

Appendix 50

Non-breeding Waterbird Survey Interim Report – January – June 2024

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1. Introduction

1.1 About this Document

- 1.1.1 WSP was commissioned by Cadent Gas Ltd ('Cadent') to undertake non-breeding waterbird surveys in 2024. This report describes the methods and interim results of these surveys and has been prepared to support the development and consenting process of the HyNet North west West Hydrogen Pipeline Project ('the Project'). This report has been produced for the purpose of presenting the methods and results of the non-breeding waterbird surveys undertaken by WSP ornithologists between January and June 2024 inclusive. The results of this report will be used to inform the Environmental Statement (ES) for the Project and this report forms a technical appendix to **Chapter 5: Biodiversity**.

1.2 Site Description

- 1.2.1 The Project includes the construction, operation and maintenance of approximately 100km of new pipelines to distribute hydrogen to industry, power stations and opportunities for blending with the existing natural gas network in the North West. A number of Hydrogen Above Ground Installations (HAGIs), including Block Valve Installations (BVIs) are required to control the flow and pressure of hydrogen at key points along the proposed pipeline.
- 1.2.2 The Project connects the Hydrogen Production Plant (HPP) at the Stanlow site, as the source of hydrogen, for onward distribution to the network. The pipeline transports hydrogen to the Central Hub at the centre of the network, which then serves as the connection and onward distribution point to the North, East and South corridors, which would extend to St. Helens, Partington and Northwich respectively. Branching off from each main corridor would be pipeline spurs connecting hydrogen customers to the main pipeline. Infrastructure has also been included which supports the potential blending of hydrogen with methane in the existing gas network. The Project would also link to underground hydrogen storage facilities in Cheshire used to balance supply and demand through the network.
- 1.2.3 The Draft Order Limits for the Project are illustrated within **Figure 50.1**. The habitats within this area mainly comprise mixed farmland, interspersed with other habitats such as wet woodland, scrub, marshland, industrial / brownfield land, amenity grassland / parkland (e.g. playing fields and golf courses), and waterways including rivers, lakes, canals, ditches and streams.
- 1.2.4 A full description of the Project including details on the construction, operation and decommissioning of The Project is detailed within the Draft Environmental Statement (ES) **Chapter 2: The Project**.

1.3 Desk-based Review

- 1.3.1 A desk study was conducted to identify European sites featuring qualifying ornithological interests that could be affected by the Project, with results fully documented within the **Baseline Ornithology Report Winter 2021-2022**¹. This has been updated and is presented within Draft ES **Chapter 5: Biodiversity**.

¹ Wood. 2022. HyNet Decarbonisation Project Baseline Ornithology Report Winter 2021-2022.

2. Methodology

2.1 Target Species

- 2.1.1 Target species comprised of all qualifying species associated with the Mersey Estuary SPA and Ramsar Site (**Table 5O 2.1**), although all waterbirds were recorded (including those associated with other designated sites within the search area). Additionally, all Schedule 1 and Annex I listed species were also recorded.

Table 5O 2.1 Mersey Estuary and Ramsar qualifying features

Designated site	Qualifying features
Mersey Estuary SPA	Non-breeding: shelduck, teal, pintail, golden plover, dunlin, black-tailed godwit, redshank. Waterbird assemblage.
Mersey Estuary Ramsar site	International Waterfowl assemblage: 89,576 individuals in winter Shelduck: 12,676 individuals in spring/autumn Black-tailed godwit: 2,011 individuals in spring/autumn Redshank: 6,651 individuals in spring/autumn Teal: 10,613 individuals in winter Pintail: 565 individuals in winter Dunlin: 48,364 individuals in winter National Ringed plover: 429 individuals in spring/autumn Curlew: 2,010 individuals (breeding) Spotted redshank: three individuals in spring/autumn Greenshank: six individuals in spring/autumn Wigeon: 8,268 individuals in winter

2.2 Study Area

- 2.2.1 The study area comprised all potential Functionally Linked Land (FLL) within 500m of the Order Limits, as illustrated in **Figure 5O.2**.
- 2.2.2 The five transects that were originally prepared by WSP in areas identified as requiring wetland bird surveys/intertidal surveys included Frodsham and Ince Marshes, plus three other areas along the River Mersey. It was considered that minor amendments to these transects (Transects 5, 6, 7b, 13b and 14) would ensure robust coverage of FLL relating to the Mersey Estuary SPA within the study area and are illustrated within **Figure 5O.3**.

2.3 Non-breeding Waterbird Survey Methods

- 2.3.1 In the absence of best practice guidelines, the survey method comprised fortnightly transects walked between January and June 2024. Transects 7b, 13b and 14 were walked fortnightly between January and March 2024 only, with Transects 5 and 6 surveyed fortnightly for the entire period.
- 2.3.2 Transect timings varied between morning and afternoon to avoid any time related bias and considered low and high tide times on the Mersey Estuary, so that survey results were representative of habitat use by birds at varying stages of tidal movement and habitat exposure. Full survey timings, tidal and weather conditions are detailed in **Annex 5O1, Table 5O1.1**. During each survey visit the transect was walked slowly, scanning and listening for target species as well as notable aggregations of other species. The locations of birds both seen and heard were digitally mapped using ArcGIS.

2.4 Surveyors

- 2.4.1 All surveys were conducted by experienced WSP Ornithologists, all of whom have extensive field experience, a detailed understanding of bird survey methods and experience of monitoring bird activity and distribution at proposed development sites.

2.5 Limitations

- 2.5.1 It was considered that there were no limitations to the survey programme.

3. Results

3.1.1 The following target species were recorded during the non-breeding waterbird surveys: shelduck, pintail, teal, golden plover, black-tailed godwit, dunlin and redshank. A further 31 waterbird assemblage species were also recorded.

3.1.2 **Table 5O 3.1** details the peak counts of each waterbird species for each transect. Results are illustrated in **Annex 5O3, Figure 5O.4** for each survey visit.

Table 5O 3.1 Peak counts of waterbird assemblage species (number of visits present in parentheses)

Species	Transect 5	Transect 6	Transect 7b	Transect 13b	Transect 14
Qualifying species					
Black-tailed godwit	0 (0)	1,145 (9)	5 (2)	0 (0)	0 (0)
Dunlin	0 (0)	80 (2)	1 (2)	0 (0)	0 (0)
Golden plover	0 (0)	1,270 (4)	150 (1)	0 (0)	0 (0)
Pintail	0 (0)	60 (5)	10 (3)	0 (0)	0 (0)
Redshank	0 (0)	7 (4)	9 (5)	0 (0)	1 (1)
Shelduck	5 (2)	250 (12)	78 (5)	0 (0)	3 (1)
Teal	2 (3)	580 (10)	73 (6)	133 (5)	2 (1)
Assemblage species					
Avocet	0 (0)	4 (1)	16 (1)	0 (0)	0 (0)
Black-headed gull	0 (0)	0 (0)	0 (0)	3 (1)	0 (0)
Cormorant	0 (0)	1 (1)	6 (3)	37 (5)	1 (2)
Canada goose	130 (2)	691 (11)	27 (4)	39 (5)	22 (5)
Cattle egret	15 (4)	0 (0)	0 (0)	0 (0)	0 (0)
Coot	5 (10)	65 (12)	10 (5)	30 (6)	26 (6)
Curlew	73 (2)	28 (7)	5 (1)	12 (2)	1 (1)
Gadwall	3 (8)	31 (8)	5 (4)	20 (6)	8 (4)

Species	Transect 5	Transect 6	Transect 7b	Transect 13b	Transect 14
Great crested grebe	0 (0)	0 (0)	5 (5)	14 (6)	0 (0)
Greylag goose	0 (0)	8 (3)	1 (1)	0 (0)	0 (0)
Goldeneye	0 (0)	0 (0)	0 (0)	2 (1)	0 (0)
Garganey	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)
Grey heron	1 (1)	4 (4)	2 (5)	1 (3)	3 (1)
Kingfisher	0 (0)	0 (0)	1 (1)	2 (1)	0 (0)
Lapwing	7 (1)	1,000 (12)	811 (5)	0 (0)	30 (1)
Little egret	28 (4)	1 (1)	1 (4)	0 (0)	0 (0)
Little grebe	4 (8)	3 (3)	1 (1)	8 (6)	2 (2)
Mallard	11 (12)	100 (12)	30 (5)	34 (6)	62 (6)
Moorhen	16 (9)	12 (9)	1 (1)	8 (5)	21 (6)
Mute swan	1 (1)	8 (5)	2 (1)	0 (0)	3 (4)
Oystercatcher	0 (0)	2 (4)	2 (2)	0 (0)	0 (0)
Pink-footed goose	280 (1)	145 (2)	0 (0)	0 (0)	0 (0)
Pochard	0 (0)	40 (3)	0 (0)	0 (0)	0 (0)
Ruff	0 (0)	12 (3)	0 (0)	0 (0)	0 (0)
Snow goose	0 (0)	24 (1)	0 (0)	0 (0)	0 (0)
Snipe	3 (1)	56 (3)	17 (2)	0 (0)	0 (0)
Shoveler	0 (0)	245 (10)	2 (1)	2 (2)	0 (0)
Tufted duck	9 (7)	200 (10)	0 (0)	67 (6)	0 (0)
Whimbrel	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)
Wigeon	0 (0)	180 (4)	0 (0)	44 (4)	0 (0)
Whooper swan	0 (0)	21 (3)	0 (0)	0 (0)	0 (0)

