Stantec Consulting Services Inc.
209 Commerce Parkway, Cottage Grove, WI, 53527

September 23, 2024

Attention: [redacted]

Dear [redacted],

Reference: Wild Lupine and Karner Blue Butterfly Surveys at Saratoga Solar Project, Wood County, WI

This letter report summarizes the results of the 2024 wild lupine and Karner blue butterfly (KBB) surveys conducted by Stantec Consulting Services Inc. (Stantec) on behalf of Invenergy Solar Project Development LLC (Invenergy) for the Saratoga Solar Project (the Project) located in Saratoga, Wisconsin.

PROJECT DESCRIPTION

The Project includes the construction and operation of a 150-megawatt (MW) energy-generating facility and associated infrastructure on a 1,926-acre site in Wood County, Wisconsin (Appendix A, Figure A1). The Project falls within the Wisconsin Department of Natural Resources (WDNR) Karner Blue Butterfly High Potential Range (HPR). The Project area and surrounding landscape are characterized by planted pine plantations interspersed with areas of open grassland. In July 2024, Stantec staff, trained and certified by the WDNR for KBB and lupine surveys, conducted wild lupine and KBB surveys across the western portion of the Project site (~1,100 acres). This report outlines the species information, methods, and results of the 2024 surveys.

WILD LUPINE SURVEY

Species Information

Wild lupine (*Lupinus perennis*; also "lupine") is a native perennial plant in the pea family that grows in habitats characterized by full sun, dry to moderate moisture, and sandy soils (Black & Judziewicz 2009). Lupine serves as the only known host plant of the KBB (WDNR 2014). Survey protocols for lupine were based on WDNR's document "A Guide to Conducting Monitoring for the Wisconsin Karner Blue Butterfly Habitat Conservation Plan" (WDNR 2014). WDNR protocols require that lupine surveys be conducted from late May to July 31 at the latest, of any given year, otherwise lupine may be senescent. Lupine surveys are valid for five years.

Methods

WDNR protocols (WDNR 2014) indicate that the following sites are eligible for lupine surveys:

1. Sites within the HPR of KBB; and
2. Sites that meet the definition of potential habitat (i.e., sites on dry, sandy soils with dominant overstory vegetation of an age and/or character that could support KBB habitat). This includes:

a. Forest stands and upland openings or existing corridors;

b. Forested stands that support trees between 0-15 years of age which are not dense enough to cause crown closure; or

c. Non-forested sites characterized by upland openings or existing corridors.

Sites considered a low priority for lupine surveys include:

1. Wetlands or other flooded areas;
2. Forests with dense canopy (>75%);
3. Sites on non-sandy soils; or
4. Cultivated or otherwise developed areas supporting no native vegetation.

To thoroughly survey the Project site, Stantec divided the site into 26 uniquely identified 40-acre parcels (quarter-quarter sections or QQ) (Appendix A, Figure A1). Aerial imagery showed forest stands and areas of grasslands, necessitating a survey of the entire project area. Using the WDNR protocols, pairs of Stantec WDNR-trained biologists walked transects with approximately 20-meter spacing throughout all areas of QQ sections. Transects were typically walked in a north-to-south direction. If lupine was found within a QQ, the remainder of the QQ section was walked using north-to-south transects spaced 20 meters apart.

In the event that multiple lupine patches were detected during systematic surveys, Stantec's methods included assigning unique IDs and features to areas of lupine depending on size and spacing of the plant. If patches of lupine contained many plants spaced apart or formed large areas, polygon features would be recorded on an iPad using Field Maps for ArcGIS and labeled as a "Lupine Patch". Patch labeling would use the corresponding QQ identifier, the abbreviation "LU," and an ascending number in the order that they were detected (for example, QQ1-LU-01 would be the first lupine patch found in QQ 1). Should lupine be identified as a single plant, small clusters of fewer than 25 lupine plants, or clumps at a density of less than 50 lupine plants per acre, these areas would be labeled as 'Lupine Point.' These clusters are not sufficient to support a KBB population. Point labeling would use the corresponding QQ identifier, the abbreviation 'LP,' and an ascending number in the order that they were detected (for example, QQ1-LP-01 would be the first lupine point found in QQ 1). All data sheets are attached in Appendix B, and a photolog of images collected at each QQ section is provided in Appendix C.

