessment surveys between August to October, 2013 within an environmental survey corridor. The habitat assessment is necessary to determine the specific locations for surveys of piping plover individuals prior to pipeline construction activities and to evaluate potential impacts on the federally threatened Great Plains piping plover.

The environmental survey corridor crosses through five counties in North Dakota where the piping plover is known to occur: Williams, Mountrail, Ward, McHenry, and Pierce counties. Piping plover nest on exposed, sparsely vegetated beaches surrounding large wetlands. The suitability of a wetland for piping plover depends on water levels and may vary annually.

The piping plover habitat assessment is described in the 2013 Piping Plover Habitat Assessment Protocol ("Protocol"). The habitat assessment was conducted in two steps: (1) preliminary desktop review of wetlands using several years of aerial imagery that represented dry and wet years to assess potentially suitable habitat within a one-mile study area, and (2) field-based habitat assessment of wetlands identified in the desktop review and located within the environmental survey corridor to further evaluate their suitability as piping plover habitat based on a suite of characteristics. The desktop review and field-based habitat assessment took place from August to October 2013 in counties where piping plover have the potential to occur.

The desktop review identified 242 wetlands within a one-mile study area that were considered to provide potentially suitable habitat because they were 2 hectares or larger and had evidence of exposed substrate during dry or wet years. Of the 242 wetlands identified as potentially suitable habitat during the desktop review, 54 wetlands are located within the environmental survey corridor. Fifty three wetlands were surveyed. One wetland in Mountrail County (PPHMO047a) was not surveyed due to access restrictions.

Wetlands were eliminated as potentially suitable piping plover habitat if one or more of the following characteristics were present:

- 1) greater than 25 percent vegetative cover along the shoreline;
- 2) silty or mucky substrate with no sand, gravel, or salt-encrusted substrate present; or
- 3) presence of trees within the environmental survey corridor.

Forty-six of the 53 surveyed wetlands were eliminated as potential habitat due to the presence of vegetative cover greater than 25 percent along the shoreline.

Of the remaining seven wetlands that were surveyed, four did not have gravel or sand in the substrate and one had trees in the environmental survey corridor. Based on these characteristics, two wetlands had the characteristics necessary to be suitable habitat: PPHWA001b and PPHPI070a.

The results of the habitat assessment will inform future survey efforts for piping plover individuals during the nesting season, facilitate discussions with U.S. Fish and Wildlife Service ("USFWS"), and provide data to evaluate potential impacts on the species under the federal Endangered Species Act.

1.0 INTRODUCTION

Western Ecosystems Technologies, Inc. (“WEST”), on behalf of Merjent, Inc. (“Merjent”) and Enbridge, conducted piping plover (*Charadrius melodus*) habitat assessment surveys within an environmental survey corridor. The assessment included a preliminary desktop review followed by field-based habitat assessment. The desktop review and field-based habitat assessment were conducted by WEST from August to October, 2013.

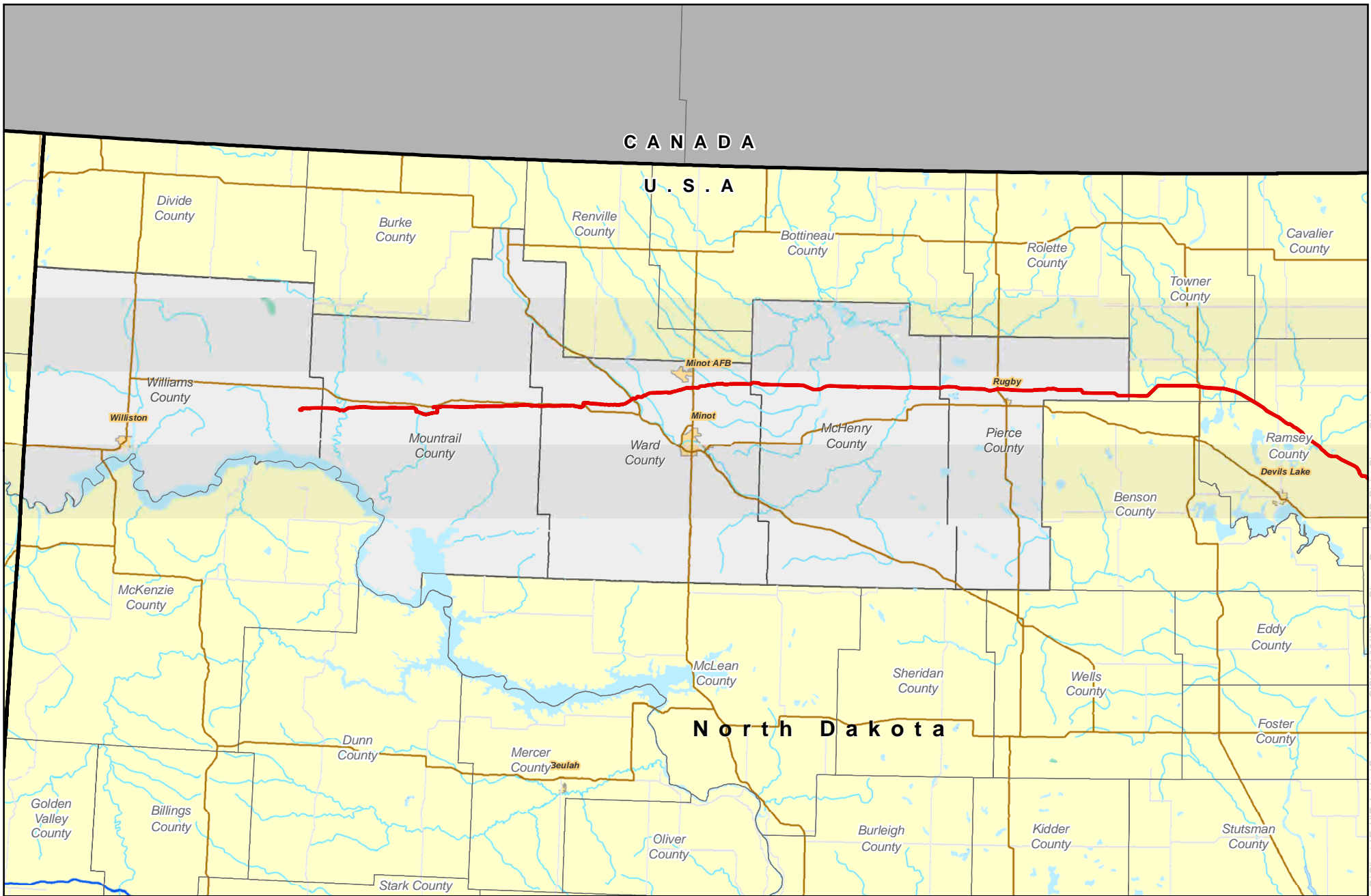
2.0 PURPOSE OF HABITAT ASSESSMENT



The purpose of the 2013 Piping Plover Habitat Assessment is to identify potentially suitable piping plover habitat within the environmental survey corridor, which ranges from approximately 250-foot to 450-foot wide area. Under Section 7 of the federal Endangered Species Act (“ESA”), the potential effects of actions that are implemented, funded, or permitted by a federal agency must be evaluated to determine if federally listed species may be impacted. In order to determine potential impacts, the presence of suitable habitat within the environmental survey corridor was assessed. The results of the habitat assessment will inform potential surveys for piping plover individuals, future consultations with the USFWS, impact analysis under the ESA, and conservation measures development for the species.

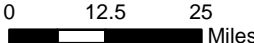
3.0 PIPING PLOVER STATUS, NATURAL HISTORY, AND RANGE

Piping plover are small shorebirds that breed in three geographic regions in North America. The range of the Great Plains population of piping plover overlaps with the environmental survey corridor. The Great Plains population of piping plover is listed under the ESA as threatened. In the Great Plains, piping plover nest on open, sparsely vegetated sand or gravel beaches adjacent to wetlands, and on beaches, sand bars, and dredged material islands of major river systems. Piping plover arrive on breeding grounds in early April through mid-May and remain for 3 to 4 months. They lay 3 to 4 eggs in shallow scraped depressions lined with light colored pebbles and shell fragments. The eggs are well camouflaged and blend in well with their surroundings. Both sexes incubate the eggs, which hatch within 30 days, and both sexes feed the young until they can fly, about 30 days after hatching (USFWS, undated).

Prairie freshwater and alkali wetlands and surrounding shoreline may provide courtship, nesting, foraging, sheltering, brood-rearing, and dispersal habitat for Great Plains piping plovers. Piping plovers nest in wetlands ranging from 3 to 2,576 hectares (Licht, 2001). Piping plover generally nest on beaches that are sparsely vegetated; wetlands with cattails or trees are not suitable habitat (C. Aron, USFWS, pers. comm. June 26, 2013). Some research indicates that piping plover nest primarily in alkali wetlands (Root and Ryan, 2004). However, surveys have found piping plover nesting in freshwater wetlands, as well (Haig et al. 2005; C. Aron, USFWS, pers. comm., June 26, 2013). The suitability of wetlands for piping plover nesting depends in part on water levels that may vary annually. Thus, wetlands should be initially evaluated using several years of aerial imagery that include years with both high and low water levels (C. Aron, USFWS, pers. comm., June 26, 2013).



 Survey Corridor
 Counties with Piping Plover Occurrences within the Environmental Survey Corridor

0 12.5 25
 Miles
 1 inch = 25 miles



Enbridge
Figure 3.0-1
Piping Plover Habitat Survey



4.0 METHODS

The 2013 Piping Plover Habitat Assessment Protocol (Protocol), prepared by Merjent, describes the methods used to identify potentially suitable piping plover habitat within the environmental survey corridor (Appendix A). The assessment included a preliminary desktop review followed by field-based habitat assessment. The desktop review and field-based habitat assessment were conducted by WEST on behalf of Merjent and Enbridge from August to October, 2013.

The Protocol was developed based on general information about the species provided by the USFWS North Dakota Field Office (“NDFO”) (Appendix B). Merjent and Enbridge forwarded the Protocol to the USFWS NDFO on June 3, 2013 and requested agency review, recommendations, and concurrence regarding the Protocol. The USFWS NDFO initially indicated that they would be able to discuss the Protocol and provided some preliminary comments. However, before detailed discussions could occur, the USFWS NDFO determined that further consultations with Enbridge could not occur until a federal lead agency had been identified. Enbridge was not able to receive recommendations or concurrence on the Protocol prior to implementation of the desktop review and field-based habitat assessment described in this report. Enbridge received additional guidance from the USFWS NDFO in December 2013 and January 2014 after a lead federal agency had been identified (Appendix B). This guidance was used to further define suitable habitat based on the data that was collected during the field-based habitat assessment.

4.1 DESKTOP REVIEW

The desktop review of potential piping plover habitat was conducted by WEST Geographic Information System (“GIS”) specialists and biologists within the five North Dakota counties where the USFWS indicates piping plover may occur, specifically within the environmental survey corridor. Using GIS data, National Wetland Inventory (“NWI”) wetlands were identified within a one-mile study area. Multi-basin wetlands were divided into single basins and basins less than 2 hectares (“ha”) were omitted. A 2-hectare minimum size instead of 3 hectares was used to be additionally inclusive during the identification of potential piping plover suitable habitat.

Wetlands greater than 2 hectares were assessed during a wet year (2012) and two dry years (2003 & 2006) using National Agricultural Imagery Program (“NAIP”) county mosaic imagery. Wetlands greater than two hectares that showed no open water or no exposed substrate (i.e., exposed, sparsely vegetated areas) during both the wet (2012) and dry time periods (2003 and 2006) were omitted. The remaining NWI wetlands within the environmental survey corridor and within one-mile study area were documented and included in a shapefile for use in the field-based habitat assessment effort.

4.2 FIELD-BASED HABITAT ASSESSMENT

A field-based habitat assessment of the 54 wetlands located within the environmental survey corridor and identified as potential piping plover suitable habitat during the desktop review was conducted in Williams, Mountrail, Ward, McHenry, and Pierce counties.

4.2.1 Field Methods

Data was collected on a sub-meter Trimble GeoXH unit using the North Dakota State Plane North, NAD 83 survey feet coordinate system.

Survey crews recorded the following characteristics for use in evaluating a wetland as piping plover suitable habitat:

- Presence of sand, gravel, and/or salt-encrusted substrate;
- Estimated percentage of overall vegetative cover using an overall visual qualitative observation and the Daubenmire cover class method (Daubenmire, 1959);
- Presence of halophytic vegetation such as *Salicornia rubra*, *Suaeda calceoliformis*, *Atriplex patula*, *Hordeum jubatum*, *Distichils spicata*, and *Puccinellia nuttalliana*;
- Presence of cattails (*Typha* spp.);
- Presence of trees; and
- Visual and auditory observations of piping plover.

Percent vegetative cover was estimated using two methods—an overall visual qualitative assessment and the Daubenmire cover class method. The visual qualitative assessment consisted of surveyors visually estimating the approximate percent of vegetative cover along the shoreline using six categories of vegetative cover: 0-5 percent, 5-25 percent, 25-50 percent, 50-75 percent, 75-95 percent, and 95-100 percent. A second method, the Daubenmire cover class method, was used to confirm the results of the visual qualitative assessment. For the Daubenmire cover class method, surveyors employed a 50 centimeters (“cm”) by 20 cm Daubenmire frame, which was placed at the sample point, typically located 5 to 10 feet from the water’s edge (Daubenmire, 1959). In some cases the sample point was closer to the water’s edge because 5 to 10 feet would have been within upland. Total vegetative cover within the Daubenmire frame was estimated and assigned one of six cover classes (0-5 percent, 5-25 percent, 25-50 percent, 50-75 percent, 75-95 percent, and 95-100 percent). Each sample point and actual water’s edge were recorded. In cases in which the results from the two methods differed, the results of the visual qualitative assessment were used because this method assessed the entire wetland as opposed to a small sample plot.

4.2.2 Interpretation of Field Data

Following the completion of field surveys, wetlands identified as providing potentially suitable habitat during the desktop review were further evaluated based on the data collected during field surveys. Wetlands were omitted as suitable habitat if surveys showed either of the following:

- Habitat had been disturbed or destroyed since aerial imagery was recorded; or
- Presence of one or more of the following characteristics:
 - greater than 25 percent vegetative cover along the shoreline;
 - silty or mucky substrate with no sand, gravel, or salt-encrusted substrate present; and
 - presence of trees in the environmental survey corridor.

Presence of cattails was not used to eliminate wetlands as potential suitable habitat for piping plovers; piping plover may nest along the shorelines of wetlands if cattails are sparse or present in discrete patches. Limiting suitable habitat to wetlands with less than 25 percent vegetative cover ensured that wetlands that were included as potential habitat did not have cattails covering most of their shoreline. Absence of exposed wetland substrate during field surveys was also not used to eliminate the area as potentially suitable habitat because in wet years, such as 2013, typically exposed beach habitat may be inundated. Presence or absence of halophytic vegetation provided information on the alkaline nature of the wetland, but was not

used to eliminate a wetland as potential habitat because piping plover may nest near freshwater wetlands during some years.

5.0 RESULTS

5.1 RESULTS OF DESKTOP REVIEW

The desktop review of aerial imagery resulted in the identification of 242 wetlands with the potential to serve as providing potentially suitable habitat located within the one-mile study area; 54 of the 242 wetlands are located within the environmental survey corridor (see Table 5.1-1). Wetlands were included as potentially suitable habitat if they were greater than 2 hectares in size and if there was evidence of open water and barren beach habitat in aerial imagery from past dry (2003, 2006) or wet time periods (2012). Maps of the wetlands documented during the desktop habitat assessment are provided in Appendix C.

County	Wetland Basins Within Environmental Survey Corridor	Wetland Basins Within 1-mile Study Area
Williams	0	1
Mountrail	18	83
Ward	10	54
McHenry	6	39
Pierce	20	65
TOTAL	54	242

Each of the wetlands within the environmental survey corridor is listed in Table 5.1-2, along with the tract number(s) where they occur, their size, and NWI classification. These wetlands range in size from 2 hectares (i.e., the minimum size to be considered potential piping plover habitat) to 228 hectares. The majority (39) are classified as “freshwater emergent wetland”. Nine are classified as “lake”, and six are classified as “freshwater pond”. None of these wetlands occur entirely within the environmental survey corridor, and many have little overlap with the corridor.

Table 5.1-1 Wetlands Identified as Potentially Suitable Habitat Based on Desktop Review				
Wetland Number	Tract Number(s)	Size of Wetland (hectares)	Wetland Type	Wetland Code¹
PPHMO031a	ND-MO-031	2.13	Freshwater Emergent Wetland	PEMC
PPHMO032a	ND-MO-032	2.63	Freshwater Emergent Wetland	PEMC
PPHMO032b	ND-MO-032, ND-MO-033	4.27	Freshwater Emergent Wetland	PEMC
PPHMO034a	ND-MO-034	55.78	Lake	L2ABG
PPHMO038a	ND-MO-038	2.87	Freshwater Emergent Wetland	PEMC
PPHMO039a	ND-MO-038, ND-MO-039	35.55	Freshwater Emergent Wetland	PEMC
PPHMO047a	ND-MO-047.900RV	21.16	Freshwater Emergent Wetland	PEMA
PPHMO056.210a	ND-MO-056.210	13.36	Freshwater Emergent Wetland	PEM/ABFh
PPHMO076.1a	ND-MO-075, ND-MO-75.900RD, ND-MO-076.1	6.07	Freshwater Pond	PABF
PPHMO076a	ND-MO-076	5.94	Freshwater Emergent Wetland	PEM/ABF
PPHMO096a	ND-MO-096	3.32	Freshwater Emergent Wetland	PEMC
PPHMO096b	ND-MO-096, ND-MO-097	2.00	Freshwater Emergent Wetland	PEMC
PPHMO097a	ND-MO-097, ND-MO-097.900RD	3.29	Freshwater Emergent Wetland	PEMC
PPHMO098a	ND-MO-098, ND-MO-099	8.32	Freshwater Emergent Wetland	PEM/ABF
PPHMO100a	ND-MO-100, ND-MO-101	16.13	Lake	L2ABG
PPHMO102a	ND-MO-102	14.84	Lake	L2ABG
PPHMO103a	ND-MO-103, ND-103.100	20.17	Lake	L2ABG
PPHMO105a	ND-MO-105	4.69	Freshwater Emergent Wetland	PEMC
PPHWA001a	ND-WA_001	3.24	Freshwater Emergent Wetland	PEMC
PPHWA001b	ND-WA-001, ND-WA-001.1	7.73	Freshwater Emergent Wetland	PEMF
PPHWA001.1a	ND-WA-001	2.01	Freshwater Emergent Wetland	PEMF
PPHWA003a	ND-WA-003	2.12	Freshwater Pond	PABF

Table 5.1-1 Wetlands Identified as Potentially Suitable Habitat Based on Desktop Review				
Wetland Number	Tract Number(s)	Size of Wetland (hectares)	Wetland Type	Wetland Code¹
PPHWA003b	ND-WA-003	2.10	Freshwater Emergent Wetland	PEM/ABF
PPHWA004a	ND-WA-004a	15.84	Lake	L2ABG
PPHWA006a	ND-WA-006	5.80	Freshwater Pond	PABF
PPHWA007a	ND-WA-007	30.36	Lake	L2ABG
PPHWA010a	ND-WA-010, ND-WA-010.900RR	2.06	Freshwater Emergent Wetland	PEMF
PPHWA070a	ND-WA-070	29.41	Freshwater Emergent Wetland	PEM/ABF
PPHMC029.520a	ND-MC-029.520	8.18	Freshwater Emergent Wetland	PEMC
PPHMC029.540a	ND-MC-029.540	203.66	Freshwater Emergent Wetland	PEM/ABF
PPHMC034a	ND-MC-034	2.10	Freshwater Emergent Wetland	PEMC
PPHMC034b	ND-MC-034	9.93	Freshwater Emergent Wetland	PEMC
PPHMC046a	ND-MC-046	42.33	Freshwater Emergent Wetland	PEMC
PPHMC071a	ND-MC-071	28.29	Freshwater Emergent Wetland	PEMC
PPHPI004a	ND-PI-004	20.17	Freshwater Emergent Wetland	PEMC
PPHPI005a	ND-PI-005	8.36	Freshwater Emergent Wetland	PEMC
PPHPI006a	ND-PI-006, ND-PI-007	4.38	Freshwater Emergent Wetland	PEMCd
PPHPI008a	ND-PI-008	9.84	Freshwater Emergent Wetland	PEMC
PPHPI011a	ND-PI-011, ND-PI-012, ND-PI-013	66.73	Lake	L2ABF
PPHPI020a	ND-PI-020	10.53	Freshwater Emergent Wetland	PEMC
PPHPI022a	ND-PI-022	3.15	Freshwater Emergent Wetland	PEMC
PPHPI044a	ND-PI-044	3.72	Freshwater Emergent Wetland	PEM/ABF
PPHPI044b	ND-PI-044	3.11	Freshwater Emergent Wetland	PEM/ABF
PPHPI045a	ND-PI-045, ND-PI-046	2.73	Freshwater Emergent Wetland	PEM/ABF
PPHPI049.504a	ND-PI-049,504, ND-PI-049.506	96.65	Lake	L2ABG
PPHPI049.506a	ND-PI-049.506	23.33	Freshwater Pond	PABF

Table 5.1-1 Wetlands Identified as Potentially Suitable Habitat Based on Desktop Review				
Wetland Number	Tract Number(s)	Size of Wetland (hectares)	Wetland Type	Wetland Code ¹
PPHPI058a	ND-PI-058, ND-PI-058.200	2.35	Freshwater Emergent Wetland	PEMC
PPHPI058.2a	ND-PI-058.200, ND-PI-058	7.93	Freshwater Pond	PABF
PPHPI060a	ND-PI-060, ND-PI-061	4.83	Freshwater Emergent Wetland	PEM/ABF
PPHPI061a	ND-PI-061	4.59	Freshwater Pond	PABF
PPHPI062a	ND-PI-062, ND-PI-063	4.50	Freshwater Emergent Wetland	PEMC
PPHPI067a	ND-PI-067	11.96	Freshwater Emergent Wetland	PEMF
PPHPI070a	ND-PI-070.200, ND-PI-070	228.05	Lake	L2ABG
PPHPI086a	ND-PI-086	2.95	Freshwater Emergent Wetland	PEMAd

Notes:

¹ PEMC – Palustrine, emergent, seasonally flooded
 L2ABG – Lacustrine, littoral, aquatic bed, intermittently exposed
 PEMA - Palustrine, emergent, temporarily flooded
 PEM/ABFh – Palustrine emergent/aquatic bed, semi-permanently flooded, diked/impounded
 PABF - Palustrine, aquatic bed, semi-permanently flooded
 PEM/ABF – Palustrine emergent/aquatic bed, semi-permanently flooded
 PEMF - Palustrine, emergent, semi-permanently flooded
 PABF - Palustrine, aquatic bed, semi-permanently flooded
 PEMCd - Palustrine, emergent, seasonally flooded, partially drained/ditched
 L2ABF – Lacustrine, littoral, aquatic bed, semi-permanently flooded
 PEMAd - Palustrine, emergent, temporarily flooded, partially drained/ditche

5.2 FIELD LIMITATIONS

Data were collected on all but one (PPHMO047a) of the 54 wetlands identified during the desktop review. This wetland was not surveyed due to access restrictions, but will be surveyed in 2014 if access is granted. All 54 wetlands are included in the mapset.

Most wetlands that were investigated occurred in depressions in the landscape; their size may vary considerably from year to year depending on precipitation and groundwater. Overall, 2013 was above average for precipitation in the portion of North Dakota where the environmental survey corridor is located, and in particular, in the five counties where wetlands were investigated for piping plover habitat. Therefore, many of the wetlands were at or near their full capacity. However, two wetlands, PPHMO032b and PPHMO038a, appeared to be declining wetlands (i.e., becoming upland), probably as a result of sedimentation from wind and water erosion from adjacent cultivated fields.

5.3 FIELD-BASED HABITAT ASSESSMENT

Maps of the wetlands that were investigated in the field are provided in Appendix C. Data sheets collected at each wetland are provided in Appendix D. Photographs of each wetland are available in Appendix E, including overviews of the wetlands, photos of substrate, and the Daubenmire plot. A summary of the habitat features recorded at each wetland is provided in Table 5.3-1.

The habitat assessment included documenting visual and auditory observations of piping plover individuals. The presence of piping plover at a site would indicate that the wetland was suitable habitat, regardless of the presence or absence of other features. However, the efficacy of the habitat assessment did not depend on being timed to occur when individuals were present. Each field crew included at least one biologist familiar with piping plover. No evidence either visual or auditory indicated presence of piping plover. Therefore, no wetlands were included as suitable habitat based on this criterion. Given the timing of the habitat assessment, the lack of observations of piping plover individuals may have been because the piping plovers had left their breeding habitat for the year.

According to the Protocol, any wetlands investigated in the field that were found to be disturbed or destroyed could be eliminated as potentially suitable piping plover habitat. None of the wetlands were found to be destroyed; however, as described above in Section 5.2, 2 of the wetlands (PPHMO032b and PPHMO038a) investigated appeared to be “filling in” and had no surface water, most likely due to sedimentation from surrounding cultivated fields. While this might be considered a type of disturbance, data were collected at these wetlands, and they were not eliminated based on disturbance.

Wetlands were considered suitable piping plover habitat, if they had one or more of the following characteristics:

- greater than 25 percent vegetative cover along the shoreline;
- silty or mucky substrate with no sand, gravel, or salt-encrusted substrate present; and
- presence of trees in the environmental survey corridor.

Approximately 46 of the 53 surveyed wetlands were eliminated due to the presence of vegetative cover greater than 25 percent (Table 5.3-1)¹. Forty-six (46) of the 53 wetlands were eliminated as potential habitat due to the presence of vegetative cover greater than 25 percent along the shoreline. Of the remaining seven wetlands that were surveyed, four did not have gravel or sand in the substrate, and one had trees in the environmental survey corridor. Based on these characteristics, two wetlands had the characteristics necessary to be suitable habitat: PPHWA001b and PPHPI070a.