- 3.1.3 Records of non-waterbird assemblage Schedule 1 / Annex I listed species during the survey period comprised: marsh harrier, barn owl, peregrine and Cetti's warbler.
- 3.1.4 Marsh harrier was recorded on Transect 6 and Transect 7b. A communal roost was also identified with further details outlined in the Confidential Annex.
- 3.1.5 Barn owl was recorded on a single occasion only during the survey period, on Transect 6. An individual bird was noted hunting over the lagoon bund, above Lordship Lane, at dusk on 18 January.
- 3.1.6 Peregrine was recorded on Transect 6 only, with individual birds recorded hunting at the waterbody within Frodsham Sludge Lagoons (juvenile bird) and Lordship Marsh on 18 January and 26 March respectively.
- 3.1.7 Cetti's warbler was recorded on all Transects, with the following peak counts recorded at each location (number of visits birds recorded in parentheses):
- Transect 5 – four singing males (three);
 - Transect 6 – six singing males (four);
 - Transect 7b – three singing males (three);
 - Transect 13b – one single male (one); and
 - Transect 14 – two singing males (two).

4. Key Species Summary

4.1.1 The following section details survey results for qualifying species of the Mersey Estuary SPA and Ramsar Site. Additionally, survey results for notable other species are also summarised in this section.

4.2 Shelduck

4.2.1 A peak count of 250 SPA-qualifying shelduck were recorded utilising a waterbody within Frodsham Sludge Lagoons at SJ 500 780 (Transect 6) in February. This constitutes 1.8% of the most recent Mersey Estuary five-year (2018/19-2022/23) peak mean of 13,704 individuals (Woodward *et al.*, 2024²). Additionally, this peak count of 250 shelduck exceeds the five-year (2016/17-2020/21) peak mean of 132 individuals for the Frodsham Sludge Lagoon Wetland Bird Survey (WeBS) count sector. Shelduck were also recorded utilising Ince Marshes (peak count of five birds), the Weaver Bend (peak count of 78 birds) and a single record of three birds on the River Mersey at SJ 572 864.

4.3 Pintail

4.3.1 A peak count of 60 pintail were recorded utilising a waterbody within Frodsham Sludge Lagoons at SJ 500 780 (Transect 6) in February. This constitutes 27.5% of the most recent Mersey Estuary five-year (2018/19-2022/23) peak mean of 218 individuals (Woodward *et al.*, 2024). Additionally, this peak count of 60 pintail exceeds the five-year (2016/17-2020/21) peak mean of 32 individuals for the Frodsham Sludge Lagoon WeBS count sector. Records of pintail utilising the waterbody also exceeded 56% of the WeBS five-year peak mean in both January (27 birds) and April (18 birds). Pintail also utilised the Weaver Bend (Transect 7b), with a peak count of ten birds recorded in January.

4.4 Teal

4.4.1 Teal were most frequently recorded on Transect 6, with peak counts of 274 and 550 birds recorded on pools between Moorditch Lane and the Manchester Ship Canal in February and a waterbody within Frodsham Sludge Lagoons in January, respectively. The latter peak count of 550 birds at the Frodsham Sludge Lagoon waterbody constitutes 12.5% of the most recent Mersey Estuary five-year (2018/19-2022/23) peak mean of 4,394 individuals (Woodward *et al.*, 2024) and 55.2% of the five-year (2016/17-2020/21) peak mean of 844 individuals for the Frodsham Sludge Lagoon WeBS count sector. Teal were also recorded in numbers constituting greater than 1% of the most recent Mersey Estuary five-year

² Woodward, I.D., Calbrade, N.A., Birtles, A., Feather, G.A., Peck, K., Wotton, S.R., Shaw, J.M., Balmer, D.E. and Frost, T.M. 2024. *Waterbirds in the UK 2022/23: The Wetland Bird Survey and Goose & Swan Monitoring Programme*. BTO/RSPB/JNCC/NatureScot. Thetford.

peak mean at Transects 7b and 13b; with a peak count of 63 birds on the Weaver Bend and 120 birds utilising the mud flat on the River Mersey at SJ 572 864, respectively. Transects 5 and 14 also recorded teal, but in numbers less than 1% of Mersey Estuary five-year peak mean.

4.5 Golden Plover

- 4.5.1 A peak count of 1,220 golden plover were recorded feeding as part of a large, mixed species flock across several fields between Moorditch Lane and the Manchester Ship Canal (Transect 6) in January. This constitutes 58.99% of the most recent Mersey Estuary five-year (2018/19-2022/23) peak mean of 2,068 individuals (Woodward *et al.*, 2024). Golden plover were also recorded utilising a lagoon area on the inner Weaver Bend (Transect 7b) in March, with 150 birds accounting for 7.25% of the Mersey Estuary five-year peak mean.

4.6 Black-tailed Godwit

- 4.6.1 Black-tailed godwit was most frequently recorded at Frodsham Sludge Lagoons (Transect 6), with the largest flock size of 1,100 birds recorded on a pool between Moorditch Lane and the Manchester Ship Canal at SJ 494 784 in March. This count constitutes 30.7% of the most recent Mersey Estuary five-year (2018/19-2022/23) peak mean of 3,579 individuals (Woodward *et al.*, 2024) and constitutes 2.82% of the latest GB wintering estimate (39,000 individuals, Woodward *et al.* 2020³). Peak counts at Frodsham Sludge Lagoons exceeded 3% of the Mersey Estuary five-year peak mean each month from January to May. Black-tailed godwit was also recorded at the Weaver Bend (Transect 7b) in January and March, though in numbers accounting for less than 1% of the Mersey Estuary five-year peak mean.

4.7 Dunlin

- 4.7.1 A peak count of 80 dunlin were recorded feeding between Moorditch Lane and the Manchester Ship Canal (Transect 6) in January. The most recent Mersey Estuary five-year (2018/19-2022/23) peak mean of dunlin is 41,318 individuals (Woodward *et al.*, 2024). All records from the survey period constitute less than 1% of this population. Dunlin was also recorded at the Weaver Bend (Transect 7b), with single birds recorded on the January visits.

³ Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D. and Noble, D. 2020. *Population estimates of birds in Great Britain and the United Kingdom*. In: British Birds 113, pp 69-104

4.8 Redshank

- 4.8.1 Redshank were recorded on three of the five transect routes (6, 7b and 14), but was only recorded in numbers less than 1% of the most recent Mersey Estuary five-year (2018/19-2022/23) peak mean of 9,018 individuals (Woodward *et al.*, 2024). A peak count of nine birds was recorded at the Weaver Bend (Transect 7b) in January.

5. Summary

- 5.1.1 Most records (and largest peak counts) of target waterbird species across all transect routes relate to birds roosting and/or feeding at Frodsham Sludge Lagoons (Transect 6); notably at the waterbody at approximate grid reference SJ 500 780; also at Lordship Marsh and within the area between Moorditch Lane and the Manchester Ship Canal.
- 5.1.2 The waterbody within Frodsham Sludge Lagoons is a well-used high-tide roost site for waterbird species including SPA-qualifying black-tailed godwit, shelduck and teal, as well as assemblage species such as wigeon and curlew⁴. This area is deemed to be functionally linked to the Mersey Estuary SPA⁵.
- 5.1.3 There was only a single record of black-tailed godwit utilising the waterbody within the Frodsham Sludge Lagoons, with 125 birds feeding in late January. Birds were recorded roosting on Lordship Marsh and the area between Moorditch Lane and the Manchester Ship Canal, where 30.7% (1,100 individuals) of the most recent Mersey Estuary five-year (2018/19-2022/23) peak mean (3,579 individuals) were noted. This peak count also constitutes 2.82% of the latest GB wintering estimate (39,000 individuals).
- 5.1.4 Teal were recorded consistently across the survey period regardless of time of day or tidal state. Pintail were recorded between January and April, with the largest flock count of 60 feeding within the Frodsham Sludge Lagoon waterbody in February. Similarly, the largest counts of both shelduck (250) and teal (550) across all transects were also recorded at Frodsham Sludge Lagoon in February and January respectively.
- 5.1.5 Golden plover and dunlin were not recorded within at Frodsham Sludge Lagoon but were recorded feeding on Lordship Marsh and within the area between Moorditch Lane and the Manchester Ship Canal.
- 5.1.6 Large counts (>100 individuals) of assemblage species were also recorded at Transect 6, including: pink-footed goose, shoveler, wigeon, tufted duck and lapwing. A notable record of a single garganey was also recorded at Transect 6, roosting between Moorditch Lane and the Manchester Ship Canal in May. A notable count of 56 snipe at Transect 6 in January, accounts for 83.58% of the Mersey Estuary five-year peak mean.
- 5.1.7 There were also notable records of Schedule 1 listed barn owl, peregrine and Cetti's warbler (peak count of six singing males) during surveys at Transect 6.

