

**Buffalo Ridge II, Iberdrola Renewables  
Brookings County, SD  
2009 Butterfly Survey Results**

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**Report**

Submitted  
to

**Joyce Pickle, Environmental Scientist  
HDR Engineering, Inc.**

701 Xenia Avenue South, Suite 600  
Minneapolis, MN 55416

Submitted  
by

**Gerald Selby  
Ecological and GIS Services**

807 North W Street  
Indianola, Iowa 50125-4731  
515-961-0718

[jsselby@mchsi.com](mailto:jsselby@mchsi.com)

## Overview

This report summarizes the results of rare prairie butterfly surveys conducted by Ecological and GIS Services in July of 2009 for HDR Engineering, Inc as part of their environmental assessment for the Buffalo Ridge II Wind Power Project in Brookings County, South Dakota. Primary target species included Dakota skipper (*Hesperia dacotae*) and Ottoe skipper (*H. ottoe*). Secondary targets included Poweshiek skipperling (*Oarisma poweshiek*) and regal fritillary (*Speyeria idalia*). Two sites were identified by HDR as having habitat that might support the primary target species. These surveys confirmed that both sites have good habitat for the target species and other prairie butterflies. Dakota skippers and regal fritillaries were found at both sites but Ottoe skippers and Poweshiek skipperlings were not found. Unfortunately, it appears that the healthy Poweshiek skipperling population that was documented at Site #1 in 2008 has either declined to the point where it was not detected this year or has been extirpated.

Site #1 has good quality habitat within the transmission corridor and one Dakota skipper and numerous regal fritillaries were seen within that area. There is additional high quality habitat east and southeast of the corridor and single observations of Dakota skippers were seen in each area. Conditions were not ideal for any of the surveys and it is likely that more Dakota skippers would have been seen under better conditions (e.g. see increase of numbers from first to second survey at Site #2). Despite marginal survey conditions, there was a lot of butterfly activity and during the 7 July survey 185 regal fritillaries were seen! Poweshiek skipperlings, which had been abundant in the area southeast of the corridor in 2008, were not found. It is possible that they were still there, but that their numbers were too low to be detected under the survey conditions.

Site #2 has areas of good quality habitat, especially in the northern and southern portions, and there is also habitat on prairie adjacent to the corridor. There appears to be a healthy Dakota skipper population at the site. Regal fritillaries were present in fairly good numbers, but were not nearly as abundant as at Site #1. The area surveyed was east of the fence for the access lane and the pasture to the west. The pasture was fairly degraded by grazing, but there were areas within the access lane that had good habitat. Surveys within the access lane were limited to a visual check from across the fence.

I (Gerald Selby, owner) conducted the butterfly surveys. Data were collected using a GPS unit and ArcPad software (UTM coordinate system Zone 15; Datum = NAD83). Shape files for the butterfly data and survey route track logs were reprojected to Zone 14 and are also included as a part of this report. Data were collected for the distribution and abundance of all butterfly species observed during the surveys. Abundance data for all observations are summarized in a series of tables (Tables 1-4) and distribution data for target species, other butterfly observations, and the routes surveyed are illustrated in a series of maps (Figures 1-5)

Surveys were conducted at each site on 7, 9, and 10 July 2009 at Site #1 and on 8 and 10 July 2009 at Site #2. Cool temperatures and overcast skies throughout much of the flight made it difficult to complete replicated surveys under good survey conditions. Two thorough surveys of the transmission corridor and associated prairie ridges to the east and southeast were conducted at Site #1. Conditions for Site #1 surveys ranged from fair to fair-poor, but there was a lot of butterfly activity (especially for the 7 and 9 July surveys). A few Dakota skippers were seen and

it is likely that more would have been observed under better survey conditions. Conditions for Site #2 surveys were fair-poor early to fair late on 8 July, and good on 10 July. Good numbers of Dakota skippers were seen and fair numbers of regal fritillaries.

Site survey summary information, data tables summarizing the survey results, and figures illustrating the routes surveyed and the distribution of target species observations can be found below.

## Site Survey Summaries

### **Buffalo Ridge II – Skipper Survey Site #1**

Date: **7 July 2009 (Tuesday)**

Surveyor: **Jerry Selby**

Time: 10:20 a.m. – 11:20 a.m. (1 hr 0 min) Transmission Corridor  
11:30 a.m. – 01:15 p.m. (1 hr 45 min) Ridges E/SE of Transmission Corridor  
01:30 a.m. – 02:45 p.m. (1 hr 15 min) Ridges E of Transmission Corridor  
02:50 a.m. – 03:40 p.m. (0 hr 40 min) Transmission Corridor

Weather:

10:20 a.m.	Temp = 69° F	Wind = 6-8 mph W	% Clear = 0-25%
11:30 a.m.	Temp = 74° F	Wind = 8-10 mph SE; gusts to 12 mph	% Clear = 25-50%
02:45 p.m.	Temp = 77° F	Wind = 6-8 mph SE; gusts to 12 mph	% Clear = 25-50%
03:40 p.m.	Temp = 75° F	Wind = 8-10 mph SE; gusts to 12 mph	% Clear = 0-25%

