



Norwich Western Link

Environmental Statement

Chapter 11: Bats

Appendix 4b: Vantage Point Surveys

Author: WSP

Document Reference: 3.11.04b

Version Number: 00

Date: March 2024



Contents

1	Introduction	3
1.1	Vantage Point Surveys	3



1 Introduction

1.1 Vantage Point Surveys

1.1.1 WSP UK Ltd was commissioned by NCC in 2021 to complete a comprehensive suite of bat activity surveys for the Proposed Scheme, including a number of bat activity surveys during winter 2020/2021 and all summer activity surveys (ranging from 2019 to 2021).

1.1.2 Technical appendix 4b presents a series of maps labelled Figure B-1 to Figure B-18, showing the results of vantage point surveys (VP1 to VP8) and the observed flight lines of barbastelle and *Myotis* species at each vantage point. The final unlabelled figure shows the winter bat activity index value for barbastelle including average passes per night during winter deployment.

Table B-1 Meteorological data for vantage point surveys completed between May to September 2020 and 2021

1.1.3 Table B-1 shows the meteorological data for vantage point surveys completed between May to September in the years 2020 and 2021. From left to right, the first column details the vantage point location (VP1-VP8). The second column details the month each survey was conducted (May to September repeated). The third column displays the date of each survey. The fourth column details the survey start and end times in addition to the sunset time in brackets. The fifth column details weather conditions for each survey with the relevant description including wind (Beaufort) and rain ratings. The sixth column displays the temperature (Celsius) at the start of each survey. The seventh column displays the temperature (Celsius) at the end of each survey. The final column details the weather conditions for each survey with the relevant description including cloud cover rating (oktas).



Figure B-1

- 1.1.4 Figure B-1 shows vantage point 1, which is located within a woodland block, with observed barbastelle flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of barbastelle (1 to 5+). Barbastelle flight lines extended in multiple directions at VP1 including north-west, south-west and north-east. The highest number of flight lines recorded were north-east to south-west in both directions.

Figure B-2

- 1.1.5 Figure B-2 shows vantage point 1, which is located within a woodland block, with observed *Myotis* species flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of *Myotis* species (1 to 5+). *Myotis* species flight lines extended in multiple directions at VP1 including north-west, south-west and north-east. The highest number of flight lines recorded were north-east to south-west in both directions.

Figure B-3

- 1.1.6 Figure B-3 shows vantage point 2, which is located between two woodland blocks, with observed barbastelle flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of barbastelle (1 to 5+). Barbastelle flight lines extended in multiple directions at VP2 including west, north-west and south-east. The highest number of flight lines recorded were east to west.

Figure B-4

Figure B-4 shows vantage point 2, which is located between two woodland blocks, with observed *Myotis* species flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of *Myotis* species (1 to 5+). *Myotis* species flight lines extended in multiple directions at VP2 including north-east, east and south-west. The highest number of observed flight lines recorded were equal between all directions.



Figure B-5

- 1.1.7 Figure B-5 shows vantage point 3, which is located between two woodland blocks, with observed barbastelle flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of barbastelle (1 to 5+). Barbastelle flight lines were recorded in only one direction at VP3: south to north.

Figure B-6

Figure B-6 shows vantage point 3, which is located between two woodland blocks, with observed *Myotis* species flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of *Myotis* species (1 to 5+). *Myotis* species flight lines extended in multiple directions at VP3 including north, south, north-east and north-west. The highest number of flight lines recorded were south to north.

Figure B-7

Figure B-7 shows vantage point 4, which is located along a country road, with observed barbastelle flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of barbastelle (1 to 5+). Barbastelle flight lines extended in two directions at VP4: east to west and south to north. The highest number of observed flight lines recorded were equal between both directions.

Figure B-8

- 1.1.8 Figure B-8 shows vantage point 4, which is located along a country road, with observed *Myotis* species flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of *Myotis* species (1 to 5+). *Myotis* species flight lines were recorded in only one direction at VP4: west to south-east.

Figure B-9

- 1.1.9 Figure B-9 shows vantage point 5 for the 2020 surveys, which is located along a dogleg hedgerow, with observed barbastelle flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines



recorded of barbastelle (1 to 5+). Barbastelle flight lines extended in multiple directions at VP5 including west, south, east, north-east, north-west, south-east and south-west. The highest number of flight lines recorded were south-east to north-west in both directions.

