Bat Survey Report
Bluebird Solar Farm

BayWa r.e. Solar Projects, LLC
Bluebird Solar Farm
Harrison County, Kentucky

Prepared by:

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Prepared for:

BayWa r.e.
renewable energy

September 2020

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1.0 INTRODUCTION

Projects within the state of Kentucky lie within the range of the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*). Jackson Group was contracted by BayWa r.e. Solar Projects, LLC (BayWa) to determine if suitable Indiana bat and/or northern long-eared bat habitat is present within the project rea at the proposed Bluebird Solar Farm Project (Project) in Harrison County, Kentucky.

Jackson Group biologists conducted a Phase 1 bat habitat assessment to evaluate and document any potentially suitable Indiana bat and/or northern long-eared bat habitat within the project area. During the field investigations suitable habitat was observed and documented for the Indiana bat and northern long-eared bat. Therefore, a mist net survey study plan was subsequently submitted to the Kentucky Department of Fish and Wildlife resources (KDFWR) and U.S. Fish & Wildlife Service (USFWS) on 8 July 2020. The study plan was approved to conduct mist net surveys on 10 July 2020.

1.1 Project Description

BayWa is developing utility-scale, ground-mounted Solar Photovoltaic (PV) projects throughout the United States. The Bluebird Cluster Project (Project) is in within the territory of Eastern Kentucky Power Cooperative, Inc. (EKPC). The Project will interconnect with an EKPC Substation due north of the Project area, near the community of Broadwell in Harrison County. The Project area (Approximately 1,400 acres) is depicted on mapping provided in Appendix A.

2.0 METHODS

Jackson Group biologist conducted a mist net survey according to the 2020 Range-Wide Indiana Bat Summer Survey Guidelines (USFWS 2020), to address threatened and endangered bat species presence/probable absence within the proposed Project area. Surveys were conducted between 13 July and 15 July 2020. Per the 2020 Guidelines, for every 123 acres (0.5km^2) of potential summer habitat a minimum of 9 net nights of survey effort are required, therefore 2 survey sites were established within the approximately 191 acres of forested habitat within the project area. Final location of the sites was selected by a permitted bat biologist in the field and were based on the best possible net locations (e.g., streams, trails, corridors) that are typically the most effective places to survey. The survey was conducted at two sites for three nights using three net sets each night for a total of 18 net nights of survey effort. Additionally, all netting was conducted using the most current National White-Nose Syndrome (WNS) Decontamination Protocol (Version 09.13.2018).

Upon capture, bats were removed from the nets, identified to species, weighed, measured, and released unharmed near the point of capture. The following data was recorded for each individual captured: species, age, reproductive condition, right forearm length (millimeters), weight (grams), time of capture, and WNS damage index score based upon Reichard and Kunz's (2009) Wing Damage Index. All bats were identified to species based upon distinctive morphological characteristics (e.g. body size, hair color, ear length, tragus shape, presence/absence of a keeled calcar, etc.). Age was determined by the degree of epiphyseal – diaphyseal fusion. Adult female bats were considered reproductive if they were pregnant (based upon palpation of the abdomen), or bore signs of nursing young (i.e. lack of hair surrounding the teats). Males were considered reproductive if the testes were descended into the scrotum.

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3.0 RESULTS

3.1 Mist-Netting Survey

A total of 69 bats were captured during the survey efforts. Bat species captured included the big brown bat (*Eptesicus* fuscus, n=57), evening bat (*Nycticeius humeralis*, n=4), eastern red bat (*Lasiurus borealis*, n=5), and little brown bat (*Myotis lucifugus*, n=2). No threatened or endangered bats were captured during the survey efforts. Detailed site specific information and site diagrams are provided on the Mist Net Survey Data sheets in Appendix B. Mist net site net set photographs can be found in Appendix C and scientific collections permits in Appendix D.

3.2 Radio Telemetry

No threatened or endangered bats were captured during survey efforts; therefore no radio tracking was conducted.

4.0 DISCUSSION

This summer mist net survey was conducted with the appropriate level of effort and under the appropriate conditions to investigate the presence/absence of threatened and endangered bat species at the proposed Bluebird Solar Farm Project. A total of 69 bats, comprised of 4 species were captured during survey efforts. No threatened or endangered bat species were captured during the mist net survey efforts. No winter habitat was observed within the Project area.

The species captured during the survey are representative of bat species known to occur in the region. Given that the species captured during the survey are ubiquitous on the landscape and the absence of federally threatened or endangered bats, it is the opinion of Jackson Group that the proposed Project will not likely adversely affect threatened and endangered bat species populations in the project area.

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5.0 REFERENCES

United States Fish and Wildlife Service (USFWS). 2020. White Nose Syndrome Decontamination Protocol, U.S Fish and Wildlife Service, Version 09.13.2018

United States Fish and Wildlife Service (USFWS). 2020. 2020 Range-Wide Indiana Bat Summer Survey Guidelines, March 2020

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Appendix A

Project Mapping

Legend

- Project Boundary
- Mist-Net Survey Locations

BayWa r.e.

Bluebird Solar

Harrison County, Kentucky

TITLE

BAT SURVEY - AERIAL MAP

FIGURE

1

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SCALE

1:13,370.96

Appendix B

Bat Capture Data Sheets

Bat Capture Data Sheet

Site No: MS 1	**Project No.:**	**Company:** Jackson Group	**Project Name:** Bluebird	**Date:** 07-13-2020
Location: Lail Ln		**Pipeline Segment:**	**KM Block No.**	**Approx. Mile Post:**
County: Harrison		**State:** KY	**Surveyor(s):** Shane Roberts, Devin Bingham	
Lat/Long	**N** 38.286843	**W** -84.342156	**Quad:** Leesburg	**Tract No.:**

#	Time	Species	Age	Sex	Repro. Cond **	RFA (MM)	Mass (g)	Wing Score*	Band No.	Guano/ Hair	Net Name	Net Height	Photo
1	22:46	LABO	A	M	TD	37	11	0	N/A	N/A	B	4m	N/A
2	23:00	EPFU	A	F	PL	48	25.25	0	N/A	N/A	A	1m	N/A
3													
4													
5													
6													
7													
8													
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*Wing Score: (**0**) No Damage; (**1**) Light Damage (<50%); (**2**) Moderate Damage (>50%); (**3**) Heavy Damage - deteriorated wing membrane with isolated holes

** Repro. Cond (Reproductive Condition): (**P**) Pregnant; (**L**) Lactating; (**PL**) Post-lactating; (**NR**) Non-reproductive; (**TD**) Testes descended

Moon Phase:

Waning Crescent 38.8%

	Rise	Set
Moon	01:32 am	14:32 pm
Sun	06:25 am	21:01 pm

Time	Temp	Sky	Wind	# Bats
21.01	68	0	0	0
22:01	65	0	0	0
23:01	63	0	0	2
00:01	62	0	0	0
01:01	62	0	0	0
02:01	62	0	0	0

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or Overcast
4	Smoke or Fog
5	Drizzle or Light Rain
6	Thunderstorm

Beauford Wind Code	
0	Calm (0 mph)
1	Light Wind (1-3 mph)
2	Light Breeze (4-7 mph)
3	Gentle Breeze (8-12 mph)
4	Moderate Breeze (13-18 mph)

Acoustic Unit Serial No:

NA

Lat: N

Long: W

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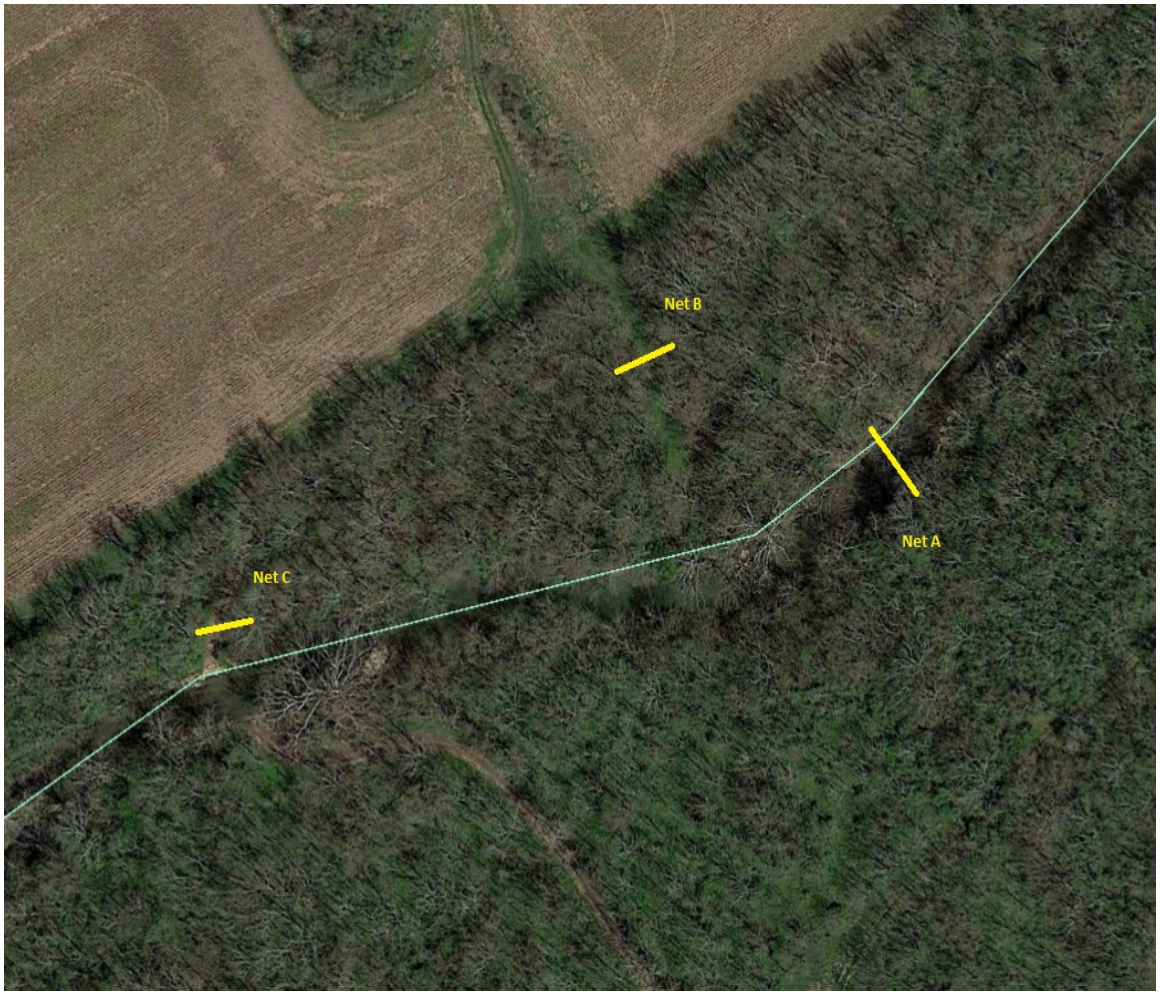
Bat Capture Data Sheet

Net Site Diagram



Dominant Vegetation

1	Sycamore
2	Osage-orange
3	Sugarberry
4	Shagbark hickory
5	Tree of heaven

Other Species:

Net Site(s) by Habitat

Habitat	A	B	C	D	
River					
Stream	X				
Pond					
Road Rut					
Corridor		X	X		
Cave/Mine					
Edge					
Total	1	1	1		

No. of Nets		X	Net Height	X	Net Width	Total Area
A	2	X	2.6	X	12	62.4m
B	2	X	2.6	X	6	31.2m
C	2	X	2.6	X	6	31.2m
D		X		X		

Comments:

Net A 38.286866,-84.340961, Net B 38.286775,-84.341688, Net C 38.286418,-84.342897

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Bat Capture Data Sheet

Site No: MS 1	**Project No.:**	**Company:** Jackson Group	**Project Name:** Bluebird	**Date:** 07-14-2020
Location: Lail Ln		**Pipeline Segment:**	**KM Block No.**	**Approx. Mile Post:**
County: Harrison		**State:** KY	**Surveyor(s):** Shane Roberts, Devin Bingham	
Lat/Long	**N** 38.286843	**W** -84.342156	**Quad:** Leesburg	**Tract No.:**

#	Time	Species	Age	Sex	Repro. Cond **	RFA (MM)	Mass (g)	Wing Score*	Band No.	Guano/ Hair	Net Name	Net Height	Photo
1	22:06	LABO	A	M	TD	39	12.25	0	N/A	N/A	B	4m	N/A
2	22:30	MYLU	J	M	NR	37	7	0	KYF&WB04590	N/A	A	1m	Yes
3	22:47	EPFU	J	F	NR	46	15.25	0	N/A	N/A	C	3m	N/A
4													
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*Wing Score: (**0**) No Damage; (**1**) Light Damage (<50%); (**2**) Moderate Damage (>50%); (**3**) Heavy Damage - deteriorated wing membrane with isolated holes

** Repro. Cond (Reproductive Condition): (**P**) Pregnant; (**L**) Lactating; (**PL**) Post-lactating; (**NR**) Non-reproductive; (**TD**) Testes descended

Moon Phase:
Waning Crescent 40%

	Rise	Set
Moon	01:58 am	15:30 pm
Sun	06:25 am	21:01 pm

Time	Temp	Sky	Wind	# Bats
21.01	73	0	0	0
22:01	68	0	0	0
23:01	66	0	0	3
00:01	64	0	0	0
01:01	62	0	0	0
02:01	62	0	0	0

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or Overcast
4	Smoke or Fog
5	Drizzle or Light Rain
6	Thunderstorm

Beauford Wind Code	
0	Calm (0 mph)
1	Light Wind (1-3 mph)
2	Light Breeze (4-7 mph)
3	Gentle Breeze (8-12 mph)
4	Moderate Breeze (13-18 mph)