**Primary Target Species Observed:** *Hesperia dacotae* (Dakota skipper) – 2 (♂C1, ♀C1)

**Secondary Target Species Observed:** *Speyeria idalia* (regal fritillary) – 185

#### **Surveyor Comments:**

A thorough survey was conducted of the prairie within the transmission corridor, the prairie ridges to the east-southeast of the corridor, and the prairie ridges immediately east of the corridor. Then, a second complete survey of the corridor was conducted at the end. Survey conditions were fair for portions of the survey but were fair-poor early and late due to the combination of cool temperatures and overcast skies. Despite that, there was a lot of butterfly activity including quite a few non-target skippers. Two Dakota skippers were seen on prairie ridges adjacent to the transmission corridor, but Poweshiek skipperlings, which were abundant in 2008, were not seen.

#### **Plant Phenology:**

*Echinacea angustifolia* (purple coneflower) – ray florets mid-full; disk florets mid

*Heliopsis helianthoides* (ox-eye) – mid bloom

*Stipa spartea* (porcupine grass) – seed release mid-late

**Buffalo Ridge II – Skipper Survey Site #1 (cont.)**

Date: **9 July 2009 (Thursday)**

Surveyor: **Jerry Selby**

Time: 04:10 p.m. – 05:00 p.m. (0 hr 50 min) Transmission Corridor  
05:00 p.m. – 05:45 p.m. (0 hr 45 min) Ridges E/SE of Transmission Corridor  
05:45 p.m. – 06:30 p.m. (0 hr 45 min) Ridges E of Transmission Corridor  
06:30 a.m. – 06:55 p.m. (0 hr 25 min) Ridges E of Corridor (primary targets only)

Weather:

04:10 p.m.	Temp = 75° F	Wind = 8-10 mph WSW	% Clear = 0%
05:00 p.m.	Temp = 75° F	Wind = 2-4 mph WSW	% Clear = 0% (bright hazy)
06:30 p.m.	Temp = 74° F	Wind = 4-6 mph SE	% Clear = 0-25% (bright hazy)

**Primary Target Species Observed:** *Hesperia dacotae* (Dakota skipper) – 1♂C1

**Secondary Target Species Observed:** *Speyeria idalia* (regal fritillary) – 70

**Surveyor Comments:**

A thorough survey was conducted of the prairie within the transmission corridor, the prairie ridges to the east-southeast of the corridor, and the prairie ridges immediately east of the corridor. An extended search for target skippers was conducted following the main survey in the optimal habitat of the ridges east of the corridor, but none were seen. Survey conditions were generally fair-poor due to overcast skies and it was getting a little late in the day for a survey at the end. Despite that, there was still quite a bit of butterfly activity, although skipper activity was considerably lower than the previous survey. A single Dakota skipper was seen within the transmission corridor.

Date: **10 July 2009 (Friday)**

Surveyor: **Jerry Selby**

Time: 07:15 p.m. – 07:55 p.m. (0 hr 40 min) Transmission Corridor & E Ridges (N part)

Weather:

07:15 p.m.	Temp = 72° F	Wind = 5-7 mph N	% Clear = 50-75%
07:55 p.m.	Temp = 71° F	Wind = 6-8 mph N	% Clear = 75-90%

**Primary Target Species Observed:** NONE

**Secondary Target Species Observed:** *Speyeria idalia* (regal fritillary) – 5

**Surveyor Comments:** Brief final check for targets. Fair-good conditions, but too late in the day for a good survey.

## **Buffalo Ridge II – Skipper Survey Site #2**

Date: **8 July 2008 (Wednesday)**

Surveyor: **Jerry Selby**

Time: 03:40 p.m. – 04:10 p.m. (0 hr 30 min) Access S of Transmission Corridor  
04:10 p.m. – 06:30 p.m. (2 hrs 20 min) Transmission Corridor  
06:30 p.m. – 07:20 p.m. (0 hr 50 min) Return (Transmission Corridor & Access)

Weather:

03:40 p.m.	Temp = 73° F	Wind = 10-12 mph SE	% Clear = 0-25%
06:30 p.m.	Temp = 72° F	Wind = 10-12 mph SE	% Clear = 50-75%

**Primary Target Species Observed:** *Hesperia dacotae* (Dakota skipper) – 4 (3♂, 1♀)

**Secondary Target Species Observed:** *Speyeria idalia* (Regal fritillary) – 17

### **Surveyor Comments:**

A thorough survey was conducted of the prairie within the access south of the transmission corridor, within the transmission corridor, and on a few prairie ridges adjacent to the corridor. Survey conditions were fair-poor early due to cool temperatures and overcast skies, becoming fair latter with some clearing. Butterfly activity was moderate and four Dakota skippers were seen at locations scattered along the transmission corridor.