Figure B-10

1.1.10 Figure B-10 shows vantage point 5 for the 2020 surveys, which is located along a dogleg hedgerow, with observed *Myotis* species flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of *Myotis* species (1 to 5+). *Myotis* species flight lines extended in multiple directions at VP5 including west, south, east, north-east, north-west, south-east and south-west. The highest number of flight lines recorded were north-west to south-east.

Figure B-11

1.1.11 Figure B-11 shows vantage point 5 for the 2021 surveys, which is located along a dogleg hedgerow, with observed barbastelle flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of barbastelle (1 to 5+). Barbastelle flight lines extended in multiple directions at VP5 including west, south, east, north-east, north-west, south-east and south-west. The highest number of flight lines recorded were south-east to north-west in both directions.

Figure B-12

1.1.12 Figure B-12 shows vantage point 5 for the 2021 surveys, which is located along a dogleg hedgerow, with observed *Myotis* species flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of *Myotis* species (1 to 5+). *Myotis* flight lines extended in multiple directions at VP5 including south-east, north-west and east. The highest number of flight lines recorded were north-west to south-east.

Figure B-13

1.1.13 Figure B-13 shows vantage point 6, which is located within a woodland block, with observed barbastelle flight lines within the Site Boundary, colour coded in



relation to the number of observed flight lines recorded of barbastelle (1 to 5+). Barbastelle flight lines extended in multiple directions at VP6 including west, south, east, north-east, north-west, south-east and south-west. The highest number of flight lines recorded were south-east to north-west in both directions.

Figure B-14

1.1.14 Figure B-14 shows vantage point 6, which is located within a woodland block, with observed *Myotis* species flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of *Myotis* species (1 to 5+). *Myotis* flight lines extended in two directions at VP6 including south-east and north-west. The highest number of flight lines recorded were south-east to north-west.

Figure B-15

1.1.15 Figure B-15 shows vantage point 7, which is located within a woodland block, with observed barbastelle flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of barbastelle (1 to 5+). Barbastelle flight lines extended in multiple directions at VP7 including north, south, east, north-east, north-west, south-east and south-west. The highest number of flight lines recorded were east to north-west in both directions.

Figure B-16

1.1.16 Figure B-16 shows vantage point 7, which is located within a woodland block, with observed *Myotis* species flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of *Myotis* species (1 to 5+). *Myotis* species flight lines extended in multiple directions at VP7 including north-east, north-west, south-east and south-west. The highest number of flight lines recorded were south-east to north-west.

Figure B-17

1.1.17 Figure B-17 shows vantage point 8, which is located along the edge of a woodland block, with observed barbastelle flight lines within the Site



Boundary, colour coded in relation to the number of observed flight lines recorded of barbastelle (1 to 5+). Barbastelle flight lines extended in multiple directions at VP8 including north-east, north-west, south-east and south-west. The highest number of flight lines recorded were south-east to north-west.

Figure B-18

Figure B-18 shows vantage point 8, which is located along the edge of a woodland block, with observed *Myotis* species flight lines within the Site Boundary, colour coded in relation to the number of observed flight lines recorded of *Myotis* species (1 to 5+). *Myotis* species flight lines extended in two main directions at VP8 including north-east and south-west. However, this comprised of multiple separate flight lines, with the highest number of observed flight lines recorded were equal between all directions.

Final Figure

- 1.1.18 The final figure shows the winter bat activity index value for barbastelle within the Site Boundary. This map illustrates where the locations are with the highest average passes per night were recorded for barbastelle specifically, during winter deployment. The data includes the average passes per night during the Winter deployment.
- 1.1.19 There are 20 locations in total scattered across the Site Boundary. Three of the locations with the highest average passes per night during winter deployment are located within the south-west area of the Site Boundary, near to The Broadway, a country lane lined with trees and plantation woodland on either side.
- 1.1.20 We have included a summary of key information shown in this document in an accessible format. However, some users may not be able to access all technical details. If you require this document in a more accessible format, please contact norwichwesternlink@norfolk.gov.uk.