Acoustic Unit Serial No:
NA

Lat: N

Long: W

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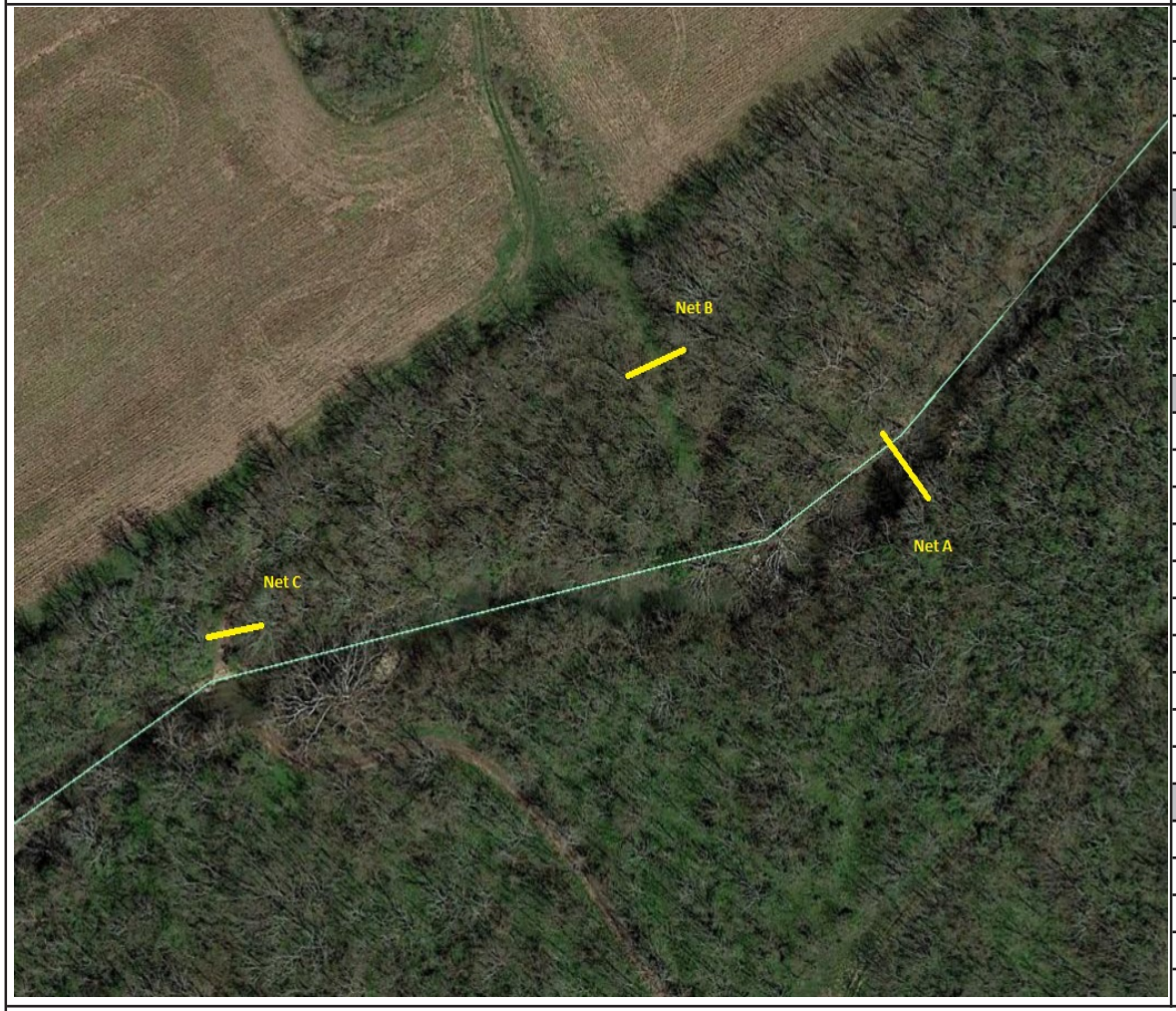
Bat Capture Data Sheet

Net Site Diagram



Dominant Vegetation

1	Sycamore
2	Osage-orange
3	Sugarberry
4	Shagbark hickory
5	Tree of heaven

Other Species:

Net Site(s) by Habitat

Habitat	A	B	C	D	
River					
Stream	X				
Pond					
Road Rut					
Corridor		X	X		
Cave/Mine					
Edge					
Total	1	1	1		

	No. of Nets		X Net Height		X Net Width	Total Area
A	2	X	2.6	X	12	62.4m
B	2	X	2.6	X	6	31.2m
C	2	X	2.6	X	6	31.2m
D		X		X		

Comments:

Net A 38.286866,-84.340961, Net B 38.286775,-84.341688, Net C 38.286418,-84.342897

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Bat Capture Data Sheet

Site No: MS 1	**Project No.:**	**Company:** Jackson Group	**Project Name:** Bluebird	**Date:** 07-15-2020
Location: Lail Ln		**Pipeline Segment:**	**KM Block No.**	**Approx. Mile Post:**
County: Harrison		**State:** KY	**Surveyor(s):** Shane Roberts, Devin Bingham	
Lat/Long	**N** 38.286843	**W** -84.342156	**Quad:** Leesburg	**Tract No.:**

#	Time	Species	Age	Sex	Repro. Cond **	RFA (MM)	Mass (g)	Wing Score*	Band No.	Guano/ Hair	Net Name	Net Height	Photo
1	22:10	EPFU	A	M	TD	49	19	0	N/A	N/A	A	5m	N/A
2	22:27	EPFU	A	F	PL	47	22	0	N/A	N/A	C	4m	N/A
3													
4													
5													
6													
7													
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26													
27													
28													
29													

*Wing Score: (**0**) No Damage; (**1**) Light Damage (<50%); (**2**) Moderate Damage (>50%); (**3**) Heavy Damage - deteriorated wing membrane with isolated holes

** Repro. Cond (Reproductive Condition): (**P**) Pregnant; (**L**) Lactating; (**PL**) Post-lactating; (**NR**) Non-reproductive; (**TD**) Testes descended

Moon Phase:

Waning Crescent 27%

	Rise	Set
Moon	02:25 am	16:29 pm
Sun	06:26 am	21:00 pm

Time	Temp	Sky	Wind	# Bats
21:00	73	0	0	0
22:00	70	0	0	0
23:00	69	0	0	0
00:00	70	0	0	0
01:00	69	0	0	0
02:00	69	0	0	0

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or Overcast
4	Smoke or Fog
5	Drizzle or Light Rain
6	Thunderstorm

Beauford Wind Code	
0	Calm (0 mph)
1	Light Wind (1-3 mph)
2	Light Breeze (4-7 mph)
3	Gentle Breeze (8-12 mph)
4	Moderate Breeze (13-18 mph)

Acoustic Unit Serial No:

NA

Lat: N

Long: W

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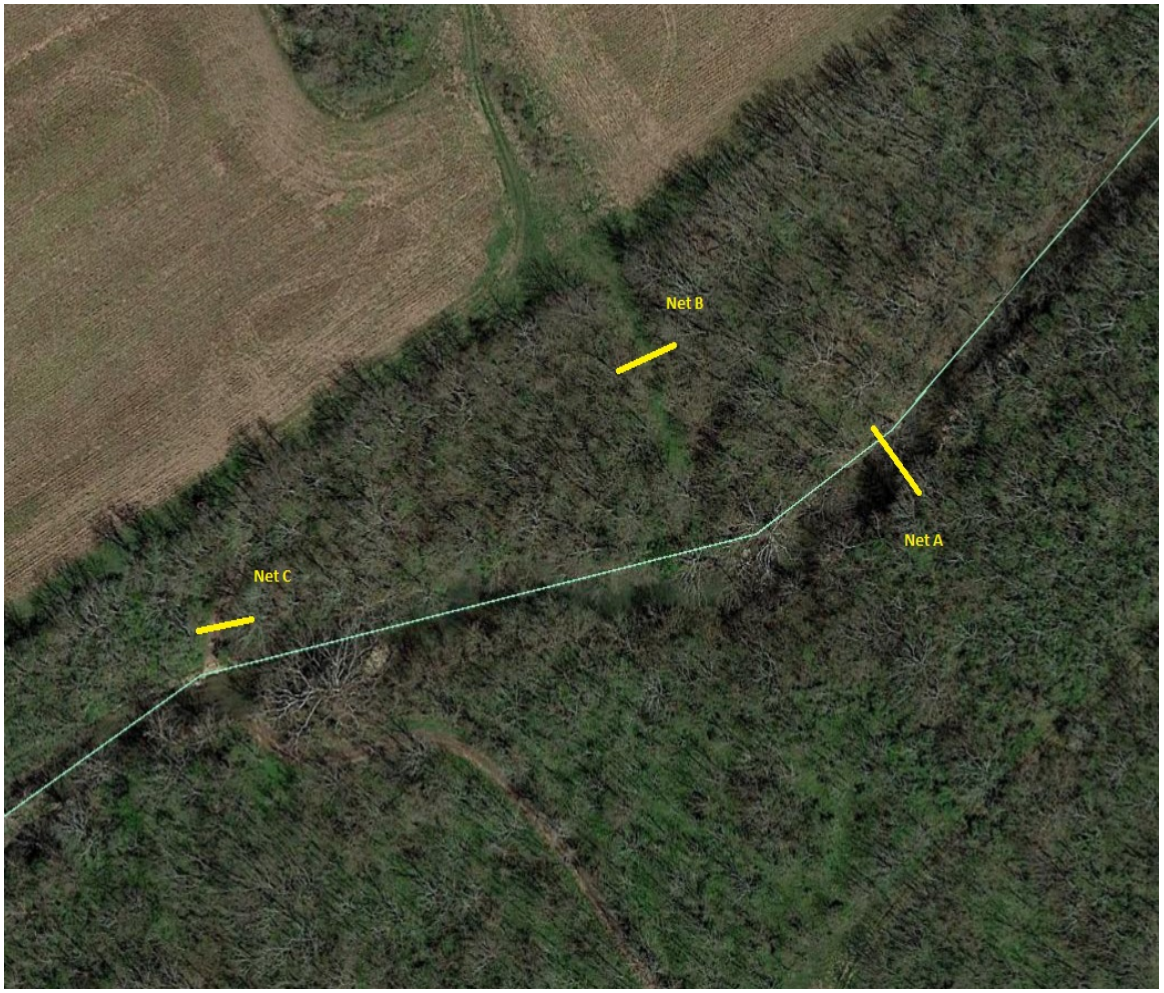
Bat Capture Data Sheet

Net Site Diagram



Dominant Vegetation

1	Sycamore
2	Osage-orange
3	Sugarberry
4	Shagbark hickory
5	Tree of heaven

Other Species:

Net Site(s) by Habitat

Habitat	A	B	C	D	
River					
Stream	X				
Pond					
Road Rut					
Corridor		X	X		
Cave/Mine					
Edge					
Total	1	1	1		

No. of Nets X Net Height X Net Width						Total Area
A	2	X	2.6	X	12	62.4m
B	2	X	2.6	X	6	31.2m
C	2	X	2.6	X	6	31.2m
D		X		X		

Comments:

Net A 38.286866,-84.340961, Net B 38.286775,-84.341688, Net C 38.286418,-84.342897

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Bat Capture Data Sheet

Site No: MS-2	**Project No.:**	**Company:** Jackson Group	**Project Name:** Bluebird Cluster	**Date:** 13 July 2020
Location: Riparian/road corridors		**Pipeline Segment:**	**KM Block No.**	**Approx. Mile Post:**
County: Harrison		**State:** Kentucky	**Surveyor(s):** Robert Oney	
Lat/Long	**N** 38.292968	**W** -84.381647	**Quad:**	**Tract No.:**

#	Time	Species	Age	Sex	Repro. Cond **	RFA (MM)	Mass (g)	Wing Score*	Band No.	Guano/ Hair	Net Name	Net Height	Photo
1	21:30	EPFU	A	F	PL	50.7	21.0	1	-	-	C	4	N
2	21:37	LABO	A	M	TD	39.5	12.0	0	-	-	A	3	N
3	21:46	EPFU	A	F	PL	48.5	20.5	1	-	-	C	3	N
4	21:46	EPFU	A	F	PL	50.5	18.5	1	-	-	C	4	N
5	21:46	EPFU	A	F	PL	47.5	18.25	0	-	-	C	5	N
6	21:46	EPFU	A	M	TD	48.5	17.75	1	-	-	C	3	N
7	21:55	EPFU	A	F	PL	50.5	23.0	1	-	-	C	4	N
8	21:55	EPFU	A	M	NR	48.1	15.5	0	-	-	B	3	N
9	21:55	EPFU	A	M	NR	47.5	16.5	0	-	-	C	4	N
10	22:20	EPFU	A	M	NR	49.7	15.5	0	-	-	C	5	Y
11	22:35	NYHU	A	F	PL	37.7	13.0	0	-	-	A	4	Y
12	22:47	NYHU	A	F	PL	36.4	12.0	0	-	-	B	5	N
13	23:00	EPFU	A	F	NR	47.1	14.5	0	-	-	C	3	N
14	23:00	EPFU	A	M	NR	46.0	14.0	0	-	-	C	4	N
15	23:00	EPFU	A	F	PL	47.5	19.0	0	-	-	C	5	N
16	23:15	LABO	A	M	TD	39.7	11.25	0	-	-	B	4	Y
17	23:20	EPFU	A	F	NR	51.6	18.0	0	-	-	C	4	N
18	23:20	EPFU	A	M	TD	47.5	17.0	1	-	-	C	3	N
19	23:30	MYLU	A	M	NR	36.1	7.5	0	B13341	-	A	3	Y
20	23:45	EPFU	A	F	PL	49.5	23.0	1	-	-	C	4	N
21	23:45	EPFU	A	F	PL	49.8	34.5	1	-	-	C	5	N
22	23:45	EPFU	A	F	PL	48.5	21.0	1	-	-	C	3	N
23	23:55	EPFU	A	F	NR	49.9	17.5	0	-	-	B	4	N
24	23:55	EPFU	A	M	TD	46.5	16.5	1	-	-	B	5	N
25	23:55	EPFU	A	M	TD	45.5	17.5	1	-	-	C	3	N
26	00:10	EPFU	A	F	PL	49.0	17.5	0	-	-	C	4	N
27	00:10	EPFU	A	F	PL	48.2	22.5	1	-	-	C	3	N
28	01:23	EPFU	A	F	PL	49.7	18.0	0	-	-	C	4	N
29													

*Wing Score: (**0**) No Damage; (**1**) Light Damage (<50%); (**2**) Moderate Damage (>50%); (**3**) Heavy Damage - deteriorated wing membrane with isolated holes

** Repro. Cond (Reproductive Condition): (**P**) Pregnant; (**L**) Lactating; (**PL**) Post-lactating; (**NR**) Non-reproductive; (**TD**) Testes descended

Moon Phase:

Waning Crescent 45%

	Rise	Set
Moon	11:49 am	18:33 pm
Sun	06:25 am	20:59 pm

Time	Temp	Sky	Wind	# Bats
21:00	70	0	0	9
22:00	67	0	0	3
23:00	64	1	0	13
00:00	62	1	0	2
01:00	62	1	0	1
02:00	61	0	0	0

Sky Code	
0	**Clear**
1	**Few Clouds**
2	**Partly Cloudy**
3	**Cloudy or Overcast**
4	**Smoke or Fog**
5	**Drizzle or Light Rain**
6	**Thunderstorm**

Beauford Wind Code	
0	**Calm (0 mph)**
1	**Light Wind (1-3 mph)**
2	**Light Breeze (4-7 mph)**
3	**Gentle Breeze (8-12 mph)**
4	**Moderate Breeze (13-18 mph)**