⁴ Natural England. 2015. Review and analysis of changes in waterbird use of the Mersey Estuary SPA, Mersey Narrows & North Wirral Foreshore pSPA and Ribble & Alt Estuaries SPA (NECR173). 27 May 2015. Annex II: Roost locations by species at a regional level. See:

<https://publications.naturalengland.org.uk/publication/4713137133584384>

⁵ Bowland Ecology. 2021. Identification of Functionally Linked Land supporting SPA waterbirds in the North West of England. NERC361. Natural England.

- 5.1.8 Shelduck and teal were the only target waterbird species recorded at Ince Marshes (Transect 5) and occurred only in low numbers (one to five individuals), amounting to less than 1% of their most recent Mersey Estuary five-year (2018/19-2022/23) peak mean, respectively. Counts were noted of assemblage species Canada goose (130) and pink-footed goose (280), both of which exceed 1% of their most recent Mersey Estuary five-year (2018/19-2022/23) peak mean.
- 5.1.9 There were also notable records at Transect 5 of cattle egret and Cetti's warbler (peak count of four singing males). Cattle egret was recorded on Transect 5 only across visits 1-4 (January and February), utilising the same field south of Marsh Lane. A peak count of 15 birds was recorded on 30 January, accounting for more than three times the Mersey Estuary five-year peak mean of four birds and 38.08% of the latest GB wintering estimate (Woodward *et al.*, 2020).
- 5.1.10 All target waterbird species were recorded at the Weaver Bend/Estuary (Transect 7b) across the survey period; though shelduck, black-tailed godwit, dunlin and redshank were recorded in numbers below 1% of their most recent Mersey Estuary five-year peak means. Shelduck notably only used the area to roost, with groups roosting on the inner bend lagoon and Frodsham Marsh. A peak count of 150 golden plover (constituting 7.25% of the Mersey Estuary five-year peak mean) was recorded flying from a lagoon area on the inner Weaver Bend in March, though this was the only record of the species in this locality (Transect 7b) across the survey period. The same lagoon recorded large counts of assemblage species, including lapwing in both January (800 birds) and February (500 birds), with the peak count constituting 12.9% of the Mersey Estuary five-year peak mean of 6,201 individuals. All target waterbird records were in excess of 500m from the Draft Order Limits, with the exception of two records of shelduck and teal, respectively; single shelduck and groups of four and eight teal were recorded utilising fields around Weaver Lane, within 400m of the Draft Order Limits. There were also notable records at Transect 7b of Schedule 1 listed kingfisher, marsh harrier (a feeding female) and Cetti's warbler (peak count of three singing males).
- 5.1.11 Teal was the only target waterbird species recorded at Transect 13b. A peak count of 120 birds was recorded roosting on River Mersey mudflat close to Fiddlers Ferry in January, amounting to 2.73% of the Mersey Estuary five-year peak mean. A notable count of 36 cormorant (constituting 5.07% of the Mersey Estuary five-year peak mean) was recorded roosting in trees at Lapwing Lake within Moore Nature Reserve in late January. Both Lapwing Lake and Birchwood Pool within Moore Nature Reserve also supported assemblage species including gadwall, wigeon, mallard, tufted duck, moorhen, coot, little grebe and great crested grebe. There were also notable records at Transect 13b of Schedule 1 listed kingfisher (pair) and Cetti's warbler (a single singing male).
- 5.1.12 No significant numbers of target waterbird species (i.e. more than 1% of the Mersey Estuary five-year peak means) were recorded at Transect 14, with only three shelduck, two teal and a single redshank observed. Waterbird assemblage species were consistently present in both the Sankey Canal and River Mersey in relatively low numbers, though peak counts exceeded 1% of the Mersey Estuary five-year peak means for mute swan, gadwall, mallard, moorhen, coot, little grebe and grey heron. No non-waterbird Schedule 1 species were recorded at Transect 14.

Annex 501

Survey Conditions

Table 501.1 Non-breeding waterbird survey conditions January-June 2024

Date	Time	Sunrise	Sunset	HT time	HT height	LT time	LT height	Weather conditions
Transect 5								
17/01/2024	09:00-12:40	08:16	16:25	16:16	4.69m	13:37	0.46m	Dry, Wind F1 N, Cloud Cover 0-2/8, Visibility >3km, all day frost and lying snow, Temp 0c to -2c
30/01/2024	08:30-11:30	07:59	16:49	14:28	4.35m	11:46	0.45m	Dry, Wind F4 NW, Cloud Cover 5-8/8, Visibility >3km, Temp 6-7c
08/02/2024	13:50-15:23	07:43	17:06	10:32	4.20m	07:58	0.42m	Light rain to Dry, Wind F3 E, Cloud Cover 8/8, Visibility >3km, Temp 3c
26/02/2024	08:30-11:00	07:05	17:42	13:04	4.74m	10:24	0.38m	Dry, Wind F2 N, Cloud Cover 3-6/8, Visibility >3km, Temp 5c-6c
13/03/2024	10:00-11:30	06:28	18:11	13:52	5.84m	11:23	0.43m	Dry, Wind F4 S, Cloud Cover 7-8/8, Visibility >3km, Temp 13c
26/03/2024	08:30-10:55	05:56	18:36	12:36	4.70m	09:58	0.38m	Dry, Wind F2 E, Cloud Cover 7-8/8, Visibility >3km, Temp 8c-10c
08/04/2024	10:30-13:00	06:26	19:59	12:22	5.58m	09:57	0.43m	Dry to Light rain, Wind F4 S, Cloud Cover 8/8. Visibility >3km, Temp 13-14c

Date	Time	Sunrise	Sunset	HT time	HT height	LT time	LT height	Weather conditions
23/04/2024	07:00-11:30	05:52	20:26	12:34	4.42m	10:00	0.44m	Dry, Wind F2 N, Cloud Cover 3-6/8, Visibility >3km, Temp 8-10c
01/05/2024	06:30-10:30	05:36	20:40	05:31	3.19m	15:20	0.42m	Dry, Wind F2 SE, Cloud Cover 3-4/8, Visibility >3km, Temp 0-15c
14/05/2024	09:30-12:30	05:12	21:03	04:41	3.45m	14:45	0.43m	Light rain to Dry, Wind F3 S, Cloud Cover 8/8, Visibility >3km, Temp 15-17c
10/06/2024	09:30:00-12:30	04:43	21:37	02:51	4.35m	12:52	0.47m	Dry, Wind F4 N, Cloud Cover 6-8/8, Visibility >3km, Temp 12-14c
19/06/2024	08:00-12:00	04:42	21:42	10:47	3.45m	08:07	0.43m	Dry, Wind F1 SE, Cloud Cover 4-5/8, Visibility >3km, Temp 13-17c
Transect 6								
17/01/2024	13:10-16:20	08:16	16:25	16:16	4.69m	13:37	0.46m	Dry, Wind F1 N, Cloud Cover 0-2/8, Visibility >3km, all day frost and lying snow, Temp 0-2c
18/01/2024	13:20-17:10	08:15	16:27	17:12	4.22m	14:29	0.44m	Dry, Wind F1 N, Cloud Cover 0-1/8, Visibility >3km, all day frost and lying snow, Temp 0-5c
30/01/2024	12:15-16:40	07:59	16:49	14:28	4.35m	11:46	0.45m	Dry, Wind F4 NW, Cloud Cover 3/8, Visibility >3km, Temp 6-8c
08/02/2024	08:31-12:00	07:43	17:06	10:32	4.20m	07:58	0.42m	Moderate rain, Wind F4 E, Cloud Cover 8/8, Visibility 1-3km, Temp 1c-2c
26/02/2024	13:45-18:15	07:05	17:42	13:04	4.74m	10:24	0.38m	Dry, Wind F2 N, Cloud Cover 1-4/8, Visibility >3km, Temp 7c-8c