¹ This includes the 2 wetlands where vegetation was not sampled using a Daubenmire plot because there was no open water (PPHMO032b and PPHMO038a); the vegetative cover at these 2 wetlands was estimated visually at greater than 95 percent cover.

**Table 5.3-1
Characteristics of Potentially Suitable Piping Plover Wetlands within the Environmental Survey Corridor**

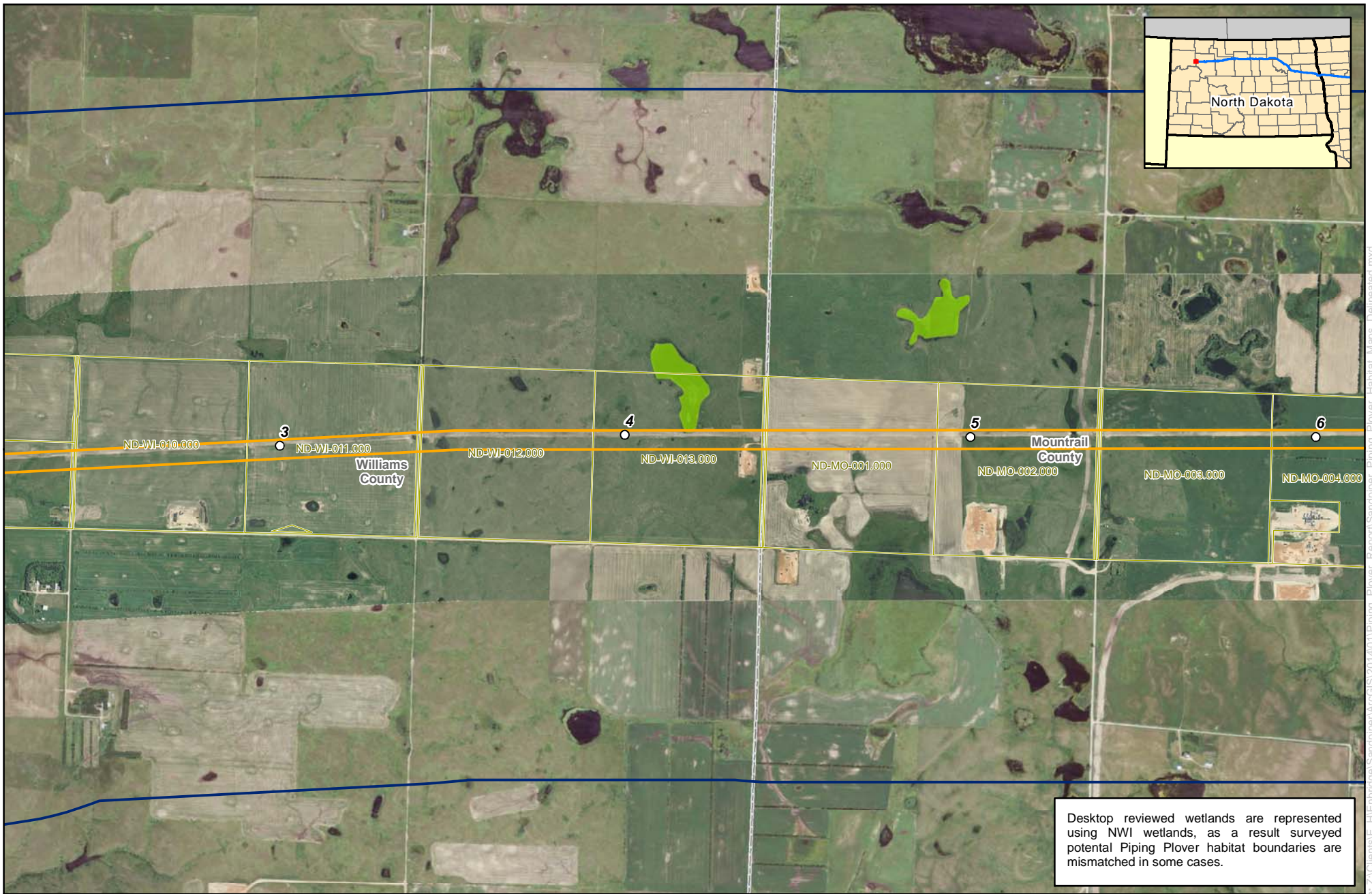
Wetland Number	Size (ha)	Vegetative Cover	Halophytic Vegetation Present?	Sand, Gravel, or Salt Encrusted Substrate Present?		Substrate Observed At Sample Point	Cattail Present?		Trees Present?		Potentially Suitable Piping Plover Habitat
				Within Corridor	Outside Corridor		Within Corridor	Outside Corridor	Within Corridor	Outside Corridor	
PPHMO031a	2.13	95-100 percent	No	No	No	Muck	No	No	No	Yes	No
PPHMO032a	2.63	75-95 percent	No	No	No	Muck	Yes	Yes	No	Yes	No
PPHMO032b	4.27	>95 percent (est.)	No	No	No	None exposed	No	No	No	Yes	No
PPHMO034a	55.78	95-100 percent	No	No	No	None exposed	No	No	No	Yes	No
PPHMO038a	2.87	>95 percent (est.)	Yes ¹	No	No	None exposed	No	No	No	No	No
PPHMO039a	35.55	5-25 percent	Yes ¹	No	No	Silty muck	Yes	Yes	No	No	No
PPHMO047a ⁷	21.16										Unknown
PPHMO056.210a	13.36	95-100 percent	Yes ^{1,2,3,4,5}	No	No	Silty clay	Yes	Yes	No	No	No
PPHMO076.1a	6.07	95-100 percent	Yes ¹	No	No	Rock, debris	No	No	No	No	No
PPHMO076a	5.94	75-95 percent	Yes ^{1,4}	No	No	Muck	Yes	No	No	Yes	No
PPHMO096a	3.32	95-100 percent	Yes ¹	No	No	None exposed	Yes	Yes	No	No	No
PPHMO096b	2.00	25-50 percent	Yes ¹	No	No	Muck	Yes	Yes	No	No	No
PPHMO097a	3.29	95-100 percent	Yes ¹	No	No	Muck	Yes	Yes	No	No	No
PPHMO098a	8.32	50-75 percent	Yes ¹	No	No	Clayey muck	Yes	Yes	No	Yes	No
PPHMO100a	16.13	5-25 percent	Yes ¹	Yes	Yes	Gravel, soil	Yes	Yes	Yes	Yes	No
PPHMO102a	14.84	50-75 percent	Yes ¹	Yes	Yes	Dark soil; sand & gravel in water	Yes	Yes	Yes	Yes	No
PPHMO103a	20.17	50-75 percent	Yes ¹	No	No	Dark muck	No	No	No	Yes	No
PPHMO105a	4.69	75-95 percent	Yes ¹	No	No	Dark muck	Yes	Yes	Yes	No	No
PPHWA001a	3.24	0-5 percent	Yes ¹	No	No	Dark clay	Yes	Yes	No	No	No
PPHWA001b	7.73	5-25 percent	Yes ¹	Yes	Yes	Dark clay; some gravel	Yes	Yes	No	No	Yes
PPHWA001.1a	2.01	0-5 percent	Yes ¹	No	No	No sand or gravel	No	No	No	No	No

**Table 5.3-1
Characteristics of Potentially Suitable Piping Plover Wetlands within the Environmental Survey Corridor**

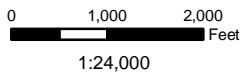
Wetland Number	Size (ha)	Vegetative Cover	Halophytic Vegetation Present?	Sand, Gravel, or Salt Encrusted Substrate Present?		Substrate Observed At Sample Point	Cattail Present?		Trees Present?		Potentially Suitable Piping Plover Habitat
				Within Corridor	Outside Corridor		Within Corridor	Outside Corridor	Within Corridor	Outside Corridor	
PPHWA003a	2.12	5-25 percent	Yes ¹	No	No	Dark muck	Yes	Yes	No	No	No
PPHWA003b	2.10	25-50 percent	Yes ¹	Yes	Yes	Sand & gravel in water	Yes	Yes	No	No	No
PPHWA004a	15.84	25-50 percent	Yes ^{1,6}	Yes	Yes	Sand & dark soil	Yes	Yes	No	Yes	No
PPHWA006a	5.80	95-100 percent	Yes ¹	No	No	Muck	No	No	No	No	No
PPHWA007a	30.36	25-50 percent	Yes ¹	Yes	Yes	Sand & muck	Yes	Yes	Yes	Yes	No
PPHWA010a	2.06	50-75 percent	Yes ¹	No	No	Dark clay	Yes	Yes	Yes	Yes	No
PPHWA070a	29.41	25-50 percent	No	No	No	Black soil	Yes	Yes	Yes	Yes	No
PPHMC029.520a	8.18	50-75 percent	No	No	No	Black soil	Yes	Yes	No	Yes	No
PPHMC029.540a	203.66	95-100 percent	No	No	No	Dark, no sand	Yes	Yes	No	No	No
PPHMC034a	2.10	95-100 percent	Yes ⁶	No	No	Not recorded	Yes	Yes	No	No	No
PPHMC034b	9.93	75-95 percent	Yes ^{1,6}	No	No	Slight sand	Yes	Yes	No	No	No
PPHMC046a	42.33	50-75 percent	Yes ¹	No	No	Not sandy	Yes	Yes	No	No	No
PPHMC071a	28.29	75-95 percent	No	No	No	None exposed	Yes	Yes	No	Yes	No
PPHPI004a	20.17	95-100 percent	Yes ^{1,6}	No	No	Muck	Yes	Yes	No	No	No
PPHPI005a	8.36	75-95 percent	Yes ^{1,4,6}	No	No	Muck	Yes	Yes	No	No	No
PPHPI006a	4.38	50-75 percent	Yes ⁶	No	No	Muck	Yes	Yes	No	No	No
PPHPI008a	9.84	75-95 percent	Yes ^{1,6}	No	No	None exposed	Yes	Yes	No	No	No
PPHPI011a	66.73	95-100 percent	Yes ^{1,3,4,5,6}	Yes	No	Fine sand, salt crust	Yes	Yes	Yes	No	No
PPHPI020a	10.53	95-100 percent	Yes ^{1,2,3,4,5,6}	Yes	Yes	Sandy, silty soil	Yes	Yes	No	No	No
PPHPI022a	3.15	95-100 percent	Yes ^{1,2,3}	No	No	Sandy silt	Yes	Yes	No	No	No
PPHPI044a	3.72	95-100 percent	Yes ^{1,6}	No	No	Muck	No	Yes	No	No	No
PPHPI044b	3.11	95-100 percent	No	No	No	None exposed	Yes	Yes	No	No	No
PPHPI045a	2.73	95-100 percent	No	No	No	None exposed	Yes	Yes	No	Yes	No

Appendix C

Maps of Potentially Suitable Piping Plover Habitat



Desktop reviewed wetlands are represented using NWI wetlands, as a result surveyed potential Piping Plover habitat boundaries are mismatched in some cases.

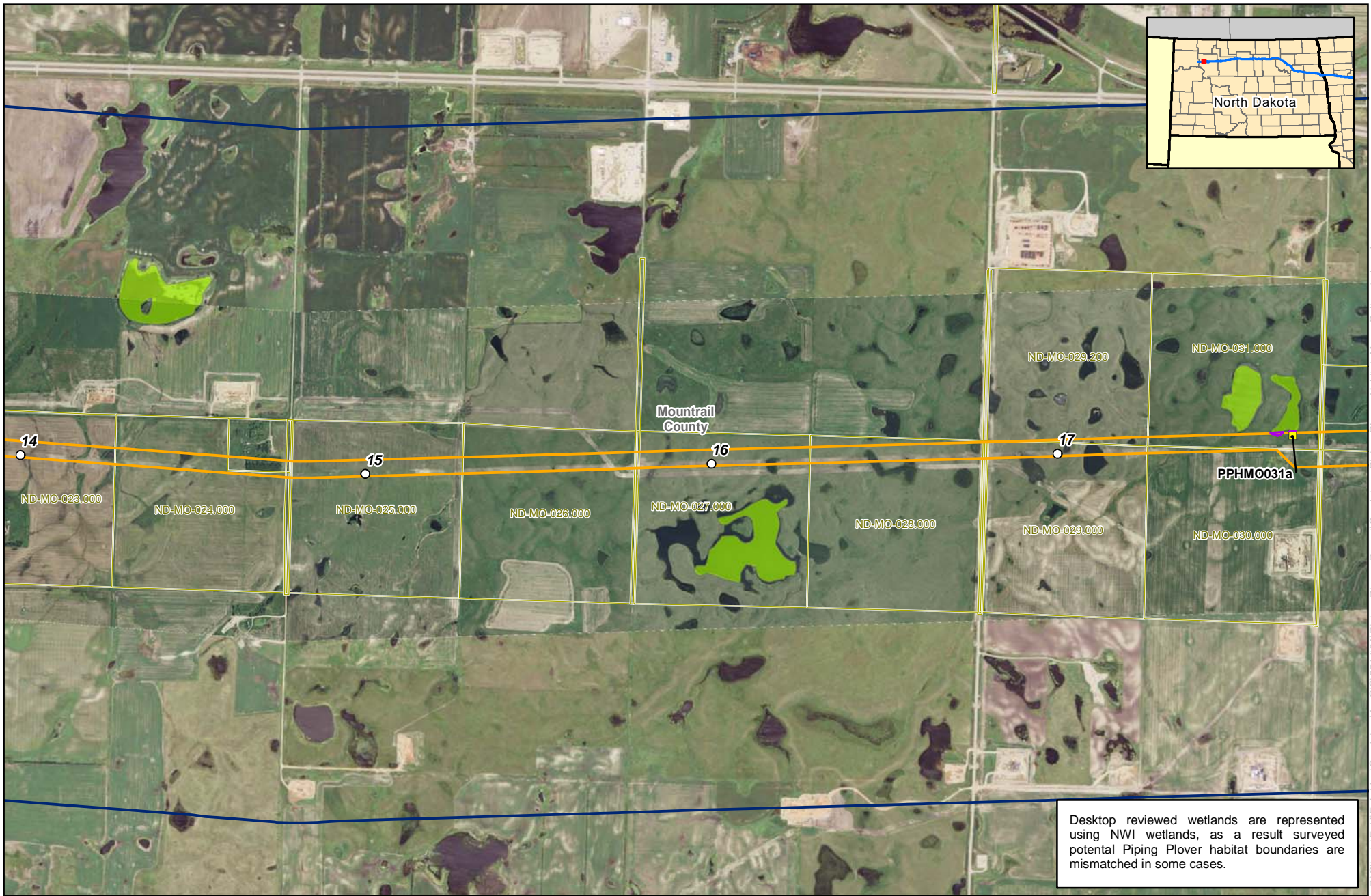


Enbridge Potential Piping Plover Suitable Habitat

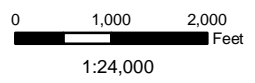
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|---------------------------------|-----------------------------------|
| ○ Milepost | ■ Sample Point |
| ▭ Study Area | ■ Desktop Reviewed Wetlands |
| ▭ Environmental Survey Corridor | ▭ Potential Piping Plover Habitat |
| ▨ Survey Needed | ▭ Yes |
| ▭ Parcels | ▭ No |

Source: z:\Clients\E_H\Enbridge\Sandpiper\ArcGIS\2014\01\Piping_Plover_Report\Sandpiper_Piping_Plover_Habitat_Maps_Deliverables.mxd

Date: 1/20/2014



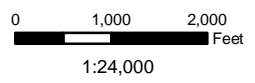
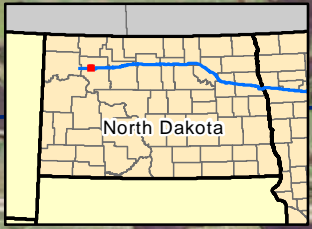
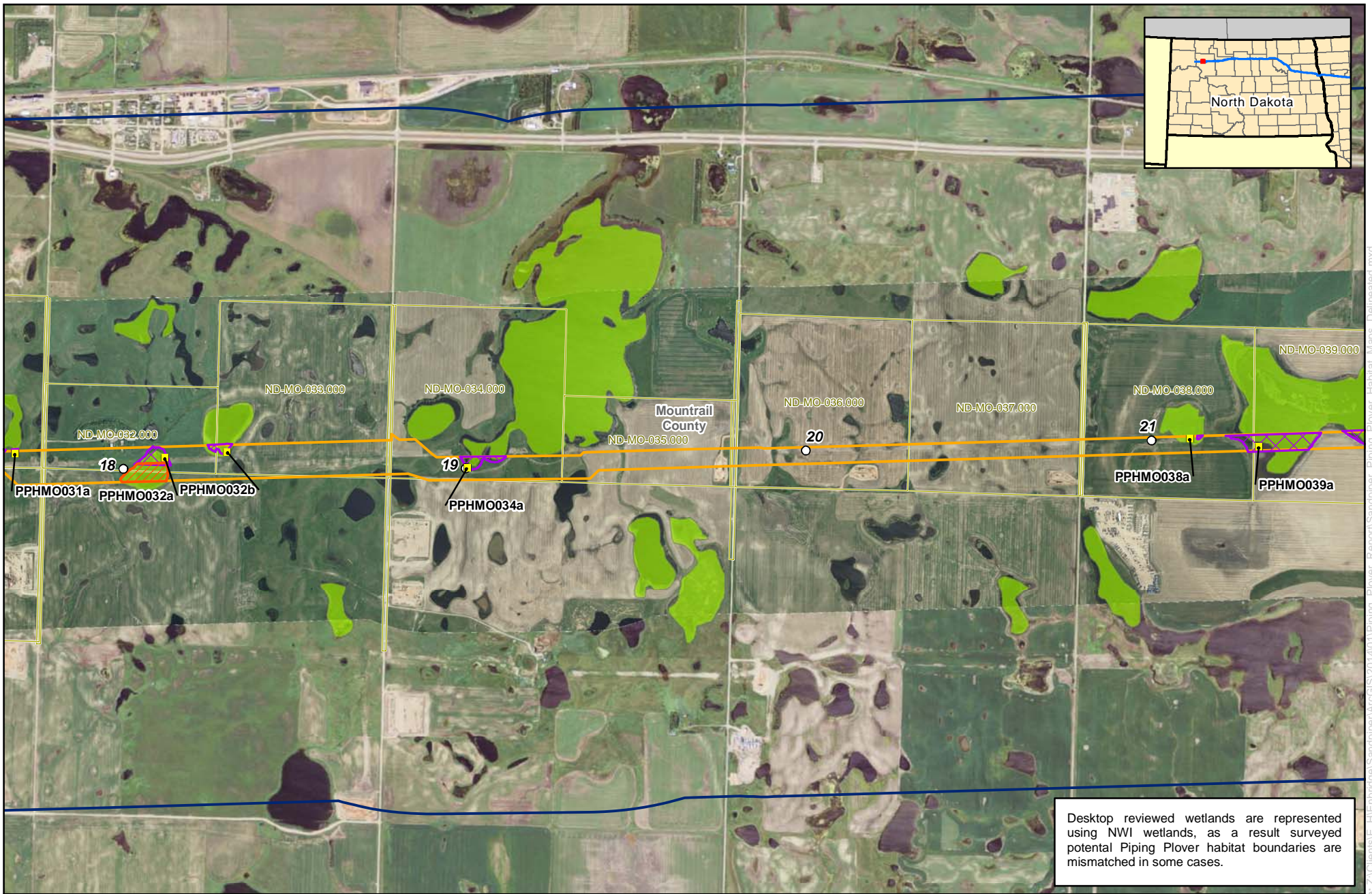
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Enbridge Potential Piping Plover Suitable Habitat

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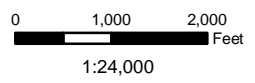
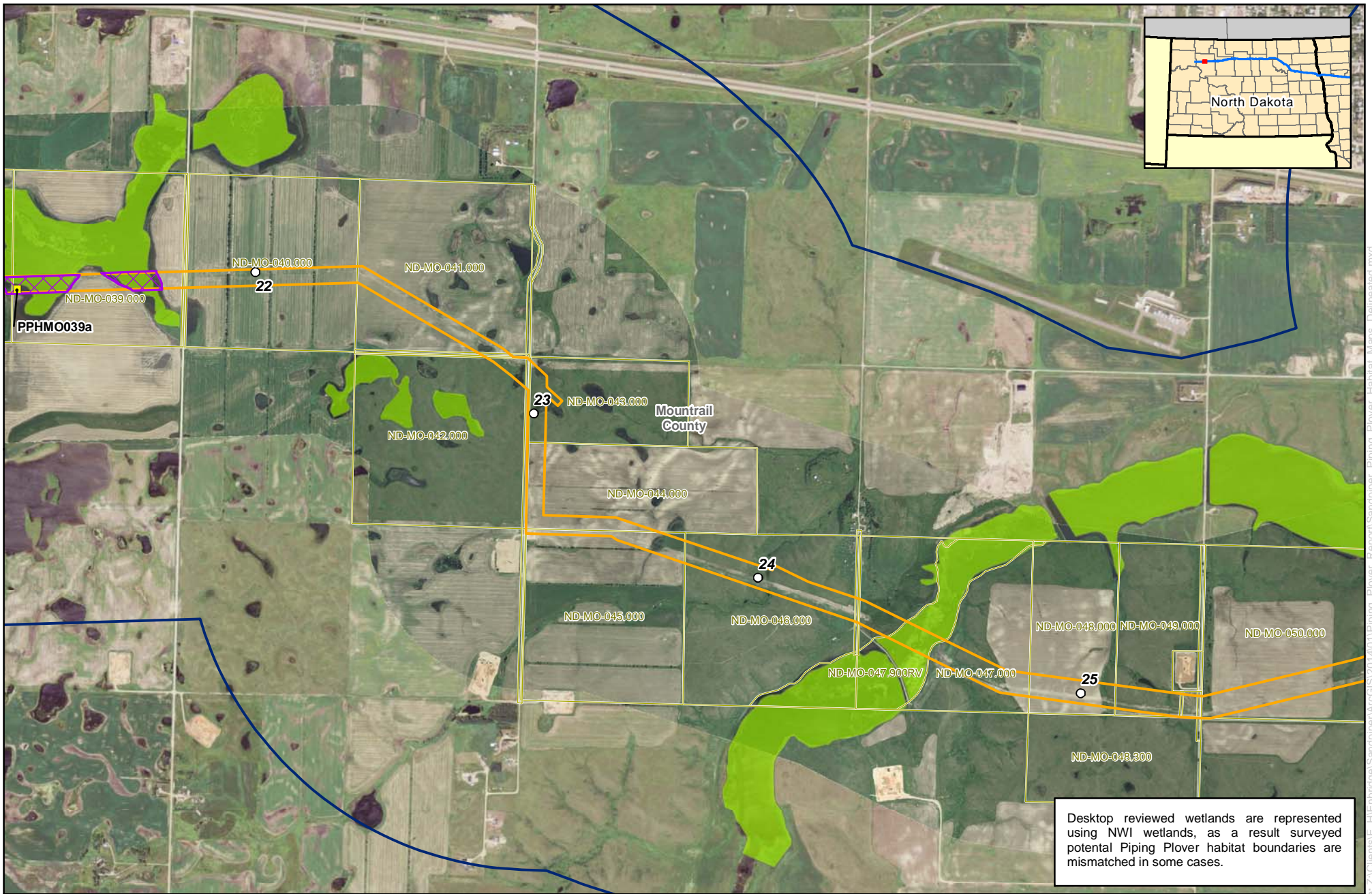
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Enbridge Potential Piping Plover Suitable Habitat

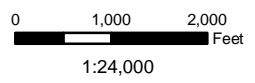
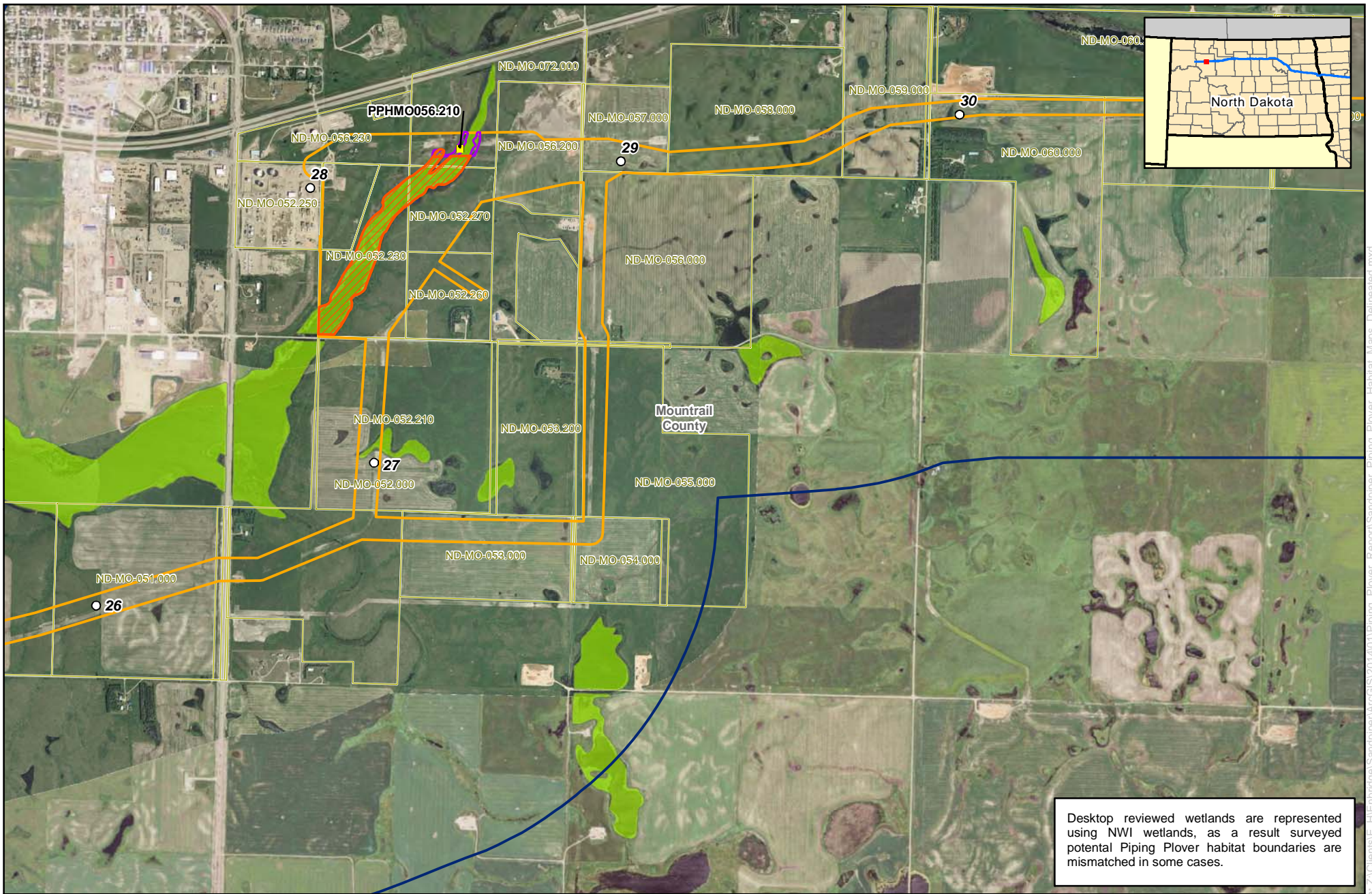
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| ▭ Parcels | ▭ No |