Appendix B

Vantage Point Surveys

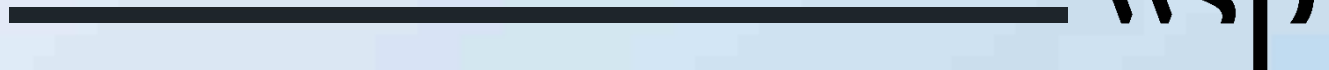




Table B-1 - Meteorological data for vantage point surveys completed between May – September 2020 and 2021

Vantage point location	Month	Date	Survey start and end times (sunset time in brackets)	Weather conditions Description (including windspeed and rain if recorded)	Temp. Start (°C)	Temp. End (°C)	Weather conditions Cloud cover (oktas)
VP1	May	12/05/21	20:56 to 23:41 (sunset: 20:41)	Wind: Beaufort 0 - 1 by end Rain: None	14	10	2
VP1	June	03/06/21	21:33 to 00:12 (sunset: 21:10)	Wind: Beaufort 0 Rain: None	21	18	4
VP1	July	29/07/20	21.06 to 23.51 (sunset: 20:51)	N/A	18	15	1
VP1	August	20/08/20	20:24 to 23:09 (sunset: 20:09)	Beaufort: 0	21	18	1
VP1	September	15/09/20	19:25 to 22:10 (sunset: 19:10)	N/A	23	17	0
VP2	May	13/05/21	20:57 to 23:42 (sunset: 20:42)	Wind: Beaufort 1 Rain: None	9	8	8



Vantage point location	Month	Date	Survey start and end times (sunset time in brackets)	Weather conditions Description (including windspeed and rain if recorded)	Temp. Start (°C)	Temp. End (°C)	Weather conditions Cloud cover (oktas)
VP2	June	23/06/20	21:39 to 00:24 (sunset: 21:24)	Beaufort: 1	21	16	3
VP2	July	28/07/20	20:38 to 22:53 (sunset: 20:53)	Beaufort: 2-4	17	14	3
VP2	August	09/09/20	19:38 to 22:23 (sunset: 19:23)	Beaufort: 1	18	15	3
VP2	September	29/09/20	18:51 to 21:36 (sunset: 18:37)	Wind: 4mph Light rain/drizzle at start of survey, dry by end	13	11	8
VP3	May	19/05/21	21:07 to 23:52 (sunset: 20:52)	Wind: Beaufort 0 Rain: None	12	8	3-0
VP3	June	24/06/20	21:38 to 00:23 (sunset: 21:23)	Beaufort: 1	21	17	0



Vantage point location	Month	Date	Survey start and end times (sunset time in brackets)	Weather conditions Description (including windspeed and rain if recorded)	Temp. Start (°C)	Temp. End (°C)	Weather conditions Cloud cover (oktas)
VP3	July ¹	27/07/20	20:40 to 22:25 (sunset: 20:55)	Beaufort: 4	19	16	4-5
VP3	July ²	06/07/21	21:33 to 00:18 (sunset: 21:18)	Wind: Beaufort 1-3 Rain: None	14	13	3-2
VP3	August	12/08/20	21:01 to 23:27 (sunset: 20:27)	Beaufort: 1	22	21	1
VP3	September	10/09/20	19:37 to 22:22 (sunset: 19:22)	Beaufort: 0	14	13	7-8
VP4	May	20/05/21	21:07 to 23:52 (sunset: 20:52)	Wind: Beaufort 4-3 Rain: None	12	12	4-3

¹ VP3 in July was terminated early (at 22:25, 1.5 hours after sunset). The July survey for VP3 was repeated in 2021 to ensure a full dataset for VP3.

² VP3 for July repeated in 2021 after 2020 early termination.

³ VP5 for June 2021 terminated 80 minutes early due to rain.



Vantage point location	Month	Date	Survey start and end times (sunset time in brackets)	Weather conditions Description (including windspeed and rain if recorded)	Temp. Start (°C)	Temp. End (°C)	Weather conditions Cloud cover (oktas)
VP4	June	29/06/20	21:38 to 00:23 (sunset: 21.22)	Beaufort: 4	16	14	8
VP4	July	21/07/20	21:18 to 00:03 (sunset 21:03)	Beaufort: 0	14	13	6-8
VP4	August	10/08/20	20:46 to 23:31 (sunset: 20:30)	Beaufort: 0	19	21	1-0
VP4	September	17/09/20	19:19 to 22:04 (sunset: 19:04)	Beaufort: 1	15	15	5-1
VP5	May	18/05/20	21:06 to 00:06 (sunset: 20:51)	Beaufort: 0-1	15.5	10	6
VP5	May	26/05/21	22:01 to 02:01 (sunset: 21:01)	Wind: Beaufort 1 Rain: None	9	8	1-7
VP5	June	25/06/20	21:37 to 00:37 (sunset: 21:23)	Beaufort: 0-1	20	16	0