Acoustic Unit Serial No:

N/A

Lat: N

Long: W

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Bat Capture Data Sheet

Net Site Diagram

Dominant Vegetation

1	Quercus macrocarpa
2	Juglans nigra
3	Celtis occidentalis
4	Carya cordiformis
5	Fraxinus pennsylvanica

Other Species:

Prunus serotina

Quercus alba

Net Site(s) by Habitat

Habitat	A	B	C	D	
River					
Stream					
Pond	X				
Road Rut					
Corridor		X	X		
Cave/Mine					
Total	1	1	1		

	No. of Nets	X	Net Height	X	Net Width	Total Area
A	2	X	2.6m	X	6m	31.2m
B	2	X	2.6m	X	6m	31.2m
C	2	X	2.6m	X	6m	31.2m
D		X		X		

Comments:

Net A was set up in an opening of a forest livestock pond margin, Net B was set up in a forested corridor, Net C was set up in a forested farm road

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Bat Capture Data Sheet

Site No: MS-2	**Project No.:**	**Company:** Jackson Group	**Project Name:** Bluebird Cluster	**Date:** 14 July 2020
Location: Riparian/road corridors		**Pipeline Segment:**	**KM Block No.**	**Approx. Mile Post:**
County: Harrison		**State:** Kentucky	**Surveyor(s):** Robert Oney	
Lat/Long	**N** 38.292968	**W** -84.381647	**Quad:**	**Tract No.:**

#	Time	Species	Age	Sex	Repro. Cond **	RFA (MM)	Mass (g)	Wing Score*	Band No.	Guano/ Hair	Net Name	Net Height	Photo
1	21:40	LABO	A	M	TD	38.5	12.0	0	-	-	B	3	N
2	21:50	EPFU	J	M	NR	39.1	16.25	0	-	-	B	4	N
3	21:50	EPFU	J	M	NR	38.7	15.5	0	-	-	B	5	N
4	22:01	EPFU	J	F	NR	51.0	17.0	0	-	-	A	2	N
5	22:10	EPFU	A	F	L	47.0	18.0	0	-	-	B	4	N
6	22:15	NYHU	A	F	L	37.5	10.5	0	-	-	A	2	N
7	22:20	EPFU	J	F	NR	46.5	16.0	0	-	-	C	3	N
8	22:20	EPFU	A	F	L	49.1	20.5	1	-	-	C	4	N
9	22:20	EPFU	A	F	L	46.7	19.25	1	-	-	C	4	N
10	22:20	EPFU	J	M	NR	46.0	14.75	0	-	-	C	5	Y
11	22:25	EPFU	J	M	NR	47.4	17.75	0	-	-	C	4	Y
12	22:36	EPFU	J	F	NR	48.0	16.25	0	-	-	A	4	N
13	22:40	EPFU	J	F	NR	48.7	17.25	0	-	-	B	1	N
14	22:40	EPFU	J	M	NR	47.5	15.5	0	-	-	B	4	N
15	22:40	EPFU	A	F	PL	47.4	23.0	1	-	-	B	4	N
16	22:45	EPFU	J	M	NR	47.0	17.25	0	-	-	C	5	N
17	22:50	EPFU	A	F	PL	49.3	22.5	1	-	-	B	2	N
18	23:00	EPFU	J	M	NR	46.5	15.5	0	-	-	B	5	N
19	23:05	EPFU	A	M	TD	48.8	19.0	1	-	-	C	5	N
20	23:10	EPFU	A	F	PL	48.0	22.5	1	-	-	B	3	N
21	23:22	EPFU	J	F	NR	48.1	18.5	0	-	-	C	5	N
22	23:28	EPFU	A	F	PL	51.5	26.0	1	-	-	B	1	N
23	23:28	EPFU	A	F	L	48.3	21.25	1	-	-	B	4	N
24	23:32	EPFU	J	F	NR	49.0	20.0	0	-	-	C	5	N
25	23:46	EPFU	A	F	PL	48.0	23.75	1	-	-	C	5	N
26	23:50	EPFU	J	F	NR	49.7	20.25	0	-	-	A	5	N
27													
28													
29													

*Wing Score: (**0**) No Damage; (**1**) Light Damage (<50%); (**2**) Moderate Damage (>50%); (**3**) Heavy Damage - deteriorated wing membrane with isolated holes

** Repro. Cond (Reproductive Condition): (**P**) Pregnant; (**L**) Lactating; (**PL**) Post-lactating; (**NR**) Non-reproductive; (**TD**) Testes descended

Moon Phase:

Waning Crescent 38%

	Rise	Set
Moon	1:57 am	15:29 pm
Sun	06:25 am	21:00 pm

Time	Temp	Sky	Wind	# Bats
21:00	71	1	0	3
22:00	69	0	0	14
23:00	66	0	0	9
00:00	65	0	0	0
01:00	64	0	0	0
02:00	62	0	0	0

Sky Code

0	**Clear**
1	**Few Clouds**
2	**Partly Cloudy**
3	**Cloudy or Overcast**
4	**Smoke or Fog**
5	**Drizzle or Light Rain**
6	**Thunderstorm**

Beauford Wind Code

0	**Calm (0 mph)**
1	**Light Wind (1-3 mph)**
2	**Light Breeze (4-7 mph)**
3	**Gentle Breeze (8-12 mph)**
4	**Moderate Breeze (13-18 mph)**

Acoustic Unit Serial No:

N/A

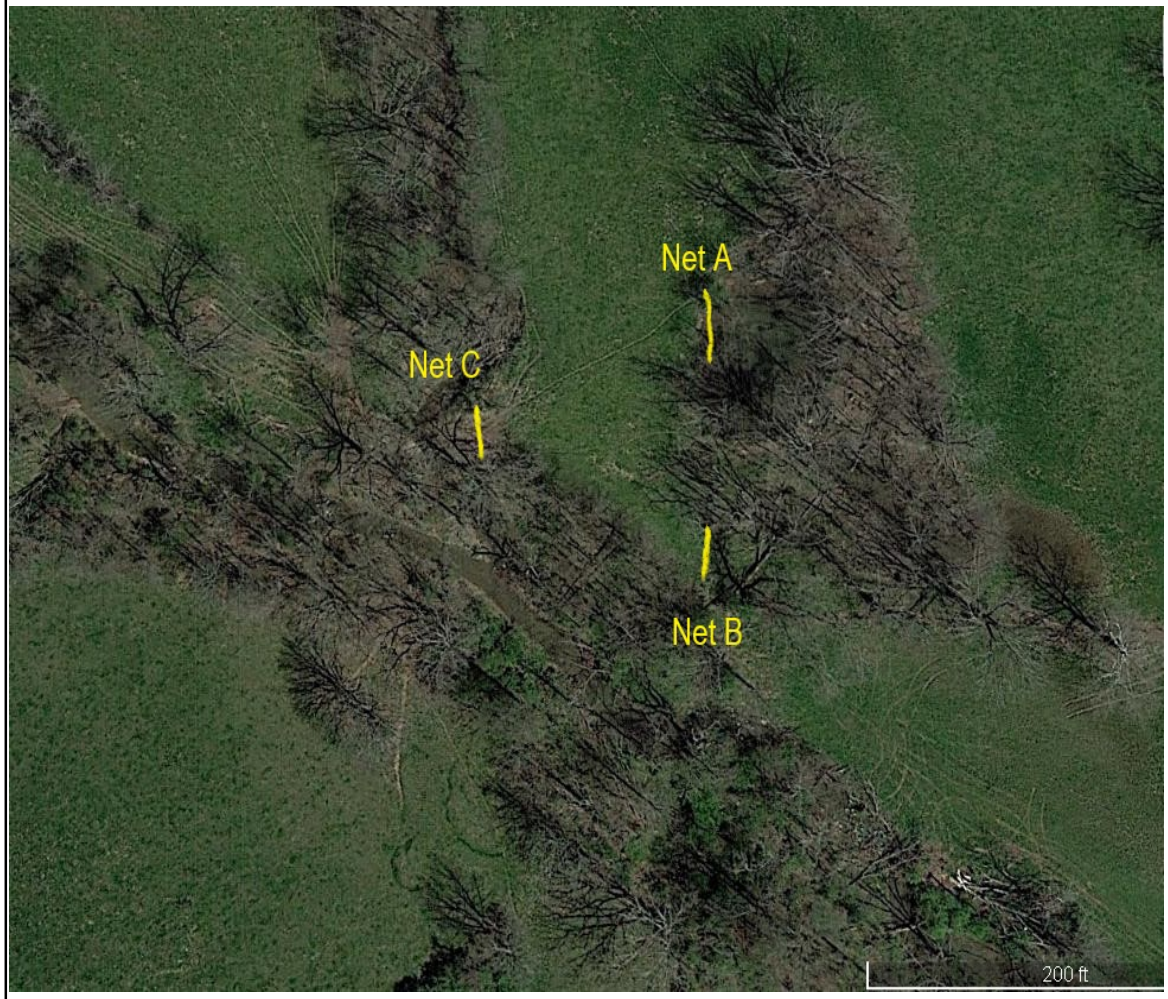
Lat: N

Long: W

JACKSON GROUP

Bat Capture Data Sheet

Net Site Diagram



Dominant Vegetation

1	Quercus macrocarpa
2	Juglans nigra
3	Celtis occidentalis
4	Carya cordiformis
5	Fraxinus pennsylvanica

Other Species:

Prunus serotina

Quercus alba

Net Site(s) by Habitat

Habitat	A	B	C	D	
River					
Stream					
Pond	X				
Road Rut					
Corridor		X	X		
Cave/Mine					
Total	1	1	1		

	No. of Nets	X	Net Height	X	Net Width	Total Area
A	2	X	2.6m	X	6m	31.2m
B	2	X	2.6m	X	6m	31.2m
C	2	X	2.6m	X	6m	31.2m
D		X		X		

Comments:

Net A was set up in an opening of a forest livestock pond margin, Net B was set up in a forested corridor, Net C was set up in a forested farm road

Band recovery KYF&W B14510 bat #17, KY F&W B14528 bat #24

JACKSON GROUP

Bat Capture Data Sheet

Site No: MS-2	**Project No.:**	**Company:** Jackson Group	**Project Name:** Bluebird Cluster	**Date:** 15 July 2020
Location: Riparian/road corridors		**Pipeline Segment:**	**KM Block No.**	**Approx. Mile Post:**
County: Harrison		**State:** Kentucky	**Surveyor(s):** Robert Oney	
Lat/Long	**N** 38.292968	**W** -84.381647	**Quad:**	**Tract No.:**

#	Time	Species	Age	Sex	Repro. Cond **	RFA (MM)	Mass (g)	Wing Score*	Band No.	Guano/ Hair	Net Name	Net Height	Photo
1	21:50	NYHU	A	F	L	37.8	12.0	0	-	-	C	4	N
2	22:10	EPFU	J	M	NR	47.3	16.5	0	-	-	C	4	N
3	22:10	EPFU	J	M	NR	47.1	15.75	0	-	-	C	5	N
4	22:30	EPFU	A	F	L	48.8	23.75	1	-	-	B	4	N
5	22:30	EPFU	A	F	PL	48.5	19.0	0	-	-	B	4	N
6	23:00	MYLU	A	M	NR	37.5	6.5	0	B13348	-	B	5	Y
7	23:30	EPFU	J	F	NR	47.1	16.0	0	-	-	C	3	N
8	23:30	EPFU	J	F	NR	50.4	19.0	0	-	-	B	4	N
9													
10													
11													
12													
13													
14													
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26													
27													
28													
29													

*Wing Score: (**0**) No Damage; (**1**) Light Damage (<50%); (**2**) Moderate Damage (>50%); (**3**) Heavy Damage - deteriorated wing membrane with isolated holes

** Repro. Cond (Reproductive Condition): (**P**) Pregnant; (**L**) Lactating; (**PL**) Post-lactating; (**NR**) Non-reproductive; (**TD**) Testes descended

Moon Phase:

Waning crescent 27%

	Rise	Set
Moon	02:25 am	4:29 pm
Sun	06:26 am	21:00 pm

Time	Temp	Sky	Wind	# Bats
21:00	72	1	0	1
22:00	70	0	0	4
23:00	68	1	0	3
00:00	67	1	0	0
01:00	66	1	0	0
02:00	64	0	0	0

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or Overcast
4	Smoke or Fog
5	Drizzle or Light Rain
6	Thunderstorm

Beauford Wind Code	
0	Calm (0 mph)
1	Light Wind (1-3 mph)
2	Light Breeze (4-7 mph)
3	Gentle Breeze (8-12 mph)
4	Moderate Breeze (13-18 mph)

Acoustic Unit Serial No:

N/A

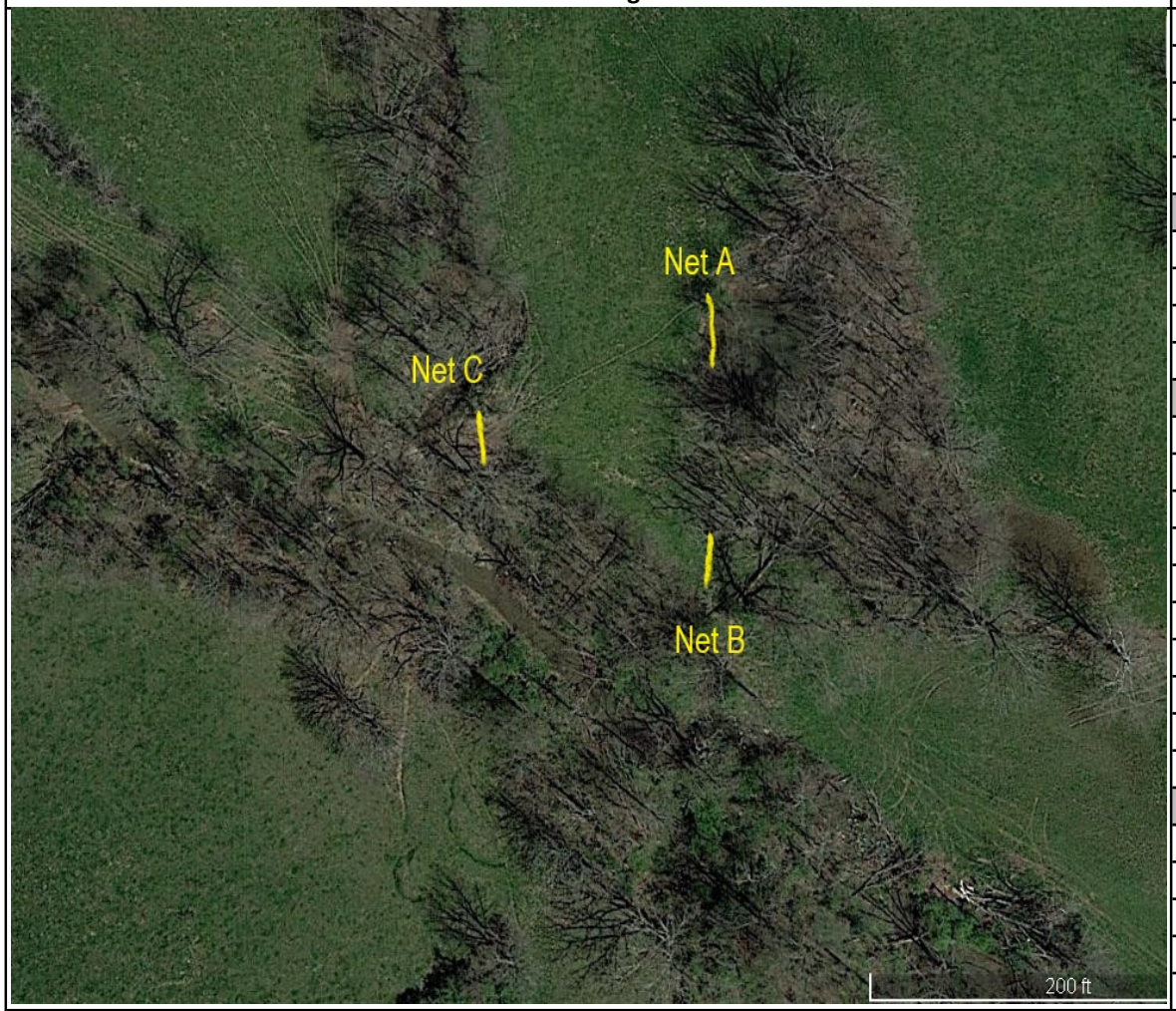
Lat: N

Long: W

JACKSON GROUP

Bat Capture Data Sheet

Net Site Diagram



Dominant Vegetation

1	Quercus macrocarpa
2	Juglans nigra
3	Celtis occidentalis
4	Carya cordiformis
5	Fraxinus pennsylvanica

Other Species:

Prunus serotina

Quercus alba

Net Site(s) by Habitat

Habitat	A	B	C	D	
River					
Stream					
Pond	X				
Road Rut					
Corridor		X	X		
Cave/Mine					
Total	1	1	1		

	No. of Nets		X Net Height		X Net Width	Total Area
A	2	X	2.6m	X	6m	31.2m
B	2	X	2.6m	X	6m	31.2m
C	2	X	2.6m	X	6m	31.2m
D		X		X		

Comments:

Net A was set up in an opening of a forest livestock pond margin, Net B was set up in a forested corridor, Net C was set up in a forested farm road

JACKSON GROUP

Appendix C
Photographs

MS-1 Net A

MS-1 Net B

MS-1 Net C

MS-2 Net A

MS-2 Net B

MS-4 Net C

Eastern Red Bat (*Lasiurus borealis*)

Big Brown Bat (*Eptesicus fuscus*)

Evening Bat (*Nycticeius humeralis*)

Little Brown Bat (*Myotis lucifugus*) face and side profile from MS-2 on 07/13/2020

Little Brown Bat back showing fur and wing color contrast from MS-2 on 07/13/2020

Little Brown Bat showing calcar not keeled from MS-2 on 07/13/2020

Little Brown Bat showing long numerous toe hairs from MS-2 on 07/13/2020

Little Brown Bat from MS-1 on 07/14/2020

Little Brown Bat from MS-1 on 07/14/2020

Little Brown Bat from MS-2 on 07/15/2020 rounded showing tragus.

Little Brown Bat from MS-2 on 07/15/2020 showing long toe hairs and calcar not keeled.

Little Brown Bat from MS-2 on 07/15/2020 showing fur and wing color contrast.

Appendix D

State and Federal Scientific Collection Permits

S11Z1006

Scientific Wildlife Collecting - Fed Protected

SC2011119

Jackson Environmental Consulting Services, LLC
Shane Roberts
3945 Simpson Lane

Richmond, KY 40475

Effective: **1/1/20**
Expires: **12/31/20**
Fed Permit # TE65346A-1

This permit allows the taking and subsequent possession or release of federally-protected wildlife for the purposes of conducting scientific investigations or evaluations for which remuneration is received.

Regulated by
301 KAR 4:070

Your Scientific Wildlife Collecting - Fed Protected is attached below. Keep top portion for your records

Authorization Number: 59323
Issued on date: 13-Feb-2020

KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES
#1 SPORTSMAN'S LANE ARNOLD L. MITCHELL BUILDING FRANKFORT, KENTUCKY 40601

PUNCH OUT CARD HERE

Kentucky Dept. of Fish and Wildlife Resources

Scientific Wildlife Collecting - Fed Protected
SC2011119 **Valid:** 1/1/20 **to** 12/31/20

Jackson Environmental Consulting Services, LLC
Shane Roberts
3945 Simpson Lane

Richmond, KY 40475

Authorized by KDFWR

TE65346A-1

The Kentucky Department of Fish and Wildlife Resources is funded through the sale of hunting and fishing licenses. KDFWR receives no general tax dollars.

REPORT-A-POACHER 1-800-25ALERT

Have a question? Call 1-800-858-1549

Visit us on the web at fw.ky.gov

SEE REVERSE SIDE FOR OPENING INSTRUCTIONS

KY Dept. of Fish & Wildlife Resources
#1 Sportsman's Lane
Frankfort, KY 40601

Important Document

Enclosed

Jackson Environmental Consulting Services, LLC
Shane Roberts
3945 Simpson Lane

Richmond, KY 40475

DEPARTMENT OF THE INTERIOR
U.S. FISH & WILDLIFE SERVICE
Ecological Services Permit Office
1875 Century Boulevard
Atlanta, GA 30345
permitsR4ES@fws.gov

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

MATTHEW S ROBERTS
319 BRANDON COURT
BEREA, KY 40403
U.S.A.

2. AUTHORITY-STATUTES
16 USC 1539(a)

REGULATIONS
50 CFR 17.22

50 CFR 13

3. NUMBER
TE65346A-1 AMENDMENT

4. RENEWABLE ☒ YES ☐ NO

5. MAY COPY ☒ YES ☐ NO

6. EFFECTIVE
06/02/2016

7. EXPIRES
05/31/2021

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*

9. TYPE OF PERMIT
NATIVE ENDANGERED SP. RECOVERY - E WILDLIFE

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
Location: Alabama, Arkansas, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL, TRIBAL, OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

C. 1. The following individual is authorized to conduct activities as authorized by this permit: Matthew S. Roberts.

Trained assistants not named on this permit may work on permitted bat activities under the direct and on-site supervision of the individual named above. However, trained assistants may not work independently at a site. Trained assistants are individuals who are considered qualified by the permittee to select sampling sites, deploy sampling equipment and nets, and handle bats in the field. The permittee must remain present at each mist-net and harp trap site while they are being operated.

D. Acceptance of this permit serves as evidence that the permittee understands and agrees to abide by the terms of this permit and all sections of title 50 Code of Federal Regulations, parts 13 and 17, pertinent to issued permits. Section 11 of the Endangered Species Act of 1973, as amended, provides for civil and criminal penalties for failure to comply with permit conditions.

E. Permittee is authorized to take (enter hibernacula or maternity roost caves, capture with mist nets or harp traps, handle, identify, band, radio-tag, collect hair samples, and salvage) gray bats (*Myotis grisescens*), Indiana bats

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
Annual reports are due by January 31 following each year this permit is in effect.

ISSUED BY	TITLE	DATE
	CHIEF, DIVISION OF ENVIRONMENTAL REVIEW	06/02/2016

(*Myotis sodalis*), and northern long-eared bats (*Myotis septentrionalis*) for presence/absence surveys, population monitoring, and studies to document habitat use, as described in permittee's January 11, 2012, and March 26, 2015, applications and as conditioned below.

F. The permitted activities described above require prior, site-specific approval from the USFWS Field Supervisor in the State(s) where the project will occur. Permittee shall notify the USFWS Field Supervisor for the State in which activities are proposed to occur at least 15 days prior to conducting any activities. Contact information is in Condition P., below. Your request for this site-specific approval must be in writing and must indicate:

F.1. The purpose and a description of the activities proposed (e.g., surveys, radio telemetry studies, etc.).

F.2. Location of proposed activities, including project site (legal description and lat/long), county, and state.

F.3. Dates when the project is proposed to take place.

F.4. You may proceed with activities only upon receipt of written concurrence from the applicable USFWS Field Supervisor. *Your concurrence letter must be carried with this permit to authorize site-specific activities.*

G. Permittee shall adhere to the following conditions involving capture and handling of bats:

G.1. Federally listed bats may be captured (e.g., mist-nets and harp traps) following the protocol(s) provided by the USFWS, when available. Permittees must contact the USFWS FO in the State(s) in which activities are proposed to ensure correct protocol(s) are used. For example, the current Range-wide Indiana Bat Summer Survey Guidelines are available at: http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html. The monitoring interval for mist nets is once every 10 minutes. Harp traps must be continually monitored.

G.2. Captured bats may be held for a maximum of 30 minutes, unless injured. If an exception is required to this prohibition, permittee must receive prior written approval from the USFWS Field Supervisor for the state in which the activities are proposed to occur.

G.3. Permittees shall carry out non-intrusive measurements on all captured bats. Data shall be recorded for all bats captured and include, but not be limited to, the data requested in any automated or species specific data form provided by the USFWS (e.g., USFWS Bat Reporting Form available at: http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html). Handling should be limited to the maximum extent practicable and should cease immediately at signs of undue stress (e.g., bat becoming unresponsive, etc.). Bats that appear stressed from handling should be placed in a dark, quiet location away from activity where it can safely fly away after recovery, and should be checked to ensure successful recovery before leaving the study site. Photographs of the identifying characteristics for each individual federally listed species captured are encouraged. The permittee may be requested to provide individual photographs after submittal of annual reporting data.

G.4. If bands are applied, they must be lipped metal bands having a unique identifier. Bands should be applied to the forearm of captured bats prior to release. No more than one band per bat may be used. Position the band on the wing so that when the bat is hanging upside down, the band numbers are right-side up. A single band should be placed on the right forearm of each male and the left forearm of each female bat.

G.5. Radio transmitters may be applied during spring, summer, and fall roosting and migration periods via nontoxic skin bond adhesive. The total weight of the transmitter may not exceed 5% of the bat's body weight and the total weight of the package (transmitter and adhesive) may not exceed 6% of the bat's body weight. The lightest package (both transmitter and adhesive) capable of accomplishing the required task should be used,

especially with pregnant females and newly volant juveniles. Bats carrying transmitters must be monitored daily for at least five days, or until the transmitter falls off, whichever occurs first.

G.6. Permittee may collect dorsal hair samples from captured bats. Hair samples shall be obtained via clipping fur from between scapula from females and juvenile males. The clipped area is the same area frequently clipped for radio transmitter attachment. All boards and equipment used to obtain samples must be disinfected according to the protocol cited in Condition G.8.

G.7. No capture activities shall occur within 20 meters of a known or potential summer or winter roost site, either natural or artificial, of a federally listed bat. If an exception is required to this prohibition, permittee must receive prior written approval from the USFWS Field Supervisor for the State in which the activities are proposed to occur.

G.8. Equipment used to capture and handle bats shall be cleaned and decontaminated, including personal gear such as boots and gloves, using products cited in decontamination guidelines and in compliance with label directions. The most recent decontamination guidance is found on the web at: <http://whitenosesyndrome.org/>

G.9. Caves, mines, or other suitable hibernation sites may be quietly searched in a manner that minimizes disturbance by utilizing the minimum number of people and time required to complete the survey. Surveys of known hibernacula conducted during the winter hibernation season shall follow the guidelines established in the recovery plans for each federally listed bat species with regards to how often a site may be visited and other species-specific requirements related to entering hibernaculum (for example, for Indiana bats, winter surveys should not be repeated more often than once every other year in any given hibernaculum), unless authorized by the appropriate Service Recovery Lead identified in Condition O (below).

Under no circumstances should multiple trips to the hibernation area occur within the same year without written approval of the USFWS Field Supervisor for the state in which activities are proposed.

Bats may be handled during winter surveys in order to collect band information and confirm the identification of listed species. When possible, bands should be read without touching the bat. Banded bats should only be handled if easily accessible and removal of the bat does not disturb a large number of additional bats and is unlikely to result in injury to the bat. Detailed photographs should be taken to document the presence of listed species in previously undocumented hibernaculum. Where hibernacula area and safety conditions allow, individuals entering hibernacula are recommended to utilize night vision goggles or red-filtered light and to remain in the site no more than 90 minutes to complete the work.

G.10. Surveys of gray bat maternity roosts and their other known summer roost sites shall be conducted by observing the bats with night vision equipment and/or infrared light sources (e.g., thermal infrared) as they emerge from their roosts to avoid any possible disturbance to these bats. At previously undocumented sites for these species, the accepted method to determine if they are present is to carefully and slowly enter the potential roost site to check for evidence of presence/use, such as visual observation of bats, significant quantities or a strong smell of guano, or the audible sounds produced by bats roosting at the site. As soon as any evidence is obtained that the roost site is being used by a federally listed bat species, survey team members shall immediately exit the roost site and make further observations from outside the entrance to the roost. All further observations shall be made from the entrance during the evening emergence.

H. Upon determination that endangered bats are present, permittee shall notify the following offices immediately (not to exceed 1 business day): the appropriate USFWS Regional Office (Condition N.), and the USFWS Field Office within the geographic location of study areas (Condition P.).

I. Permittee must carry a copy of this permit at all times when conducting the authorized activities. NOTE: This

permit is limited to the above activities and identified species.

J. Issuance of this permit does not constitute permission to conduct these activities on National Wildlife Refuges or any other public or private lands; such permission must be obtained separately from the appropriate landowner or land manager before beginning these authorized activities. This permit, neither directly nor by implication, grants the right of trespass.

K. The Service anticipates that no federally listed bats will be injured or killed as a result of permitted activities. In the event that any accidental injury or mortality occurs, all activities must cease and the injury or mortality reported immediately (not to exceed 1 business day) to the Southeast Regional Office listed in condition N.3. and to the Lead Recovery Biologist for the species (Condition O). The USFWS will work with the permittee to determine the cause of injury or mortality and whether such could be avoided should activities be allowed to proceed. Dead or moribund bats may be retained for further study only with the written permission of the USFWS. Any bats that are not authorized for retention are to be chilled and promptly transferred to the USFWS for potential necropsy and/or for scientific or educational purposes.