Date	Time	Sunrise	Sunset	HT time	HT height	LT time	LT height	Weather conditions
13/03/2024	13:50-16:05	06:28	18:11	13:52	5.84m	11:23	0.43m	Dry, Wind F4 S, Cloud Cover 8/8, Visibility >3km, Temp 13c
26/03/2024	14:00-18:00	05:56	18:36	12:36	4.70m	09:58	0.38m	Dry, Wind F2 E, Cloud Cover 8/8, Visibility >3km, Temp 9c-13c
09/04/2024	08:00-11:30	06:24	20:01	13:04	5.83m	10:39	0.45m	Heavy rain, Wind F6-7 NW, Cloud Cover 8/8, Visibility 1-3km, Temp 7-9c
23/04/2024	12:00-17:30	05:52	20:26	12:34	4.42m	10:00	0.44m	Dry, Wind F2 N, Cloud Cover 3-6/8, Visibility >3km, Temp 10-12c
01/05/2024	13:00-18:00	05:36	20:40	18:14	2.82m	15:20	0.42m	Dry, Wind F2 SE, Cloud Cover 3-5/8, Visibility >3km, Temp 17-20c
14/05/2024	13:00-17:30	05:12	21:03	17:20	2.89m	14:45	0.43m	Dry, Wind F3 S, Cloud Cover 6-8/8, Visibility >3km, Temp 17-19c
10/06/2024	13:00-16:30	04:43	21:37	15:21	3.91m	12:52	0.47m	Dry, Wind F4 N, Cloud Cover 6-7/8, Visibility >3km, Temp 14-15c
19/06/2024	12:15-17:30	04:42	21:42	10:47	3.45m	20:35	0.43m	Dry, Wind F1 SE, Cloud Cover 5/8, Visibility >3km, Temp 16-18c
Transect 7b								
18/01/2024	09:00-13:00	08:15	16:27	17:12	4.22m	14:29	0.44m	Dry, Wind F1 N, Cloud Cover 1-2/8, Visibility >3km, all day frost and lying snow, Temp 1c to -5c

Date	Time	Sunrise	Sunset	HT time	HT height	LT time	LT height	Weather conditions
31/01/2024	09:00-12:45	07:58	16:51	14:59	4.09m	12:19	0.44m	Dry, Wind F4 SW, Cloud Cover 4-8/8, Visibility >3km, Temp 7-11c
09/02/2024	09:00-11:15	07:41	17:08	11:21	4.84m	08:49	0.44m	Dry to Drizzle, Wind F2 E, Cloud Cover 8/8, Visibility 1-3km to >3km, Temp 5c-7c
26/02/2024	11:15-13:30	07:05	17:42	13:04	4.74m	10:24	0.38m	Dry, Wind F2 N, Cloud Cover 4-6/8, Visibility >3km, Temp 6c-8c
12/03/2024	13:20-15:45	06:31	18:10	13:11	6.03m	10:43	0.43m	Dry, Wind F3 W-SW, Cloud Cover 6-8/8, Visibility >3km, Temp 12c
26/03/2024	11:10-13:45	05:56	18:36	12:36	4.70m	09:58	0.38m	Dry, Wind F2 E, Cloud Cover 6-8/8, Visibility >3km, Temp 11c-13c
Transect 13b								
19/01/2024	08:30-12:00	08:14	16:28	19:28	3.42m	16:43	0.41m	Dry, Wind F2 SW, Cloud Cover 0-2/8, Visibility >3km, all day frost and lying snow, Temp -1c to 2c
29/01/2024	13:10-16:00	08:01	16:47	13:57	4.52m	11:15	0.46m	Dry then light showers, Wind F2 S, Cloud Cover 8/8, Visibility >3km to 1-3km, Temp 12c
07/02/2024	12:30-15:00	07:45	17:04	09:38	3.52m	07:03	0.40m	Dry, Wind F1 W-SW, Cloud Cover 3-4/8, Visibility >3km, Temp 4c-5c
27/02/2024	07:00-13:00	07:04	17:41	13:33	4.69m	10:52	0.39m	Dry to Light rain, Wind F2 S, Cloud Cover 8/8, Visibility >3km, Temp 1c-7c

Date	Time	Sunrise	Sunset	HT time	HT height	LT time	LT height	Weather conditions
12/03/2024	09:45-12:15	06:31	18:10	13:11	6.03m	10:43	0.43m	Dry, Wind F3 S, Cloud Cover 5-8/8, Visibility >3km, Temp 8c-11c
27/03/2024	07:30-12:30	05:55	18:37	13:03	4.66m	10:26	0.38m	Dry to Heavy rain showers, Wind F3 S, Cloud Cover 6-8/8, Visibility 1-3km to >3km, Temp 6c-8c
Transect 14								
19/01/2024	12:15-13:30	08:14	16:28	19:28	3.42m	16:43	0.41m	Dry, Wind F2 SW, Cloud Cover 2/8, Visibility >3km, all day frost and lying snow, Temp 3-5c
29/01/2024	11:15-12:40	08:01	16:47	13:57	4.52m	11:15	0.46m	Heavy showers then dry, Still to Wind F2 SE, Cloud Cover 8/8, Visibility >3km to 1-3km, Temp 8-12c
07/02/2024	09:30-11:15	07:45	17:04	09:38	3.52m	07:03	0.40m	Dry, Wind F1 E-S, Cloud Cover 4-7/8, Visibility >3km, Temp 4c-5c
27/02/2024	13:30-15:00	07:04	17:41	13:33	4.69m	10:52	0.39m	Light rain, Wind F2 S, Cloud Cover 8/8, Visibility >3km to 1-3km, Temp 7c-10c
14/03/2024	09:50-10:55	06:26	18:13	14:34	5.38m	12:03	0.41m	Light rain showers, Wind F3 S, Cloud Cover 8/8, Visibility >3km, Temp 12c
27/03/2024	13:00-14:30	05:55	18:37	13:03	4.66m	10:26	0.38m	Dry, Wind F3 S, Cloud Cover 7/8, Visibility >3km, Temp 8c

Annex 502

Survey Results

Table 502.1 Transect 5: Non-breeding waterbird survey results January-June 2024

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population*	17-Jan	30-Jan	08-Feb	26-Feb	13-Mar	26-Mar	08-Apr	23-Apr	01-May	14-May	10-Jun	19-Jun
Canada goose	Assemblage	10,191	160,000	130	0	0	0	0	36	0	0	0	0	0	0
Cattle egret	Assemblage	4	65	4	15	11	6	0	0	0	0	0	0	0	0
Coot	Assemblage	228	200,000	2	2	2	4	5	3	4	0	1	1	2	0
Curlew	Assemblage	1,541	120,000	0	73	60	0	0	0	0	0	0	0	0	0
Gadwall	Assemblage	109	31,000	2	0	2	0	2	2	2	3	3	2	0	0
Grey heron	Assemblage	97	45,000	0	0	1	0	0	0	0	0	0	0	0	0
Lapwing	Assemblage	6,201	620,000	7	0	0	0	0	0	0	0	0	0	0	0
Little egret	Assemblage	126	11,500	28	16	1	1	0	0	0	0	0	0	0	0

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population*	17-Jan	30-Jan	08-Feb	26-Feb	13-Mar	26-Mar	08-Apr	23-Apr	01-May	14-May	10-Jun	19-Jun
Little grebe	Assemblage	33	15,000	3	1	0	0	0	4	2	0	2	1	2	1
Mallard	Assemblage	875	665,000	2	0	8	7	11	8	4	1	6	4	7	4
Moorhen	Assemblage	53	300,000	3	6	16	2	6	1	0	3	1	1	0	0
Mute swan	Assemblage	53	50,500	0	0	0	0	0	0	0	0	1	0	0	0
Pink-footed goose	Assemblage	8,169	510,000	0	0	0	280	0	0	0	0	0	0	0	0
Shelduck	Qualifying (SPA and Ramsar)	13,704	47,000	0	0	0	0	0	5	0	0	2	0	0	0
Snipe	Assemblage	67	1,000,000	0	0	0	0	0	3	0	0	0	0	0	0
Teal	Qualifying (SPA and Ramsar)	4,394	430,000	0	1	2	2	0	0	0	0	0	0	0	0
Tufted duck	Assemblage	387	130,000	2	0	0	7	3	9	5	2	2	0	0	0