Date: **10 July 2008 (Friday)**

Surveyor: **Jerry Selby**

Time: 03:50 p.m. – 06:25 p.m. (2 hrs 35 min) Transmission Corridor & N Access  
06:25 p.m. – 06:55 p.m. (0 hr 30 min) Return (Transmission Corridor & Access)

Weather:

03:50 p.m.	Temp = 79° F	Wind = 5-7 mph N	% Clear = 90-100%
05:10 p.m.	Temp = 78° F	Wind = 3-4 mph N	% Clear = 50-75%
06:25 p.m.	Temp = 75° F	Wind = 10-12 mph N	% Clear = 50-75%

**Primary Target Species Observed:** *Hesperia dacotae* (Dakota skipper) – 13 (6♂, 7♀)

**Secondary Target Species Observed:** *Speyeria idalia* (Regal fritillary) – 25

### **Surveyor Comments:**

A thorough survey was conducted of the prairie within the transmission corridor starting from the north end. Survey conditions were generally good and there was quite a bit of butterfly activity including Dakota skippers and regal fritillaries observed throughout the transmission corridor.

Table 1. Butterfly observations during 7 July 2009 surveys at Buffalo Ridge II, Site #1. Comparison of main transmission corridor (TC; two surveys), ridges east-southeast of corridor (SE), and ridges east of corridor (E).

Species Observed	# Obs				Total	Comments
	TC1	TC2	SE	E		
Blue sp.				1	1	
<i>Boloria bellona</i>			3	1	4	
<i>Cercyonis pegala</i>	8	3	10	13	34	1 mating pair
Colias sp.	6	6	19	10	41	
<i>Danaus plexippus</i>		3	2	1	6	
<i>Hesperia dacotae</i>			1	1	2	♀C1 (coll #1); ♂C1; @Echiangu
<i>Lycaena dione</i>				1	1	C1 @ Echiangu
<i>Nymphalis antiopa</i>			1		1	
<i>Pieris rapae</i>	1				1	
<i>Plebejus melissa</i>			2		2	2♀(C1,C2+)
<i>Polites mystic</i>	1	1	2	1	5	1♀C2; 1♂C2+; 2C2+
<i>Polites themistocles</i>	1	2	2	8	13	1@ Echiangu; 1@Phlopilo 10♂(5C1,3C1+,C2-); 1♀C1; 1@Achimill; 1@Amorcane; 10@Echiangu; coll #2 = ♂C1
<i>Satyrodes eurydice</i>	2	3		1	6	
Skipper sp.		1		1	2	@Echiangu
<i>Speyeria aphrodite</i>	1		4	2	7	4C1
<i>Speyeria idalia</i>	23	33	55	74	185	2♂C1-; 20♂C1; ♀C1 8@Cardnuta; 27@ Echiangu; 4@Liliphil
<b>Total Count:</b>	<b>43</b>	<b>52</b>	<b>101</b>	<b>115</b>	<b>311</b>	
<b>Total Species:</b>	<b>8</b>	<b>7</b>	<b>11</b>	<b>12</b>	<b>14</b>	
<b>Total hours:</b>	<b>1.00</b>	<b>0.67</b>	<b>1.75</b>	<b>1.25</b>	<b>4.67</b>	
<b>Observations/Hour:</b>	<b>43</b>	<b>78</b>	<b>58</b>	<b>92</b>	<b>67</b>	
<b>Other Observations:</b> <i>Catocola</i> sp. – 1 (east ridges)						

Table 2. Butterfly observations during 9 July 2009 surveys at Buffalo Ridge II, Site #1. Comparison of main transmission corridor (TC), ridges east-southeast of corridor (SE), and ridges east of corridor (E).

Species Observed	# Obs			Total	Comments
	TC	SE	E		
<i>Boloria bellona</i>		2	1	3	
<i>Cercyonis pegala</i>	15	8	6	29	1♀; 1@Echiangu
<i>Colias</i> sp.	2	1	4	7	
<i>Danaus plexippus</i>	2	1	1	4	
<i>Hesperia dacotae</i>	1			1	1♂C1 @Echiangu
<i>Polites mystic</i>		1		1	
<i>Polites themistocles</i>	2			2	1♀C1 @Heliheli; 1♂C1
<i>Satyroides eurydice</i>	2	2		4	
<i>Speyeria aphrodite</i>		1		1	C1
<i>Speyeria idalia</i>	16	15	39	70	2♂(C1,C1+); 1♀C1; 1♀; 1C1 1@Cardnuta; 19@Echiangu; 1@Liliphil
<b>Total Count:</b>	<b>40</b>	<b>31</b>	<b>51</b>	<b>122</b>	
<b>Total Species:</b>	<b>7</b>	<b>8</b>	<b>5</b>	<b>10</b>	
<b>Total Hours:</b>	<b>0.83</b>	<b>0.75</b>	<b>0.75</b>	<b>2.33</b>	
<b>Observations/Hour:</b>	<b>48</b>	<b>41</b>	<b>68</b>	<b>52</b>	

Table 3. Butterfly observations during 10 July 2009 surveys at Buffalo Ridge II, Site #1. Brief survey of northern portions of transmission corridor (TC) and ridges to the east (E).