Upon locating a dead, injured, or sick bat, or any other threatened or endangered species, under circumstances not addressed in this authorization, initial notification must be made immediately (not to exceed 1 business day) to the appropriate Regional Office identified in Condition N., below, including a description of the circumstances, location information, and photo documentation. Notification should also be made at the same time to the appropriate USFWS Field Office identified in Condition P., below. Care should be taken in handling sick, injured, or dead specimens to ensure effective treatment or to preserve biological materials for later analysis. In conjunction with the care of sick or injured threatened or endangered species, and the preservation of biological materials from a dead animal, the permittee should take responsible steps to ensure that the site is not unnecessarily disturbed. Prior to collecting the specimen(s), you must photograph the specimen(s) to document the conditions in which they were found. You may preserve the specimen(s) by freezing them or other suitable method to allow scientific study. Disposition of collected specimen(s) shall be determined by the USFWS Field Office.

L. This permit is non-transferable.

M. Reports are due on January 31 following each year this permit is in effect. At a minimum, your report shall include:

M.1. The date, time, geographic locations (including datum and projection information).

M.2. All locations surveyed (regardless of whether federally listed bats were captured/observed).

M.3. Band numbers of all bats banded and all bats recovered/observed.

M.4. Information on any injuries and/or mortalities and disposition of specimens.

M.5. Location and characteristics of roost trees and bat colonies.

M.6. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.

M.7. Data shall be submitted for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data form provided by the USFWS (e.g., USFWS Bat Reporting Form available at: http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html). Photographs of the identifying characteristics for each individual federally listed species captured are encouraged. The permittee may

Scientific Wildlife Collecting - Fed Protected

SC2011120

Jackson Environmental Consulting Services, LLC
Robert C Oney
3945 Simpson Lane

Richmond, KY 40475

Effective: **1/1/20**
Expires: **12/31/20**
Fed Permit # TE65002A-1

This permit allows the taking and subsequent possession or release of federally-protected wildlife for the purposes of conducting scientific investigations or evaluations for which remuneration is received.

Regulated by
301 KAR 4:070

Your Scientific Wildlife Collecting - Fed Protected is attached below. Keep top portion for your records

Authorization Number: 6195
Issued on date: 13-Feb-2020

KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES
#1 SPORTSMAN'S LANE ARNOLD L. MITCHELL BUILDING FRANKFORT, KENTUCKY 40601

PUNCH OUT CARD HERE

Kentucky Dept. of Fish and Wildlife Resources

Scientific Wildlife Collecting - Fed Protected
SC2011120 **Valid:** 1/1/20 **to** 12/31/20

Jackson Environmental Consulting Services, LLC
Robert C Oney
3945 Simpson Lane

Richmond, KY 40475

Authorized by KDFWR

TE65002A-1

The Kentucky Department of Fish and Wildlife Resources is funded through the sale of hunting and fishing licenses. KDFWR receives no general tax dollars.

REPORT-A-POACHER 1-800-25ALERT

Have a question? Call 1-800-858-1549

Visit us on the web at fw.ky.gov

SEE REVERSE SIDE FOR OPENING INSTRUCTIONS

KY Dept. of Fish & Wildlife Resources
#1 Sportsman's Lane
Frankfort, KY 40601

Important Document

Enclosed

Jackson Environmental Consulting Services, LLC
Robert C Oney
3945 Simpson Lane

Richmond, KY 40475

DEPARTMENT OF THE INTERIOR
U.S. FISH & WILDLIFE SERVICE
Ecological Services Permit Office
1875 Century Boulevard
Atlanta, GA 30345
permitsR4ES@fws.gov

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

ROBERT C ONEY
101 POWE DRIVE
WINCHESTER, KY 40391
U.S.A.

2. AUTHORITY-STATUTES
16 USC 1539(a)

REGULATIONS
50 CFR 17.22

50 CFR 13

3. NUMBER
TE65002A-1
AMENDMENT

4. RENEWABLE
☒ YES
☐ NO

5. MAY COPY
☐ YES
☒ NO

6. EFFECTIVE
05/09/2016

7. EXPIRES
05/31/2021

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*

9. TYPE OF PERMIT
NATIVE ENDANGERED SP. RECOVERY - E WILDLIFE

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
Location: Alabama, Arkansas, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL, TRIBAL, OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

C. 1. The following individual is authorized to conduct activities as authorized by this permit: Robert C. Oney.

Trained assistants not named on this permit may work on permitted bat activities under the direct and on-site supervision of the individual named above. However, trained assistants may not work independently at a site. Trained assistants are individuals who are considered qualified by the permittee to select sampling sites, deploy sampling equipment and nets, and handle bats in the field. The permittee must remain present at each mist-net and harp trap site while they are being operated.

D. Acceptance of this permit serves as evidence that the permittee understands and agrees to abide by the terms of this permit and all sections of title 50 Code of Federal Regulations, parts 13 and 17, pertinent to issued permits. Section 11 of the Endangered Species Act of 1973, as amended, provides for civil and criminal penalties for failure to comply with permit conditions.

E. Permittee is authorized to take (enter hibernacula or maternity roost caves, capture with mist nets or harp traps, handle, identify, band, radio-tag, collect hair samples, and salvage) gray bats (*Myotis grisescens*), Indiana bats

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
Annual reports are due January 31 following each year the permit is in effect.

ISSUED BY	TITLE	DATE
	CHIEF, DIVISION OF ENVIRONMENTAL REVIEW	05/09/2016

(*Myotis sodalis*), northern long-eared bats (*Myotis septentrionalis*), and Virginia big-eared bats(*Corynorhinus townsendii virginianus*) for presence/absence surveys, population monitoring, and studies to document habitat use, as described in permittee's January 4, 2012, and March 26, 2015, applications and as conditioned below.

F. The permitted activities described above require prior, site-specific approval from the USFWS Field Supervisor in the State(s) where the project will occur. Permittee shall notify the USFWS Field Supervisor for the State in which activities are proposed to occur at least 15 days prior to conducting any activities. Contact information is in Condition P., below. Your request for this site-specific approval must be in writing and must indicate:

F.1. The purpose and a description of the activities proposed (e.g., surveys, radio telemetry studies, etc.).

F.2. Location of proposed activities, including project site (legal description and lat/long), county, and state.

F.3. Dates when the project is proposed to take place.

F.4. You may proceed with activities only upon receipt of written concurrence from the applicable USFWS Field Supervisor. *Your concurrence letter must be carried with this permit to authorize site-specific activities.*

G. Permittee shall adhere to the following conditions involving capture and handling of bats:

G.1. Federally listed bats may be captured (e.g., mist-nets and harp traps) following the protocol(s) provided by the USFWS, when available. Permittees must contact the USFWS FO in the State(s) in which activities are proposed to ensure correct protocol(s) are used. For example, the current Range-wide Indiana Bat Summer Survey Guidelines are available at:
http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html. The monitoring interval for mist nets is once every 10 minutes. Harp traps must be continually monitored.

G.2. Captured bats may be held for a maximum of 30 minutes, unless injured. If an exception is required to this prohibition, permittee must receive prior written approval from the USFWS Field Supervisor for the state in which the activities are proposed to occur.

G.3. Permittees shall carry out non-intrusive measurements on all captured bats. Data shall be recorded for all bats captured and include, but not be limited to, the data requested in any automated or species specific data form provided by the USFWS (e.g., USFWS Bat Reporting Form available at:
http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html). Handling should be limited to the maximum extent practicable and should cease immediately at signs of undue stress (e.g., bat becoming unresponsive, etc.). Bats that appear stressed from handling should be placed in a dark, quiet location away from activity where it can safely fly away after recovery, and should be checked to ensure successful recovery before leaving the study site. Photographs of the identifying characteristics for each individual federally listed species captured are encouraged. The permittee may be requested to provide individual photographs after submittal of annual reporting data.

G.4. If bands are applied, they must be lipped metal bands having a unique identifier. Bands should be applied to the forearm of captured bats prior to release. No more than one band per bat may be used. Position the band on the wing so that when the bat is hanging upside down, the band numbers are right-side up. A single band should be placed on the right forearm of each male and the left forearm of each female bat.

G.5. Radio transmitters may be applied during spring, summer, and fall roosting and migration periods via nontoxic skin bond adhesive. The total weight of the transmitter may not exceed 5% of the bat's body weight and the total weight of the package (transmitter and adhesive) may not exceed 6% of the bat's body weight. The lightest package (both transmitter and adhesive) capable of accomplishing the required task should be used,

especially with pregnant females and newly volant juveniles. Bats carrying transmitters must be monitored daily for at least five days, or until the transmitter falls off, whichever occurs first.

G.6. Permittee may collect dorsal hair samples from captured bats. Hair samples shall be obtained via clipping fur from between scapula from females and juvenile males. The clipped area is the same area frequently clipped for radio transmitter attachment. All boards and equipment used to obtain samples must be disinfected according to the protocol cited in Condition G.8.

G.7. No capture activities shall occur within 20 meters of a known or potential summer or winter roost site, either natural or artificial, of a federally listed bat. If an exception is required to this prohibition, permittee must receive prior written approval from the USFWS Field Supervisor for the State in which the activities are proposed to occur.

G.8. Equipment used to capture and handle bats shall be cleaned and decontaminated, including personal gear such as boots and gloves, using products cited in decontamination guidelines and in compliance with label directions. The most recent decontamination guidance is found on the web at: <http://whitenosesyndrome.org/>

G.9. Caves, mines, or other suitable hibernation sites may be quietly searched in a manner that minimizes disturbance by utilizing the minimum number of people and time required to complete the survey. Surveys of known hibernacula conducted during the winter hibernation season shall follow the guidelines established in the recovery plans for each federally listed bat species with regards to how often a site may be visited and other species-specific requirements related to entering hibernaculum (for example, for Indiana bats, winter surveys should not be repeated more often than once every other year in any given hibernaculum), unless authorized by the appropriate Service Recovery Lead identified in Condition O (below).

Under no circumstances should multiple trips to the hibernation area occur within the same year without written approval of the USFWS Field Supervisor for the state in which activities are proposed.

Bats may be handled during winter surveys in order to collect band information and confirm the identification of listed species. When possible, bands should be read without touching the bat. Banded bats should only be handled if easily accessible and removal of the bat does not disturb a large number of additional bats and is unlikely to result in injury to the bat. Detailed photographs should be taken to document the presence of listed species in previously undocumented hibernaculum. Where hibernacula area and safety conditions allow, individuals entering hibernacula are recommended to utilize night vision goggles or red-filtered light and to remain in the site no more than 90 minutes to complete the work.

G.10. Surveys of gray bat and Virginia big-eared bat maternity roosts and their other known summer roost sites shall be conducted by observing the bats with night vision equipment and/or infrared light sources (e.g., thermal infrared) as they emerge from their roosts to avoid any possible disturbance to these bats. At previously undocumented sites for these species, the accepted method to determine if they are present is to carefully and slowly enter the potential roost site to check for evidence of presence/use, such as visual observation of bats, significant quantities or a strong smell of guano, or the audible sounds produced by bats roosting at the site. As soon as any evidence is obtained that the roost site is being used by a federally listed bat species, survey team members shall immediately exit the roost site and make further observations from outside the entrance to the roost. All further observations shall be made from the entrance during the evening emergence.

H. Upon determination that endangered bats are present, permittee shall notify the following offices immediately (not to exceed 1 business day): the appropriate USFWS Regional Office (Condition N.), and the USFWS Field Office within the geographic location of study areas (Condition P.).

I. Permittee must carry a copy of this permit at all times when conducting the authorized activities. NOTE: This

permit is limited to the above activities and identified species.

J. Issuance of this permit does not constitute permission to conduct these activities on National Wildlife Refuges or any other public or private lands; such permission must be obtained separately from the appropriate landowner or land manager before beginning these authorized activities. This permit, neither directly nor by implication, grants the right of trespass.

K. The Service anticipates that no federally listed bats will be injured or killed as a result of permitted activities. In the event that any accidental injury or mortality occurs, all activities must cease and the injury or mortality reported immediately (not to exceed 1 business day) to the Southeast Regional Office listed in condition N.3. and to the Lead Recovery Biologist for the species (Condition O). The USFWS will work with the permittee to determine the cause of injury or mortality and whether such could be avoided should activities be allowed to proceed. Dead or moribund bats may be retained for further study only with the written permission of the USFWS. Any bats that are not authorized for retention are to be chilled and promptly transferred to the USFWS for potential necropsy and/or for scientific or educational purposes.

Upon locating a dead, injured, or sick bat, or any other threatened or endangered species, under circumstances not addressed in this authorization, initial notification must be made immediately (not to exceed 1 business day) to the appropriate Regional Office identified in Condition N., below, including a description of the circumstances, location information, and photo documentation. Notification should also be made at the same time to the appropriate USFWS Field Office identified in Condition P., below. Care should be taken in handling sick, injured, or dead specimens to ensure effective treatment or to preserve biological materials for later analysis. In conjunction with the care of sick or injured threatened or endangered species, and the preservation of biological materials from a dead animal, the permittee should take responsible steps to ensure that the site is not unnecessarily disturbed. Prior to collecting the specimen(s), you must photograph the specimen(s) to document the conditions in which they were found. You may preserve the specimen(s) by freezing them or other suitable method to allow scientific study. Disposition of collected specimen(s) shall be determined by the USFWS Field Office.

L. This permit is non-transferable.

M. Reports are due on January 31 following each year this permit is in effect. At a minimum, your report shall include:

M.1. The date, time, geographic locations (including datum and projection information).

M.2. All locations surveyed (regardless of whether federally listed bats were captured/observed).

M.3. Band numbers of all bats banded and all bats recovered/observed.

M.4. Information on any injuries and/or mortalities and disposition of specimens.

M.5. Location and characteristics of roost trees and bat colonies.

M.6. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.

M.7. Data shall be submitted for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data form provided by the USFWS (e.g., USFWS Bat Reporting Form available at: http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html). Photographs of the identifying characteristics for each individual federally listed species captured are encouraged. The permittee may

Scientific Wildlife Collecting - Fed Protected

SC2011237

Jackson Environmental Consulting Services, LLC
Devin Bingham
3945 Simpson Lane

Richmond, KY 40475

Effective: **1/1/20**
Expires: **12/31/20**
Fed Permit # TE52113D-0

This permit allows the taking and subsequent possession or release of federally-protected wildlife for the purposes of conducting scientific investigations or evaluations for which remuneration is received.

Regulated by
301 KAR 4:070

Your Scientific Wildlife Collecting - Fed Protected is attached below. Keep top portion for your records

Authorization Number: 63809
Issued on date: 15-Jul-2020

Kentucky Dept. of Fish and Wildlife Resources

Scientific Wildlife Collecting - Fed Protected
SC2011237 **Valid:** 1/1/20 **to** 12/31/20

Jackson Environmental Consulting Services, LLC
Devin Bingham
3945 Simpson Lane

Richmond, KY 40475

Authorized by KDFWR

TE52113D-0

The Kentucky Department of Fish and Wildlife Resources is funded through the sale of hunting and fishing licenses. KDFWR receives no general tax dollars.