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population*	17-Jan	30-Jan	08-Feb	26-Feb	13-Mar	26-Mar	08-Apr	23-Apr	01-May	14-May	10-Jun	19-Jun
Incidental records															
Cetti's warbler	Schedule 1	N/A	3,450 breeding males	0	0	0	1	0	4	1	0	0	0	0	0

* Wintering individuals, unless otherwise stated

Table 502.2 Transect 6: Non-breeding waterbird survey results January-June 2024

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB populatio n*	17- Jan	18- Ja n	30- Ja n	08- Feb	26- Fe b	13- Mar	26- Ma r	09- Ap r	23- Ap r	01- Ma y	14- Ma y	10- Ju n	19- Ju n
Avocet	Assemblage	205	8,700	0	0	0	0	0	0	0	0	4	0	0	0	0
Black-tailed godwit	Qualifying (SPA and Ramsar)	3,579	39,000	0	65	125	425	293	114 5	396	250	0	154	1	0	0
Canada goose	Assemblage	10,191	160,000	67	0	0	691	400	143	210	90	38	12	130	180	30
Coot	Assemblage	228	200,000	65	0	10	14	37	21	23	20	16	3	2	4	6
Cormorant	Assemblage	710	62,000	0	0	0	0	0	0	1	0	0	0	0	0	0
Curlew	Assemblage	1,541	120,000	0	26	1	22	17	28	12	10	0	0	0	0	0
Dunlin	Qualifying (SPA and Ramsar)	41,318	345,000	80	0	0	70	0	0	0	0	0	0	0	0	0
Gadwall	Assemblage	109	31,000	0	0	0	0	30	12	24	13	25	16	31	6	0
Garganey	Assemblage	2	105 breeding pairs	0	0	0	0	0	0	0	0	0	1	0	0	0

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population*	17-Jan	18-Jan	30-Jan	08-Feb	26-Feb	13-Mar	26-Mar	09-Apr	23-Apr	01-May	14-May	10-Jun	19-Jun
Golden plover	Qualifying (SPA)	2,068	400,000	1220	50	70	10	0	0	45	0	0	0	0	0	0
Grey heron	Assemblage	97	45,000	0	0	0	4	0	1	1	0	0	1	0	0	0
Greylag goose	Assemblage	71	230,000	0	0	0	0	0	6	2	0	0	0	8	0	0
Lapwing	Assemblage	6,201	620,000	530	0	150	1000	3	6	11	4	14	43	7	10	29
Little egret	Assemblage	126	11,500	0	0	0	0	1	0	0	0	0	0	0	0	0
Little grebe	Assemblage	33	15,000	0	0	0	0	0	1	0	0	2	3	0	0	0
Mallard	Assemblage	875	665,000	25	0	55	76	100	45	34	52	41	46	45	21	21
Moorhen	Assemblage	53	300,000	1	0	9	2	12	4	1	3	1	0	0	0	1
Mute swan	Assemblage	53	50,500	0	0	0	8	1	0	1	0	0	2	0	1	0
Oystercatcher	Assemblage	1,005	285,000	0	0	0	1	0	0	0	2	0	0	2	0	2
Pink-footed goose	Assemblage	8,169	510,000	0	0	145	0	0	23	0	0	0	0	0	0	0

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population*	17-Jan	18-Jan	30-Jan	08-Feb	26-Feb	13-Mar	26-Mar	09-Apr	23-Apr	01-May	14-May	10-Jun	19-Jun
Pintail	Qualifying (SPA and Ramsar)	218	19,500	20	0	27	0	60	0	1	18	0	0	0	0	0
Pochard	Assemblage	52	23,000	0	0	0	2	40	2	0	0	0	0	0	0	0
Redshank	Qualifying (SPA and Ramsar)	9,018	94,500	0	0	7	6	2	0	0	0	2	0	0	0	0
Ruff	Assemblage	16	895	0	1	12	0	0	0	1	0	0	0	0	0	0
Shelduck	Qualifying (SPA and Ramsar)	13,704	47,000	12	0	41	11	250	7	6	17	116	23	7	13	22
Shoveler	Assemblage	227	19,000	120	0	47	58	214	176	245	21	10	4	1	0	0
Snipe	Assemblage	67	1,000,000	1	0	0	0	56	0	3	0	0	0	0	0	0
Snow goose	Assemblage	0	75	0	0	0	0	0	0	0	0	0	0	24	0	0
Teal	Qualifying (SPA and Ramsar)	4,394	430,000	550	0	580	400	428	331	94	122	12	0	0	2	30

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population*	17-Jan	18-Jan	30-Jan	08-Feb	26-Feb	13-Mar	26-Mar	09-Apr	23-Apr	01-May	14-May	10-Jun	19-Jun
Tufted duck	Assemblage	387	130,000	0	0	0	37	200	23	52	35	153	45	69	12	27
Whimbrel	Assemblage	37	38	0	0	0	0	0	0	0	0	0	1	0	0	0
Whooper swan	Assemblage	26	16,000	0	0	0	0	21	19	12	0	0	0	0	0	0
Wigeon	Assemblage	2,059	445,000	0	0	180	2	12	0	0	0	0	5	0	0	0
Incidental records																
Barn owl	Schedule 1	N/A	4,000-14,000 breeding pairs	0	1	0	0	0	0	0	0	0	0	0	0	0
Cetti's warbler	Schedule 1	N/A	3,450 breeding males	1	0	0	0	4	0	6	1	0	0	0	0	0
Peregrine	Schedule 1	N/A	1,650 breeding pairs	0	1	0	0	0	0	1	0	0	0	0	0	0

* Wintering individuals, unless otherwise stated.

Table 502.3 Transect 7b: Non-breeding waterbird survey results January-March 2024

Species	Mersey Estuary Spa / Ramsar Site Status	Mersey Estuary Webs 5-Year Peak Mean	Gb Population	18- Jan	31- Jan	09- Feb	26- Feb	12- Mar	26- Mar
Avocet	Assemblage	205	8,700	0	0	16	0	0	0
Black-tailed godwit	Qualifying (SPA and Ramsar)	3,579	39,000	1	0	0	0	0	5
Canada goose	Assemblage	10,191	160,000	0	0	4	27	19	10
Coot	Assemblage	228	200,000	2	0	2	4	10	5
Cormorant	Assemblage	710	62,000	2	0	6	4	0	0
Curlew	Assemblage	1,541	120,000	0	0	0	0	5	0
Dunlin	Qualifying (SPA and Ramsar)	41,318	345,000	1	1	0	0	0	0
Gadwall	Assemblage	109	31,000	0	0	5	3	3	2
Golden plover	Qualifying (SPA)	2,068	400,000	0	0	0	0	150	0
Great crested grebe	Assemblage	65	16,500	4	3	5	1	4	0
Grey heron	Assemblage	97	45,000	1	2	1	1	1	0
Greylag goose	Assemblage	71	230,000	0	0	0	0	0	1

Species	Mersey Estuary Spa / Ramsar Site Status	Mersey Estuary Webs 5-Year Peak Mean	Gb Population	18- Jan	31- Jan	09- Feb	26- Feb	12- Mar	26- Mar
Kingfisher	Assemblage	4	3,650-6,100 breeding pairs	0	0	0	1	0	0
Lapwing	Assemblage	6,201	620,000	0	811	500	50	8	4
Little egret	Assemblage	126	11,500	0	1	1	1	0	1
Little grebe	Assemblage	33	15,000	1	0	0	0	0	0
Mallard	Assemblage	875	665,000	0	16	30	14	24	8
Moorhen	Assemblage	53	300,000	0	1	0	0	0	0
Mute swan	Assemblage	53	50,500	0	0	0	0	2	0
Oystercatcher	Assemblage	1,005	285,000	0	0	0	0	1	2
Pintail	Qualifying (SPA and Ramsar)	218	19,500	10	0	0	4	5	0
Redshank	Qualifying (SPA and Ramsar)	9,018	94,500	9	6	6	5	0	1
Shelduck	Qualifying (SPA and Ramsar)	13,704	47,000	0	1	37	19	3	78
Shoveler	Assemblage	227	19,000	2	0	0	0	0	0
Snipe	Assemblage	67	1,000,000	17	0	0	3	0	0

Species	Mersey Estuary Spa / Ramsar Site Status	Mersey Estuary Webs 5-Year Peak Mean	Gb Population	18- Jan	31- Jan	09- Feb	26- Feb	12- Mar	26- Mar
Teal	Qualifying (SPA and Ramsar)	4,394	430,000	28	63	35	65	73	30
Incidental records									
Cetti's warbler	Schedule 1	N/A	3,450 breeding males	1	0	0	2	0	3
Marsh harrier	Schedule 1	N/A	590-695 breeding pairs	0	0	1	0	0	0

* Wintering individuals, unless otherwise stated.