Vantage point location	Month	Date	Survey start and end times (sunset time in brackets)	Weather conditions Description (including windspeed and rain if recorded)	Temp. Start (°C)	Temp. End (°C)	Weather conditions Cloud cover (oktas)
VP5	June ³	24/06/21	22:22 to 01:02 (sunset: 21:22)	Wind: Beaufort 1-0 Rain: Heavy rain in last quarter of survey time; survey terminated early.	17	16	8-2
VP5	July	16/07/20	21:26 to 00:11 (sunset: 21:11)	Beaufort: 1	19	17	8
VP5	July	22/07/21	22:04 to 04:04 (sunset: 21:04)	Wind: Beaufort 1 Rain: None	16	14	0
VP5	August	11/08/20	20:43 to 23:28 (sunset: 20:28)	Beaufort: 1	26	23	1-0
VP5	August	24/08/21	21:05 to 03:05 (sunset: 20:05)	Wind: Beaufort 1 Rain: Light drizzle at	17	14	8-4



Vantage point location	Month	Date	Survey start and end times (sunset time in brackets)	Weather conditions Description (including windspeed and rain if recorded)	Temp. Start (°C)	Temp. End (°C)	Weather conditions Cloud cover (oktas)
				beginning of survey.			
VP5	September	16/09/20	19:22 to 22:07 (sunset: 19:07)	Beaufort: 4	16	14	8-7
VP5	September	09/09/21	19:27 to 23:27 (sunset: 19:23)	Wind: Beaufort 2 Rain: None	22	18	3-0
VP6	May	14/05/20	21:00 to 00:00 (sunset: 20.45)	Beaufort: 0	4.5	1.3	0
VP6	June	08/06/20	21:32 to 00:17 (sunset: 21:17)	Beaufort: 1-2	10	7	3-0
VP6	July	14/07/20	21:28 to 00:13 (sunset: 21:13)	Beaufort: 0	17	14	8-5
VP6	August	06/08/20	20:53 to 23:38 (sunset: 20:38)	Beaufort: 0	24	21	2-0



Vantage point location	Month	Date	Survey start and end times (sunset time in brackets)	Weather conditions Description (including windspeed and rain if recorded)	Temp. Start (°C)	Temp. End (°C)	Weather conditions Cloud cover (oktas)
VP6	September	08/09/20	19:40 to 22:25 (sunset: 19:25)	Beaufort: 1	23	20	5-2
VP7	May	12/05/20	20:40 to 23:30 (sunset: 20:42)	Beaufort: 0	9	8	4
VP7	June	04/06/20	21:28 to 00:13 (sunset: 21:13)	Beaufort: 1	10	10	4-6
VP7	July	07/07/20	21:33 to 00:18 (sunset: 21:18)	Beaufort: 1-0	13	12	8
VP7	August	13/08/20	20:39 to 23:24 (sunset: 20:24)	Beaufort: 1	17	15	8
VP7	September	07/09/20	19:44 to 22:29 (sunset: 19:29)	Beaufort: 3-2	16	16	8
VP8	May	20/05/20	21:09 to 00:09 (sunset: 20:54)	Beaufort: 1-0	20	15	0



Vantage point location	Month	Date	Survey start and end times (sunset time in brackets)	Weather conditions Description (including windspeed and rain if recorded)	Temp. Start (°C)	Temp. End (°C)	Weather conditions Cloud cover (oktas)
VP8	June	21/06/20	21:38 to 00:23 (sunset: 21:23)	Beaufort: 0	17	13	3-2
VP8	July	20/07/20	21:21 to 00:06 (sunset: 21:06)	Beaufort: 0	14	11	2-1
VP8	August	03/08/20	20:59 to 23:44 (sunset: 20:44)	Beaufort: 0	16	11	5-2
VP8	September	03/09/20	19:53 to 22:38 (sunset: 19:32)	Beaufort: 1	18	17	5-6