Source: z:\Clients\IE_HIE\enbridge\Sandpiper\ArcGIS\2014\01\Piping_Plover_Report\Sandpiper_Piping_Plover_Habitat_Maps_Deliverables.mxd Date: 1/20/2014



Enbridge Potential Piping Plover Suitable Habitat

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| Milepost | Sample Point |
| Study Area | Desktop Reviewed Wetlands |
| Environmental Survey Corridor | Potential Piping Plover Habitat |
| Survey Needed | Yes |
| Parcels | No |

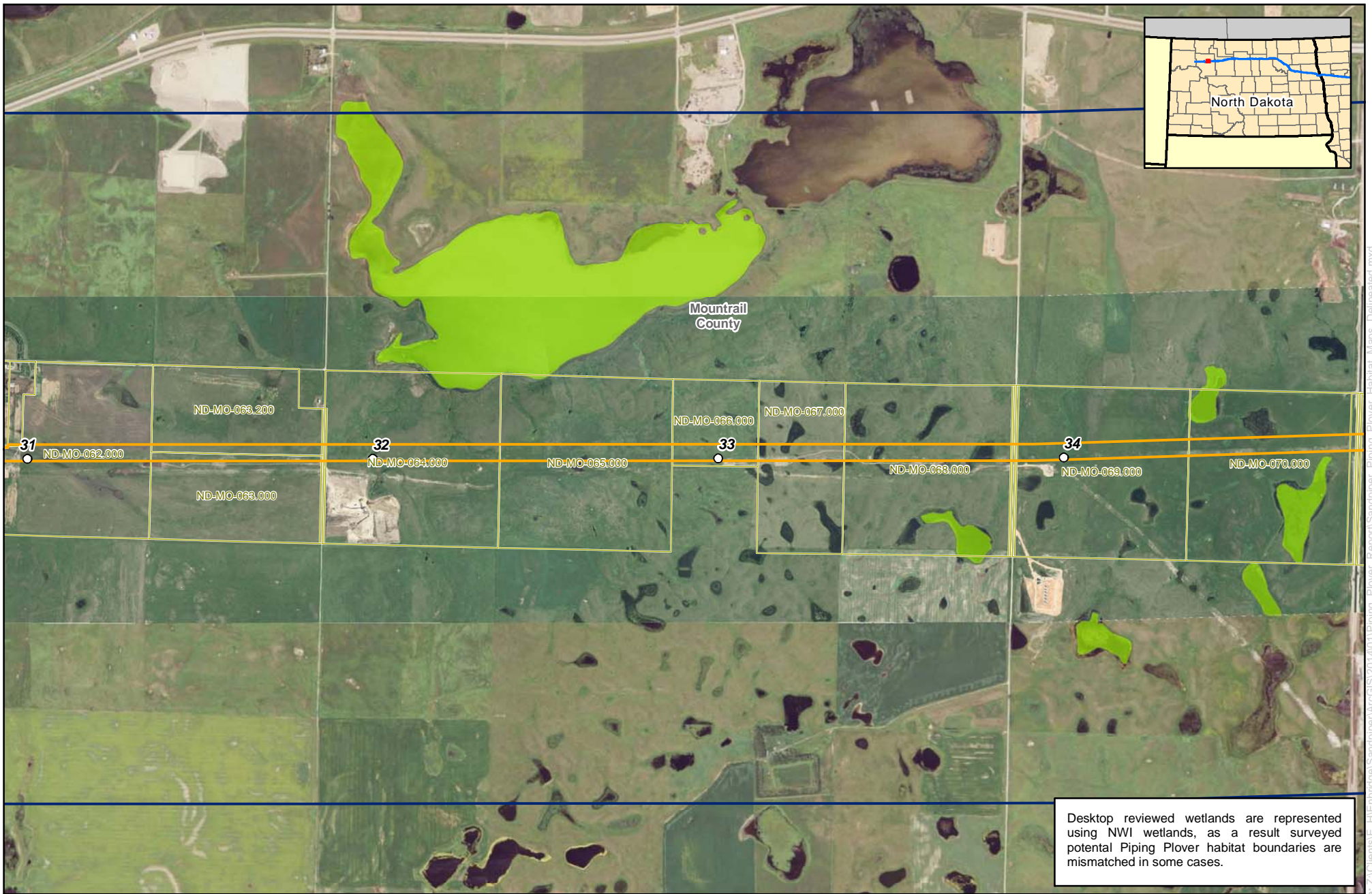


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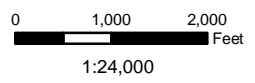
Potential Piping Plover Suitable Habitat

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| ▭ Parcels | ▭ No |

Date: 1/20/2014 Source: z:\Clients\E_H\Enbridge\Sandpiper\ArcGIS\2014011\Piping_Plover_Report\Sandpiper_Piping_Plover_Habitat_Maps_Delimited.mxd



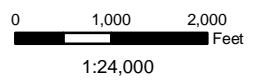
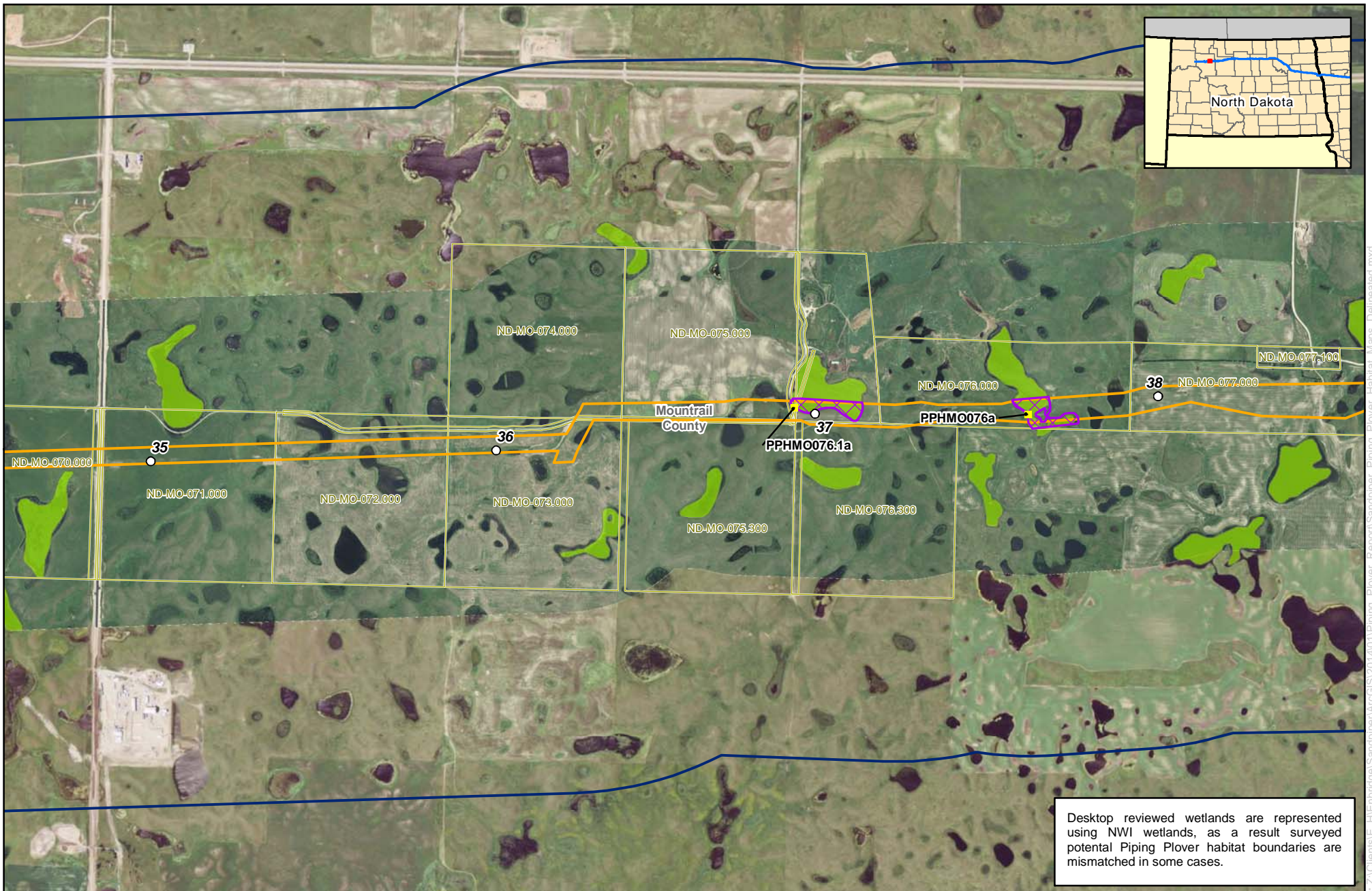
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| ▨ Survey Needed | ▭ Yes |
| ▭ Parcels | ▭ No |

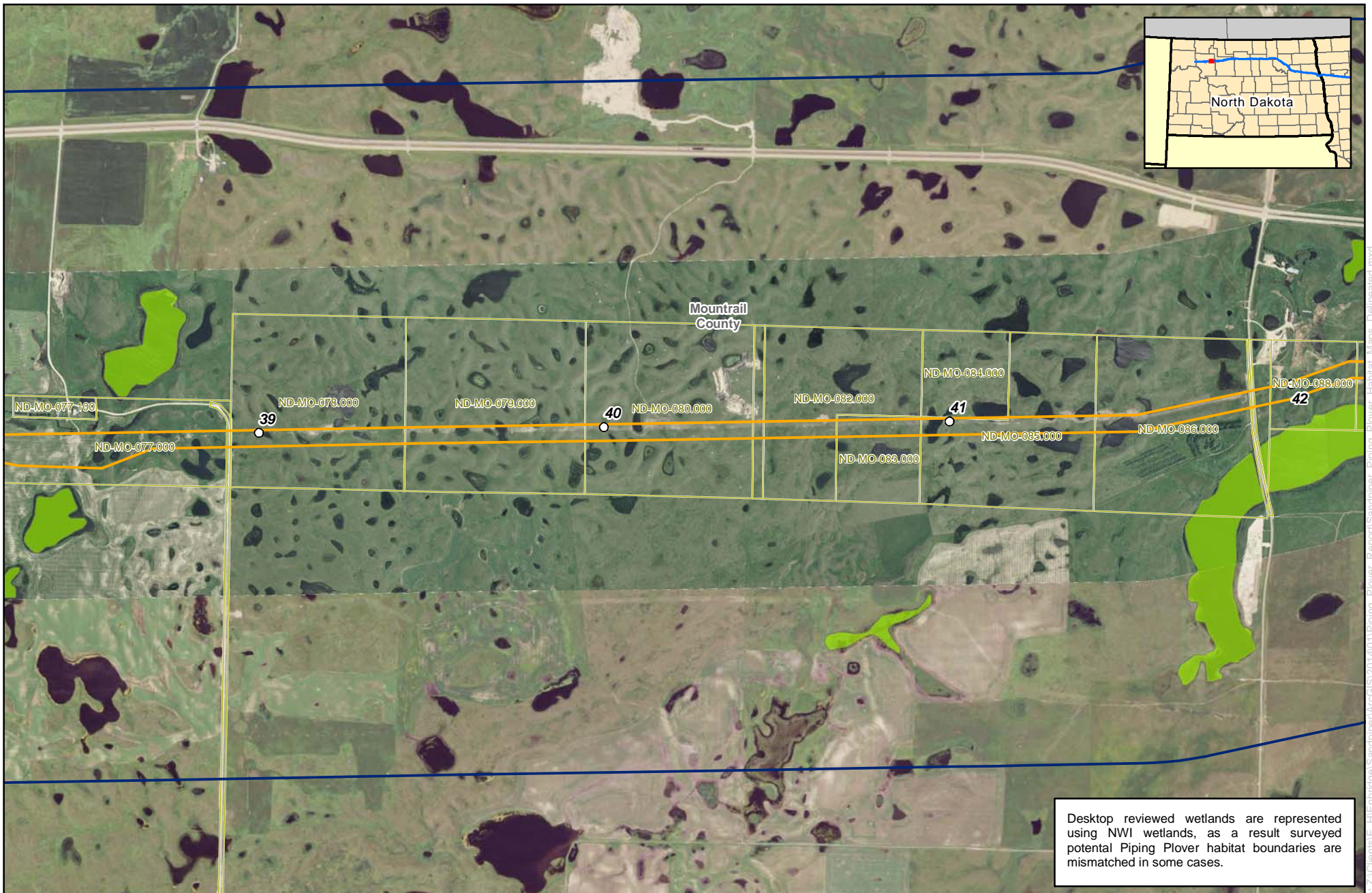
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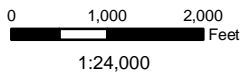
Enbridge Potential Piping Plover Suitable Habitat

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| ▭ Parcels | ▭ No |

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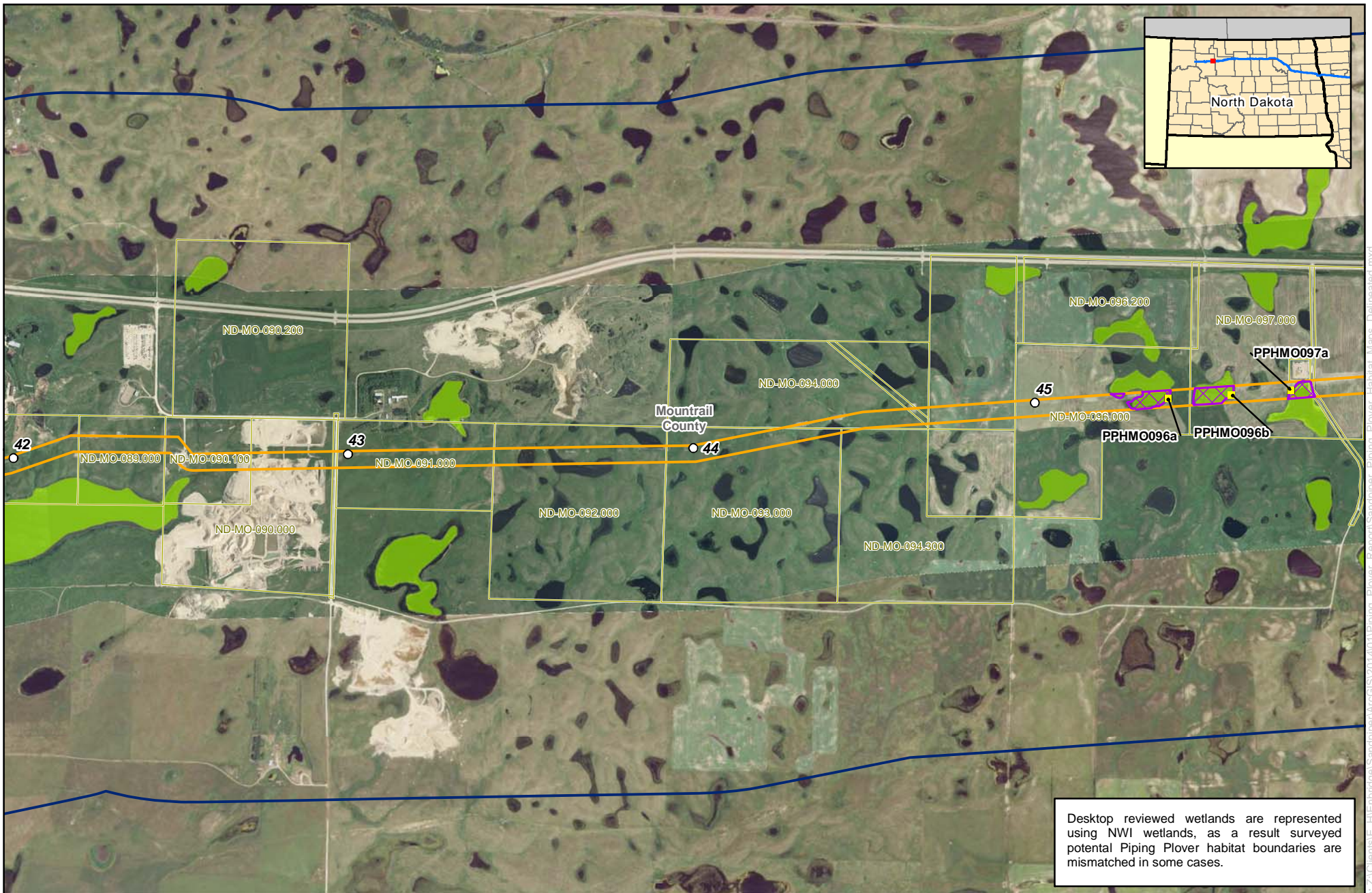
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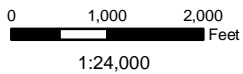
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Potential Piping Plover Suitable Habitat

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| ▭ Parcels | ▭ No |

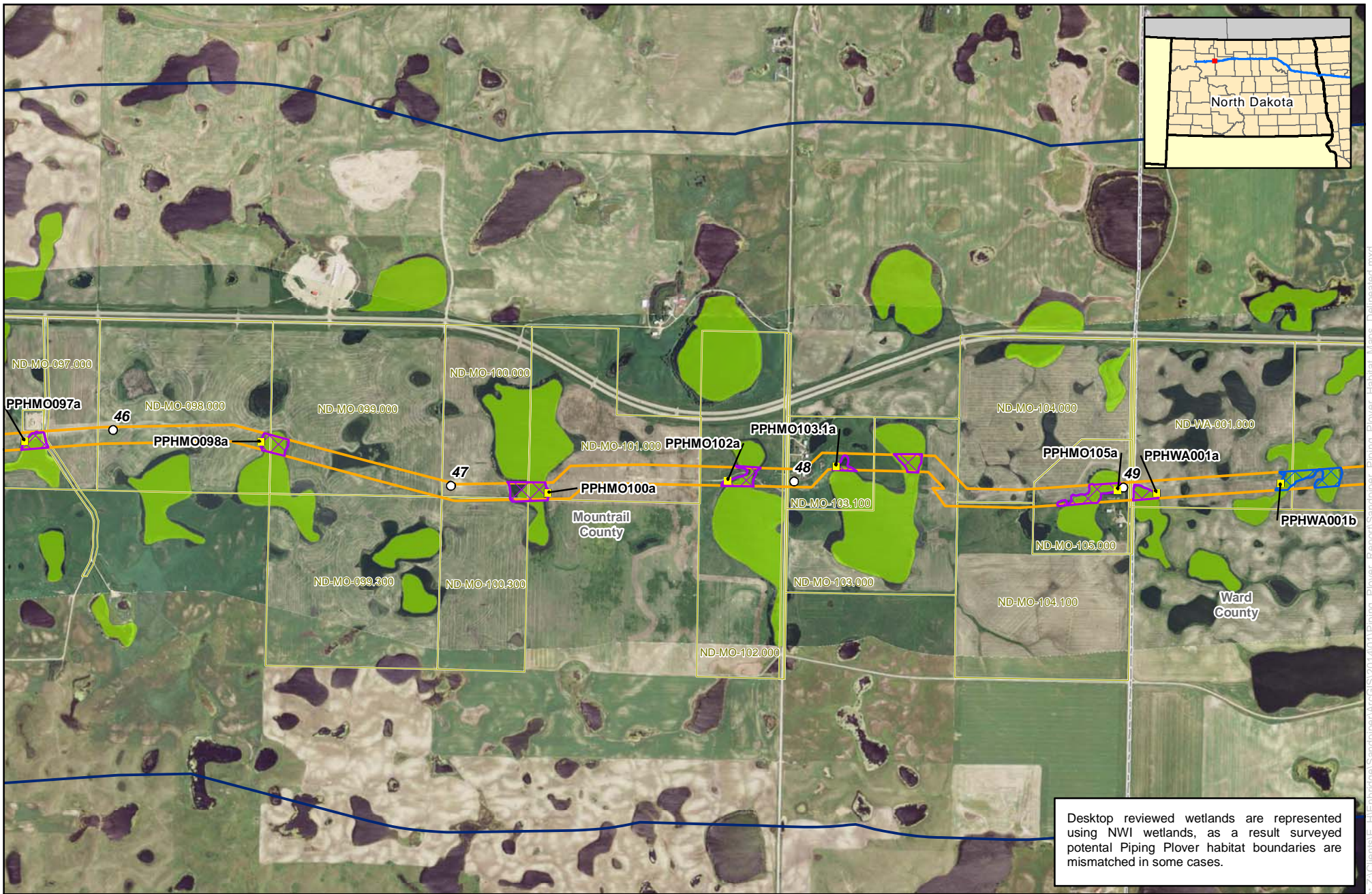


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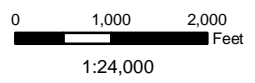


Enbridge Potential Piping Plover Suitable Habitat

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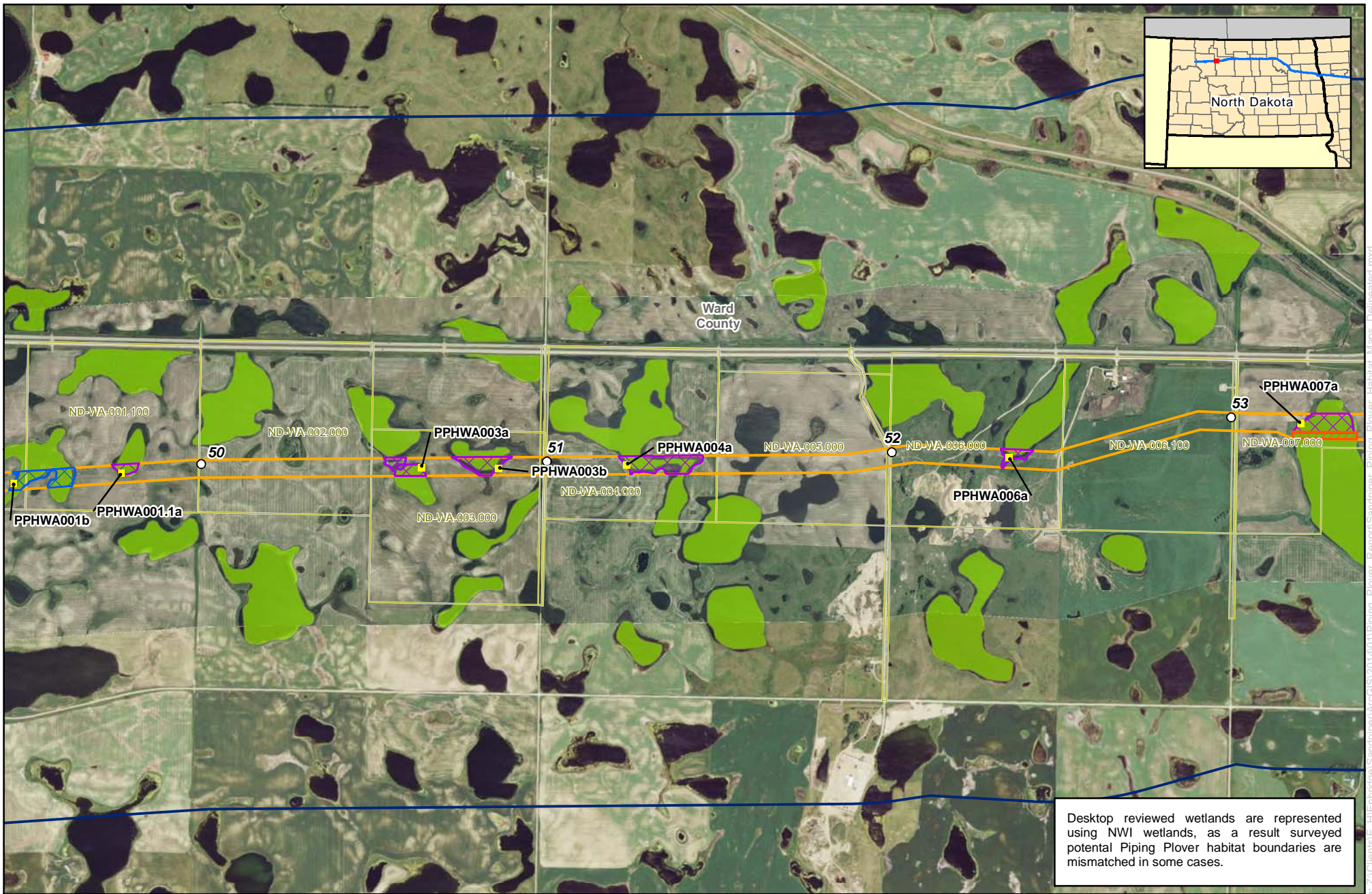
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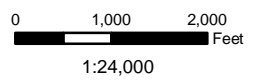
Enbridge Potential Piping Plover Suitable Habitat

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Source: z:\Clients\IE_HIE\enbridge\Standpipes\ArcGIS\2014\011\piping_Plover_Report\Standpipes\Piping_Plover_Habitat_Maps_Deliverables.mxd Date: 1/20/2014