Table 502.4 Transect 13b: Non-breeding waterbird survey results January-March 2024

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population	19- Jan	29- Jan	07- Feb	27- Feb	12- Mar	27- Mar
Black-headed gull	Assemblage	12,162	2,200,000	0	0	0	0	3	0
Canada goose	Assemblage	10,191	160,000	39	0	14	24	11	18
Coot	Assemblage	228	200,000	29	30	21	16	7	10
Cormorant	Assemblage	710	62,000	0	37	19	5	13	4
Curlew	Assemblage	1,541	120,000	0	0	12	0	1	0
Gadwall	Assemblage	109	31,000	4	7	8	7	2	20
Goldeneye	Assemblage	21	18,500	0	2	0	0	0	0
Great crested grebe	Assemblage	65	16,500	7	1	5	14	6	4
Grey heron	Assemblage	97	45,000	1	0	1	0	0	1
Kingfisher	Assemblage	4	3,650-6,100 breeding pairs	0	0	0	0	0	2
Little grebe	Assemblage	33	15,000	6	3	3	6	4	8
Mallard	Assemblage	875	665,000	3	34	17	26	17	21
Moorhen	Assemblage	53	300,000	8	0	8	2	3	1

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population	19- Jan	29- Jan	07- Feb	27- Feb	12- Mar	27- Mar
Shoveler	Assemblage	227	19,000	0	2	2	0	0	0
Teal	Qualifying (SPA and Ramsar)	4,394	430,000	133	0	2	22	6	6
Tufted duck	Assemblage	387	130,000	6	20	19	67	22	42
Wigeon	Assemblage	2,059	445,000	0	44	30	43	39	0
Incidental records									
Cetti's warbler	Schedule 1	N/A	3,450 breeding males	0	0	0	0	0	1

* Wintering individuals, unless otherwise stated.

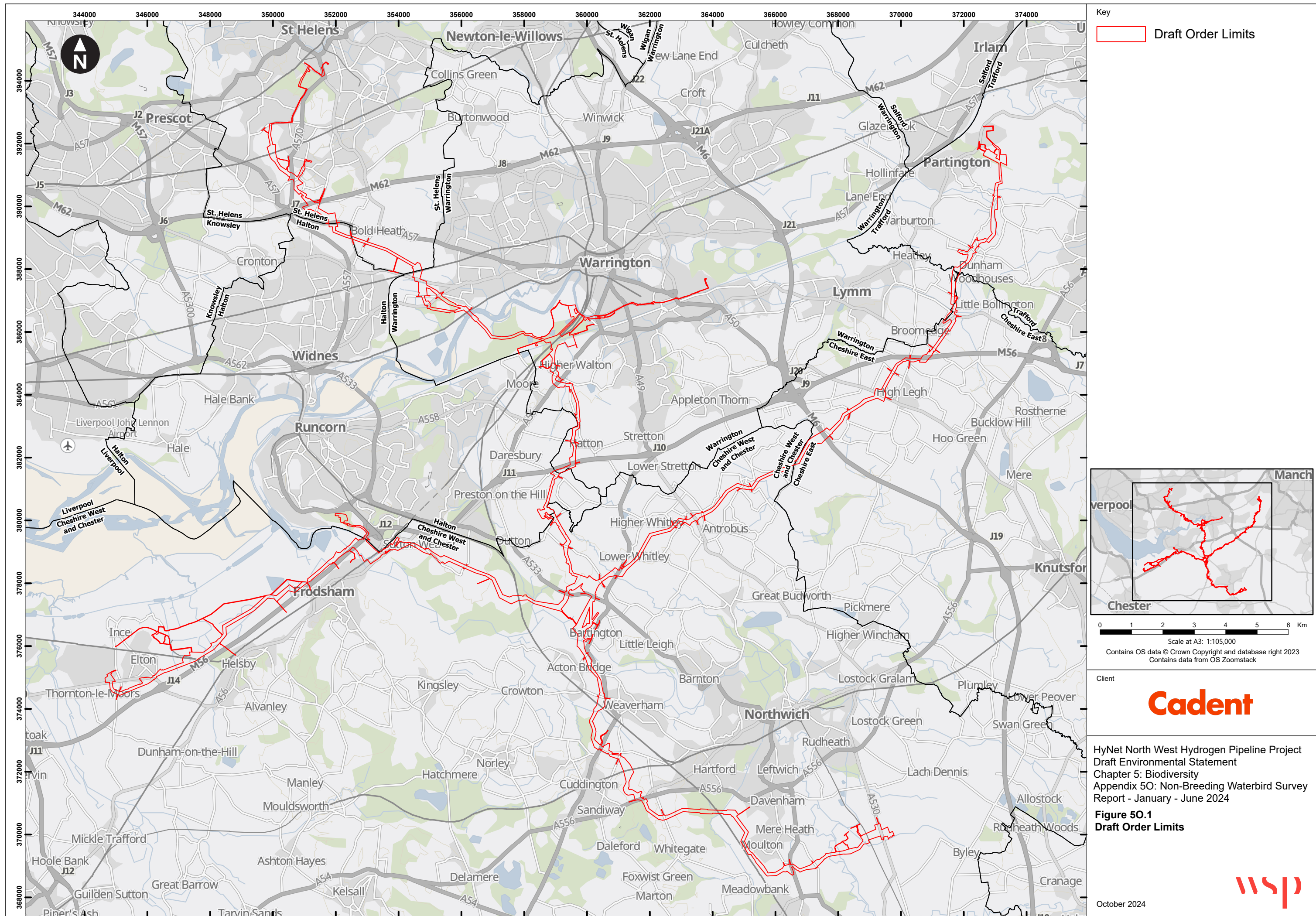
Table 502.5 Transect 14: Non-breeding waterbird survey results January-March 2024

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population	19- Jan	29- Jan	07- Feb	27- Feb	14- Mar	27- Mar
Canada goose	Assemblage	10,191	160,000	6	22	9	14	5	0
Coot	Assemblage	228	200,000	26	16	7	3	4	1
Cormorant	Assemblage	710	62,000	0	1	0	0	1	0
Curlew	Assemblage	1,541	120,000	0	0	0	0	1	0
Gadwall	Assemblage	109	31,000	4	6	8	0	3	0
Grey heron	Assemblage	97	45,000	0	3	0	0	0	0
Lapwing	Assemblage	6,201	620,000	0	30	0	0	0	0
Little grebe	Assemblage	33	15,000	0	0	2	0	1	0
Mallard	Assemblage	875	665,000	62	26	21	9	17	38
Moorhen	Assemblage	53	300,000	21	17	15	3	8	4
Mute swan	Assemblage	53	50,500	3	0	2	2	0	1
Redshank	Qualifying (SPA and Ramsar)	9,018	94,500	1	0	0	0	0	0
Shelduck	Qualifying (SPA and Ramsar)	13,704	47,000	3	0	0	0	0	0

Species	Mersey Estuary SPA / Ramsar Site status	Mersey Estuary WeBS 5-year peak mean	GB population	19- Jan	29- Jan	07- Feb	27- Feb	14- Mar	27- Mar
Teal	Qualifying (SPA and Ramsar)	4,394	430,000	2	0	0	0	0	0
Incidental records									
Cetti's warbler	Schedule 1	N/A	3,450 breeding males	0	2	0	0	0	1
Grey partridge	Incidental	N/A	37,000 breeding territories	0	0	1	0	0	0

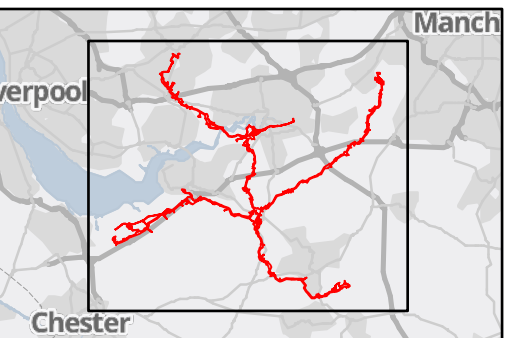
* Wintering individuals, unless otherwise stated