Results

Stantec staff performed lupine surveys at all QQ sections of the survey area between July 8th – 11th, 2024. During the survey, Stantec staff identified and mapped a single lupine patch, designated QQ43-LU-01, in the southwestern part of the Project site (Appendix A, Figure A2). This patch spans 8.39 acres within a pine plantation, with an understory consisting largely of sparse and clumped vegetation. The lupine stem count is in the thousands, and small areas within the patch feature blooming nectar plants, making it large enough to support KBB.

Reference: **Wild Lupine and Karner Blue Butterfly Surveys at Saratoga Solar, Wood County, WI**

KARNER BLUE BUTTERFLY SURVEY

Species Information

The Karner blue butterfly (*Lycaeides melissa samuelis)* was listed as federally endangered on December 14, 1992. In Wisconsin, it is considered a species of special concern. KBB ecology is closely tied to its larval host plant, lupine.

In Wisconsin, KBB populations undergo two generations per year (i.e., they are bivoltine). Late summer flying adults lay eggs at the base of lupine plants, which senesce shortly thereafter. Larvae hatch and feed in spring. The first flight period (i.e., when the first annual generation becomes adults) typically begins in early June. The longer and more populous second flight period (i.e., when the second annual generation becomes adults) typically begins in mid-July and lasts approximately four weeks in duration.

Methods

According to WDNR, the purpose of the KBB survey is to determine if KBB occupy a particular habitat area (i.e., lupine and surrounding nectar plants). During surveys, KBB are marked as either "present," indicating that KBB were detected during the survey, or "absent," indicating that KBB were not detected.

WDNR protocol prioritizes monitoring on sites that meet the criteria for lupine surveys, in particular, sites where:

1. The presence of lupine has been confirmed on the site within the last five years; and
2. The site has at least 25 lupine plants or clumps of lupine at a density of 50 lupine plants per acre.

In order to indicate that KBB are absent from a particular site, up to three surveys are required. The first flight period typically runs from late May to late June, while the second flight period spans from mid-July to late August. Only one survey may be conducted during the first flight period, with a 3-7 day interval between surveys. If you are unable to conduct surveys in both flight periods, all three surveys can be conducted during the second flight period. Approximately 10 minutes of survey effort per acre of habitat is necessary. The surveyor(s) should walk the entire habitat area at a leisurely pace, covering all potential KBB concentration areas. This includes surveying lupine patches and nectar plants within a 50-meter radius of these patches. If KBB are detected during any of the three surveys, no subsequent surveys are needed.

KBB surveys are restricted to optimal times and weather conditions for KBB detection. Protocols require that surveys are only conducted:

1. Between 8:00 a.m. and 6:00 p.m.
2. When temperatures are above 60°F, and
    a. If temperatures are between 60°F and 70°F, only when skies are mostly sunny and winds are calm, or
    b. If temperatures are above 70°F, no wind restrictions apply.

Reference: **Wild Lupine and Karner Blue Butterfly Surveys at Saratoga Solar, Wood County, WI**

3. Only when conditions are not drizzly or rainy (WDNR 2014).

Results

On July 18th, July 22nd, and July 26th, 2024, Stantec staff surveyed the QQ43-LU-01 lupine patch for KBB. These surveys were conducted during the appropriate weather conditions and were spaced at least three days apart. No KBB were detected during any of the three surveys completed in patch QQ43-LU-01. A full summary of KBB survey dates and results can be found below in Table 1, and all data sheets are attached in Appendix D.

Table 1. Results of 2024 KBB Surveys: Patch QQ43-LU-01

	First Survey	Second Survey	Third Survey
Date	7/18/2024	7/22/2024	7/26/2024
Start time for survey (CDT)	11:00 am	11:00 am	10:30 am
End time for Survey (CDT)	1:15 pm	1:10 pm	12:20 pm
Temperature	70F	75F	72F
Wind	5 mph	6 mph	7 mph
Cloud Cover	Partly cloudy	Partly cloudy	Sunny
Karner adults present?	No	No	No

CONCLUSIONS

The 2024 lupine surveys conducted by Stantec on the western portion of the Project site indicate suitable habitat for the KBB is present in the southwestern part of the survey area, based on the presence of lupine. However, KBB were not detected within the single lupine patch surveyed during the 2024 season. These survey results and maps are valid from 2024 to 2029.

Regards,

Stantec Consulting Services Inc.

[redacted]

Phone: [redacted]
E-mail: [redacted]