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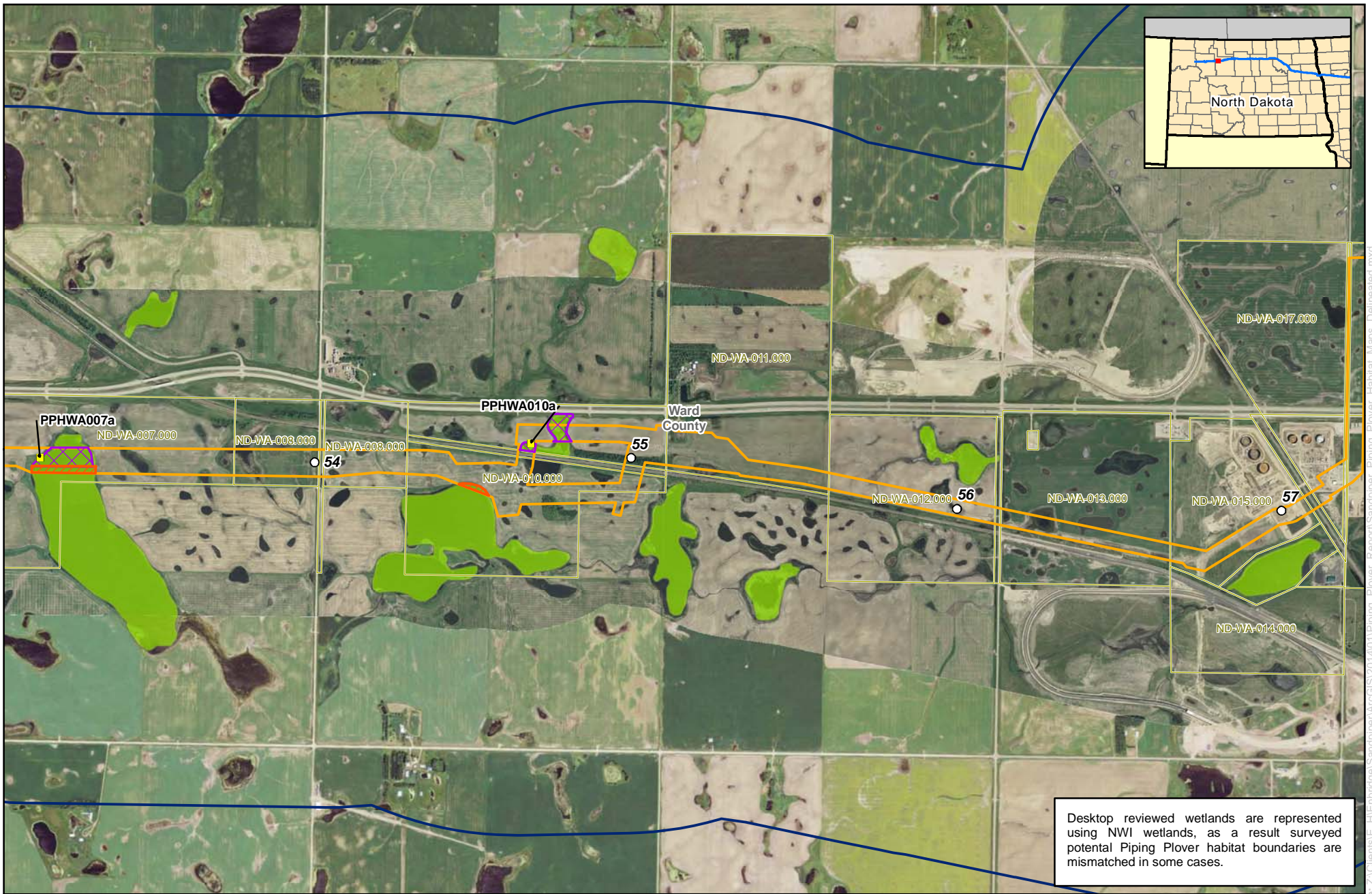


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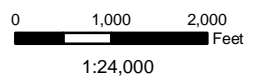
Potential Piping Plover Suitable Habitat

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| ▨ Survey Needed | ▭ Yes |
| ▭ Parcels | ▭ No |

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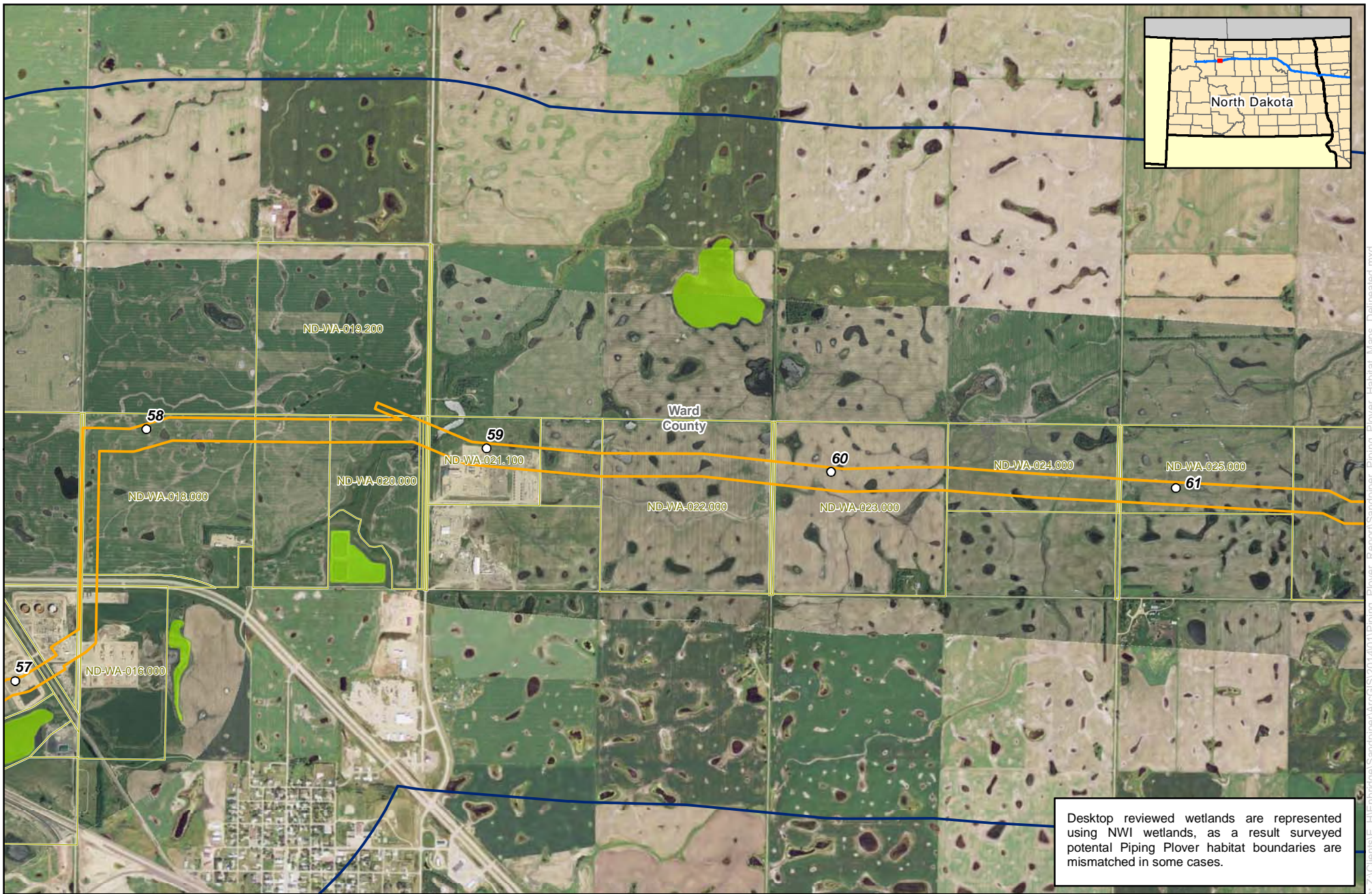


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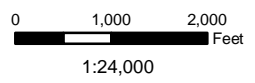


Enbridge Potential Piping Plover Suitable Habitat

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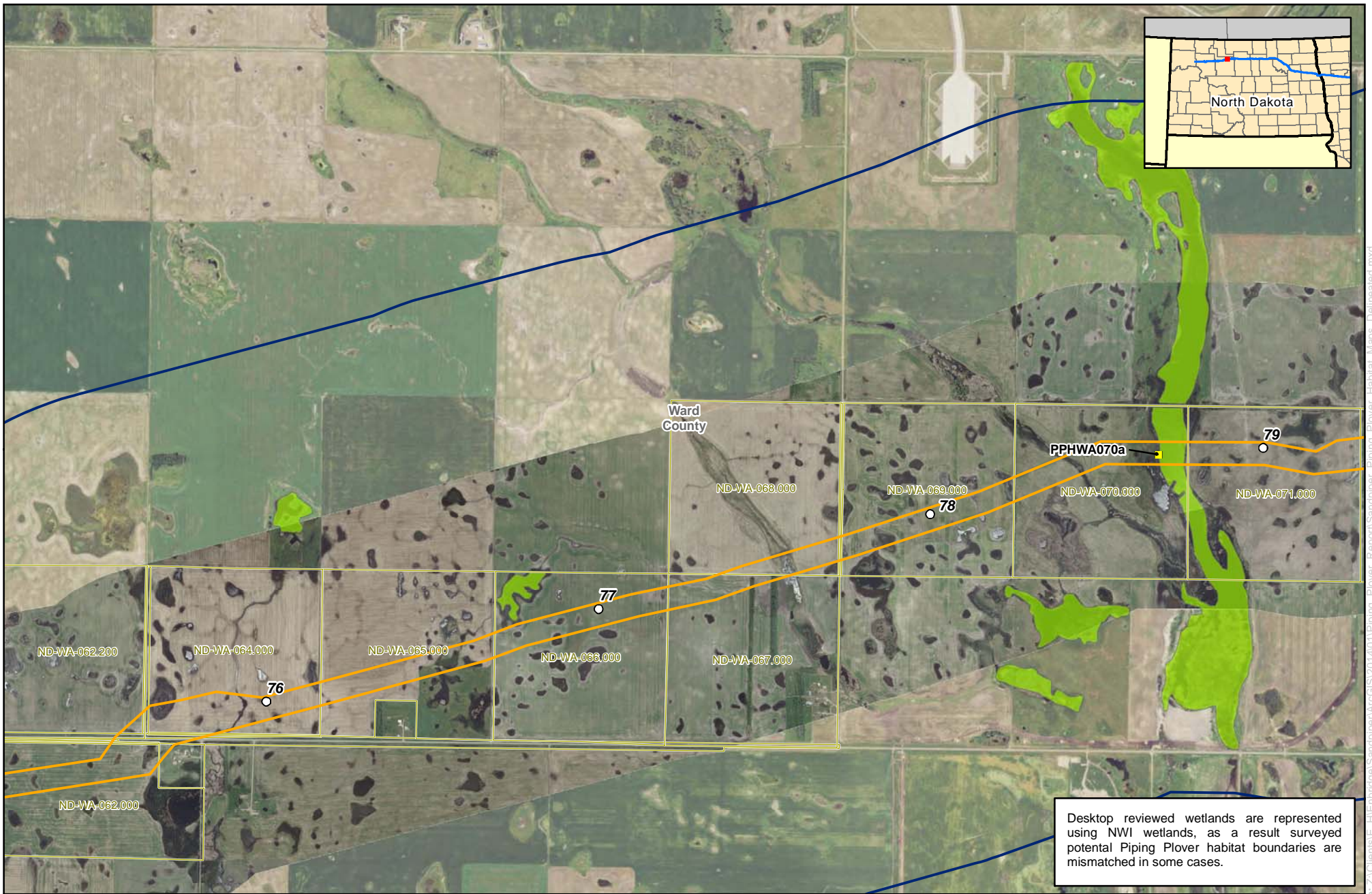


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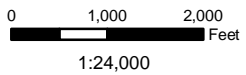


Enbridge Potential Piping Plover Suitable Habitat

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| Milepost | Sample Point |
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| Environmental Survey Corridor | Potential Piping Plover Habitat |
| Survey Needed | Yes |
| Parcels | No |



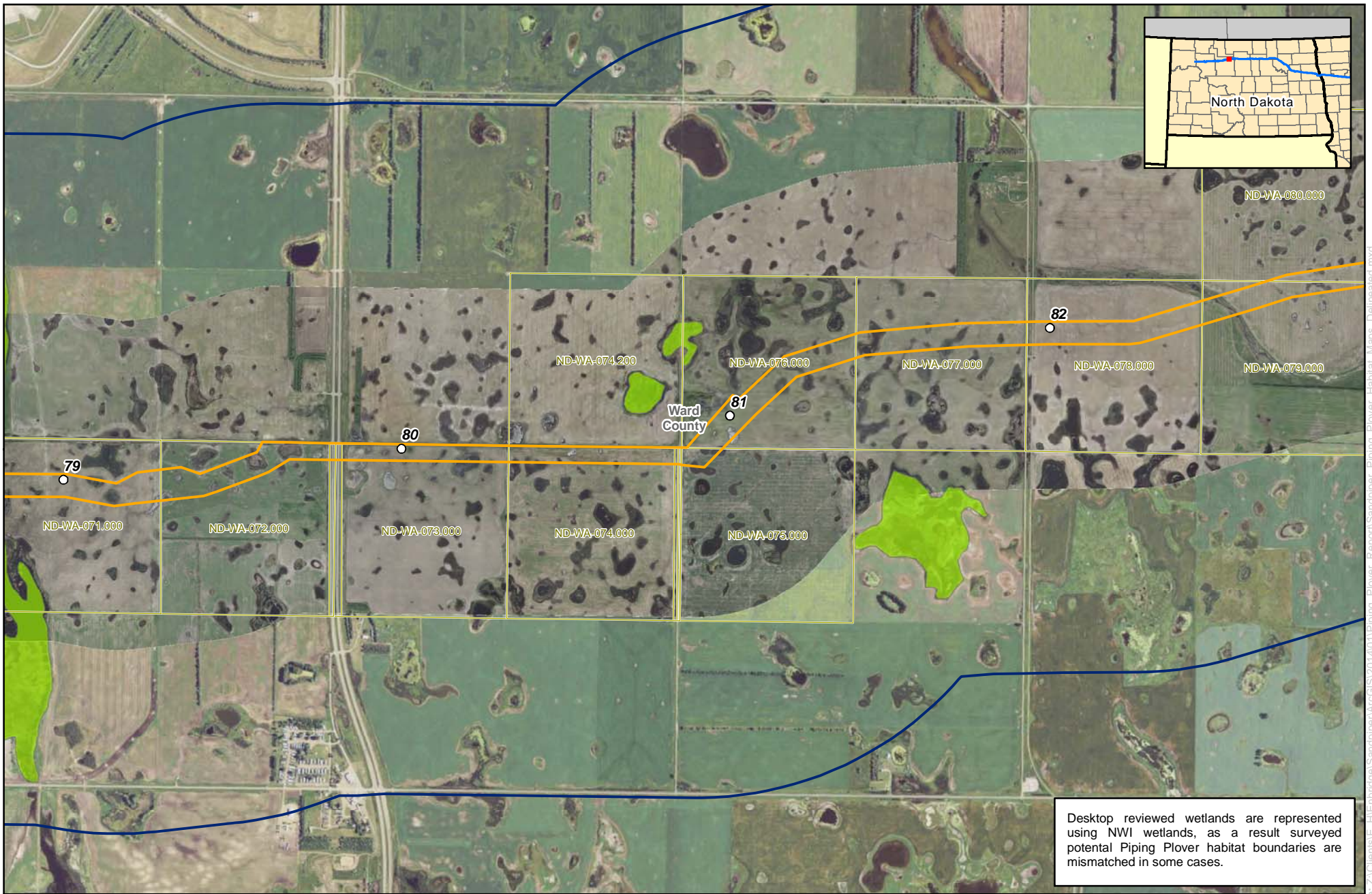
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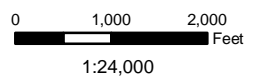
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| ▨ Survey Needed | ▭ Yes |
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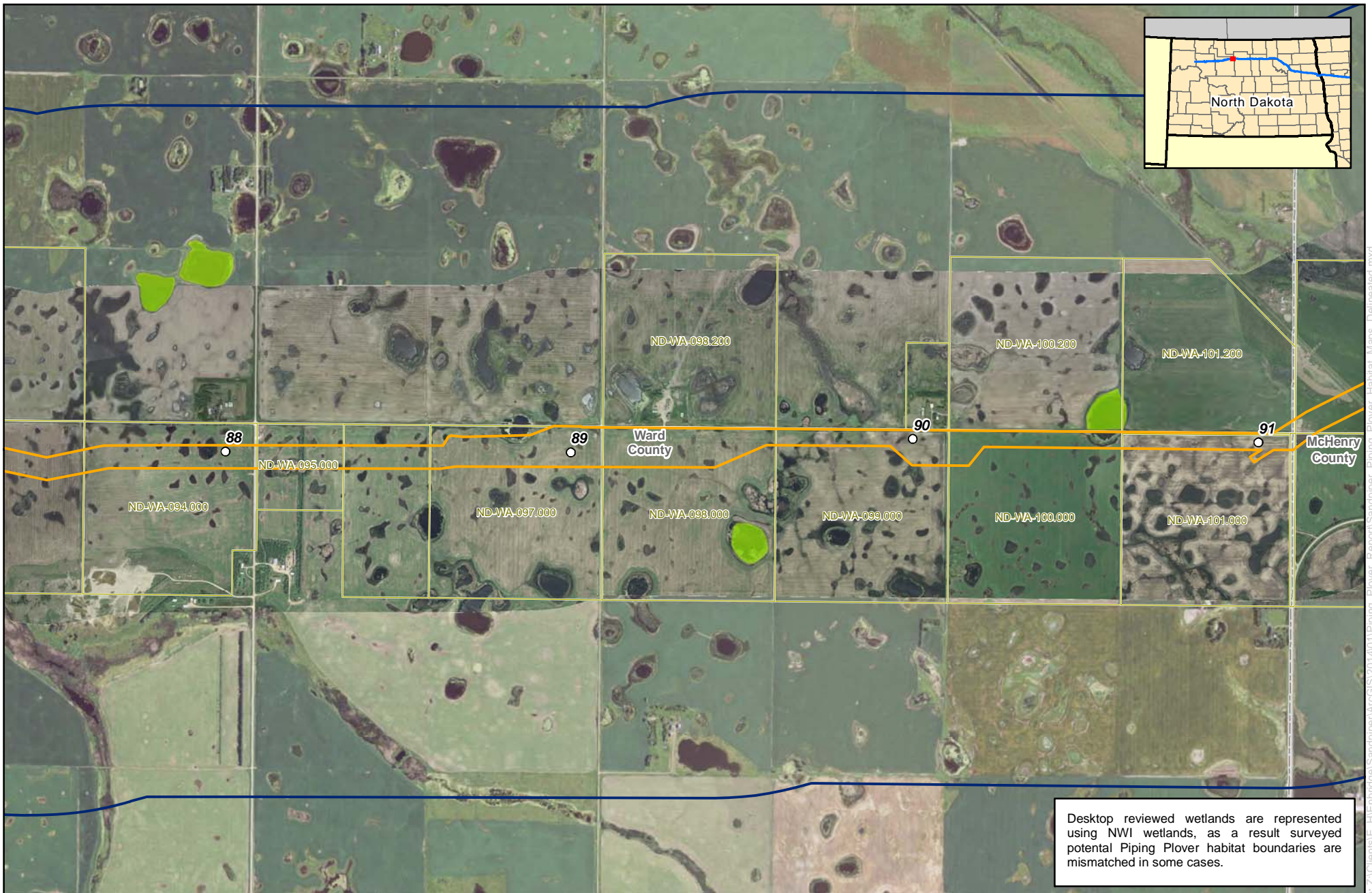
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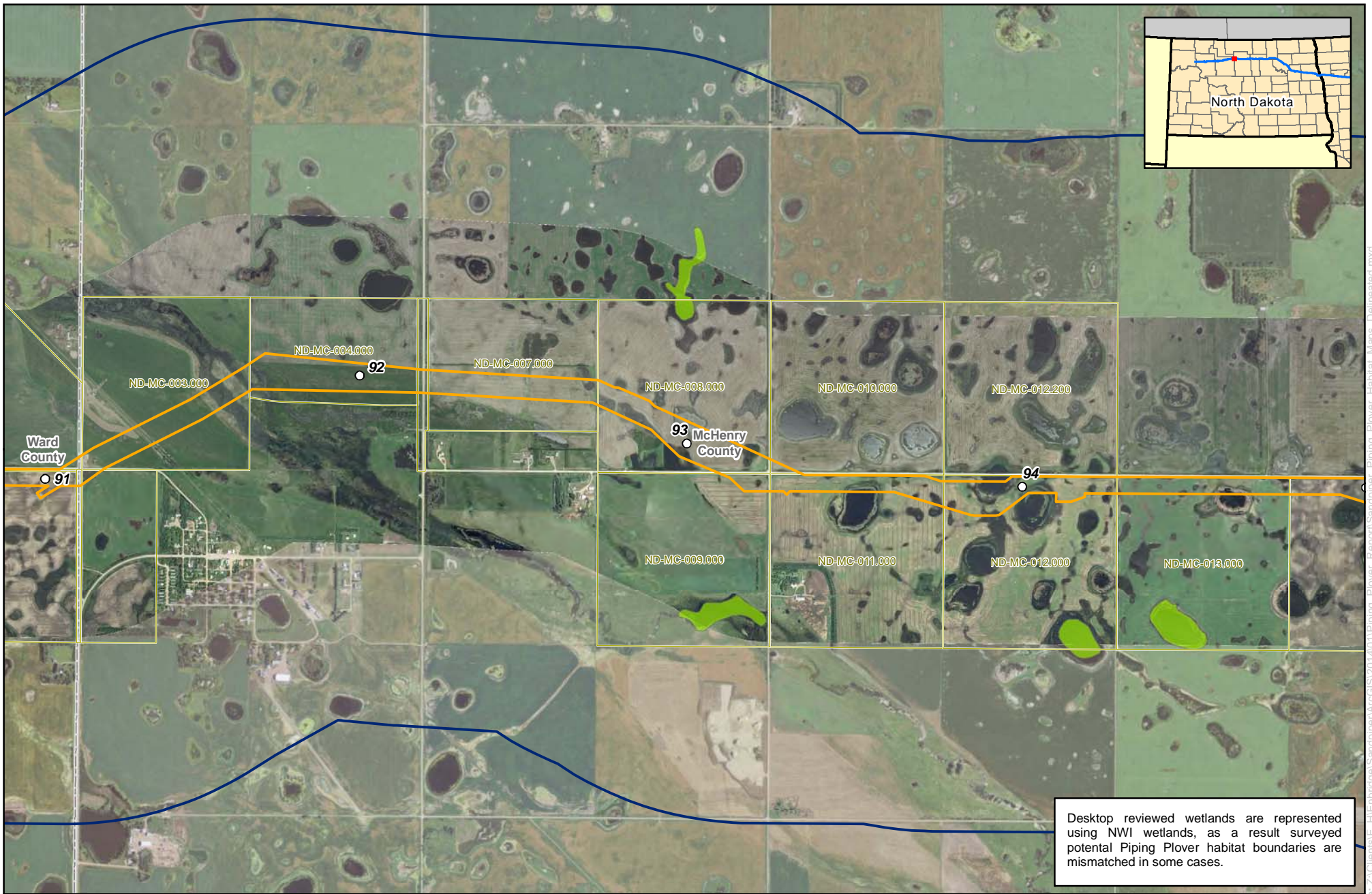


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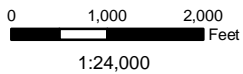


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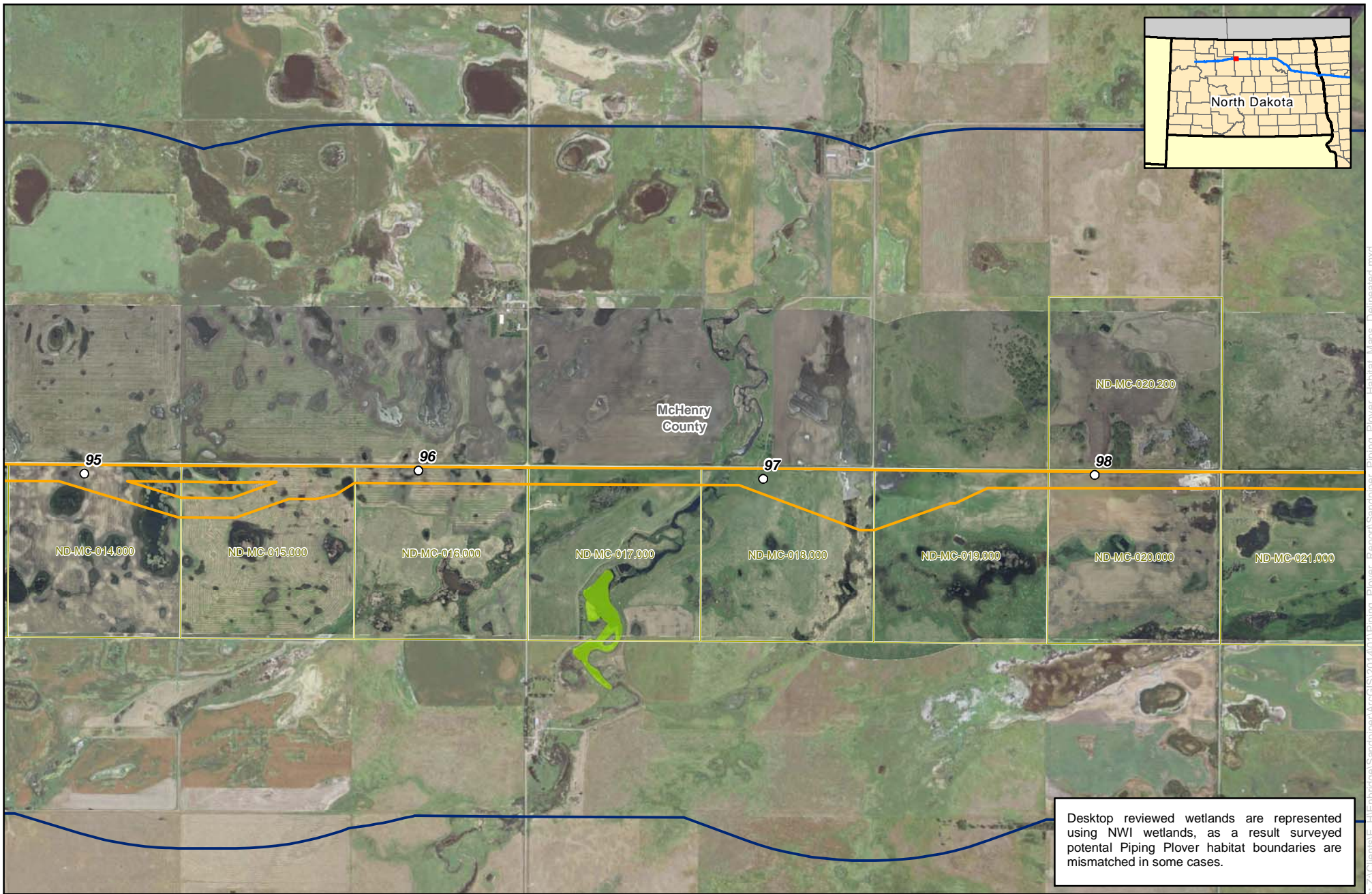