REPORT-A-POACHER 1-800-25ALERT

Have a question? Call 1-800-858-1549

Visit us on the web at fw.ky.gov

Important Document

Enclosed

Jackson Environmental Consulting Services, LLC
Devin Bingham
3945 Simpson Lane

Richmond, KY 40475

NATIVE ENDANGERED & THREATENED SP. RECOVERY
ENDANGERED & THREATENED WILDLIFE

Permit Number: TE52113D-0

Effective: 06/19/2020 Expires: 06/30/2025

Issuing Office:

Department of the Interior
U.S. FISH & WILDLIFE SERVICE
Ecological Services Permit Office
1875 Century Boulevard
Atlanta, GA 30345
permitsR4ES@fws.gov

CHIEF, DIVISION OF ENVIRONMENTAL REVIEW

Permittee:

DEVIN T BINGHAM
244 BOOKMAN MILL ROAD
IRMO, SC 29063
U.S.A.

Authority: Statutes and Regulations: 16 USC 1539(a), 16 USC 1533(d); 50 CFR 17.22, 50 CFR 17.32, 50 CFR 13.

Location where authorized activity may be conducted:

Alabama, Arkansas, Connecticut, Delaware, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Reporting requirements:

Annual Reports are due by January 31 following each year that this permit is in effect.

Authorizations and Conditions:

A. General conditions set out in Subpart B of 50 CFR 13, and specific conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accordance with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information and reports.

B. The validity of this permit is also conditioned upon strict observance of all applicable foreign, state, local tribal, or other federal law.

C. The following individual is authorized to conduct activities as authorized by this permit: Devin T. Bingham.

Trained assistants not named on this permit may work on permitted bat activities under the direct and on-site supervision of the individual named above. However, trained assistants may not work independently at a site. Trained assistants are individuals who are considered qualified by the permitted biologist to select sampling sites, deploy sampling equipment and nets, and handle bats in the field.

The permittee must remain present at each mist-net site while it is being operated.

D. Acceptance of this permit serves as evidence that the permittee understands and agrees to abide by the terms of

this permit and all sections of Title 50 Code of federal regulations, parts 13 and 17, pertinent to issued permits. Section 11 of the endangered species act of 1973, as amended, provides for civil and criminal penalties for failure to comply with permit conditions. In addition, the permittee shall have all other applicable Federal, Tribal, State, and/or local government permits prior to the commencement of activities authorized in this permit.

E. Permittee is authorized to take (capture with mist nets, handle, identify, band, and radio tag) Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*) for presence/absence surveys, as specified in permittee's August 9, 2019, application and as conditioned below.

F. The permitted activities described herein require prior, site-specific approval from the U.S. Fish and Wildlife Service (USFWS) Field Supervisor in the State(s) where the project will occur. Permittee shall notify the USFWS Field Supervisor for the State in which activities are proposed to occur at least 15 days prior to conducting any activities. Contact information is available at https://www.fws.gov/ecological-services/map/directory.html#AL. Your request for this site-specific approval must be in writing and must indicate:

1. The purpose and a description of the activities proposed.

2. Location of proposed activities, including project site (legal description and lat/long), county, and state.

3. Dates when the project is proposed to take place.

4. You may proceed with activities only upon receipt of written concurrence from the applicable USFWS Field Supervisor. *Your concurrence letter/email must be carried with this permit to authorize site-specific activities*.

G. Permittee shall adhere to the following conditions involving capture and handling of bats:

G.1. Federally listed bats may be captured following the protocol(s) provided by the USFWS, when available. Permittee must contact the USFWS FO in the state(s) in which activities are proposed to ensure correct protocol(s) are used. For example, the current Range-wide Indiana Bat Summer Survey Guidelines are available at: http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html. The monitoring interval for mist nets is once every 10 minutes.

G.2. Captured bats may be held for a maximum of 30 minutes, unless injured. If an exception is required to this prohibition, permittee must receive prior written approval from the USFWS Field Supervisor for the state in which the activities are proposed to occur (https://www.fws.gov/ecological-services/map/directory.html#AL).

G.3. Permittee shall carry out non-intrusive measurements on all captured bats. Data shall be recorded for all bats captured and include, but not be limited to, the data requested in any automated or species specific data form provided by the USFWS (e.g., USFWS Bat Reporting Form available at: http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html). Handling should be limited to the maximum extent practicable and should cease immediately at signs of undue stress (e.g., bat becoming unresponsive, etc.). Bats that appear stressed from handling should be placed in a dark, quiet location away from activity where it can safely fly away after recovery, and should be checked to ensure successful recovery before leaving the study site. Photographs of the identifying characteristics for each individual federally listed species captured are encouraged. The permittee may be requested to provide individual photographs after submittal of annual reporting data.

G.4. If bands are applied, these must be lipped metal bands having a unique identifier. Bands should be applied to the forearm of captured bats prior to release. No more than one band per bat may be used. Position the band on the wing so that when the bat is hanging upside down, the band numbers are right-side up. A single band should be placed on the right forearm of each male and the left forearm of each female bat.

G.5. Radio transmitters may be applied during spring, summer, and fall roosting and migration periods via nontoxic skin bond adhesive. The total weight of the transmitter may not exceed 5% of the bat's body weight and the total weight of the package (transmitter and adhesive) may not exceed 6% of the bat's body weight. The lightest package (both transmitter and adhesive) capable of accomplishing the required task should be used, especially with pregnant females and newly volant juveniles. Bats carrying transmitters must be monitored daily for at least five days, or until the transmitter falls off, whichever occurs first. **** Although not required as a condition of this permit, in order to gather needed information to promote the conservation of the northern long-eared bat, it is recommended that the permittee radio-track female and juvenile northern long-eared bats captured when conducting mist-netting and radio-tracking of Indiana bats within the white-nose syndrome (WNS) zone of the range of the northern long-eared bat. Specifics on the number of females and juvenile bats to be tracked will be determined in coordination with the appropriate Field Office, as specified in Condition F (above).***

G.6. No capture activities shall occur within 20 meters of a known or potential summer or winter roost site, either natural or artificial, of a federally listed bat. If an exception is required to this prohibition, permittee must receive prior written approval from the USFWS Field Supervisor for the State in which the activities are proposed to occur.

G.7. Equipment used to capture and handle bats shall be cleaned and decontaminated, including personal gear such as boots and gloves, using products cited in decontamination guidelines and in compliance with label directions. The most recent decontamination guidance is found on the web at: http://whitenosesyndrome.org/.

H. Upon determination that endangered bats are present, permittee shall notify the USFWS Field Office within the geographic location of study areas (https://www.fws.gov/ecological-services/map/directory.html#AL) immediately (not to exceed 1 business day).

I. Permittee must carry a copy of this permit at all times when conducting the authorized activities. NOTE: This permit is limited to the above activities and identified species.

J. Issuance of this permit does not constitute permission to conduct these activities on National Wildlife Refuges or any other public or private lands; such permission must be obtained separately from the appropriate landowner or land manager before beginning these authorized activities. This permit, neither directly nor by implication, grants the right of trespass.

K. No injury or mortality is expected to occur to federally listed species covered under this permit. In the event that any accidental injury or mortality occurs, all activities must cease and the injury or mortality reported immediately (not to exceed 1 business day) to the Southeast Regional Office listed in condition N.1. and to the Lead Recovery Biologist for the species (Condition O). Based on consultation between these offices, a decision will be made as to whether any of the authorized activities can continue. Decisions will also be made concerning the disposition of any dead or injured specimens. The permittee shall provide a written statement to the species recovery lead(s) and Southeast Region Permit Coordinator documenting the cause of the injury or mortality, and identifying the remedial measures that will be employed by the permittee to eliminate future mortality or injury events. The final decision on

remedial measures and disposition of specimens rests with the USFWS.

Upon locating a dead, injured, or sick federally listed species, under circumstances not addressed in this authorization, initial notification must be made immediately to the USFWS Field Office in the State in which the specimen is found (https://www.fws.gov/ecological-services/map/directory.html#AL). Notification should also be made by the next work day to the USFWS' Southeast Region Permit Coordinator identified in Condition N.1., below. Those offices will confer with the USFWS' Division of Law Enforcement as appropriate and determine next steps. Care should be taken in handling sick, injured, or dead specimens to ensure effective treatment or to preserve biological materials for later analysis. In conjunction with the care of sick or injured endangered or threatened species, and the preservation of biological materials from a dead individual, the finder should take responsible steps to ensure that the site is not unnecessarily disturbed.

L. This permit is non-transferable.

M. An annual report summarizing authorized activities must be submitted to the offices identified in Conditions N and O, as well as to the USFWS Field Offices in the States where activities occurred (https://www.fws.gov/ecological-services/map/directory.html#AL), by January 31 following each year that this permit is in effect. Each report should include, at a minimum, the following information:

M.1. The date, time, geographic locations (including datum and projection information).

M.2. All locations surveyed (regardless of whether federally-listed bats were captured/observed).

M.3. Band numbers of all bats banded.

M.4. Information on any injuries and/or mortalities and disposition of specimens.

M.5. Location and characteristics of roost trees and bat colonies.

M.6. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.

M.7. Data shall be submitted for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data form provided by the USFWS (e.g., USFWS Bat Reporting Form available at: http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html). Photographs of the identifying characteristics for each individual federally listed species captured are encouraged. The permittee may be requested to provide individual photographs after submittal of annual reporting data.

M.8. Copies of all site-specific authorization letters/emails required under Condition F.

IF NO ACTIVITIES OCCURRED OVER THE COURSE OF THE YEAR, INDICATION OF SUCH SHALL BE SUBMITTED AS AN ANNUAL REPORT.

N. For purposes of monitoring compliance and administration of the terms and conditions of this permit, the contact office of the U.S. Fish and Wildlife Service is:

Whitney Rubin

From: Shane Roberts <sroberts@jacksongroupco.com>
Sent: Monday, September 21, 2020 1:19 PM
To: Whitney Rubin
Subject: FW: [EXTERNAL] Bat Survey Study Plan - Bluebird Solar
Attachments: 2020_09_09_Bluebird_Bat_Survey_Combined_Report.pdf

Hey Whitney-

Please see below. The USFWS has approved the bat survey.

Have a great day!

Shane

Shane Roberts | Vice President | T +1 859.200.6242 | sroberts@jacksongroupco.com

---

From: Allison, Carrie <Carrie_Allison@fws.gov>
Sent: Monday, September 21, 2020 3:45 PM
To: Shane Roberts <sroberts@jacksongroupco.com>
Subject: Fw: [EXTERNAL] Bat Survey Study Plan - Bluebird Solar

Hi, Shane-

You can consider this email approval of the bat survey. The survey is valid for a period of 5 years. If you have any questions, please let me know.

Sincerely,

Carrie L. Allison
U.S. Fish and Wildlife Service
330 W. Broadway, Rm. 265
Frankfort, KY 40601
502-382-5965 (cell)
502-695-0468 ext. 46103 (office)
502.695.1024 (fax)
"You cannot get through a single day without having an impact on the world around you. What you do makes a difference, and you have to decide what kind of difference you want to make." ~Jane Goodall

SHORTS'S BLADDERPOD SURVEY REPORT

BayWa r.e. Solar Projects, LLC
Bluebird Solar Farm
Harrison County, Kentucky

Prepared by:

Jackson Group
3945 Simpson Lane
Richmond, KY 40475
www.jacksongroupco.com

Prepared for:

BayWa r.e.

JUNE 2020

Table of Contents

Executive Summary

This Short's bladderpod survey (*Physaria globosa*) was conducted with the appropriate level of effort and under the appropriate conditions to investigate the presence/absence of Short's bladderpod for the proposed Bluebird Solar Farm. Jackson Group biologists conducted a pedestrian survey within the area of interest between 22 April 2020 and 28 April 2020. A meander search method was used throughout the area of interest. Areas that exhibited characteristics of potentially suitable habitat were thoroughly searched for Short's bladderpod. Short's bladderpod was not observed during the survey effort.

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1.0 Introduction

BayWa r.e. Solar Projects, LLC (BayWa) is proposing the development of a utility-scale, ground-mounted Solar Photovoltaic (PV) project. The Bluebird Solar Farm project is located near Broadwell in Harrison County, Kentucky.

Jackson Group was contracted by BayWa to conduct a presence/absence survey for Short's bladderpod (*Physaria globosa*) within the area of interest (AOI) for the proposed Bluebird Solar Farm. In developing this document, Jackson Group has no knowledge of known occurrence information within the AOI.

1.1 Qualifications

This Short's bladderpod survey was conducted by Mr. Robert Oney, Mr. Shane Roberts, and Mr. Devin Bingham of Jackson Group. Mr. Oney and Mr. Roberts have over 20 years of experience in botanical surveys, wildlife surveys, biological assessments, linear and non-linear ecological assessments, natural resource planning, urban ecology, wildlife habitat management planning, endangered species surveys, and Clean Water Act permitting.

2.0 Project Description

BayWa is developing utility-scale, ground-mounted Solar Photovoltaic (PV) projects throughout the United States. The Bluebird Solar Farm project is within the territory of Eastern Kentucky Power Cooperative, Inc. (EKPC). The project will interconnect with an EKPC Substation near Broadwell in Harrison County, Kentucky. The project AOI is approximately 1,400 acres and is depicted on mapping provided in Appendix A.

3.0 Short's Bladderpod Background Information

Short's bladderpod typically grows on steep, rocky, wooded slopes and/or talus areas (USFWS 2017), where it occurs along the tops, bases, and ledges of bluffs. It has however infrequently been observed on sites with little topographic relief (USFWS 2017). The species is usually found in these habitats on south- to west-facing slopes near rivers or streams, with most populations closely associated with calcareous outcrops (USFWS 2017). The most vigorous and stable occurrences of Short's bladderpod are found at sites with a relatively open overstory canopy. Some occurrences have also been found in areas of deeper soil and roadsides. Short's bladderpod is a biennial/perennial that typically flowers and produces seed during the months of March through June. Some potential threats to the species include, right-of-way maintenance, overstory shading, invasive species, and small population size affect most populations. The historical and current distributions of Short's bladderpod are characterized primarily by populations of low resiliency, due to small population sizes, presence of threats to the species and its habitat (i.e. soil erosion, prolonged flooding, overstory shading, and invasive plant species). The species, according to a 1992 survey, had an abundance of 118 Short's bladderpod occurring in Bourbon County. However, more recent surveys show the species is no longer extant in Bourbon or Scott counties, but is now present in Madison and Woodford counties.