Species Observed	# Obs		Total	Comments
	TC	E		
<i>Boloria bellona</i>	1		1	
<i>Cercyonis pegala</i>	2	8	10	
<i>Colias</i> sp.	1	8	9	1@Echiangu
<i>Danaus plexippus</i>	1		1	
<i>Satyroides eurydice</i>		1	1	
<i>Speyeria idalia</i>		5	5	3@Echiangu
<b>Total Count:</b>	<b>5</b>	<b>22</b>	<b>27</b>	
<b>Total Species:</b>	<b>4</b>	<b>4</b>	<b>6</b>	
<b>Total Hours:</b>			<b>0.67</b>	
<b>Observations/Hour:</b>	<b>-</b>	<b>-</b>	<b>40</b>	

Table 4. Butterfly observations during 8 and 10 July 2009 surveys at Buffalo Ridge II, Site #2. Comparisons of 8 July survey of transmission corridor (TC08) and southern access (SA08), and 10 July survey of transmission corridor (TC10).

Species Observed	# Obs				Comments
	SA08	TC08	Total	TC10	
<i>Boloria bellona</i>				2	
<i>Cercyonis pegala</i>		16	16	24	10Jul: 1♀; 1@Cardnuta/Echiangu/Verbstri
<i>Coenonympha tullia</i>		1	1		8Jul: @Echiangu
<i>Colias</i> sp.	3	11	14	20	8Jul: 3@Echiangu; 10Jul: 3@Echiangu
<i>Danaus plexippus</i>	2		2	4	8Jul: mating pair
<i>Hesperia dacotae</i>		4	4	13	8Jul: 1♀C2; 1♂C2-; 2♂C2; all @Echiangu 10Jul: 7♀(1C1+,2C2-,2C2+); 6♂(2C1,1C1+,1C2-,1C2); 12@Echiangu 4@Echiangu
<i>Hesperia dacotae?</i>				4	
<i>Limenitis archippus</i>	1		1	1	
<i>Papilio polyxenes</i>				1	
<i>Plebejus melissa</i>				1	10Jul: 1C3+ @Verbstri
<i>Poanes massasoit</i>				1	10Jul: 1C1
<i>Polites mystic</i>	6	1	7		8Jul: 1♀C2-; 4@Cardnuta
<i>Polites origenes</i>		1	1	1	8Jul: ♀C1; 10Jul: ♀C1+ (both @Echiangu)
<i>Polites peckius</i>		1	1	1	8Jul: 1C1 @Phlopilo
<i>Polites themistocles</i>	1	1	2	3	8Jul: ♀C2+ @Cardnuta; ♂C2 @Echiangu 10Jul: ♀C1+; 2@Echiangu
<i>Satyroides eurydice</i>	4	1	5	2	
Skipper sp.		3	3	5	8Jul: 2@Echiangu; 10Jul: 3@Echiangu
<i>Speyeria Aphrodite?</i>				1	
<i>Speyeria idalia</i>	2	15	17	25	8Jul: 1♂C1 @Cardnuta 10Jul: 1♂C1(deformed); 2@Echiangu
<i>Vanessa</i> sp.		1	1		
<b>Total Count:</b>	<b>19</b>	<b>56</b>	<b>75</b>	<b>107</b>	
<b>Total Species:</b>	<b>7</b>	<b>11</b>	<b>13</b>	<b>10</b>	
<b>Total Hours:</b>	<b>0.50</b>	<b>2.33</b>	<b>2.83</b>	<b>2.58</b>	
<b>Observations/Hour:</b>	<b>38</b>	<b>24</b>	<b>27</b>	<b>41</b>	

**Additional Species Observed during Return Surveys:**

08 July 2009 – *Plebejus melissa* (♂C3-)

10 July 2009 – *Euptoieta claudia*



## Butterfly Checklist for Buffalo Ridge II Surveys

Scientific names include Opler and Warren (2003) and NABA (2001) for comparison

Common names follow NABA (2001)

Species Code – 1<sup>st</sup> three letters of genus and species names; used for recording field data

\* Designates nomenclature differences between Opler and Warren (2003), and NABA (2001)