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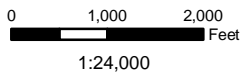


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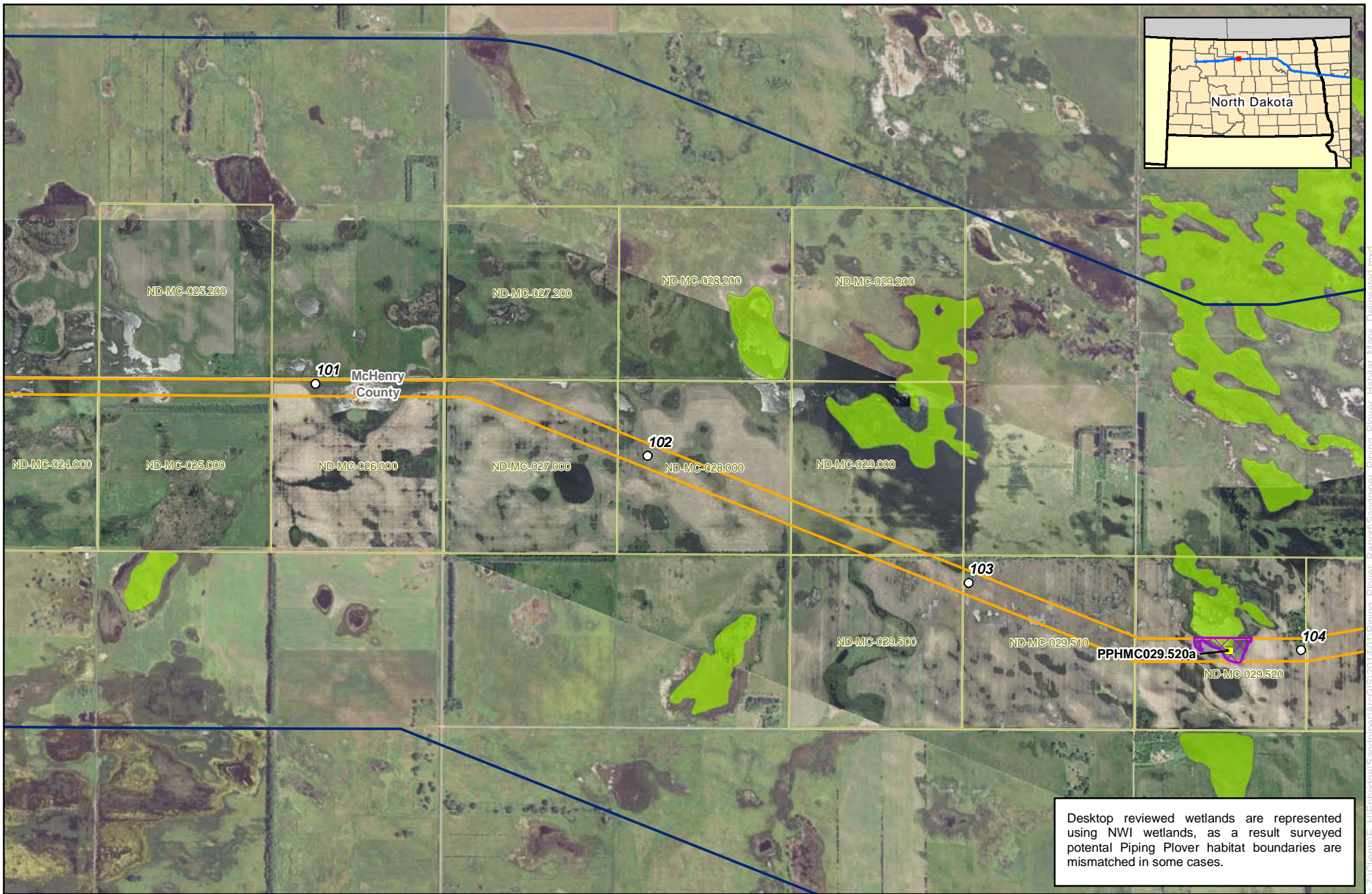


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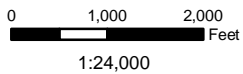


Enbridge Potential Piping Plover Suitable Habitat

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|---------------------------------|-----------------------------------|
| ○ Milepost | ■ Sample Point |
| ▭ Study Area | ■ Desktop Reviewed Wetlands |
| ▭ Environmental Survey Corridor | ▭ Potential Piping Plover Habitat |
| ▨ Survey Needed | ▭ Yes |
| ▭ Parcels | ▭ No |



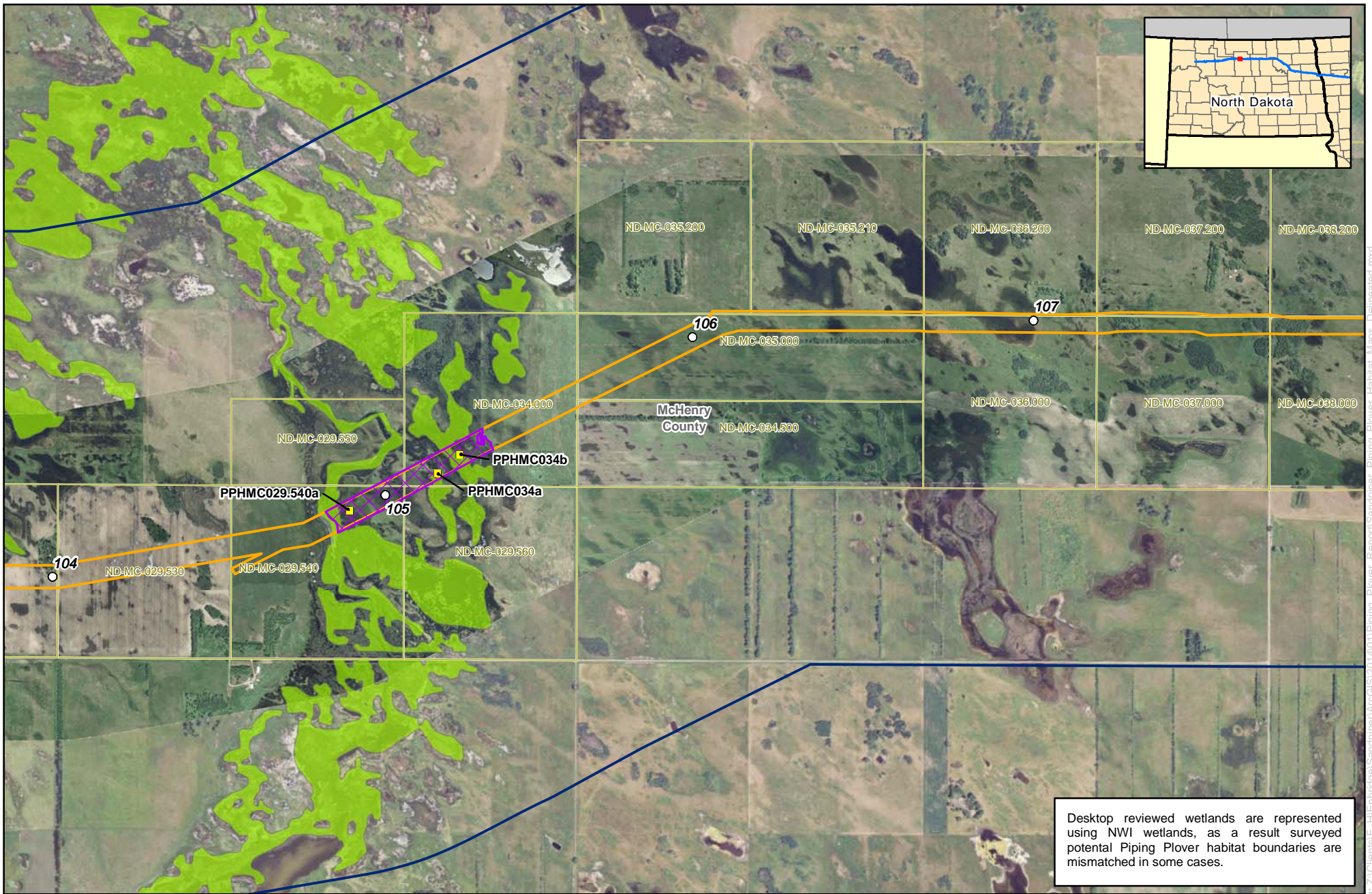
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Enbridge Potential Piping Plover Suitable Habitat

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| ○ Milepost | ■ Sample Point |
| ▭ Study Area | ■ Desktop Reviewed Wetlands |
| ▭ Environmental Survey Corridor | ▭ Potential Piping Plover Habitat |
| ▨ Survey Needed | ▭ Yes |
| ▭ Parcels | ▭ No |

Source: z:\Clients\IE_HIE\enbridge\Sandpiper\ArcGIS\2014\01\Piping_Plover_Report\Sandpiper_140111\Piping_Plover_Habitat_Maps_Deliverable.mxd Date: 1/20/2014



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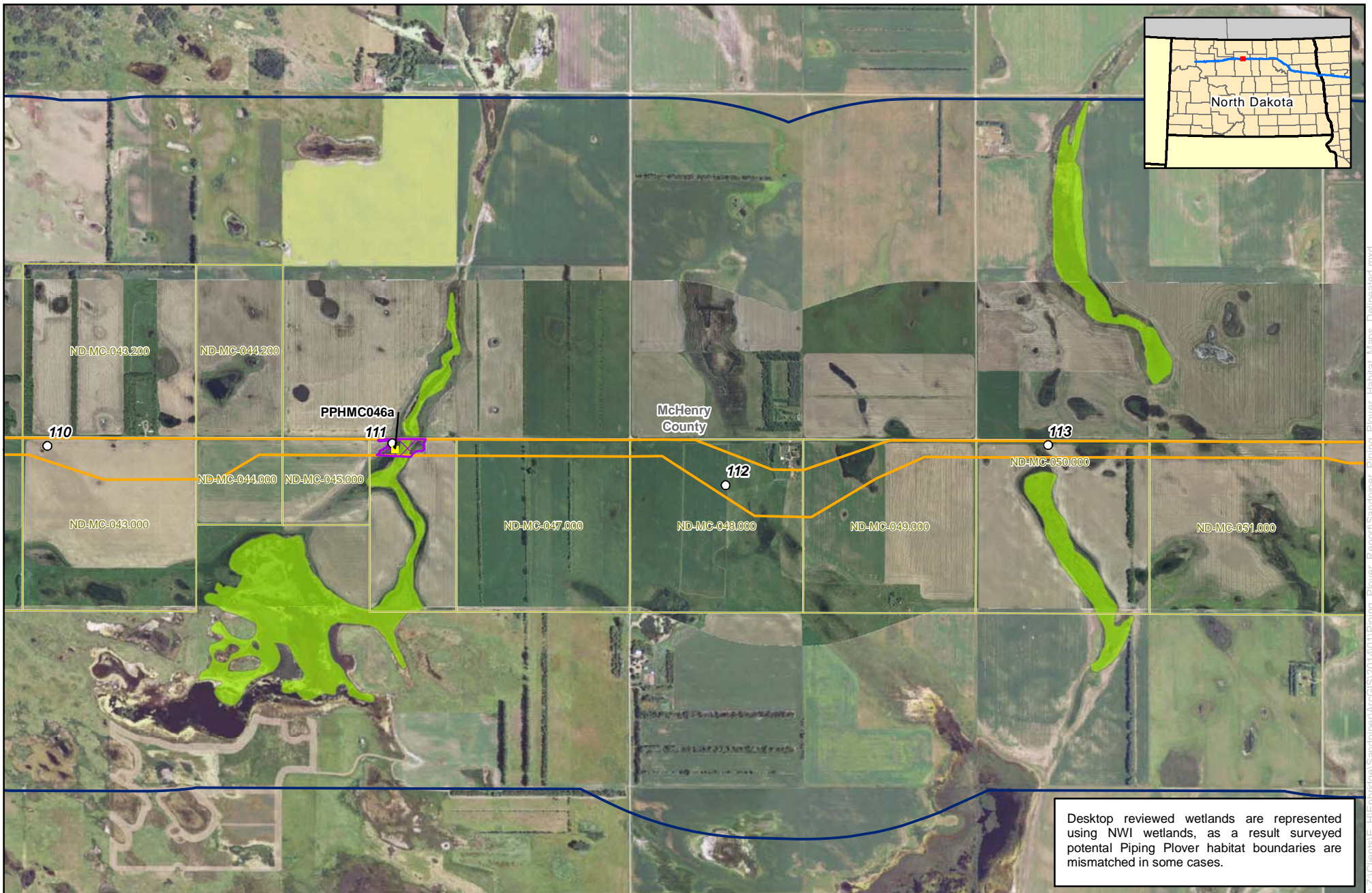


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Enbridge Potential Piping Plover Suitable Habitat

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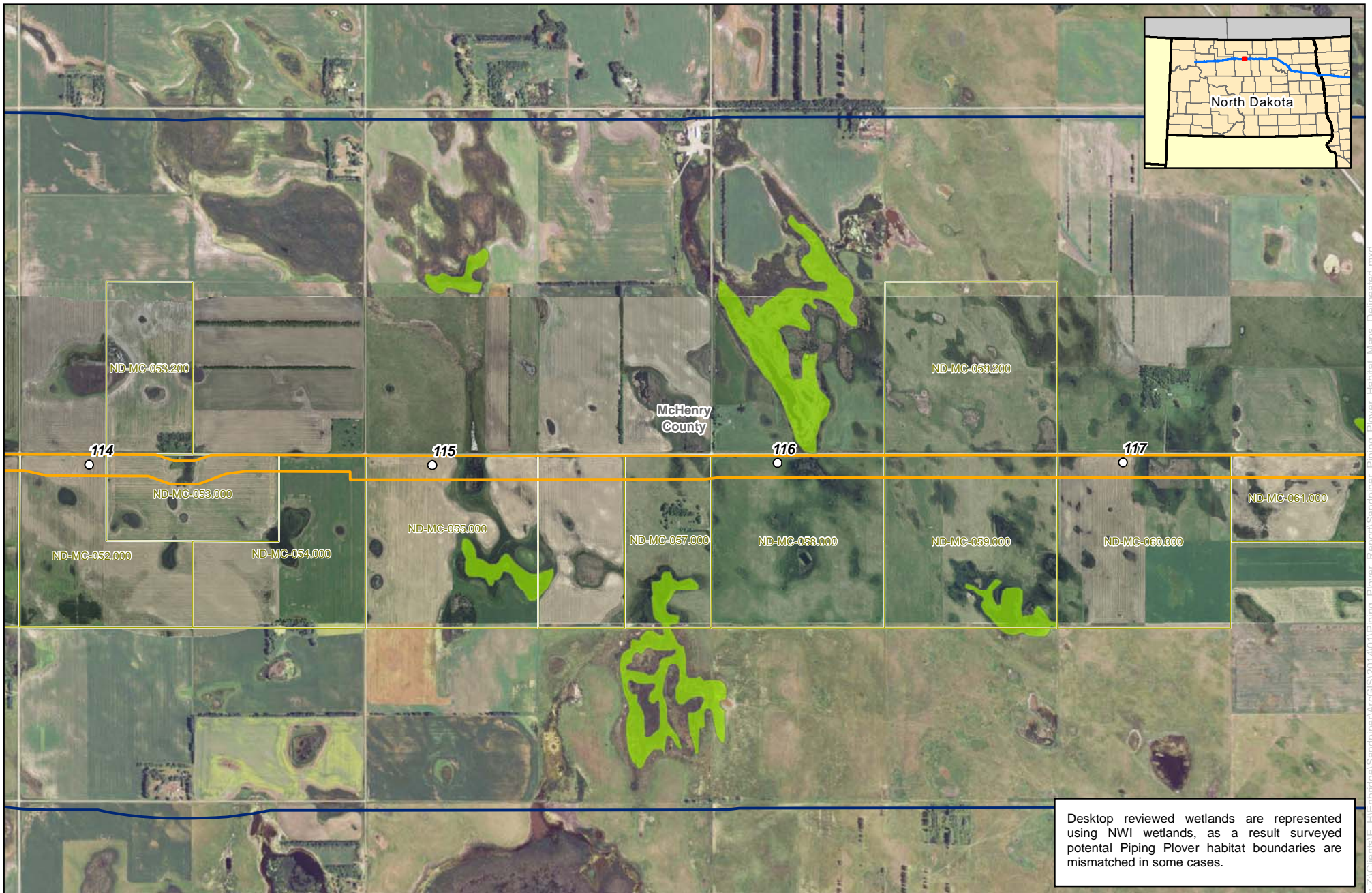


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Enbridge Potential Piping Plover Suitable Habitat

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|---------------------------------|-----------------------------------|
| ○ Milepost | ■ Sample Point |
| ▭ Study Area | ■ Desktop Reviewed Wetlands |
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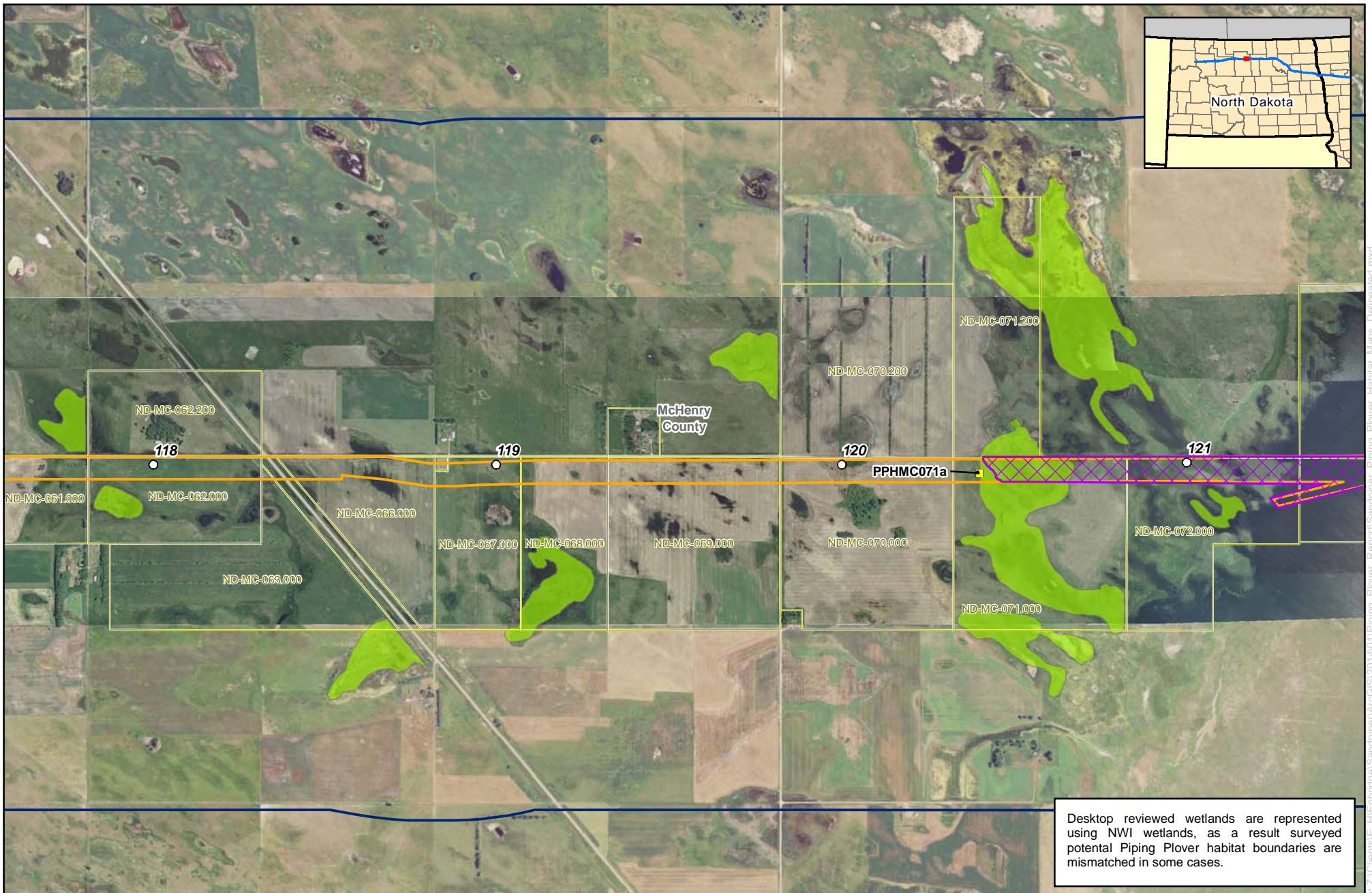
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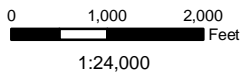
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|---------------------------------|-----------------------------------|
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| ▭ Study Area | ■ Desktop Reviewed Wetlands |
| ▭ Environmental Survey Corridor | ▭ Potential Piping Plover Habitat |
| ▨ Survey Needed | ▭ Yes |
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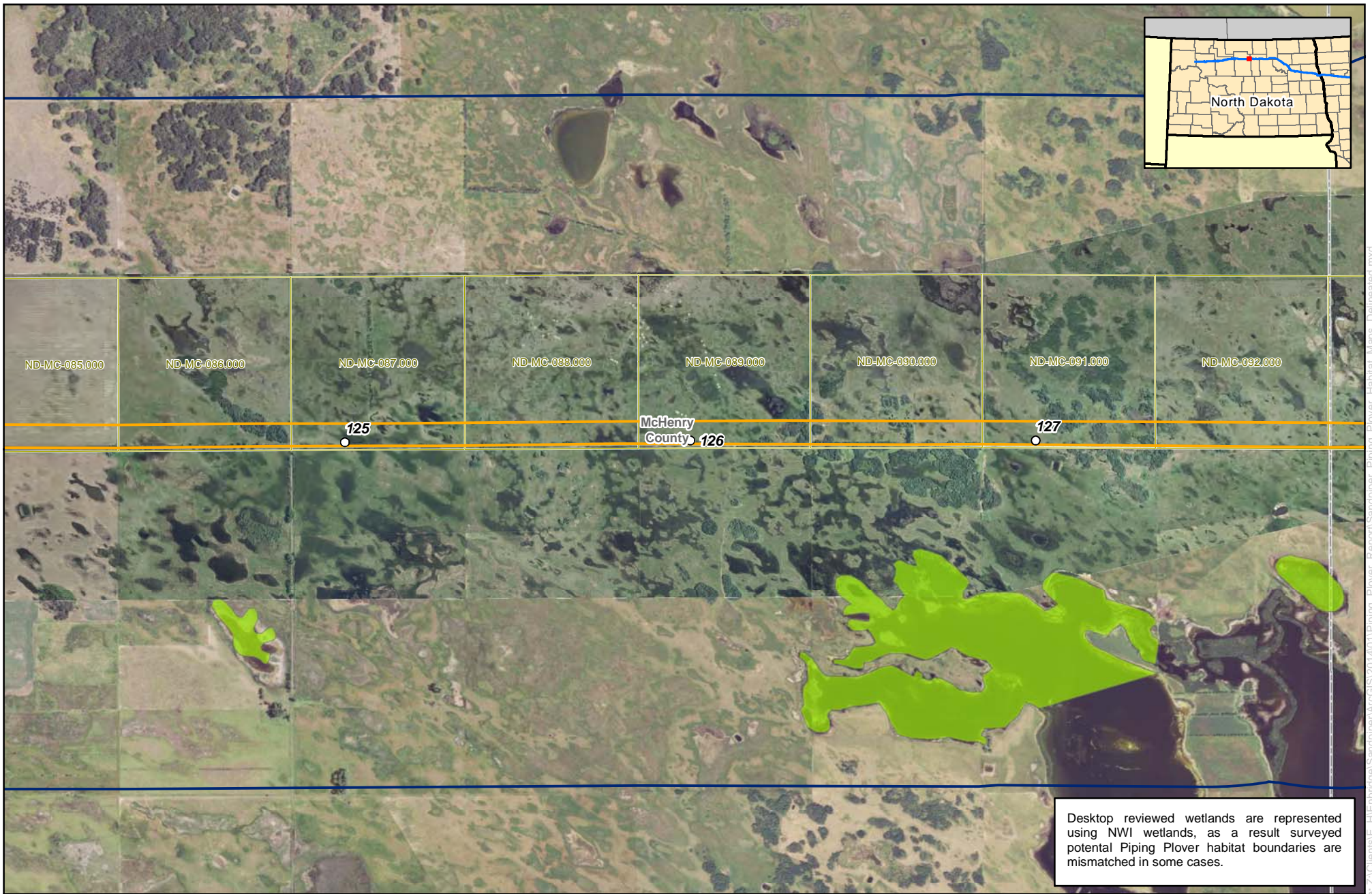
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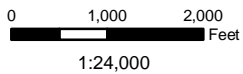
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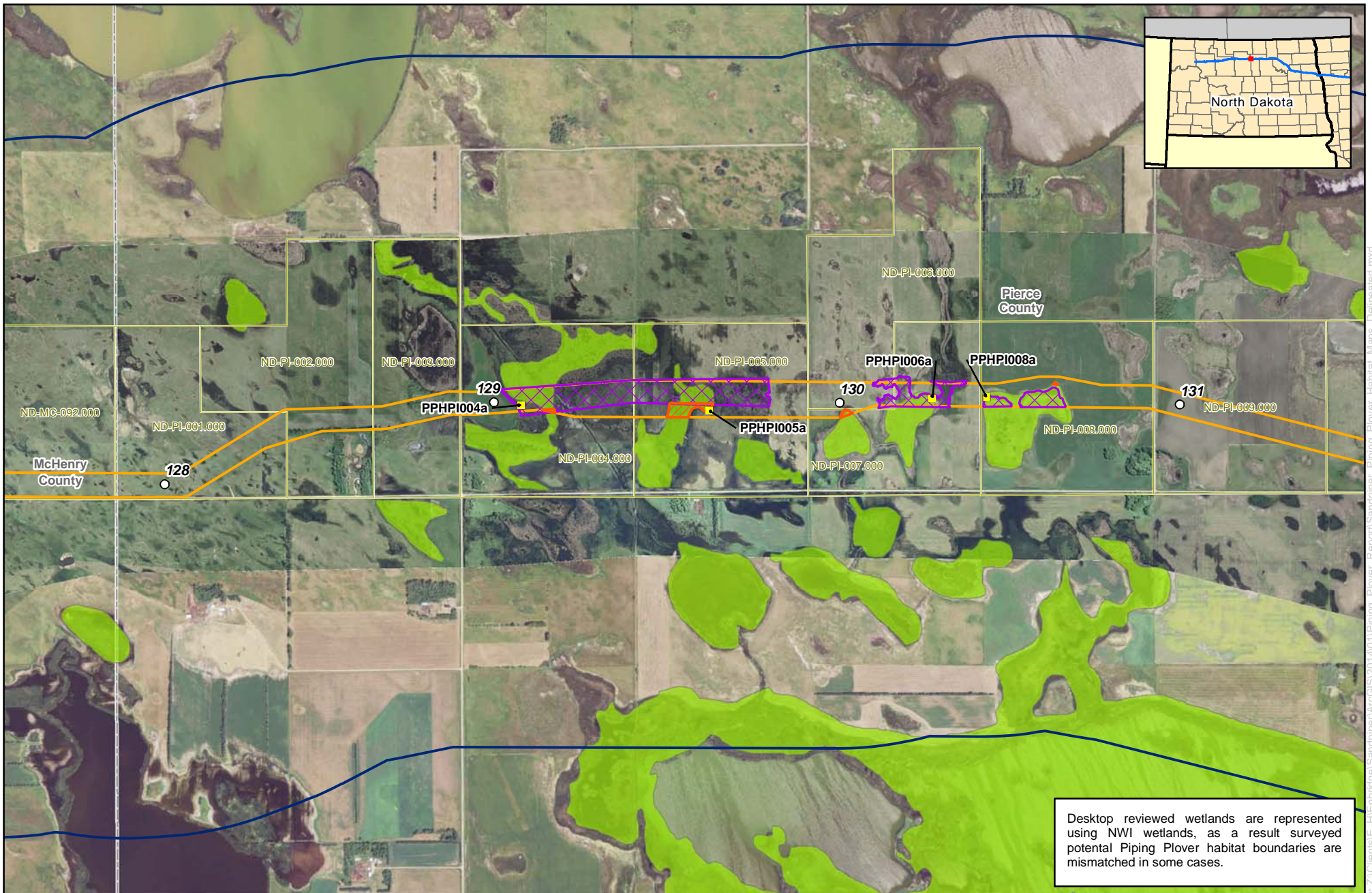