Visually, Short's bladderpod may be distinguished in the field from other yellow-flowering mustards with a shared distribution based on dense pubescence (fine hairs) that gives the leaves a gray-green appearance, the small pubescent siliques (pods) born on straight pedicels (stems that attach single flowers to the larger flowering structure), and stems that are typically (though not always) branching to give the plant a low, sprawling, bushy appearance.

4.0 Short's Bladderpod Survey

5.1 Methods

Jackson Group biologists conducted a pedestrian survey within the AOI between 22 April 2020 and 28 April 2020. Areas within the AOI that exhibited characteristics of potentially suitable habitat were thoroughly searched for Short's bladderpod using parallel transects spaced a few meters apart. The following observational data was

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collected and is located in Appendices B:

- Representative photographs of habitat composition within the AOI

5.0 Results and Summary

Historically, Short's bladderpod thrived on steep, rocky, wooded slopes and talus areas with open canopy tops. Shorts bladderpod requires rich soil along with calcareous outcrops, much like the reaches of the Cumberland and Kentucky rivers or their tributaries. These slopes provide more open canopy, dry surface limestone, and make it more difficult for invasive species to dominate the understory. Typically, Short's bladderpod is not observed growing in areas dominated by non-native plants. Invasive plants lead to unsuitable habitat conditions by way of out competing native species, including Short's bladderpod. These invasive plants lead to a lack of available resources such as moisture, nutrients, space, and sunlight.

The proposed AOI is approximately 1,400 acres, located within the Interior Plateau level III ecoregion, in Harrison County, Kentucky. The Interior Plateau ecoregion is characterized by a series of grassland plateaus and forested uplands that are generally lower in elevation than the Appalachian Mountains to the east, but higher than the plains to the south. Land use activities within and surrounding the proposed AOI are predominantly agricultural, including row crops (i.e. tobacco, corn, wheat, alfalfa, hemp) and pasture lands with interspersed forested areas (i.e. small wood lots, sparsely forested fence rows) and narrowly forested riparian zones.

The Project AOI is dominated by agriculture uses and practices. The vegetative communities present within the AOI are typical for communities associated with and disturbed by agricultural uses. The majority of the AOI is comprised of open fields for pasture and/or row crops. The overall topography for the AOI is nearly flat to gently sloping and lacks calcareous rock outcrops, which is not considered suitable habitat for Short's bladderpod. Most of the topographic relief within the AOI occurs in and around stream channels. However, stream channels within the AOI and their associated forested communities generally display a shade regime with high shade intensity (%) and duration which is not suitable for Short's bladderpod. In addition, there is an abundance of invasive plant species within the forested areas of the AOI that include Amur honeysuckle (*Lonicera maackii*), Japanese honeysuckle (*Lonicera japonica*), common chickweed (*Stellaria media*), garlic mustard (*Alliaria petiolata*), poison hemlock (*Conium maculatum*), and multiflora Rose (*Rosa multiflora*). Overall the combination of these physical and vegetative community characteristics are not conducive for Short's bladderpod.

Short's bladderpod was not observed within the AOI during survey efforts nor were any areas identified that would potentially fulfill the species habitat requirements. Therefore, it is Jackson Group's opinion that any proposed disturbance within the AOI is not likely to adversely affect Short's bladderpod.

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6.0 Literature Cited

U.S. Fish and Wildlife Service. 2017. Draft Recovery Plan for Short's Bladderpod (*Physaria globosa*). Atlanta, Georgia.

U.S. Fish and Wildlife Service. 2017. Species Status Assessment Short's Bladderpod (*Physaria globosa*). Atlanta, Georgia.

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Appendix A: Project Mapping

Legend

Area of Interest

BayWa r.e.

Bluebird Solar

Harrison County, Kentucky

TITLE

SHORT'S BLADDERPOD SURVEY
AREA OF INTEREST MAP

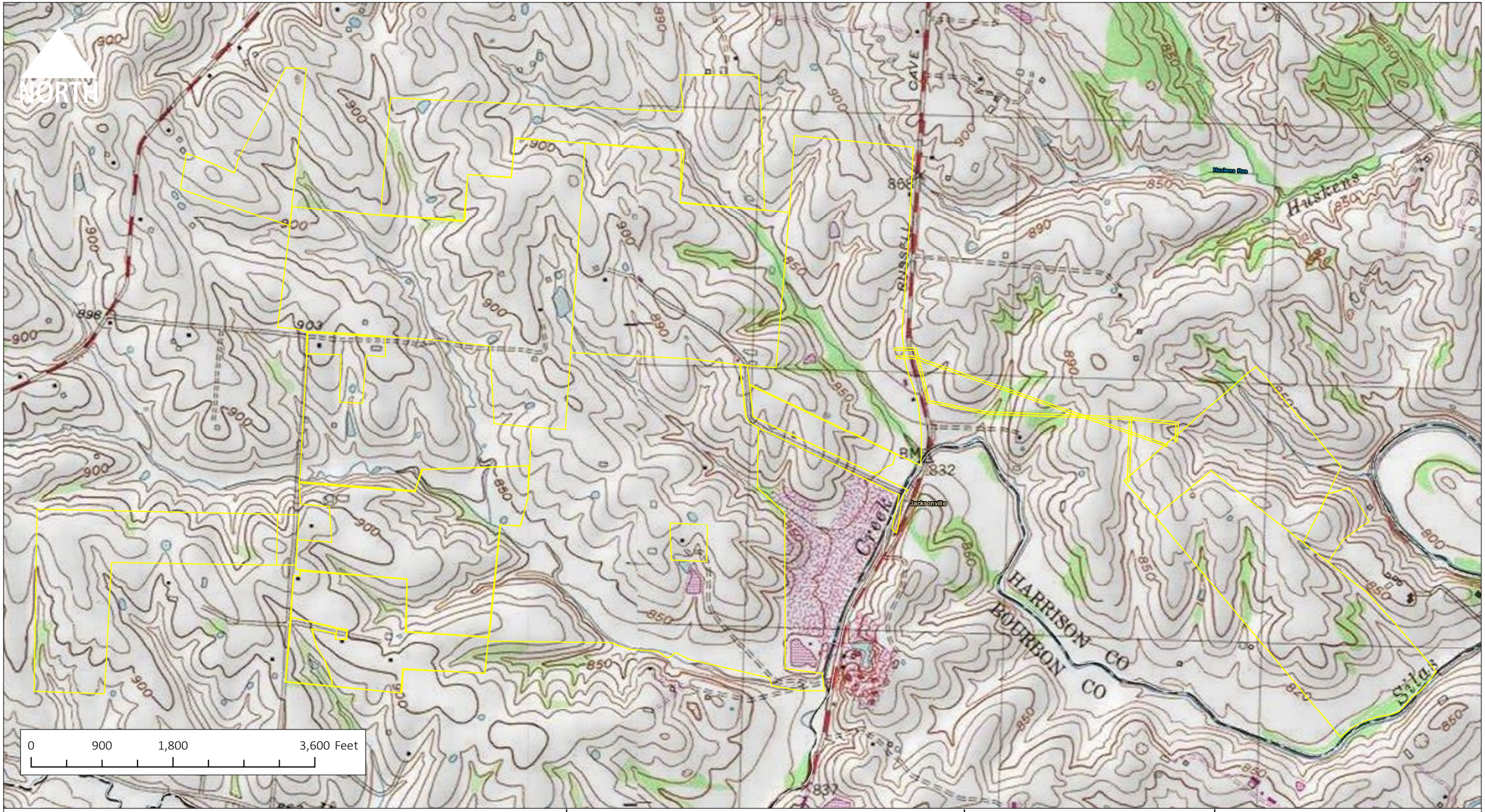
FIGURE

1

JACKSON GROUP

SCALE

1:13,500



Legend

Area of Interest

BayWa r.e.

Bluebird Solar

Harrison County, Kentucky

TITLE

SHORT'S BLADDERPOD SURVEY
AREA OF INTEREST MAP

FIGURE

1

JACKSON GROUP

SCALE

1:13,500

Appendix B: Photographs

Representative photograph of open pastureland and field edge within the AOI (April 29, 2020).

Representative photograph of open pastureland and field edge within the AOI (April 29, 2020).

Representative photograph of open pastureland within the AOI (April 29, 2020).

Representative photograph of riparian zone disturbed by livestock within the AOI (April 29, 2020).

Representative photograph of riparian zone shrub layer overgrown with invasive species within the AOI (April 29, 2020).

Representative photograph of forested area shrub layer overgrown with invasive species within the AOI (April 29, 2020).

RUNNING BUFFALO CLOVER SURVEY REPORT

BayWa r.e. Solar Projects, LLC
Bluebird Solar Farm
Harrison County, Kentucky

Prepared by:

Jackson Group
3945 Simpson Lane
Richmond, KY 40475
www.jacksongroupco.com

Prepared for:

BayWa r.e.
renewable energy

June 2017

Contents

Executive Summary

This running buffalo clover survey (*Trifolium stoloniferum*) was conducted with the appropriate level of effort and under the appropriate conditions to investigate the presence/absence of running buffalo clover within the Area Of Interest (AOI) for the Bluebird Solar Farm. Jackson Group biologists conducted a pedestrian survey within the AOI between 31 May 2017 and 3 June 2017. A meander search method was used throughout the AOI. Areas that exhibited characteristics of potentially suitable habitat were thoroughly searched for running buffalo clover. Running buffalo clover was not observed during the survey effort.

1.0 Introduction

Jackson Group was contracted by BayWa r.e. Solar Projects, LLC (BayWa) to conduct a presence/absence survey for running buffalo clover within the Area Of Interest (AOI) for the proposed Bluebird Solar Farm Project (Project) in Harrison County, Kentucky.

The federally endangered running buffalo clover has been documented in the following counties of Kentucky: Clark, Madison, Fayette, Bourbon, Montgomery, Woodford, Jessamine, Boone, Kenton, Jefferson, Jackson, Nelson and Harrison counties. As the Project is in Harrison County, Kentucky, a field assessment was conducted to determine the presence/probable absence of running buffalo clover within the AOI.

2.0 Qualifications

This running buffalo clover survey was conducted by qualified biologists Mr. Robert Oney, and Mr. Tyler Newman of Jackson Group. Robert Oney, and Tyler Newman have over 20 years of experience in botanical surveys, wildlife surveys, biological assessments, linear and non-linear project ecology, regional natural resource planning, urban ecology, wildlife management planning, and permitting.

3.0 Project Description

The Bluebird Solar Farm is a proposed solar energy farm project that will require vegetation removal and earth works of the site to develop the solar farm, associated equipment and access road(s). The AOI is approximately 1,112.5 acres. The AOI is illustrated in Appendix A.

4.0 Running Buffalo Clover Background Information

Running buffalo clover usually is found in mesic habitats with partial to filtered sunlight and a prolonged pattern of moderate and periodic disturbance, such as grazing, mowing, trampling, or flood-scouring. Running buffalo clover is often found in regions with limestone or other calcareous bedrock underlying the site, though limestone soil is not a requisite determining factor for the locations of populations of this species. Populations of running buffalo clover have been found in a variety of habitat types, including mesic woodlands, streambanks, grazed woodlots, mowed paths, old logging roads, trails, mowed wildlife openings within mature forests, savannahs, sandbars, and steep ravines. Range-wide this clover's habitats include cemeteries, Indian mounds, dooryards, historical home sites, mowed paths, jeep trails, grazed ravines and woodlots. In Kentucky, running buffalo clover seems to occur more frequently on old logging roads, off-road vehicle (ORV) trails, hawthorne thickets, grazed woodlands, jeep trails, railroad grades, game trails, and old fields succeeding to mesic woodlands. The larger occurrences exist within a matrix of mesophytic deciduous forest. All populations are associated with light to moderate disturbance such as occasional ORV traffic, stream scour, grazing, or foot-traffic. Plants occur primarily in regions underlain by limestone. To date, extant populations are located in or near the Inner and Outer Bluegrass Regions of Kentucky: Clark, Madison, Fayette, Bourbon, Montgomery, Woodford, Jessamine, Boone, Kenton, Jefferson, Jackson, Nelson and Harrison counties.

Visually, running buffalo is characterized by the two large, opposite leaves on the flowering stem. Additional characteristics include lack of the typical *Trifolium* watermark on the leaflets, as well as its stoloniferous growth pattern.

5.0 Methods

Jackson Group biologists conducted a pedestrian survey within the AOI between 31 May 2017 and 3 June 2017. A meander search method was used throughout the AOI. Areas that exhibited characteristics of potentially suitable habitat were thoroughly searched for running buffalo clover. Representative photographs documenting the site conditions are provided in Appendix B.

6.0 Results and Summary

Historically, running buffalo clover thrived in the rich soils found between open forest and prairie ecosystems, in areas receiving partial sunlight. Running buffalo clover requires periodic disturbance to flourish, however excessive grazing can directly kill off running buffalo clover through herbivory or trampling, both killing plants and degrading habitat. Typically, running buffalo clover is not observed growing in areas dominated by non-native plants. Invasive plants lead to unsuitable habitat conditions by way of out competing native species, including running buffalo clover. These invasive plants lead to a lack of available resources such as, moisture; nutrients; space; and sunlight. Non-native clovers are believed to have introduced diseases and insect predators.

The proposed AOI is approximately 1,112.5 acres, located within the Interior Plateau level III ecoregion, in Harrison County, Kentucky. The Interior Plateau ecoregion is characterized by a series of grassland plateaus and forested uplands that are generally lower in elevation than the Appalachian Mountains to the east, but higher than the plains to the south. Land use activities within and surrounding the proposed AOI are predominantly agricultural, including row crops (i.e. tobacco, corn, wheat, alfalfa, hemp) and pasture lands with interspersed forested areas (i.e. small wood lots, sparsely forested fence rows) and narrow forested riparian zones.

As the AOI is predominately agriculture, the vegetative communities present are those typically associated with agricultural areas. The majority of the AOI is comprised of open fields receiving full sunlight, invasive plants, and/or evidence of significant disturbance. All of these characteristics are not conducive for running buffalo clover. A significant portion of the forested habitat is also not suitable for running buffalo clover, as they are fully shaded with an abundance of invasive plant species such as chickweed (*Stellaria media*) and garlic mustard (*Alliaria petiolate*). The open areas consisted of interspersed white clover (*Trifolium repens*), fescue (*Festuca spp.*), asters (*Aster spp.*), and birds foot trefoil (*Lotus corniculatus*).

Running buffalo clover was not observed within the AOI. Therefore, it is Jackson Group's opinion that any proposed disturbance is not likely to adversely affect running buffalo clover.