Figure B-1 - Vantage point 1 observed Barbastelle flight lines





Figure B-2 - Vantage point 1 observed *Myotis* flight lines





Figure B-3 - Vantage point 2 observed barbastelle flight line





Figure B-4 - Vantage point 2 observed *Myotis* flight lines





Figure B-5 - Vantage point 3 observed barbastelle flight lines





Figure B-6 - Vantage point 3 observed *Myotis* flight lines





Figure B-7 - Vantage point 4 observed barbastele flight lines

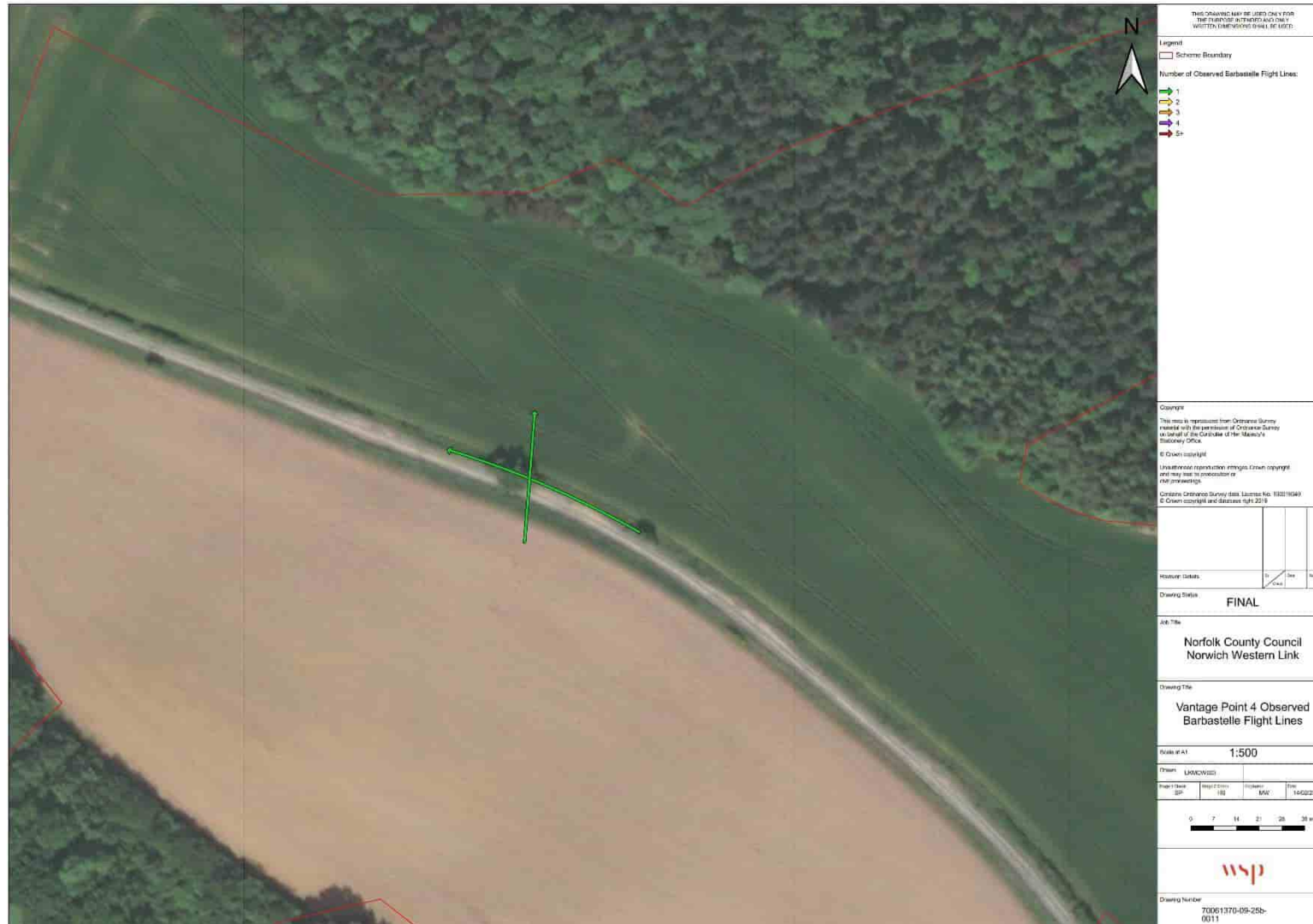




Figure B-8 - Vantage point 4 observed *Myotis* flight lines

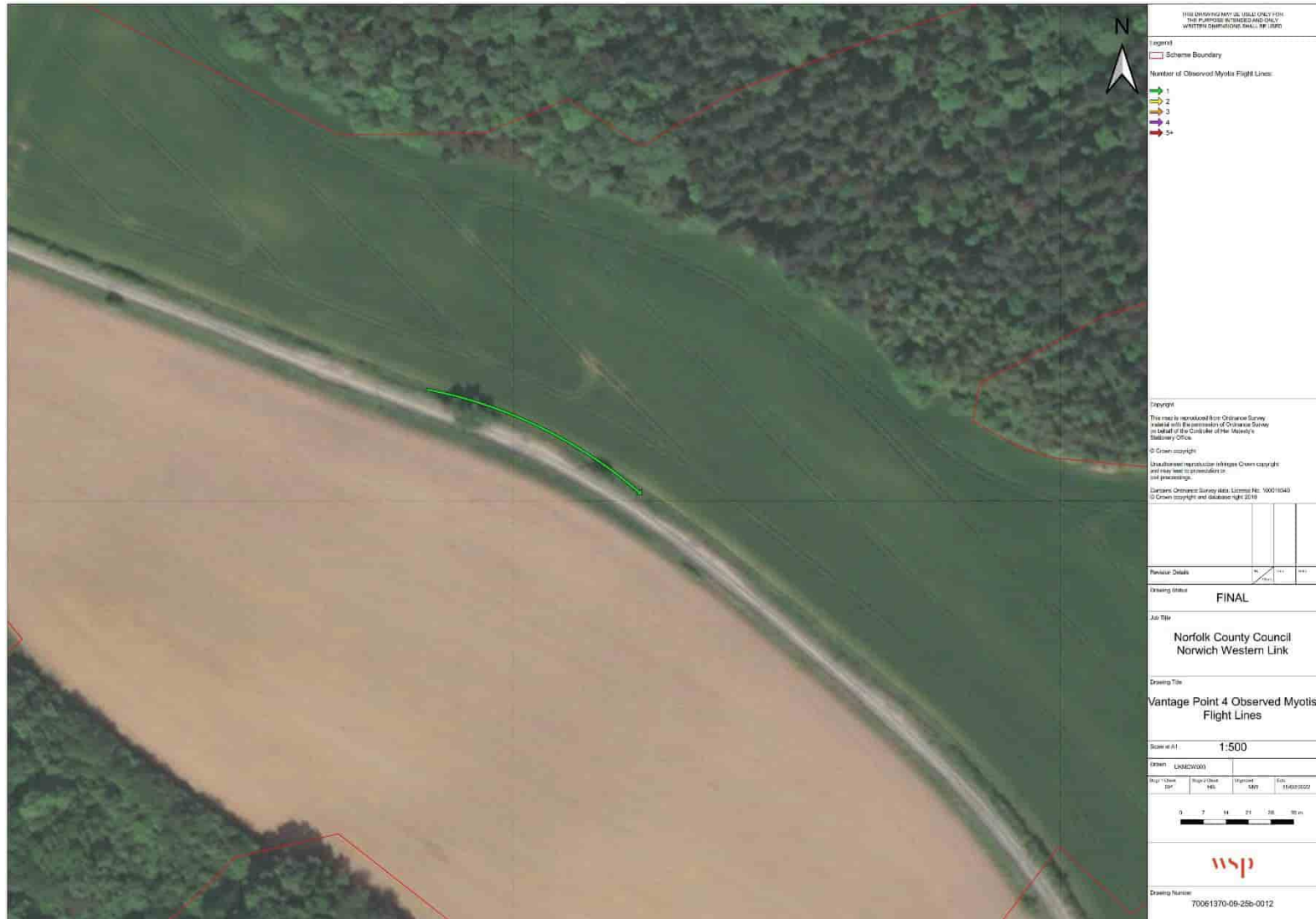




Figure B-9 - Vantage point 5 observed barbastele flight lines (2020 surveys)





Figure B-10 - Vantage point 5 observed *Myotis* flight lines (2020 Surveys)





Figure B-11 - Vantage point 5 observed barbastelle flight lines (2021 surveys)





Figure B-12 - Vantage point 5 observed *Myotis* flight lines (2021 Surveys)





Figure B-13 - Vantage point 6 observed barbastelle flight lines





Figure B-14 - Vantage point 6 observed *Myotis* flight lines





Figure B-15 - Vantage point 7 observed barbastelle flight lines





Figure B-16 - Vantage point 7 observed *Myotis* flight lines





Figure B-17 - Vantage point 8 observed barbastelle flight lines





Figure B-18 - Vantage point 8 observed *Myotis* flight lines