Annex 5O3 Figures



Key

Draft Order Limits



0 1 2 3 4 5 6 Km

Scale at A3: 1:105,000

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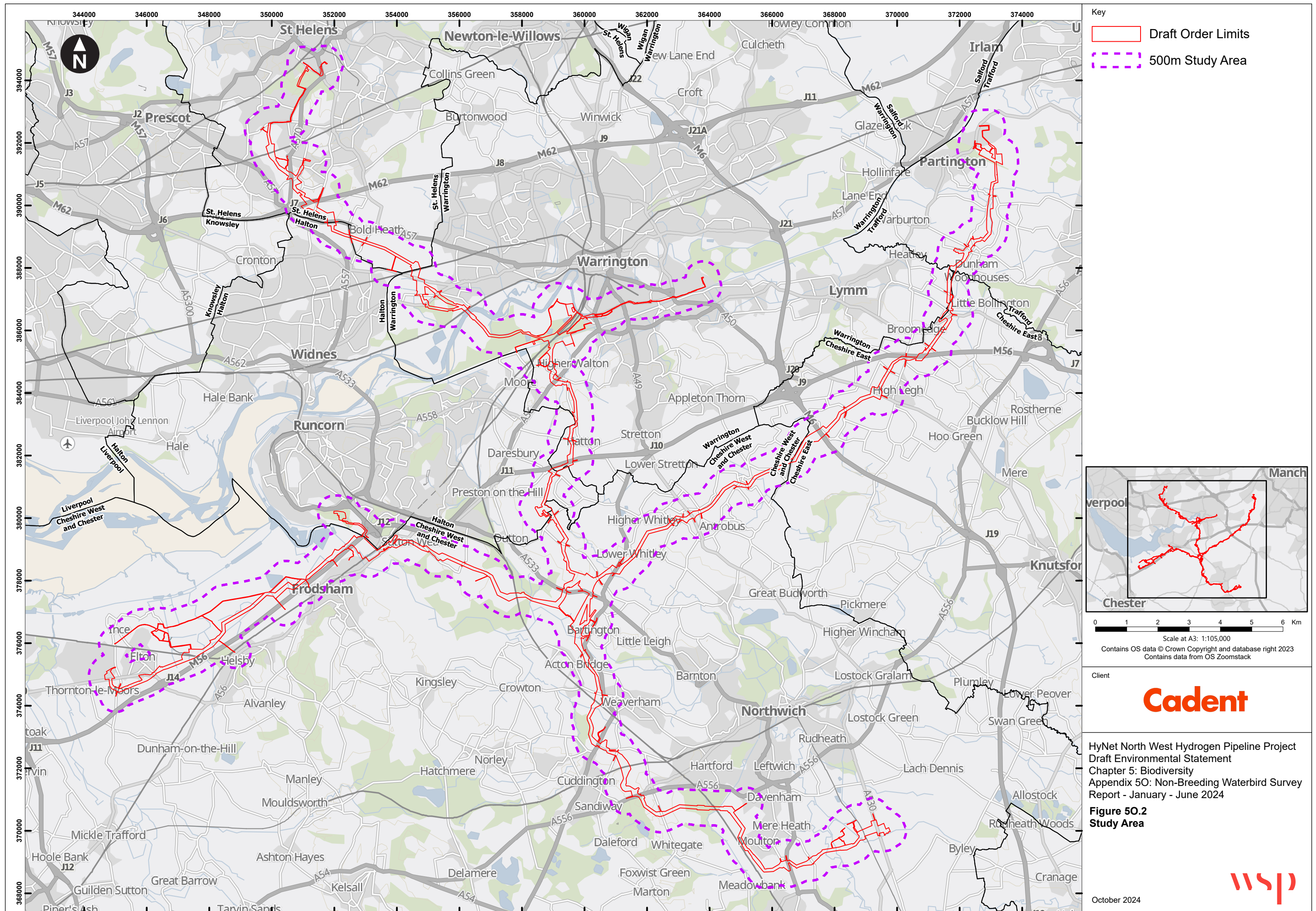
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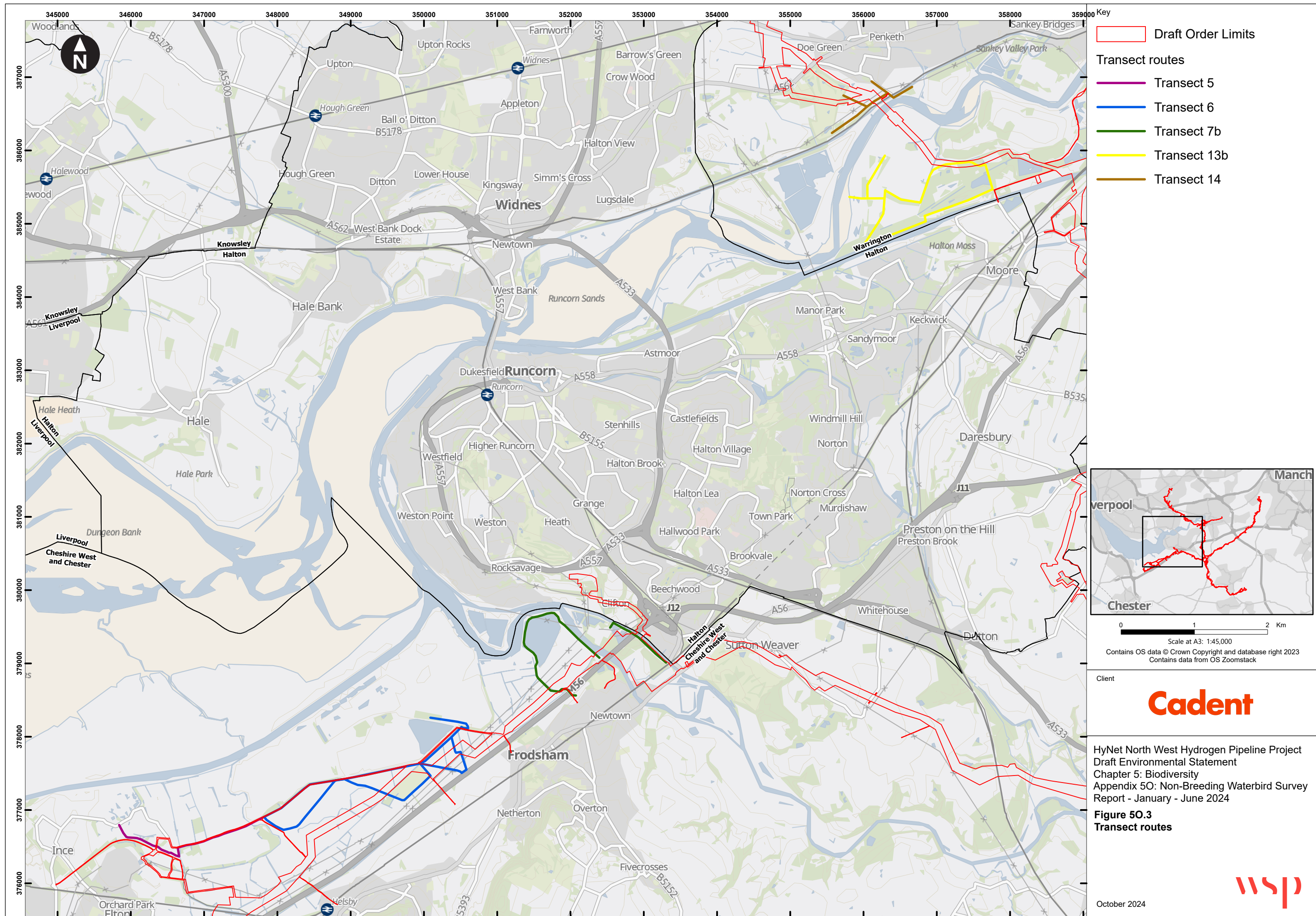
Client

Cadent

HyNet North West Hydrogen Pipeline Project
Draft Environmental Statement
Chapter 5: Biodiversity
Appendix 5O: Non-Breeding Waterbird Survey
Report - January - June 2024