Appendix A

Project Mapping

Bluebird Solar Farm
Topographic Project Map
Harrison County, Kentucky

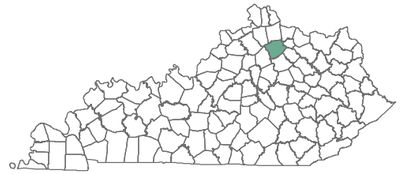
N

0 375 750 1,1251,500
Feet

- National Wetland Inventory
- Survey Areas
- Forested Areas
- Sinkhole
- Streams

JACKSON GROUP

Bluebird Solar Farm
Aerial Project Map
Harrison County, Kentucky



N

0 375 750 1,125 1,500
Feet

- National Wetland Inventory
- Survey Areas
- Forested Areas
- Sinkhole
- Streams

JACKSON GROUP

Appendix B

Photographs

Representative photo of open field on-site.

Representative photo of agriculture field on-site.

Representative photo of white clover on-site.

Representative photo of white clover on-site.

Representative photo of filtered sunlight on-site.

Representative photo of filtered sunlight on-site.

Representative photo of crop field on-site.

From: Shane Roberts
To: Whitney Rubin
Subject: FW: [EXTERNAL] Running Buffalo Clover Survey Study Plan
Date: Thursday, July 9, 2020 12:07:48 PM

Whitney-

Please see email below.

Shane

Shane Roberts | Vice President | T +1 859.200.6242 | sroberts@jacksongroupco.com

---

From: Allison, Carrie <Carrie_Allison@fws.gov>
Sent: Tuesday, July 7, 2020 11:14 AM
To: Shane Roberts <sroberts@jacksongroupco.com>; Robert Oney <roney@jacksongroupco.com>
Subject: Re: [EXTERNAL] Running Buffalo Clover Survey Study Plan

Shane-

Thank you for sending the RBC survey report for the Bluebird Solar Farm. You can consider this email approval of the survey. We agree the results of the survey indicate probable absence of the species within the project area. If you have any questions, please let me know.

Sincerely,

Carrie L. Allison
U.S. Fish and Wildlife Service
330 W. Broadway, Rm. 265
Frankfort, KY 40601
502-382-5965 (cell)
502-695-0468 ext. 46103 (office)
502.695.1024 (fax)

"You cannot get through a single day without having an impact on the world around you. What you do makes a difference, and you have to decide what kind of difference you want to make." ~Jane Goodall

From: Shane Roberts
To: Whitney Rubin
Subject: FW: [EXTERNAL] Short"s Bladderpod Survey Study Plan
Date: Thursday, July 9, 2020 12:06:43 PM

Whitney-

Please see email below.

Shane

Shane Roberts | Vice President | T +1 859.200.6242 | sroberts@jacksongroupco.com

---

From: Allison, Carrie <Carrie_Allison@fws.gov>
Sent: Thursday, July 9, 2020 2:49 PM
To: Shane Roberts <sroberts@jacksongroupco.com>
Subject: Re: [EXTERNAL] Short's Bladderpod Survey Study Plan

Shane-

Thank you for sending the SBP survey report for the Bluebird Solar Farm. You can consider this email approval of the survey. We agree the results of the survey indicate probable absence of the species within the project area. If you have any questions, please let me know.

Sincerely,

Carrie L. Allison
U.S. Fish and Wildlife Service
330 W. Broadway, Rm. 265
Frankfort, KY 40601
502-382-5965 (cell)
502-695-0468 ext. 46103 (office)
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"You cannot get through a single day without having an impact on the world around you. What you do makes a difference, and you have to decide what kind of difference you want to make." ~Jane Goodall

SHORT'S GOLDENROD SURVEY REPORT

BayWa r.e. Solar Projects, LLC
Bluebird Solar Farm
Harrison County, Kentucky

Prepared by:
Jackson Group
3945 Simpson Lane
Richmond, KY 40475
www.jacksongroupco.com

Prepared for:

BayWa r.e.

OCTOBER 2020

Table of Contents

Executive Summary

This Short's goldenrod survey (*Solidago shortii*) was conducted with the appropriate level of effort and under the appropriate conditions to investigate the presence/absence of Short's goldenrod for the proposed Bluebird Solar Farm. Jackson Group biologists conducted a pedestrian survey within the area of interest from 15-17 September 2020. A meander search method was used throughout the area of interest. Areas that exhibited characteristics of potentially suitable habitat were thoroughly searched for Short's goldenrod. Short's goldenrod was not observed during the survey effort.

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jacksongroupco.com

1.0 Introduction

BayWa r.e. Solar Projects, LLC (BayWa) is proposing the development of a utility-scale, ground-mounted Solar Photovoltaic (PV) project. The Bluebird Solar Farm project is located near Broadwell in Harrison County, Kentucky.

Jackson Group was contracted by BayWa to conduct a presence/absence survey for Short's goldenrod (*Solidago shortii*) within the area of interest (AOI) for the proposed Bluebird Solar Farm. In developing this document, Jackson Group has no knowledge of known occurrence information within the AOI.

1.1 Qualifications

This Short's goldenrod survey was conducted by Mr. Robert Oney and Mr. Shane Roberts of Jackson Group. Mr. Oney and Mr. Roberts have over 20 years of experience in botanical surveys, wildlife surveys, biological assessments, linear and non-linear ecological assessments, natural resource planning, urban ecology, wildlife habitat management planning, endangered species surveys, and Clean Water Act permitting.

2.0 Project Description

BayWa is developing utility-scale, ground-mounted Solar Photovoltaic (PV) projects throughout the United States. The Bluebird Solar Farm project is within the territory of Eastern Kentucky Power Cooperative, Inc. (EKPC). The project will interconnect with an EKPC Substation near Broadwell in Harrison County, Kentucky. The project AOI is approximately 1,400 acres and is depicted on mapping provided in Appendix A.

3.0 Short's Goldenrod Status and Distribution

Short's goldenrod is a federally protected plant species that was listed as endangered on September 5, 1985 (USFWS, 2007). In Kentucky, it is endemic to a small geographic range in the northcentral section of the state. Currently, Short's goldenrod is known to occur in Fleming, Nicholas, Robertson and Harrison Counties (USFWS, 2017). However, the Harrison County populations are part of introduction efforts at five sites between 2006 and 2014 by the USFWS working with multiple partners (USFWS, 2017).

3.1 Biology and Ecology

Habitat at known sites where Short's goldenrod populations occur or have been introduced are in various stages of vegetational succession (Baskin et al., 2000). The species is known to or has potential to occur in habitats such as rocky red cedar glade-like areas; rocky ledges and embankments along roads; powerline rights-of-way; rocky pastures and hay fields; red cedar, red cedar-hardwood, and hardwood thickets and woodlands; and oak "savannahs" maintained through activities such as periodic mowing (Baskin et al., 2000). Additionally, the species in know to grow on the upper, middle, and/or lower portions of slopes with various aspects and degrees of inclination and on several geologic formations and soil types (Baskin et al., 2000).

Short's goldenrod appears to favor sites that are dry and open with rocky and droughty soils, such as cedar glades and former bison traces (USFWS, 2007). Sites such as this ranged from relatively flat to steeply sloping with mostly western or southern solar exposures (USFWS, 2007). The species does not compete well with other species known to occur in the same habitat types such as Crown vetch (*Coronilla varia*), Queen Anne's lace (*Daucus carota*), sweet clover (*Meililotus alba*), tall fescue (*Festuca arundinacea*), musk thistle (*Carduus nutans*) and other exotic plants and it does not tolerate dense shade or low light conditions (USFWS, 2007). Sites occupied by Short's goldenrod are underlain by bedrock composed of interbedded layers of Ordovician limestones, shales, and siltstones (USFWS, 2007). Additionally, area soils on which the plant occurs have a flaggy, silty clay texture with 20 to 30 percent rock fragments (USFWS, 2007).The species flowers from mid-August to early November with fruits maturing several weeks after flowers withered (USFWS, 2007).

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4.0 Short's Goldenrod Survey

5.1 Methods

Jackson Group biologists conducted a pedestrian survey within the AOI from 15-17 September 2020. Areas within the AOI that exhibited characteristics of potentially suitable habitat were thoroughly searched for Short's goldenrod using parallel transects spaced a few meters apart. The following observational data was collected and is located in Appendices B:

- Representative photographs of habitat composition within the AOI

5.0 Results and Summary

Short's goldenrod favors sites/habitats that are dry and open with rocky and droughty soils, such as cedar glades and former bison traces (USFWS, 2007) and that are undergoing various stages of vegetational succession (Baskin et al., 2000). Typically, because Short's goldenrod does not compete well with other species known to occur in the same habitat types such as Crown vetch, Queen Anne's lace, sweet clover, tall fescue, musk thistle and other exotic plants it is not observed growing in areas dominated by non-native plants. Invasive plants lead to unsuitable habitat conditions by way of out competing Short's goldenrod and other native species. These invasive plants lead to a lack of available resources.

The proposed AOI is approximately 1,400 acres, located within the Interior Plateau level III ecoregion, in Harrison County, Kentucky. The Interior Plateau ecoregion is characterized by a series of grassland plateaus and forested uplands that are generally lower in elevation than the Appalachian Mountains to the east, but higher than the plains to the south. Land use activities within and surrounding the proposed AOI are predominantly agricultural, including row crops (i.e. tobacco, corn, wheat, alfalfa, hemp) and pasture lands with interspersed forested areas (i.e. small wood lots, sparsely forested fence rows) and narrow forested riparian zones.

The Project AOI is dominated by agriculture uses and practices. The vegetative communities present within the AOI is typical for communities associated with and disturbed by agricultural uses. The majority of the AOI is comprised of open fields for pasture and/or row crops. The overall topography for the AOI is nearly flat to gently sloping and lacks calcareous rock outcrops, and cedar glade like areas which is considered suitable habitat for Short's goldenrod. Most of the topographic relief within the AOI occurs in and around stream channels. However, stream channels within the AOI and their associated forested communities generally display a shade regime with high shade intensity (%) and duration which is not suitable for Short's goldenrod. In addition, there is an abundance of invasive plant species within the forested areas (riparian zones) of the AOI that include Amur honeysuckle (*Lonicera maackii*), Japanese honeysuckle (*Lonicera japonica*), bedstraw (*Galium aparine*), common chickweed (*Stellaria media*), garlic mustard (*Alliaria petiolata*), poison hemlock (*Conium maculatum*), and multiflora Rose (*Rosa multiflora*).

Goldenrod species such as common goldenrod (*Solidago canadensis*) were identified with the AOI along the margins of active and fallow agricultural fields, however Short's goldenrod was not observed. Associate species identified in areas where goldenrod species were observed growing were as follows: Queen Anne's lace, common ragweed (*Ambrosia artemisiifolia*), giant ragweed (*Ambrosia trifida*), tall ironweed (*Vernonia gigantea*), beggar-ticks (*Bidens* spp.), tick-trefoils (*Desmodium* spp.), blackberry (*Rubus* spp.), chicory (*Cichorium intybus*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), pokeweed (*Phytolacca americana*), Maximilian sunflower (*Helianthus maximiliani; uncommon*), Johnson grass (*Sorghum halepense*), tall fescue, New England aster (*Aster novae-angliae; uncommon*), purple coneflower (*Echinacea purpurea; uncommon*), sunflowers (*Helianthus* spp.), frostweed aster (*Aster pilosus*), late thoroughwort (*Eupatorium serotinum*), common thistle (*Cirsium vulgare*), yellow wingstem (*Verbesina alternifolia*), heal-all (*Prunella vulgaris*) white crownbeard (*Verbesina virginica*), great blue lobelia (*Lobelia siphilitica*), and horse nettle (*Solanum carolinese*).

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Short's goldenrod was not observed within the AOI during survey efforts nor were any areas identified that would potentially fulfill the species habitat requirements. Therefore, it is Jackson Group's opinion that the combination of the described above physical features and vegetative community characteristics, in addition to intensive field investigations of the AOI, that Short's goldenrod does not occur within the AOI and that the project will not likely adversely affect Short's goldenrod.

6.0 Literature Cited

U.S. Fish and Wildlife Service (USFWS). 2007 & 2017. Short's Goldenrod (*Solidago shortii*) 5-Year Review Summary and Evaluation. USFWS, Southeast Region, Ecological Services, Frankfort, Kentucky.

U.S. Fish and Wildlife Service (USFWS). 1988. Recovery Plan for Short's Goldenrod (*Solidago shortii*). USFWS, Southeast Region, Atlanta, Georgia. 27 pp.

Baskin, J.M., J.L. Walck, C.C. Baskin, and D. E. Buchele. 2000. Ecology and conservation biology of the endangered plant species *Solidago shortii* (Asteraceae). Native Plants Journal. 1:35-41.

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Appendix A: Project Mapping

Legend

Project Boundary (Area of Interest)

BayWa r.e.

Bluebird Solar

Harrison County, Kentucky

TITLE

SHORT'S GOLDENROD SURVEY
PROJECT AREA MAP

FIGURE

1

JACKSON GROUP

SCALE

1:13,500

Appendix B: Photographs

Representative agricultural field (soy beans) displaying mowed (maintained) field edge within the AOI.

Representative agricultural field displaying unmowed (not maintained) field edge within the AOI.

Example fallow agricultural field (hay field) in the early stages of succession within the AOI.

Example hay field mowed and bailed within the AOI.

Example livestock pasture within the AOI.

Representative photo of forested riparian zone with the AOI where livestock have access.

Representative photo of forested riparian zone with the AOI where livestock do not have access.

Representative photo of exotic invasive dominating the understory of forested area within the AOI.

Common goldenrod (*Solidago canadensis*) within the AOI.

From: Shane Roberts
To: Whitney Rubin
Subject: Fwd: [EXTERNAL] Short"s Goldenrod Survey - Bluebird Solar
Date: Tuesday, October 13, 2020 2:52:03 PM

Hey Whitney-

Please see survey approval below.

Thanks

Shane

Get Outlook for iOS

From: Allison, Carrie <Carrie_Allison@fws.gov>
Sent: Tuesday, October 13, 2020 4:51 PM
To: Shane Roberts
Subject: Re: [EXTERNAL] Short's Goldenrod Survey - Bluebird Solar

Hi, Shane-

The U.S. Fish and Wildlife Service's Kentucky Field Office (KFO) has reviewed the results of the Short's goldenrod survey for the Bluebird Solar Farm (FWS 2017-B-0628) in Harrison County, Kentucky. No Short's goldenrod was observed during the survey and the majority of habitat within the project area is not suitable to support the species. You can consider this email approval of the survey and we agree that the results support probable absence of the species within the project area. If you have any questions, please let me know at your earliest convenience.

Sincerely,

Carrie L. Allison
U.S. Fish and Wildlife Service
330 W. Broadway, Rm. 265
Frankfort, KY 40601
502-382-5965 (cell)
502-695-0468 ext. 46103 (office)
502.695.1024 (fax)
"You cannot get through a single day without having an impact on the world around you. What you do makes a difference, and you have to decide what kind of difference you want to make." ~Jane Goodall

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