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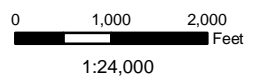


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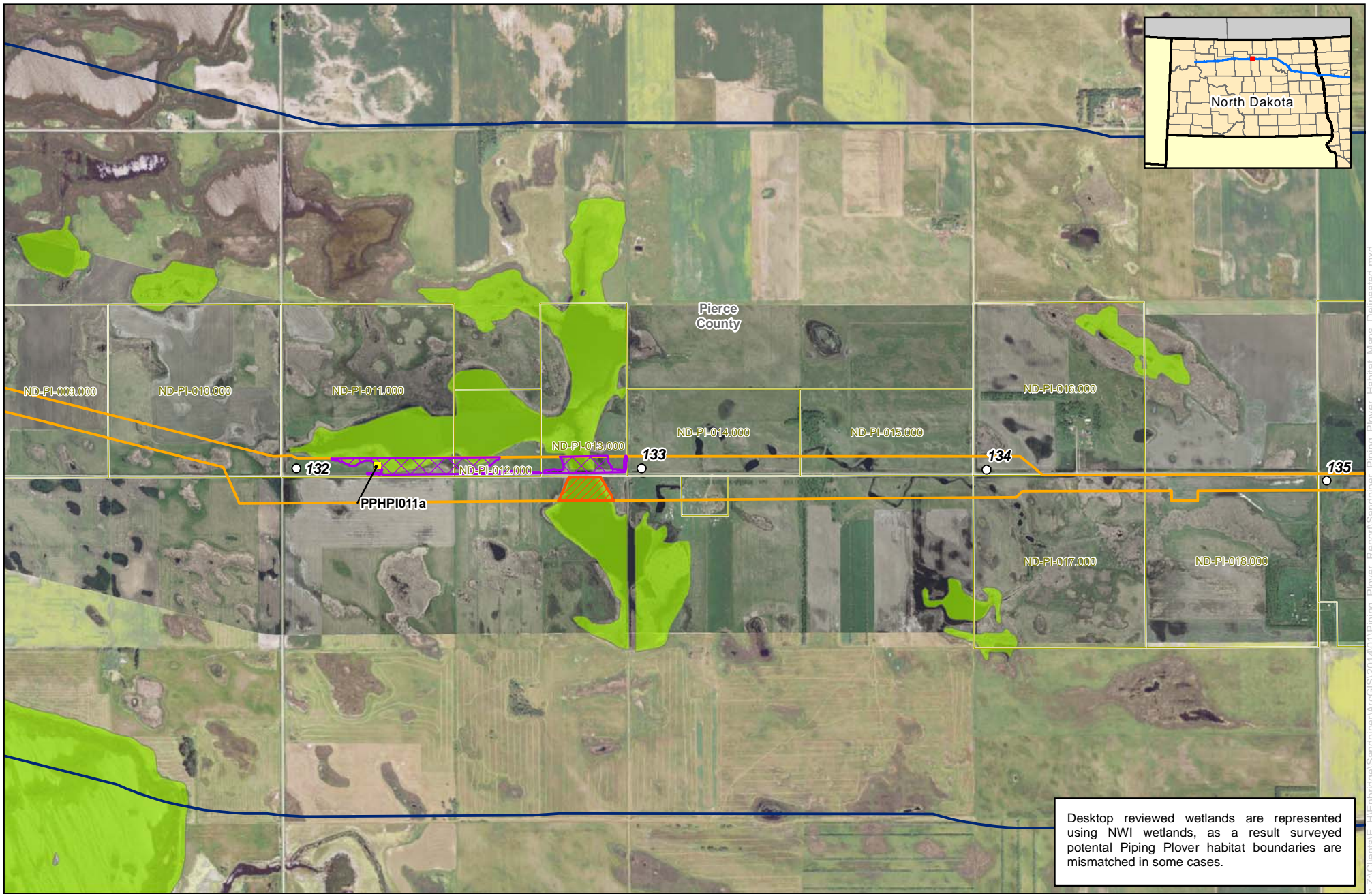
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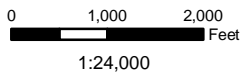
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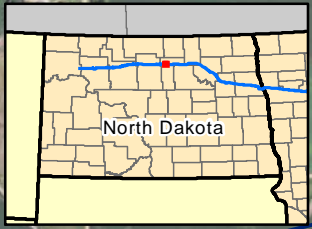
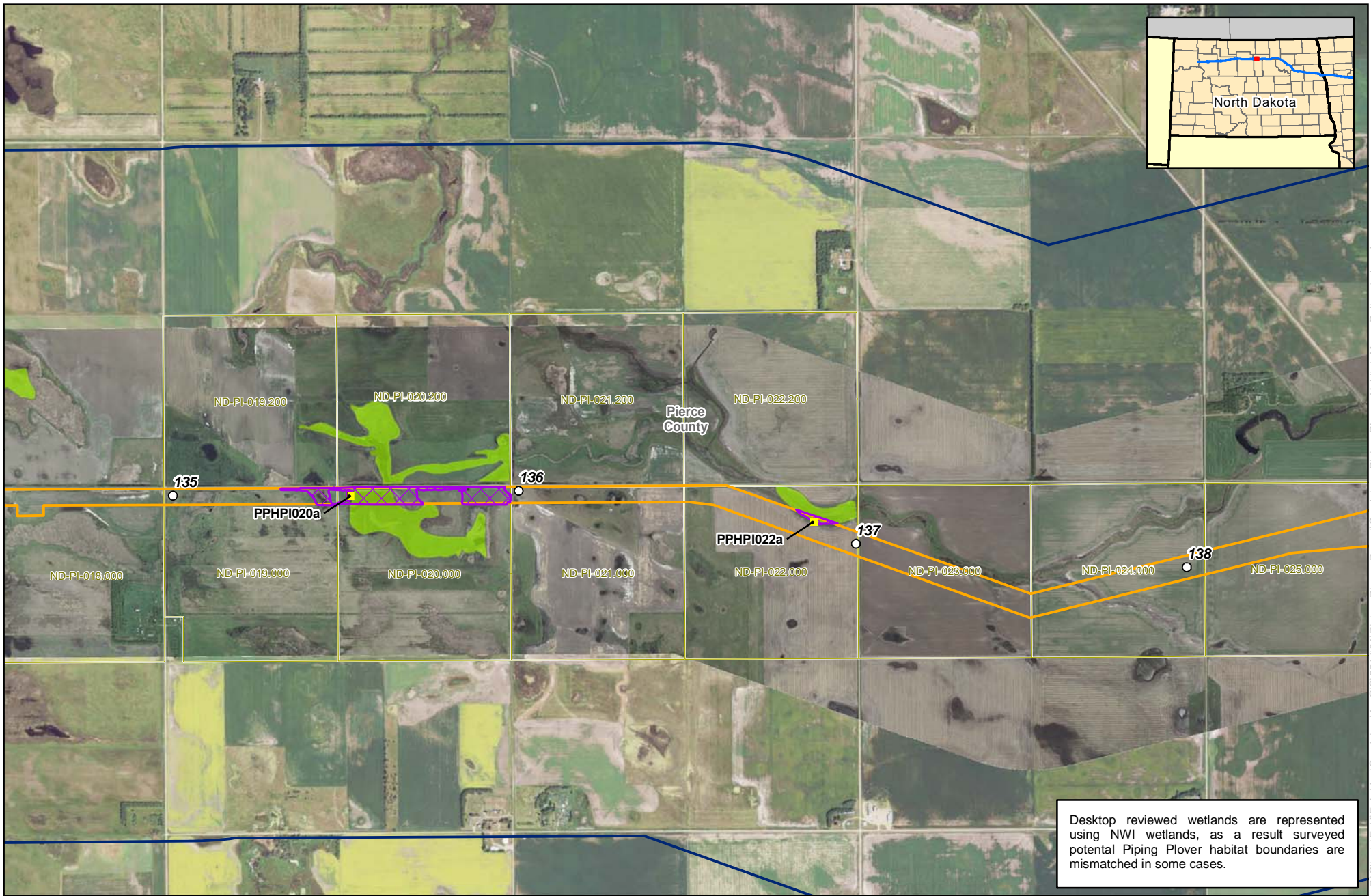
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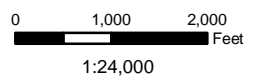
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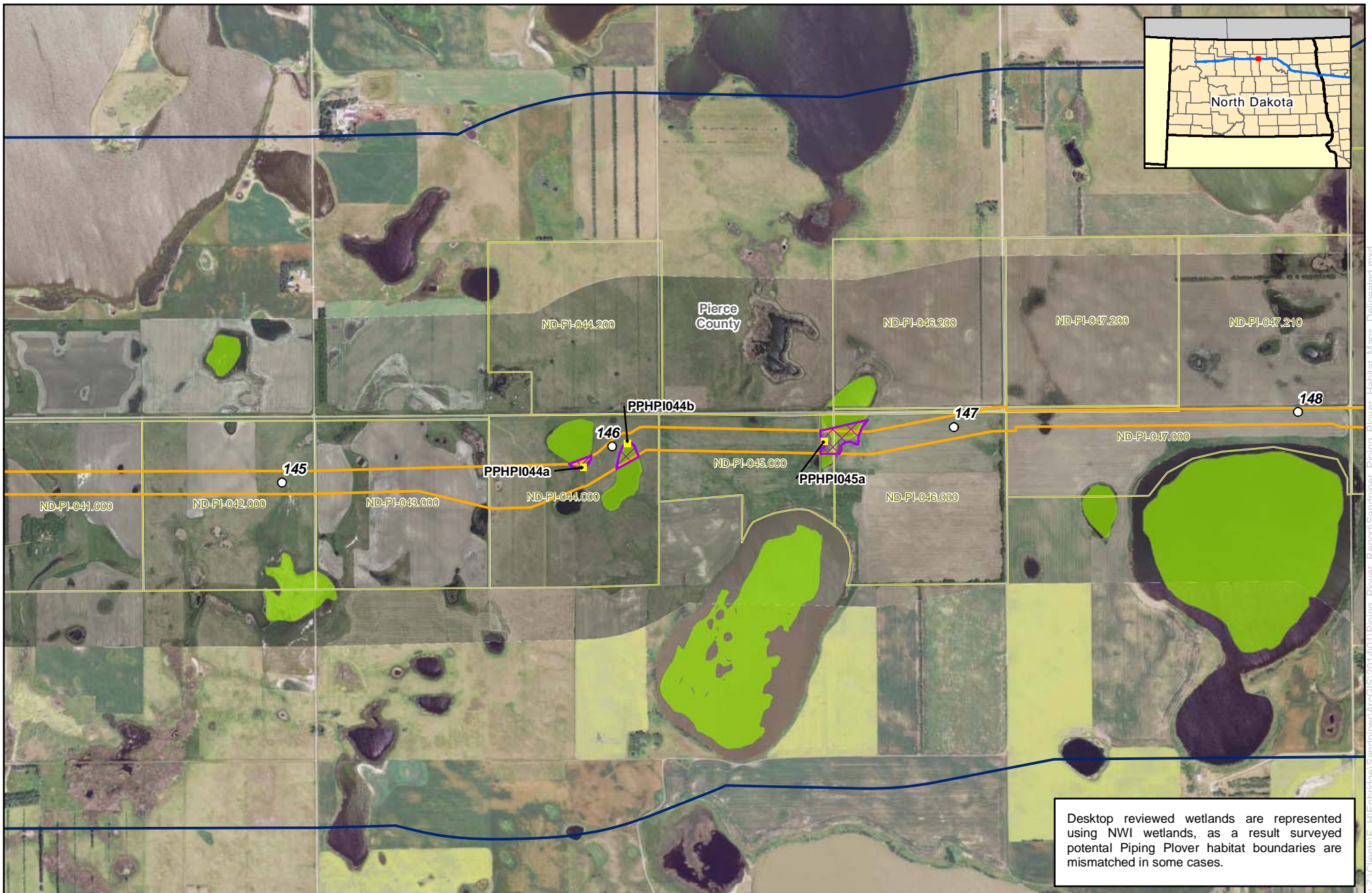
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Enbridge Potential Piping Plover Suitable Habitat

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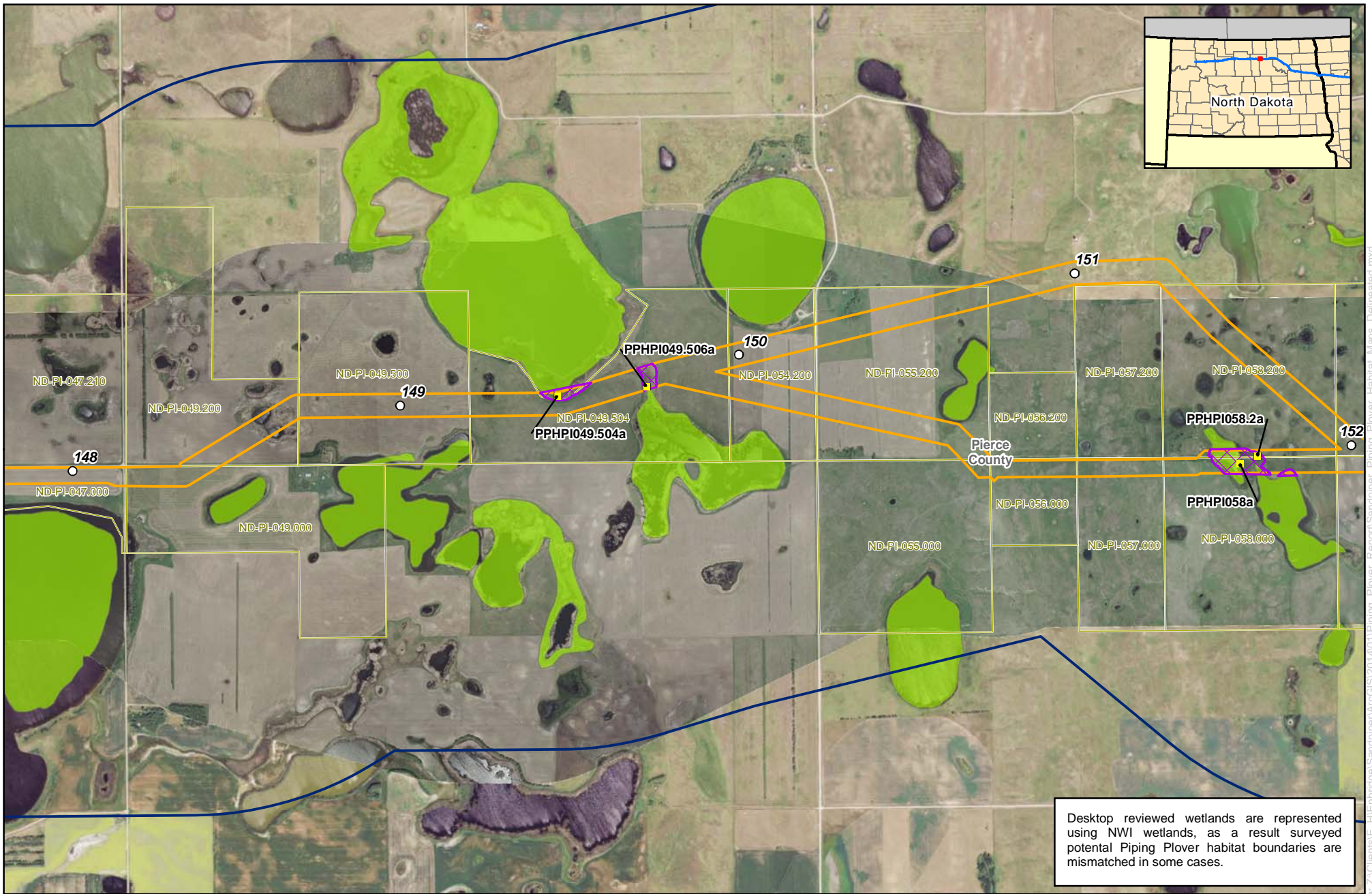
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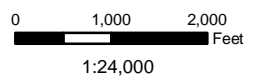
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Potential Piping Plover Suitable Habitat

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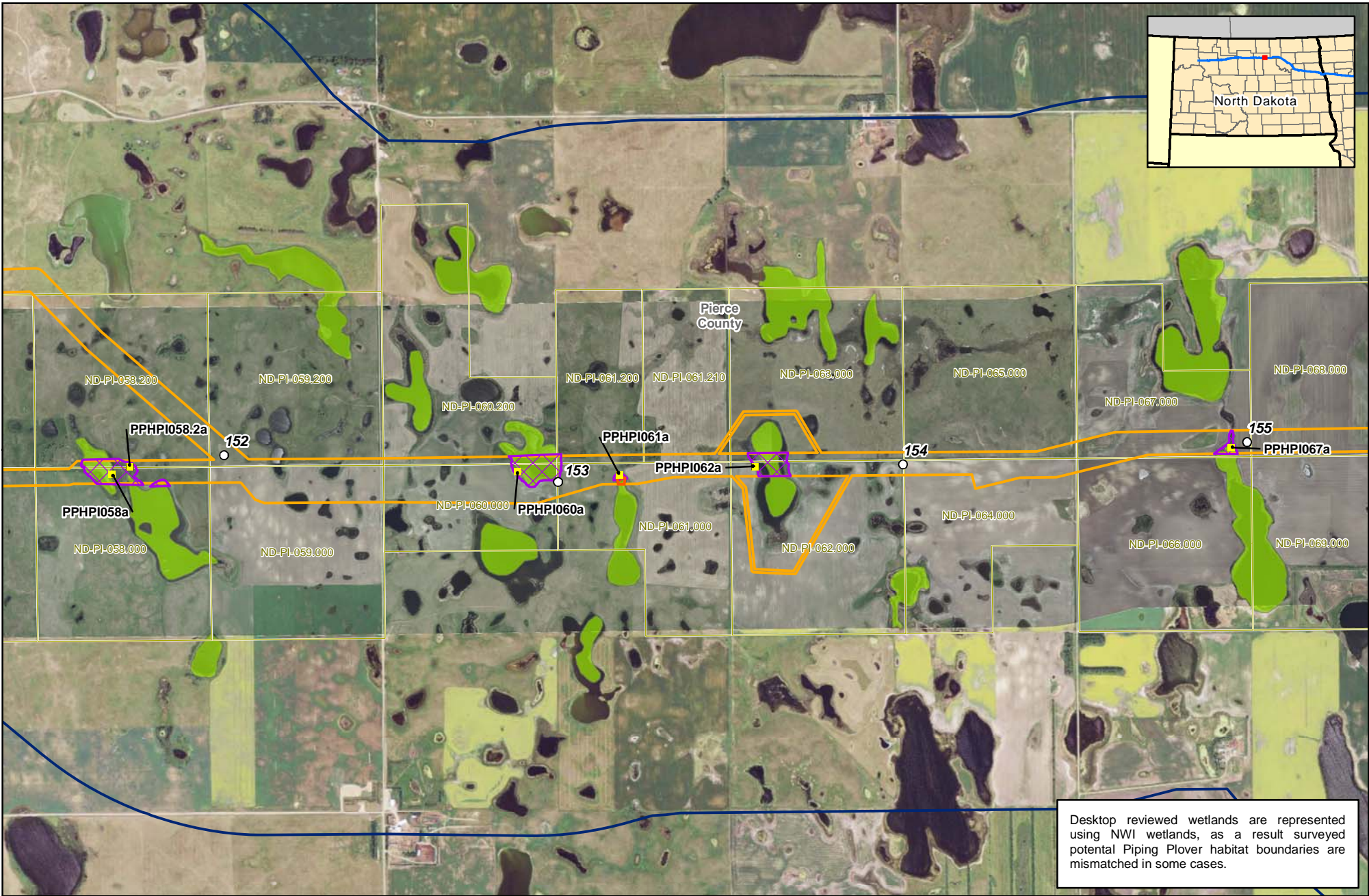
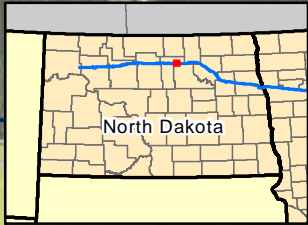


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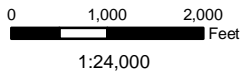
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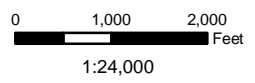
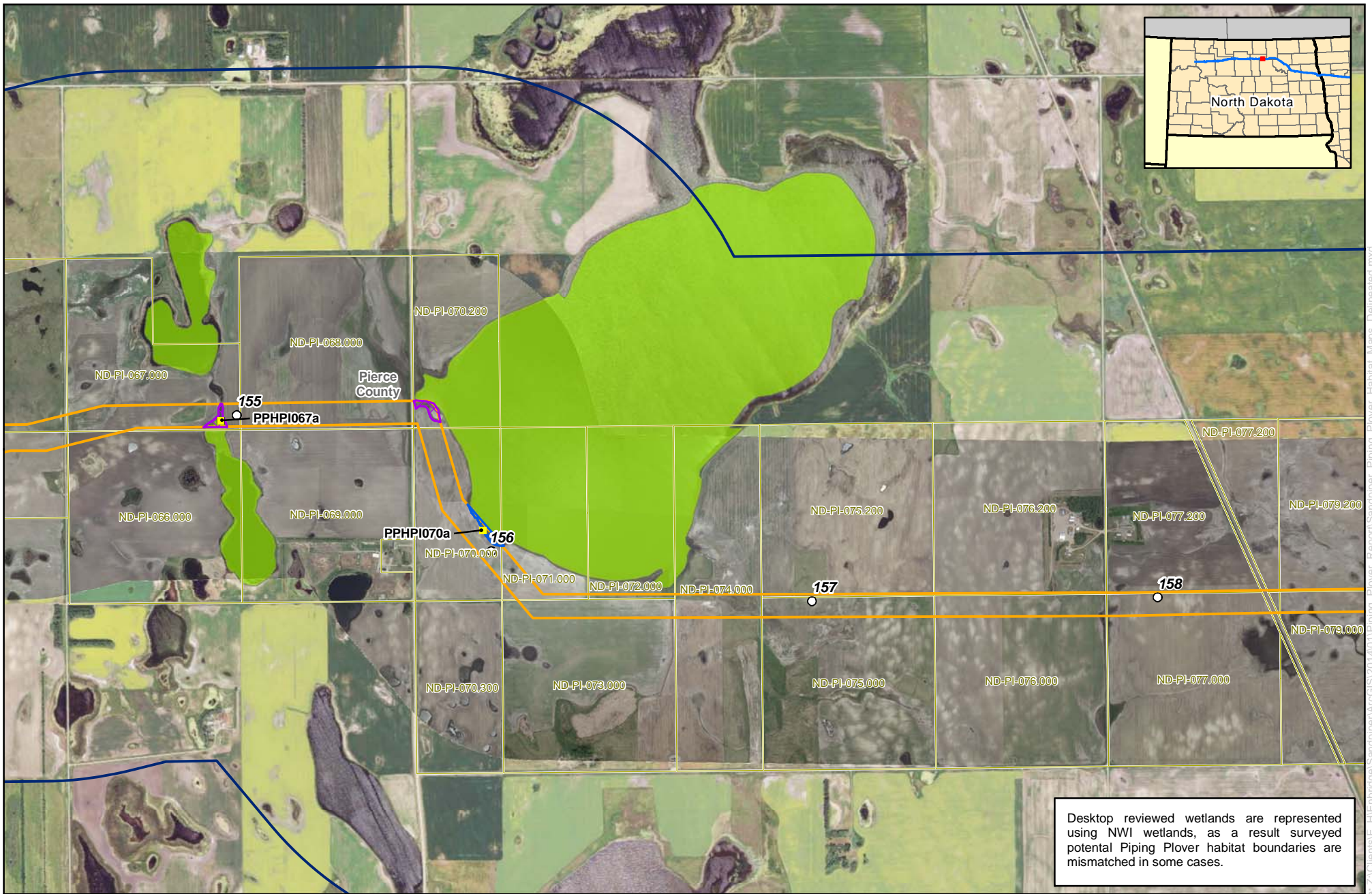