\*\* Designates species mentioned in report, but not observed during surveys

Code	Opler & Warren (2003)		NABA (2001)	
	Binomial	Binomial	Binomial	Common Name
Bolbel	<i>Boloria bellona</i>	<i>Boloria bellona</i>		Meadow Fritillary
Cerpeg	<i>Cercyonis pegala</i>	<i>Cercyonis pegala</i>		Common Wood-Nymph
Coetul	<i>Coenonympha tullia</i> *	<i>Coenonympha tullia inornata</i>		Inornate Common Ringlet
Coleur	<i>Colias eurytheme</i>	<i>Colias eurytheme</i>		Orange Sulphur
Colphi	<i>Colias philodice</i>	<i>Colias philodice</i>		Clouded Sulphur
Danple	<i>Danaus plexippus</i>	<i>Danaus plexippus</i>		Monarch
Eupcla	<i>Euptoieta claudia</i>	<i>Euptoieta claudia</i>		Variegated Fritillary
Hesdac	<i>Hesperia dacotae</i>	<i>Hesperia dacotae</i>		Dakota Skipper
Hesott	<i>Hesperia ottoe</i> **	<i>Hesperia ottoe</i>		Ottoe Skipper
Limarc	<i>Limenitis archippus</i>	<i>Limenitis archippus</i>		Viceroy
Lycdio	<i>Lycaena dione</i>	<i>Lycaena dione</i>		Gray Copper
Nymant	<i>Nymphalis antiopa</i>	<i>Nymphalis antiopa</i>		Mourning Cloak
Oarpow	<i>Oarisma poweshiek</i> **	<i>Oarisma poweshiek</i>		Poweshiek Skipperling
Pappol	<i>Papilio polyxenes</i>	<i>Papilio polyxenes</i>		Black Swallowtail
Pierap	<i>Pieris rapae</i>	<i>Pieris rapae</i>		Cabbage White
Plemel	<i>Plebejus melissa</i> *	<i>Lycaeides melissa</i>		Melissa Blue
Poamas	<i>Poanes massasoit</i>	<i>Poanes massasoit</i>		Mulberry Wing
Polmys	<i>Polites mystic</i>	<i>Polites mystic</i>		Long Dash
Polori	<i>Polites origenes</i>	<i>Polites origenes</i>		Crossline Skipper
Polpec	<i>Polites peckius</i>	<i>Polites peckius</i>		Peck's Skipper
Polthe	<i>Polites themistocles</i>	<i>Polites themistocles</i>		Tawny-edged Skipper
Sateur	<i>Satyroides eurydice</i>	<i>Satyroides eurydice</i>		Eyed Brown
Speaph	<i>Speyeria aphrodite</i>	<i>Speyeria aphrodite</i>		Aphrodite Fritillary
Specyb	<i>Speyeria cybele</i>	<i>Speyeria cybele</i>		Great Spangled Fritillary
Speida	<i>Speyeria idalia</i>	<i>Speyeria idalia</i>		Regal Fritillary
Vancar	<i>Vanessa cardui</i>	<i>Vanessa cardui</i>		Painted Lady
Vanvir	<i>Vanessa virginiensis</i>	<i>Vanessa virginiensis</i>		American Lady

North American Butterfly Association (NABA). 2001. Checklist & English names of North American butterflies (2<sup>nd</sup> edition). <http://www.naba.org/ftp/check2com.pdf>

Opler, P. A. and A. D. Warren. 2003. Butterflies of North America. 2. Scientific names list for butterfly species of North America, north of Mexico.

[http://www.biology.ualberta.ca/old\\_site/uasm//Opler&Warren.pdf](http://www.biology.ualberta.ca/old_site/uasm//Opler&Warren.pdf)