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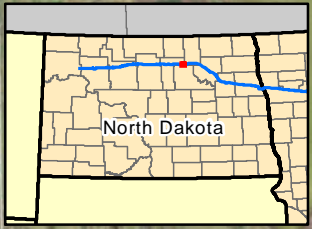
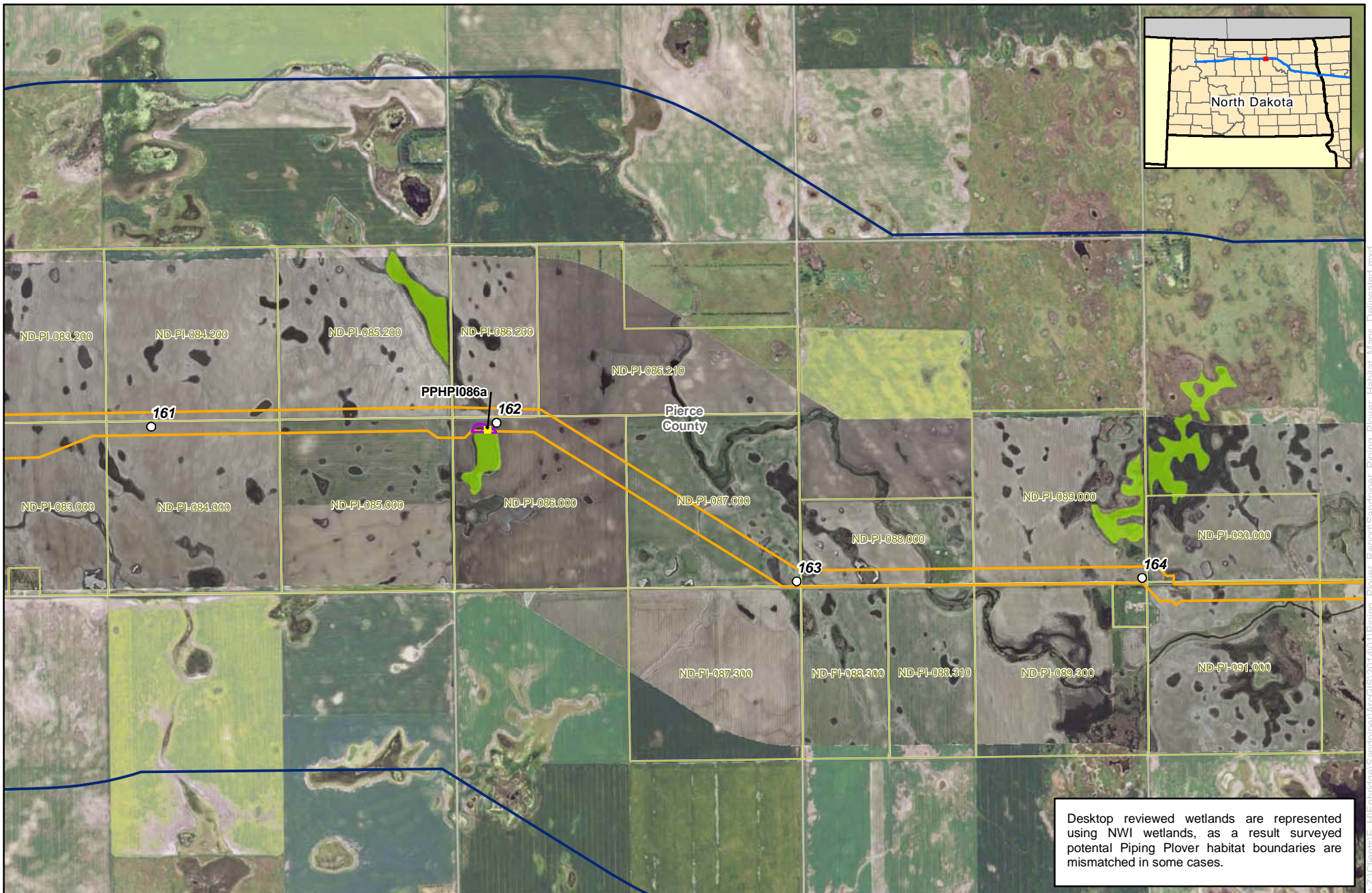
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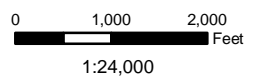
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Potential Piping Plover Suitable Habitat

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Enbridge

2013 Grassland Habitat Assessment Report (Rev 0)

PRESENTED BY MERJENT, INC.
January 21, 2014



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EXECUTIVE SUMMARY

The 2013 Grassland Habitat Assessment was conducted to document the following: (1) presence of native and non-native habitat for grassland birds, (2) suitable habitat for the Sprague's pipit (*Anthus spragueii*), (3) suitable habitat for Dakota skipper (*Hesperia dacotae*), and (4) suitable habitat for the Poweshiek skipperling (*Oarisma poweshiek*)

The 2013 Grassland Habitat Assessment was completed along the environmental survey corridor west of Enbridge's Clearbrook Storage Facility. This part of the survey corridor is considered the Great Plains and is dominated by grasslands. Grassland habitat was assessed for migratory birds along the same portion of the survey corridor. Suitable habitat for the Sprague's pipit, Dakota skipper, and Poweshiek skipperling was assessed in the counties in which there are occurrence records for each species.

The assessment was comprised of a desktop analysis that identified and determined acreages of grasslands in the one-mile study area. Field-based habitat surveys were conducted of the grasslands identified during the desktop analysis in the 250-foot- to 450-foot-wide environmental survey corridor. The field-based habitat assessment further evaluated and confirmed the grasslands identified during the desktop analysis as well as determined characteristics and suitability for grassland migratory birds, Sprague's pipit, Dakota skipper, and Poweshiek skipperling.

The field-based effort for grassland birds focused on determining if grasslands identified during the desktop analysis were predominantly native or non-native and tilled or untilled. Overall, the field-based habitat assessment showed 1034.46 hectares of grasslands within the environmental survey corridor. In North Dakota, the majority of the grasslands were tilled and dominated by non-native vegetation (386.73 hectares). Of the approximately 317 hectares in North Dakota that were untilled, 123.55 hectares were predominantly native species and 193.78 hectares were predominantly non-native species. In Minnesota, all 142 hectares of the grasslands classified were untilled. Of the tilled grasslands that intersect the environmental survey corridor in Minnesota, 2.5 hectares were predominantly native vegetation and nearly 140 hectares were predominantly by non-native vegetation. The classification of grasslands as predominantly native or non-native and tilled or untilled was used to inform the characterization of suitable habitat for the Sprague's pipit, Dakota skipper and Poweshiek skipperling.

Suitable habitat for the Sprague's pipit was defined as grasslands that were at least 69 hectares in size and that had less than 20 percent shrub cover, less than 10 percent bare ground, and an absence of trees. The habitat assessment for Sprague's pipit was conducted in the eight counties in which the species occurs along the environmental survey corridor: Williams, Mountrail, Ward, McHenry, Pierce, Towner, and Ramsey counties, North Dakota, and Polk County, Minnesota. Information on the size of each grassland that intersected the environmental survey corridor was determined during the desktop analysis. Data on amount of shrub cover and bare ground and absence of trees was collected during the field effort. The results of the habitat assessment indicated that 25 grasslands met the criteria for Sprague's pipit suitable habitat. These grasslands were located Williams, Mountrail, Ward, McHenry, and Pierce counties in North Dakota.

Suitable habitat for the Dakota skipper was defined as grasslands or discrete patches within a larger grassland that were untilled, had predominantly native species, and contained larval food and nectar plants suitable for Dakota skipper larvae and adults. Dakota skipper surveys took place in the four counties along the environmental survey corridor where the Dakota skipper has

records of occurrence: Mountrail, Ward, McHenry counties, North Dakota, and Polk County, Minnesota. Results of the field-based habitat assessment for Dakota skipper showed 25 areas of suitable habitat that intersected the environmental survey corridor.

Similar to the Dakota skipper, suitable habitat for the Poweshiek skipperling was defined as grasslands or discrete patches within a larger grassland that were untilled, had predominantly native species, and contained larval food and nectar plants suitable for Poweshiek skipperling larvae and adults. Suitable habitat for the species was assessed only in Polk County, Minnesota, because this is the sole county along the environmental survey corridor with records of occurrence for Poweshiek skipperling. Results of the field-based habitat assessment showed no areas of suitable habitat for the Poweshiek skipperling in Polk County because no predominantly native grasslands or predominantly native patches within larger grasslands intersected the environmental survey corridor.

1.0 INTRODUCTION

The 2013 Grassland Habitat Assessment was conducted to document the following: (1) presence of native and non-native habitat for grassland birds, (2) suitable habitat for the Sprague's pipit (*Anthus spragueii*), (3) suitable habitat for Dakota skipper (*Hesperia dacotae*), and (4) suitable habitat for the Poweshiek skipperling (*Oarisma poweshiek*).

The 2013 Grassland Habitat Assessment was completed along the environmental survey corridor west of Enbridge's Clearbrook Storage Facility. This part of the survey corridor is considered the Great Plains and is dominated by grasslands. Grassland habitat was assessed for migratory birds along the same portion of the survey corridor. Suitable habitat for the Sprague's pipit, Dakota skipper, and Poweshiek skipperling was assessed in the counties in which there are occurrence records for each species.

The assessment was comprised of a desktop analysis that identified and determined acreages of grasslands in the one-mile study area. Field-based habitat surveys were conducted of the grasslands identified during the desktop analysis in the 250-foot- to 450-foot-wide environmental survey corridor. The field-based habitat assessment further evaluated and confirmed the grasslands identified during the desktop analysis as well as determined characteristics and suitability for grassland migratory birds, Sprague's pipit, Dakota skipper, and Poweshiek skipperling.

2.0 PURPOSE OF HABITAT ASSESSMENT

The purpose of the 2013 Grassland Habitat Assessment is to document the presence of habitat for grassland birds, Sprague's pipit (*Anthus spragueii*), Dakota skipper (*Hesperia dacotae*), and Poweshiek skipperling (*Oarisma poweshiek*) within the 250-foot- to 450-foot-wide environmental survey corridor.

The specific objectives of the Protocol are to:

1. Identify and quantify areas of native prairie habitat and other grasslands that may be used by migratory birds, pursuant to the Migratory Bird Treaty Act ("MBTA");
2. Identify and quantify potentially suitable habitat for the Sprague's pipit, a candidate species under the federal Endangered Species Act ("ESA");
3. Identify and quantify potentially suitable habitat for the Dakota skipper, proposed on October 24, 2013 (U.S. Fish and Wildlife Service ["USFWS"] 2013a) as federally threatened under the ESA and designated as state endangered in Minnesota (Minnesota Department of Natural Resources ["MN DNR"] 2013); and
4. Identify and quantify potentially suitable habitat for the Poweshiek skipperling, proposed on October 24, 2013 as federally endangered under the ESA (USFWS 2013a) and designated as state endangered in Minnesota (MN DNR 2013).

The results of the habitat assessment will inform potential surveys for individuals, future consultations with the USFWS and MN DNR, impact analysis under the MBTA and ESA, and conservation measures development for these species.

3.0 GRASSLAND SPECIES NATURAL HISTORY AND RANGE

Native prairie and non-native grasslands provide courtship, nesting, foraging, sheltering, brood-rearing, and dispersal habitat for many species of migratory birds, including Sprague's pipit. The Dakota skipper and Poweshiek skipperling also occur in grasslands, but are limited to untilled parcels of native prairie with specific species of native prairie plants.

Sprague's pipit may occur in both native prairie and non-native grasslands. Although Sprague's pipits are more abundant and prefer nesting in native prairie throughout their range, they have been observed performing territorial displays in non-native grasslands and nesting in non-native hayfields in part of their range (Jones 2010, USFWS 2012). Vegetation structure appears to be an important predictor of species occurrence (USFWS 2012). Sprague's pipits prefer to breed in large patches of native grassland with a typical minimum size of 145 hectares (approximately 358 acres) and a range of 69 to 314 hectares (170 to 776 acres) (Davis 2004 *in* USFWS 2012). The species typically breeds in open grasslands with low shrub cover and avoids edge habitat between grassland and woody vegetation (USFWS 2012). The species also appears to prefer nesting in grasslands that are surrounded by other grasslands (C. Aron, USFWS, pers. comm. June 26, 2013) (see Appendix B). The USFWS county distribution lists indicate that the Sprague's pipit is known to occur in Williams, Mountrail, Ward, McHenry, Pierce, Towner, and Ramsey counties, North Dakota, and Polk County, Minnesota (see Table 3.0-1). Neither the historical nor the current distribution of Sprague's pipits extends as far east as Wisconsin.

Native prairie also provides habitat for the four basic life stages of the Dakota skipper and the Poweshiek skipperling. Habitats beneficial to the Dakota skipper include high-quality, wet-mesic tallgrass remnant prairie that occurs on near-shore glacial lake soil deposits or high-quality, dry-mesic remnant prairie on rolling terrain consisting of gravelly glacial moraine soil deposits. These preferred habitats are characterized by a predominance of native grasses and native flowering forbs; undisturbed (not tilled) glacial soil types including (but not limited to) loam, sandy loam, loamy sand, and gravel; an absence of or only sparse coverage of trees or large shrubs; an absence or only sparse occurrence of non-native invasive plants; and native grasses and native flowering forbs for larval and adult food and shelter (A. Horton, USFWS, pers. comm., June 14, 2013) (see Appendix B).

Habitat preferences of the Poweshiek skipperling are similar to the Dakota skipper in Minnesota, but vary more widely across the Poweshiek's historical range, from dry tallgrass prairie in North Dakota to sedge meadows and prairie fens in Michigan (USFWS 2011; A. Horton, USFWS, pers. comm., July 3, 2013) (see Appendix B). In North Dakota and Minnesota, the Poweshiek skipperling inhabits both wet and dry native prairie that are untilled, have predominantly native species, native grasses and native flowering forbs for larval and adult food and shelter; moist prairie preferred where available (USFWS 2011; MN DNR 2013; USFWS 2013a; A. Horton, USFWS, pers. comm., June 14, 2013) (see Appendix B).

USFWS county distribution lists indicate that Dakota skippers occur in Polk County, Minnesota and McHenry, Mountrail, and Ward counties, North Dakota (see Table 3.0-1). According to the USFWS county distribution lists, the Poweshiek skipperling is not known to occur in any counties along the environmental survey corridor; however, the Biotics Database of Minnesota's Natural Heritage Inventory System shows occurrence of the Poweshiek skipperling in Polk County (<http://www.dnr.state.mn.us/nhnrp/nhis.html>). The Poweshiek historically occurred as far north as Canada along the western border of Minnesota, and the USFWS recommended surveying for the species in Polk County, Minnesota (A. Horton, pers. comm., June 14, 2013) (see Appendix B).

Critical habitat for the Dakota skipper and Poweshiek skipperling was proposed concurrently with the proposal for listing these species (USFWS 2013b). Proposed critical habitat for the Poweshiek skipperling is not located in counties crossed by the environmental survey corridor. For the Dakota skipper, critical habitat is proposed in two counties crossed by the environmental survey corridor--McHenry County, North Dakota and Polk County, Minnesota. The environmental survey corridor does not intersect any critical habitat units; however, in McHenry County, North Dakota, Dakota Skipper Critical Habitat Unit 6 is located 1.3 miles north, Unit 7 is located 5.9 miles south, and Unit 8 is located 4.6 miles south of the environmental survey corridor. In Polk County, Minnesota, Critical Habitat Unit 15 is 4.3 miles south of the environmental survey corridor.

State	County	Sprague's Pipit	Dakota Skipper	Poweshiek Skipperling
North Dakota	Williams	✓		
	Mountrail	✓	✓	
	Ward	✓	✓	
	McHenry	✓	✓	
	Pierce	✓		
	Towner	✓		
	Ramsey	✓		
	Nelson			
	Grand Forks			
Minnesota	Polk	✓	✓	*
	Red Lake			
	Clearwater			
	Hubbard			
	Cass			
	Crow Wing			
	Aitkin			
	Carlton			
Wisconsin	Douglas			

Notes:
 ✓ According to USFWS county distribution list for species (<http://www.fws.gov/midwest/endangered/lists/minnesot-cty.html>; <http://ecos.fws.gov/ipac/wizard/chooseLocation!prepare.action>).
 * Presence indicated in Minnesota Department of Natural Resources Natural Heritage Information System Biotics Database (<http://www.dnr.state.mn.us/nhnrp/nhis.html>).

4.0 METHODS

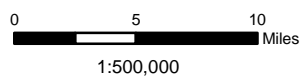
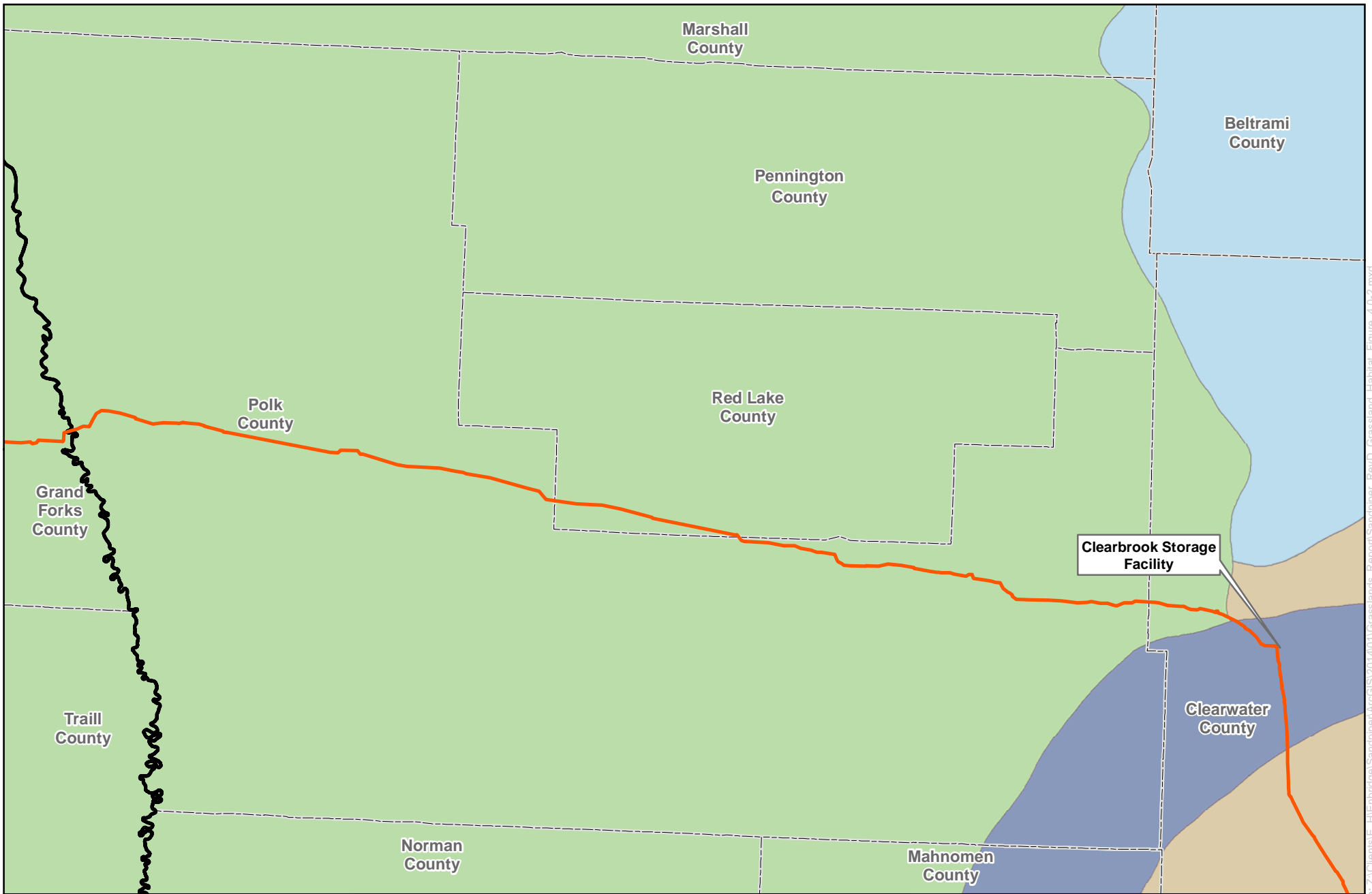
The 2013 Grassland Habitat Assessment Protocol ("Protocol"), prepared by Merjent, Inc. ("Merjent"), describes the methods used to document and assess grasslands within the environmental survey corridor (Appendix A). The assessment included a preliminary desktop review followed by field-based habitat assessment. The assessment was conducted by experienced WEST GIS specialists and biologists on behalf of Merjent and Enbridge from July to October, 2013. The field surveys were conducted by two crews, each with two members.

One member on each crew, at a minimum, was a botanist familiar with grassland vegetation of North Dakota and Minnesota. Data were collected on a Trimble GEOXH GPS Unit. The assessment was conducted along the portion of the proposed environmental survey corridor that is considered the Great Plains and that is dominated by grasslands (Figure 4.0-1). This point is approximately 3 miles west of the boundary between the grassland and forest ecoregions using EPA Level III Ecoregions (http://www.epa.gov/wed/pages/ecoregions/level_iii_iv.htm) (Figure 4.0-2).

4.1 DESKTOP ANALYSIS

The desktop analysis was completed using ArcGIS, ArcMap 10.1. Grasslands within the one-mile study area were digitized using the aerial imagery and information on the grasslands was collected using several geospatial datasets. In North Dakota, aerial imagery and geospatial datasets used were 2012 National Agricultural Imagery Program (“NAIP”) aerial imagery, 2006 National Land Cover Data land use/land cover, 2004 North Dakota Gap Analysis Program (“GAP”) land use/land cover, and 2010 and 2011 National Agricultural Statistical Service (“NASS”) land classification. In Minnesota, the imagery and geospatial databases used were 2006 Minnesota GAP land use/land cover; 2008 Minnesota GAP Conservation Reserve Program lands; 1998 MN DNR railroad rights-of-way prairies; and 2010, 2011, and 2012 NASS land classification. All disturbed areas were excluded along with the visible road right-of-way (i.e., road ditch). Trees/shrubs were also excluded if they made up approximately 20 percent or more of a grassland polygon. Large wetlands that were encompassed by grasslands were identified using National Wetland Inventory (“NWI”) data, and omitted from calculations of grassland acreages. Smaller wetlands that were encompassed in grasslands were omitted from calculations of grassland acreages after field-based wetland delineations became available in the fall of 2013. Omitting these features from digitized grasslands facilitated accurate estimation of grassland acreages within the environmental survey corridor.

Additional desktop review was completed as part of the assessment of Sprague’s pipit suitable habitat. As described above, Sprague’s pipit has been noted using grassland parcels that are a minimum of 69 hectares (170 acres) in size (USFWS 2012). In order to collect this data for the species suitable habitat determination, the size of each grassland that intersected the environmental survey corridor was determined during the desktop review.



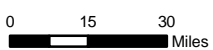
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Figure 4.0-2
EPA Level III Ecoregions Showing the Boundary between
Grassland and Forest Habitat near the Clearbrook Storage Facility

- | | |
|-------------------------|--------------------------------|
| Proposed Pipeline Route | EPA Level III Ecoregion |
| State Boundary | Lake Agassiz Plain |
| County Boundary | North Central Hardwood Forests |
| | Northern Lakes and Forests |
| | Northern Minnesota Wetlands |

Canada






Clearbrook Storage Facility



1:2,320,000



Enbridge
Figure 4.0-1
Area Surveyed During
Grasslands Habitat Assessment

-  Proposed Pipeline Route
-  State Boundary
-  County Boundary

4.2 FIELD-BASED HABITAT ASSESSMENT

Field surveys consisted of visiting each grassland area identified during the desktop review within the environmental survey corridor. The North Dakota State Plane North, NAD 83 survey feet coordinate system and Minnesota State Plane North, NAD 83 survey feet coordinate system were used per the Protocol, as applicable.

4.2.1 Confirmation and Classification of Grasslands

The field-based habitat assessment served to confirm grassland habitat, document the location of each grassland area within the environmental survey corridor, and classify the grassland as native or non-native and tilled or untilled. This confirmation, documentation, and classification of the grasslands provided information needed to quantify migratory bird and federal proposed/candidate species habitat.

To confirm and document the location of the grassland, a GPS point was taken at the western edge of each grassland area and a second point was recorded at the eastern edge within the environmental survey corridor. If the area was not grassland, a note was made on the current habitat present (e.g., wetland, cropland). Each confirmed grassland area was assigned a unique site identification number according to the nomenclature described in the Protocol.

Grasslands were then classified according to their dominant vegetation cover—native or non-native—using two methods. The first method was the rule of dominance in which a visual qualitative assessment was made to determine if native or non-native vegetation had the higher percent cover. A second method was used to confirm the results of the visual qualitative assessment; this second method employed a belt transect for each distinct grassland area that was at least 0.1 mile in length within the environmental survey corridor (Grant et al. 2004). The belt transect consisted of laying a 25-meter tape across vegetation in the grassland area. The dominant plant group at each 0.1-meter by 0.5-meter segment (50 total segments) along the tape was identified and recorded according to a hierarchical listing of plant group types for north-central and northwestern North Dakota (Grant et al. 2004). The identification of the plant group was made by a botanist on the survey crew. The location of each belt transect was recorded using a GPS, and a photograph of the belt was taken. For longer stretches of grassland area within the environmental survey corridor, an additional belt transect was conducted every 0.25 mile. With the belt transect method, a determination of dominance by native or non-native species was made by totaling the native and non-native segments within each grassland area. If the classifications of native or non-native using the two different methods did not agree, additional belt transects were completed, and the classification was based on the collective results of the belt transects for that grassland.

The dual use of the rule of dominance and belt transect methods was not possible for grasslands that spanned less than 0.1 mile in length, hayed grasslands, and heavily grazed grasslands. For grasslands that spanned less than 0.1 mile in length in the environmental survey corridor, the belt transect was not used, and the classification of native or non-native was made solely using the rule of dominance. In hayed grasslands, grasses were generally unidentifiable; because of the way these grasslands are used, they were assumed to be dominated by non-native species. If a grassland was heavily grazed, grasses were also typically not identifiable; these grasslands were classified as “unknown” because grazing occurs on native and non-native grasslands.

In addition to classifying a grassland as native or non-native, surveyors also noted if there was evidence that a grassland had been tilled. Such evidence generally included piles of rocks and boulders, topography (e.g., steep slopes that may not have been able to be tilled), and signatures on aerial photos of rows from row cropping. In North Dakota, information on lands enrolled in the federal Conservation Reserve Program (“CRP”) is not available to the public, but in Minnesota this information is available. Therefore, in Minnesota, enrollment in CRP was also used as an indicator that a grassland area was previously tilled, because lands enrolled in CRP have been used for agriculture in the past.

4.2.2 Sprague’s Pipit

In counties where Sprague’s pipit is known to occur (see Table 3.0-1), each grassland within the environmental survey corridor was assessed for Sprague’s pipit suitable habitat. The field data were collected in conjunction with the confirmation and classification of grasslands (Section 4.2.1). Per the Protocol, data collected in the field included the following that are considered characteristics of Sprague’s pipit suitable habitat (Jones 2010, USFWS 2012):

- Dominance of grass and sedge cover;
- Less than 20 percent shrub and brush cover;
- Less than 10 percent bare ground; and
- Absence of trees at territory scale (2-3 hectares [5-7.5 acres]).

Data from the desktop review and field-based habitat assessment were used in evaluating grasslands as suitable habitat for the Sprague’s pipit. Suitable habitat for the species was defined as grasslands with the above four habitat characteristics that were at least 69 hectares, as determined during the desktop review of aerial photos. The 69 hectares size limit represents the minimum size of grassland in which the species has been observed breeding (Davis 2004 *in* USFWS 2012).

4.2.3 Dakota Skipper

In counties where Dakota skipper is known to occur (see Table 3.0-1), each grassland within the environmental survey corridor was surveyed for Dakota skipper suitable habitat. Suitable habitat for the Dakota skipper is grasslands or discrete patches of habitat within a grassland that are predominantly native and that have not been tilled. In some cases, although the overall grassland may be non-native and/or tilled, a patch within the grassland may be native and untilled. Survey methods for determining whether a grassland was predominantly native or non-native and tilled or untilled are described in Section 4.2.1; the resulting classifications were used to determine the suitability of grasslands as potential Dakota skipper habitat. Per the Protocol, additional data collected in the field included the presence of appropriate plant species (A. Horton, USFWS, pers. comm., June 14, 2013) (see Appendix B):

- Presence of plants typical of native bluestem prairie: wood lily (*Lilium philadelphicum*), harebell (also known as bluebell bellflower [*Campanula rotundifolia*]), and smooth camas (*Zygadenus elegans*);
- Presence of plants typical of upland (dry) prairie (often found on ridges and hillsides): bluestem grasses, needlegrasses, pale purple coneflower (*Echinacea pallida*), upright

coneflower (also known as blacksamson Echinacea [*Echinacea angustifolia*]), and blanketflowers (*Gaillardia* spp.);

- Presence of one or both of the following native grasses available as food and shelter sources during larval stages: prairie dropseed (*Sporobolus heterolepis*) and little bluestem (*Schizachyrium scoparium*); and
- Presence of the following preferred nectar plants: long-headed coneflower (also known as upright prairie coneflower [*Ratibida columnifera*]), harebell (also known as bluebell bellflower), white prairie clover (*Dalea candida*), fleabanes (*Erigeron* spp.), blanketflowers, black-eyed susan (*Rudbeckia hirta*), blacksamson Echinacea, yellow sundrops (also known as tooth-leaved primrose [*Calylophus serrulatus*]), and groundplum milkvetch (*Astragalus crassicaarpus*).

Suitable habitat for the Dakota skipper was defined as grasslands or discrete areas within grasslands that were untilled, predominantly native, and that had appropriate larval food and nectar plant species present. Areas that met the definition of suitable habitat were delineated with a GPS. Relevant species were recorded on a datasheet, and photographs were taken.

4.2.4 Poweshiek Skipperling

In Polk County, Minnesota, the only county along the environmental survey corridor where the Poweshiek skipperling has documented occurrence (see Table 3.0-1), each grassland within the environmental survey corridor was surveyed for the Poweshiek skipperling suitable habitat. Similar to the Dakota skipper, suitable habitat for the Poweshiek skipperling are grasslands or discrete patches of habitat within a grassland that are predominantly native and that have not been tilled. In some cases, although the overall grassland may be non-native and/or tilled, a patch within the grassland may be native and untilled. Survey methods for determining whether a grassland was predominantly native or non-native and tilled or untilled are described in Section 4.2.1; the resulting classifications were used to determine the suitability of grasslands as potential Poweshiek skipperling habitat. Per the Protocol, additional data collected in the field included the presence of the following plant species (A. Horton, USFWS, pers. comm., June 14, 2013) (see Appendix B):

- Presence of characteristic wet prairie plants: big bluestem (*Andropogon gerardii*), prairie cordgrass (*Spartina pectinata*), Indian grass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), and woolly sedge (*Carex pellita*);
- Presence of characteristic dry prairie plants: big bluestem, prairie dropseed, little bluestem, Indian grass, porcupine grass (*Heterostipa spartea*), and side-oats grama (*Bouteloua curtipendula*);
- Presence of native, fine-stemmed grasses and sedges for egg-laying and larval feeding: big bluestem, prairie dropseed, little bluestem, porcupine grass, and side-oats grama; and
- Presence of the following preferred nectar plants during the flight period: smooth ox-eye (*Heliopsis helianthoides*), blacksamson echinacea, stiff tickseed (*Coreopsis palmata*), black-eyed susan, and palespike lobelia (*Lobelia spicata*).

Suitable habitat for the Poweshiek skipperling was defined as grasslands or discrete areas within larger grasslands that were untilled, predominantly native, and that had appropriate larval food and nectar plant species present. Relevant species were recorded on a datasheet.

5.0 RESULTS

Results of the grassland desktop review and field-based habitat assessment are presented below, including information on the following within the environmental survey corridor:

- Acreages of grasslands within the one-mile study area and within the environmental survey corridor based on desktop analysis;
- Classification and acreages of grasslands within the environmental survey corridor that are native or non-native and tilled or untilled as determined in field-based habitat assessments;
- Habitat characteristics and potential suitability of habitat for the Sprague's pipit;
- Habitat characteristics and potential suitability of habitat for the Dakota skipper; and
- Habitat characteristics and potential suitability of habitat for the Poweshiek skipperling.

Maps showing the locations of these grasslands and potentially suitable habitat within the environmental survey corridor are provided in Appendix D. Data sheets from the field surveys are provided in Appendix E. Representative photos of the grasslands and habitats are provided in Appendix F.

5.1 DESKTOP ANALYSIS

The desktop analysis focused on determining locations and acreages of grasslands within the one-mile study area and within the environmental survey corridor (see Table 5.1-1). The desktop analysis found a total of 19,531.03 hectares (48,262.23 acres) of potential grassland habitat in North Dakota and 3,137.82 hectares (7,753.72 acres) in Minnesota within the one-mile study area. Within the environmental survey corridor, 1,211.44 hectares (2,993.53 acres) of potential grassland habitat were recorded in North Dakota and 261.3 hectares (645.69 acres) were recorded in Minnesota (see Table 5.1-1). These estimates were refined based on the results of field-based habitat assessments.

State	County	Desktop Analysis Results	
		Grasslands within the Environmental Survey Corridor (ha) ¹	Grasslands Within the One Mile Study Area (ha) ¹
ND	Williams	47.06	489.09
ND	Mountrail	330.18	5,761.79
ND	Ward	52.31	1,009.45
ND	McHenry	210.80	3,760.64
ND	Pierce	212.44	3,236.19
ND	Towner	25.25	361.35
ND	Ramsey	47.09	463.89
ND	Nelson	129.68	2,010.65

State	County	Desktop Analysis Results	
		Grasslands within the Environmental Survey Corridor (ha) ¹	Grasslands Within the One Mile Study Area (ha) ¹
ND	Grand Forks	156.63	2,437.98
MN	Polk	198.01	2,190.92
MN	Red Lake	49.11	783.71
MN	Clearwater	14.18	163.19
North Dakota Total		1,211.44	19,531.03
Minnesota Total		261.30	3,137.82
Grand Total		1,472.74	22,668.85

Notes:
¹ Acreages in this column were determined during desktop assessment. These estimates were refined based on the results of field-based habitat assessments.

5.2 FIELD-BASED HABITAT ASSESSMENT

The field-based habitat assessment further evaluated the grasslands identified during the desktop analysis to determine characteristics and suitability for grassland migratory birds, Sprague's pipit, Dakota skipper, and Poweshiek skipperling.

5.2.1 Confirmation and Classification of Grasslands

The grasslands identified within the environmental survey corridor during the desktop analysis were verified in the field as grassland or removed from further assessment if no grassland was present (e.g., found to be cropland). Field verification resulted in a decrease in grassland acreages (see Table 5.2-1). Grassland acreages estimated during the desktop analysis were further reduced because smaller wetlands, included with grasslands during the desktop analysis, were later omitted from the grassland acreages after they were delineated during field-based wetland surveys. After this information from field-based assessments was incorporated, grassland acreages within the environmental survey corridor were 868.87 hectares in North Dakota and 165.64 hectares in Minnesota (see Table 5.2-1).

A second overall objective of the field-based habitat assessment was classification of the grasslands that intersected the environmental survey corridor as predominantly native or non-native and as either tilled or untilled. In North Dakota, most of the grasslands that intersected the environmental survey corridor were tilled and dominated by non-native species (386.73 hectares). About 1.4 hectares were tilled yet dominated by native vegetation. Over 317 hectares of grasslands that intersected the environmental survey corridor in North Dakota were untilled; of these, approximately 123.55 hectares were predominantly native species and 193.78 hectares were predominantly non-native species. In Minnesota, no grasslands that intersect the environmental survey corridor were untilled. Of the tilled grasslands that intersect the environmental survey corridor in Minnesota, 2.5 hectares were predominantly native vegetation and nearly 140 hectares were predominantly by non-native vegetation. Approximately 163 hectares in North Dakota and 24 hectares in Minnesota could not be classified as tilled or untilled and/or native or non-native (see Table 5.2-1). Field surveyors could not classify grasslands as tilled or untilled and/or native or non-native where Enbridge did not have

permission to access the grassland or the grassland was hayed or heavily grazed so that the vegetation was not identifiable.

Each field-verified discrete grassland within the environmental survey corridor is listed in the table in Appendix C by county from west to east. The grasslands dominated by native species primarily occur in the western-most counties in North Dakota; several counties in eastern North Dakota and Minnesota had no grasslands dominated by native species (Appendix C). Kentucky bluegrass (*Poa pratensis*) was the most common non-native species recorded during the survey.

State	County	Untilled		Tilled		Unknown ¹
		Dominant Native Vegetation (ha)	Dominant Non-native Vegetation (ha)	Dominant Native Vegetation (ha)	Dominant Non-native Vegetation (ha)	
ND	Williams	16.05	27.87	0	2.35	0
ND	Mountrail	85.69	77.22	0	69.61	57.90
ND	Ward	7.37	18.26	0	42.41	4.65
ND	McHenry	9.58	55.90	0	54.42	15.33
ND	Pierce	4.88	7.90	0	88.29	17.92
ND	Towner	0	4.27	0	2.46	1.56
ND	Ramsey	0	0	0	7.89	33.18
ND	Nelson	0	0	0	55.13	11.29
ND	Grand Forks	0	2.36	1.37	89.42	21.57
MN	Polk	0	0	0	122.34	7.50
MN	Red Lake	0	0	0	16.62	0
MN	Clearwater	0	0	2.57	0.39	16.22
North Dakota Total		123.55	193.78	1.37	386.73	163.39
Minnesota Total		0	0	2.57	139.35	23.72
GRAND TOTAL		123.55	193.78	3.94	526.08	187.11
Notes:						
¹ These acreages represent grassland parcels that field surveyors could not determine were tilled or untilled and/or were predominantly native or non-native vegetation.						

5.2.2 Sprague’s Pipit

Sprague’s pipit has documented occurrences in eight counties crossed by the environmental survey corridor in North Dakota. (see Table 3.0-1). Sprague’s pipit suitable habitat was found in the environmental survey corridor in the five western-most of these eight counties: Williams, Mountrail, Ward, McHenry, and Pierce counties. Suitable habitat for the Sprague’s pipit was defined as grasslands with the following characteristics:

- At least 69 hectares in size;
- Less than 20 percent shrub cover;
- Less than 10 percent bare ground; and
- Absence of trees at territory scale (2-3 hectares [5-7.5 acres]).

Table 5.2-2 lists the survey data for the grasslands that were at least 69 hectares in size. All but one of these grasslands met the criteria outlined for the species' suitable habitat (GLHMO046a). Grassland GLHMO046a had greater than 20 percent shrubs and thus did not meet the definition for suitable habitat. Overall, based on the survey data collected and definition of suitable habitat, a total of 25 grasslands that intersect the environmental survey corridor may serve as suitable habitat for the Sprague's pipit.

Grassland ID Number	County	Size (ha) Within Survey Corridor	Predominantly Native Vegetation? ¹	Less than 20% shrub cover?	Less than 10% bare ground?	No trees at territory scale?	Suitable Habitat?	Mapset ³ Page Number
GLHWI002a	Williams	15.33	Yes	Yes	Yes	Yes	Yes	1
GLHWI012a	Williams	13.58	No	Yes	Yes	Yes	Yes	3
GLHMO002a	Mountrail	5.11	No	Yes	Yes	Yes	Yes	4
GLHMO005a	Mountrail	2.48	No	Yes	Yes	No	Yes	5-6
GLHMO007a	Mountrail	6.81	Yes	Yes	Yes	Yes	Yes	6
GLHMO010a	Mountrail	43.11	No	Yes	Yes	Yes	Yes	6-9
GLHMO027a	Mountrail	10.71	No	Yes	Yes	Yes	Yes	10-11
GLHMO029a	Mountrail	8.98	No	Yes	Yes	Yes	Yes	11-12
GLHMO046a	Mountrail	8.39	No	No	Yes	Yes	No	14-15
GLHMO064a	Mountrail	22.68	Yes	Yes	Yes	Yes	Yes	21-23
GLHMO076a	Mountrail	10.80	No	Yes	Yes	Yes	Yes	25-26
GLHMO078a	Mountrail	31.77	Yes	Yes	Yes	Yes	Yes	27-29
GLHMO091a	Mountrail	18.66	No	Yes	Yes	Yes	Yes	30-31
GLHWA039a	Ward	4.23	No	Yes	Yes	Yes	Yes	35
GLHWA041a	Ward	7.37	Yes	Yes	Yes	Yes	Yes	35-36
GLHWA046a	Ward	6.71	No	Yes	Yes	Yes	Yes	36-37
GLHWA050b	Ward	4.21	No	Yes	Yes	Yes	Yes	37-38
GLHMC029a	McHenry	3.86	No	Yes	Yes	Yes	Yes	46
GLHMC038a	McHenry	9.09	No	Yes	Yes	Yes	Yes	49-50
GLHMC057a	McHenry	8.95	No	Yes ²	Yes ²	Yes ²	Yes	52-53
GLHMC086a	McHenry	30.61	No	Yes	Yes	Yes	Yes	58-61
GLHMC092a	McHenry	5.27	Yes	Yes	Yes	Yes	Yes	61-62
GLHPI001a	Pierce	1.92	No	Yes	Yes	Yes	Yes	62
GLHPI044a	Pierce	0.17	No	Yes	Yes	Yes	Yes	71
GLHPI061.2a	Pierce	3.14	No	Yes ²	Yes ²	Yes ²	Yes	76
GLHPI063a	Pierce	4.82	Yes	Yes	Yes	Yes	Yes	76-77

Notes:
¹ Sprague's pipit suitable habitat was not based on whether a grassland was predominantly native or non-native. However, this information was provided in the table because research has shown that Sprague's pipit prefer to breed in native grasslands.
² Determination based on visual assessment from nearby road and review of aerial photos.
³ See Appendix D

5.2.3 Dakota Skipper

Dakota skipper is known to occur in four counties crossed by the environmental survey corridor (see Table 3.0-1). Based on the communication with the USFWS (A. Horton, USFWS, pers. comm., June 14, 2013) (see Appendix B) and the proposed listing and critical habitat designation for the species, suitable habitat for the Dakota skipper was defined as untilled grasslands or untilled discrete patches within tilled grasslands that were dominated by native prairie plants with the appropriate species-specific larval food plants and nectar plants present (see Section 4.2.3). Suitable Dakota skipper habitat was found in the environmental survey corridor in two of the four counties where their occurrence is documented along the environmental survey corridor, Mountrail and McHenry counties, North Dakota. Twenty-five discrete areas of suitable habitat were located and recorded during the survey (see Table 5.2-3). These areas were distinctive, often small, isolated pockets typically found on a hill slope or depression in grasslands otherwise dominated by both native and non-native species. Most of these areas were located entirely within the environmental survey corridor; some were partially within the environmental survey corridor. Dakota skipper suitable habitat totaled 3.75 hectares within the environmental survey corridor and ranged in size from 0.01 to 0.98 hectare.

Per the Protocol, dominant prairie plant species were recorded as part of the field-based habitat assessment (see Table 5.2-3). Two larval food plants with the potential to occur in these grasslands were little bluestem and prairie dropseed. Little bluestem was found in all the areas of suitable habitat; prairie dropseed was not found in any of the habitat areas. A variety of nectar plants were observed; at least one species of nectar plant was present in each area of suitable habitat. In addition to the plant species that serve as sources of larval food and nectar, another group of dominant native species observed in many of the suitable habitat areas were needlegrasses.

Site ID ¹	County	Size (ha) ²		Larval Food Plants ³	Nectar Plants ³	Other Dominant Prairie Plants ³	Potentially Suitable Habitat?	Mapset Page Number ⁴
GLHMO005a_DS	Mountrail	0.57	0.57	SCSC	ECAN	--	Yes	6
GLHMO010a_DS1	Mountrail	0.15	0.15	SCSC	ECPA, ECAN, RACO, ERSP	---	Yes	7
GLHMO010a_DS2	Mountrail	0.03	0.03	SCSC	ECPA, ECAN, RACO, CASE	needlegrasses	Yes	7
GLHMO010a_DS3	Mountrail	0.06	0.06	SCSC	ECPA, ECAN, RACO, CASE	needlegrasses	Yes	8
GLHMO010a_DS4	Mountrail	0.04	0.04	SCSC	ECPA, ECAN, RACO, ERSP	needlegrasses	Yes	8
GLHMO010a_DS5	Mountrail	0.21	0.21	SCSC	RACO	needlegrasses	Yes	8
GLHMO010a_DS7	Mountrail	0.10	0.10	SCSC	ECPA, ECAN, RACO	needlegrasses	Yes	8
GLHMO010a_DS8	Mountrail	0.04	0.04	SCSC	ECPA, ECAN, RACO, ERSP, CASE	needlegrasses	Yes	8
GLHMO025a_DS	Mountrail	0.03	0.09	SCSC	ECPA, ECAN, GASP, RACO, DACA	needlegrasses	Yes	10
GLHMO027a_DS1	Mountrail	0.30	0.01	SCSC	ECPA, ECAN, RACO, CARO	needlegrasses	Yes	10
GLHMO027a_DS2	Mountrail	0.21	0.02	SCSC	ECPA, ECAN, RACO, CARO, GASP	needlegrasses	Yes	10
GLHMO029a_DS	Mountrail	0.08	0.07	SCSC	ECPA, ECAN, CARO	--	Yes	11
GLHMO046a_DS	Mountrail	0.03	0.03	SCSC	ECAN, CARO, DACA, GASP, RUHI	--	Yes	14
GLHMO047a_DS	Mountrail	0.10	0.10	SCSC	ECPA, ECAN, GASP, RACO	needlegrasses	Yes	15
GLHMO050a_DS	Mountrail	0.30	0.30	SCSC	ECPA, ECAN, CARO, DACA	needlegrasses	Yes	16
GLHMO052b_DS	Mountrail	0.21	0.21	SCSC	ECPA, ECAN, CARO, GASP, RACO, DACA	needlegrasses	Yes	17
GLHMO064a_DS	Mountrail	0.04	0.03	SCSC	ECPA, ECAN, CARO, DACA	needlegrasses	Yes	21
GLHMO078a_DS1	Mountrail	0.10	0.08	SCSC	ECPA, ECAN, CARO	--	Yes	27
GLHMO078a_DS2	Mountrail	0.05	0.05	SCSC	ECPA, ECAN, CARO	--	Yes	27
GLHMO085a_DS1	Mountrail	0.04	0.04	SCSC	ECPA, ECAN, CARO, RACO, ERSP, CASE	needlegrasses	Yes	29
GLHMO085a_DS2	Mountrail	0.03	0.03	SCSC	ECPA, ECAN, CARO, RACO, ERSP, CASE	needlegrasses	Yes	29

Site ID ¹	County	Size (ha) ²		Larval Food Plants ³	Nectar Plants ³	Other Dominant Prairie Plants ³	Potentially Suitable Habitat?	Mapset Page Number ⁴
GLHMO085a_DS3	Mountrail	0.07	0.07	SCSC	ECPA, ECAN, CARO, RACO, ERSP, CASE	needlegrasses	Yes	29
GLHMO085a_DS4	Mountrail	0.08	0.08	SCSC	CARO, RACO, CASE	needlegrasses	Yes	29
GLHMC038a_DS1	McHenry	0.47	0.37	SCSC	RACO	--	Yes	50
GLHMC038a_DS2	McHenry	1.01	0.98	SCSC	CARO, RACO	--	Yes	50
TOTAL		4.34	3.75					
Notes:								
¹ All grasslands in this table have predominantly native species and are untilled.								
² Total size of grassland; size within the environmental survey corridor								
³ Plant species codes:								
SCSC – <i>Schizachyrium scoparium</i> (little bluestem)								
ECPA – <i>Echinacea pallida</i> (pale purple coneflower)								
ECAN - <i>Echinacea angustifolia</i> (upright coneflower or blacksamson Echinacea)								
CARO - <i>Campanula rotundifolia</i> (harebell or bluebell bellflower)								
GASP - <i>Gaillardia</i> spp. (blanketflowers)								
RACO - <i>Ratibida columnifera</i> (long-headed or upright prairie coneflower)								
DACA - <i>Dalea candida</i> (white prairie clover)								
ERSP - <i>Erigeron</i> spp. (fleabanes)								
RUHI - <i>Rudbeckia hirta</i> (black-eyed susan)								
CASE - <i>Calylophus serrulatus</i> (yellow sundrops or tooth-leaved primrose)								
⁴ See Appendix D								

5.2.4 Poweshiek Skipperling

Polk County, Minnesota is the only county crossed by the environmental survey corridor has known occurrences of Poweshiek skipperling. Based on communications with the USFWS (A. Horton, USFWS, pers. comm., June 14, 2013) (see Appendix B) and the proposed listing and critical habitat designation for the Poweshiek skipperling, suitable habitat was defined as untilled grasslands or discrete patches of untilled grasslands within larger tilled grasslands that are dominated by native prairie plants with larval food plants and nectar plants present (see Section 4.2.4). None of the grasslands surveyed in Polk County were dominated by native species; all were predominantly non-native vegetation. No suitable habitat was documented.

One grassland was not surveyed due to lack of access (GLHPO063a). This grassland will be surveyed in 2014 if permission to access has been obtained. Grassland GLHPO063a is a narrow strip of grassland within cropland (based on aerial photo interpretation); it is likely previously tilled based on its location within cropland.

Two grassland areas (GLHPO065a and GLHPO.93b) had one or more plant species present indicative of Poweshiek skipperling suitable habitat, including larval food and nectar plants, as well as the other native prairie plants. However, these two grasslands were dominated by non-native species including smooth brome (*Bromus inermis*) and reed canarygrass (*Phalaris arundinaceae*) and therefore did not meet the criteria for Poweshiek skipperling suitable habitat.

6.0 REFERENCES

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