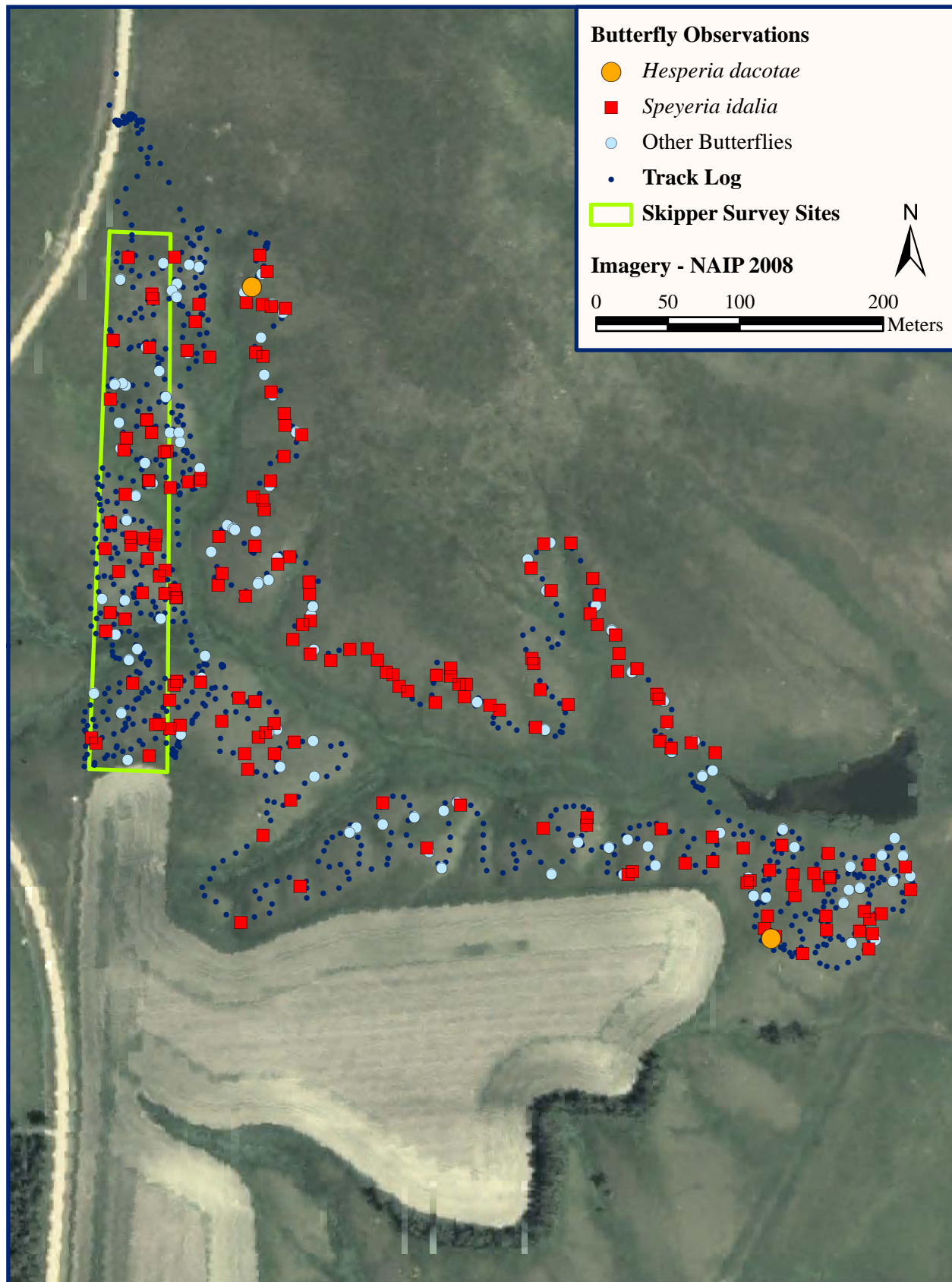


Figure 1. Buffalo Ridge II Wind Power Project: Skipper Survey Site #1 - July 7, 2009 survey.

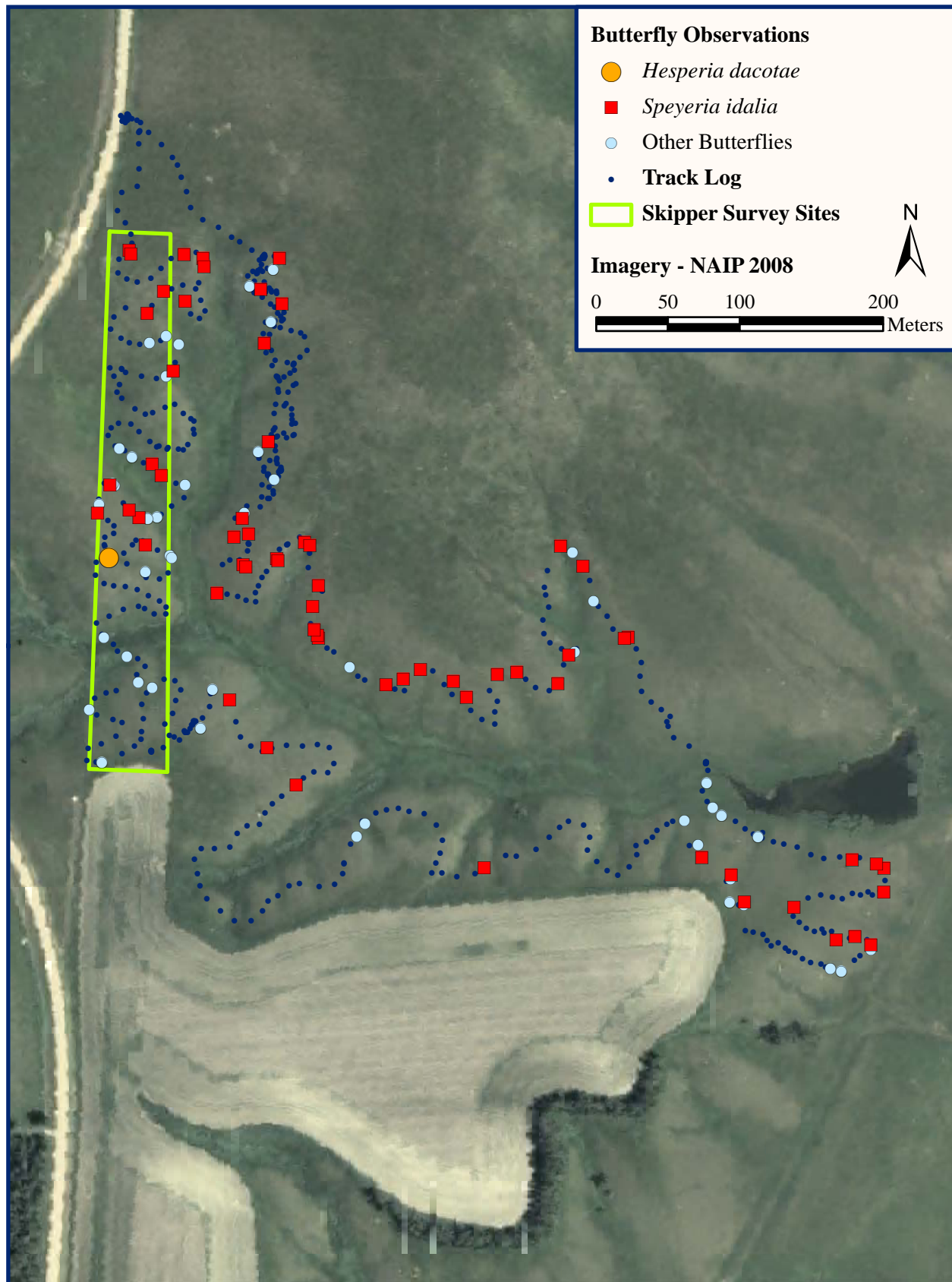


Figure 2. Buffalo Ridge II Wind Power Project: Skipper Survey Site #1 - July 9, 2009 survey.



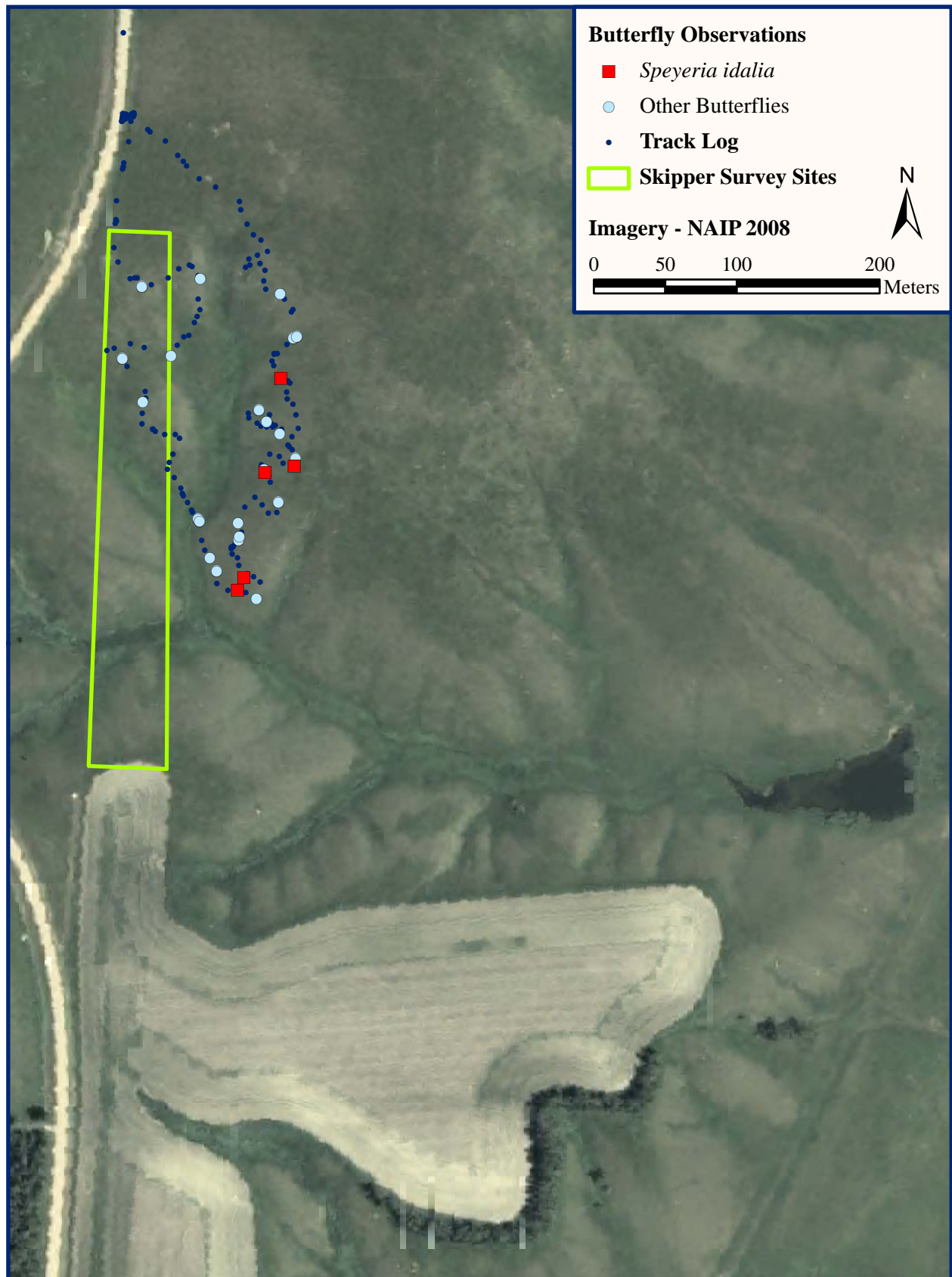


Figure 3. Buffalo Ridge II Wind Power Project: Skipper Survey Site #1 - July 10, 2009 survey.

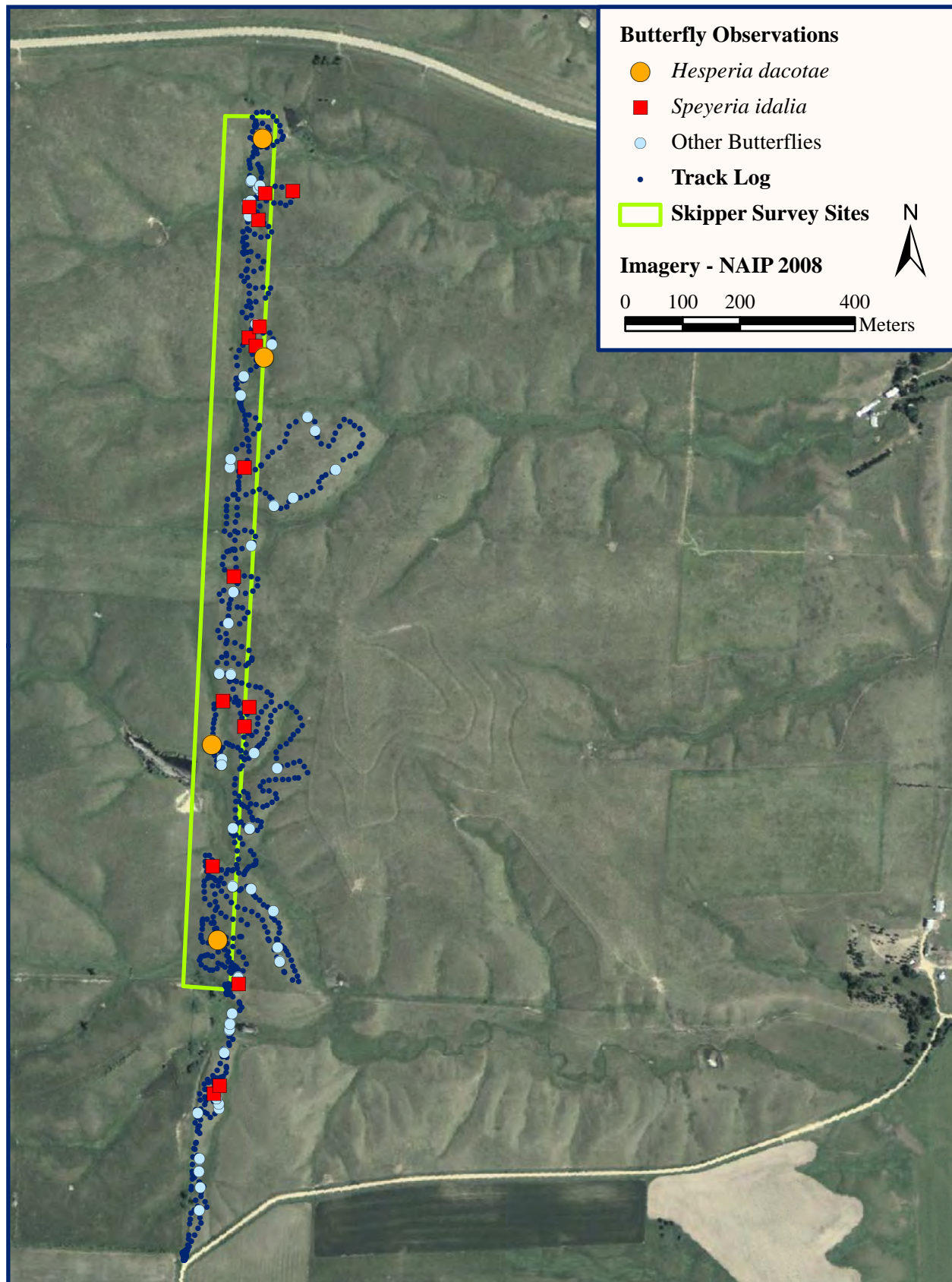


Figure 4. Buffalo Ridge II Wind Power Project: Skipper Survey Site #2 - July 8, 2009 survey.