Figure 5O.1
Draft Order Limits





Key

Draft Order Limits

Transect routes

- Transect 5
- Transect 6
- Transect 7b
- Transect 13b
- Transect 14

Scale at A3: 1:45,000

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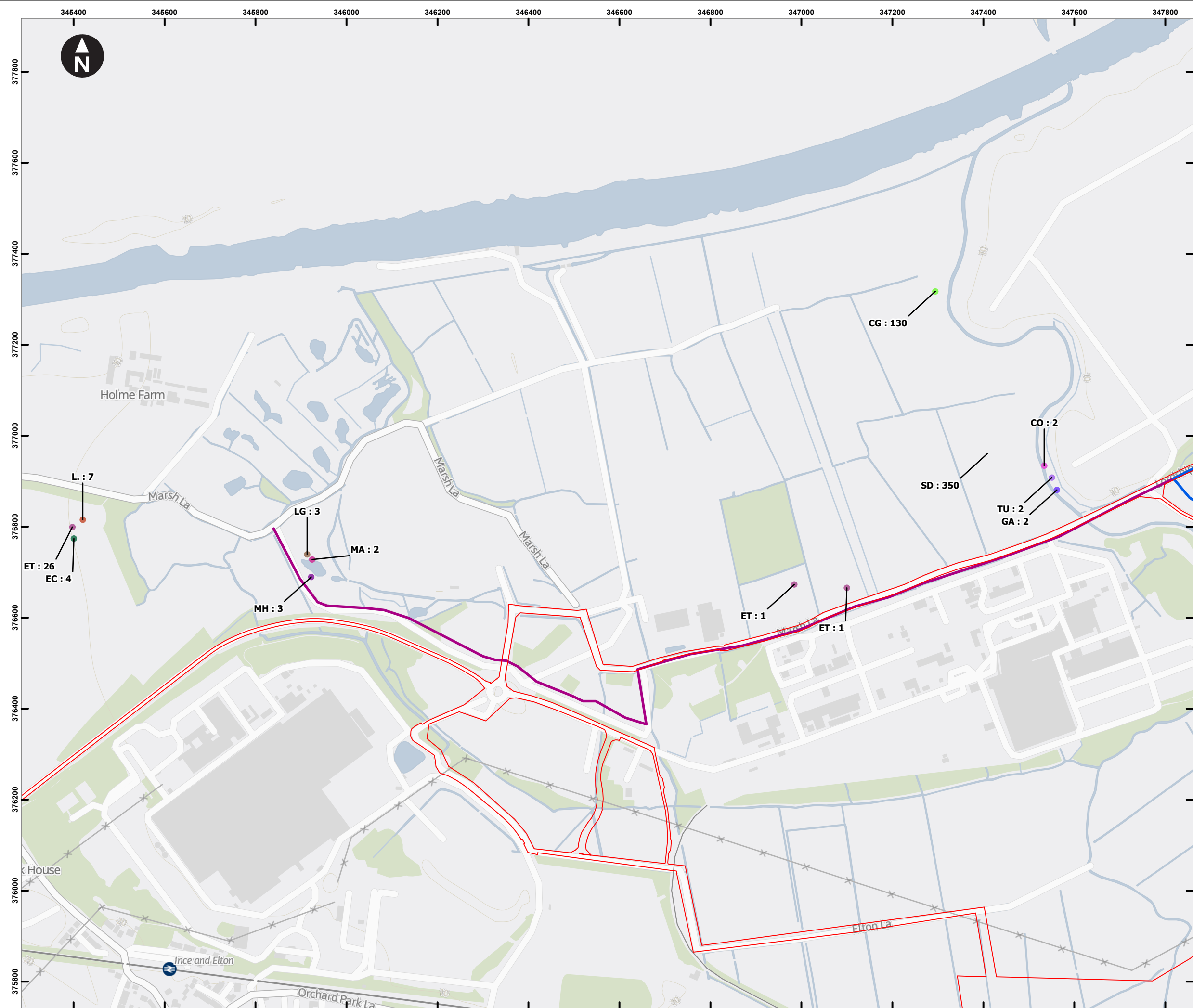
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HyNet North West Hydrogen Pipeline Project
Draft Environmental Statement
Chapter 5: Biodiversity
Appendix 5O: Non-Breeding Waterbird Survey
Report - January - June 2024

Figure 50.3
Transect routes

October 2024

wsp



Key

Draft Order Limits

Transect routes

Transect 5

Transect 6

Species

- Canada Goose (CG)
- Coot (CO)
- Gadwall (GA)
- Cattle egret (EC)
- Little egret (ET)
- Little grebe (LG)
- Lapwing (L.)
- Mallard (MA)
- Moorhen (MH)
- Tufted duck (TU)

Scale at A3: 1:8,000

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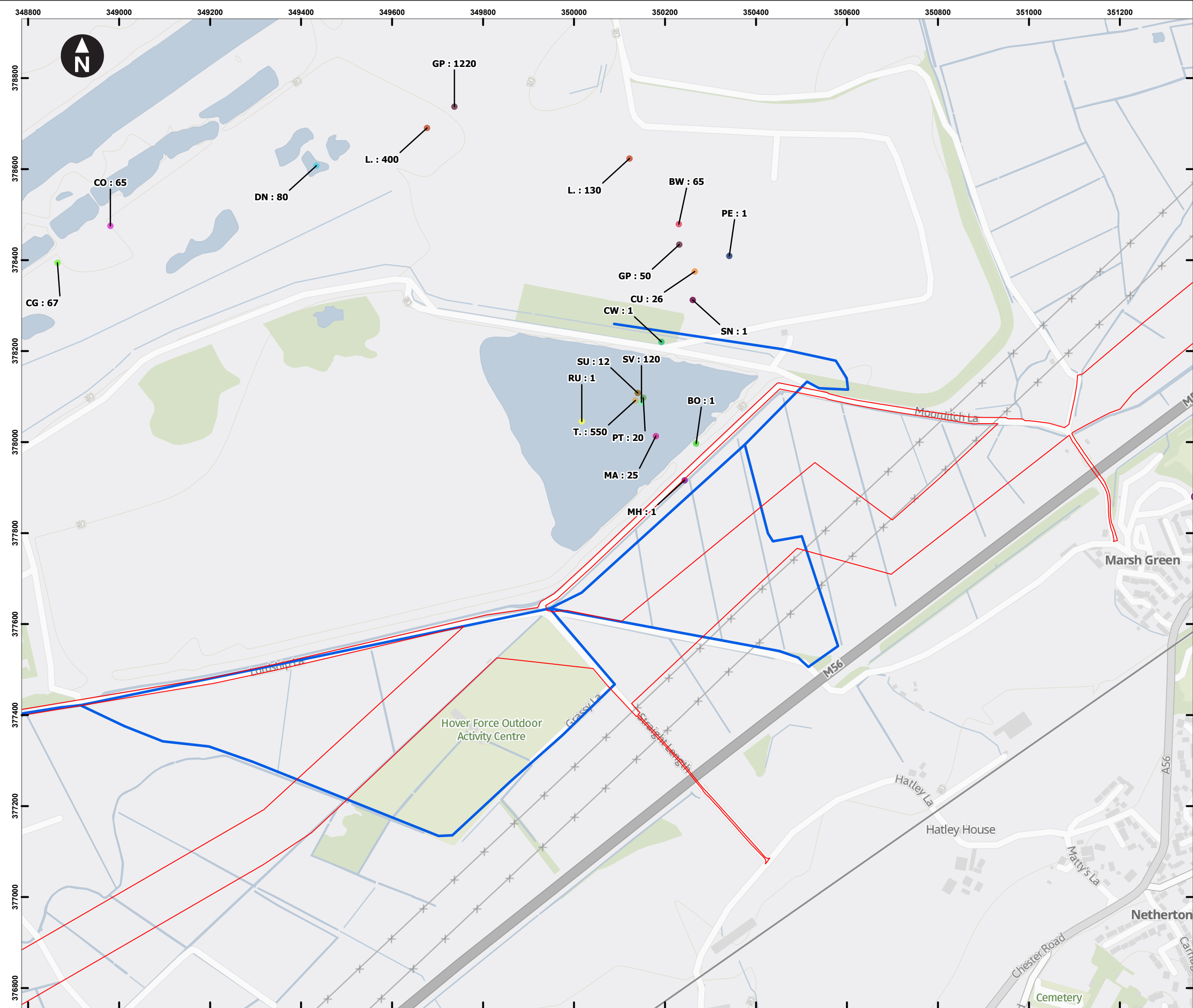
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

- Black-tailed godwit (BW)
- Canada Goose (CG)
- Coot (CO)
- Curfew (CU)
- Cetti's Warbler (CW)
- Great crested grebe (GG)
- Golden plover (GP)
- Lapwing (L.)
- Mallard (MA)
- Moorhen (MH)
- Pintail (PT)
- Snipe (SN)
- Shelduck (SU)
- Shoveler (SV)
- Teal (T.)
- Barn Owl (BO)
- Dunlin (DN)
- Peregrine (PE)
- Ruff (RU)

Scale at A3: 1:8,000

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Appendix 50: Non-Breeding Waterbird Survey Report - January - June 2024

Figure 50.4

Non-Breeding Waterbird Survey Results

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Key

Draft Order Limits

Transect routes

Transect 7b

Species

- Black-tailed godwit (BW)
- Cormorant (CA)
- Coot (CO)
- Cetti's Warbler (CW)
- Great crested grebe (GG)
- Grey Heron (H.)
- Little grebe (LG)
- Pintail (PT)
- Redshank (RK)
- Snipe (SN)
- Shoveler (SV)
- Teal (T.)
- Dunlin (DN)

Scale at A3: 1:8,000

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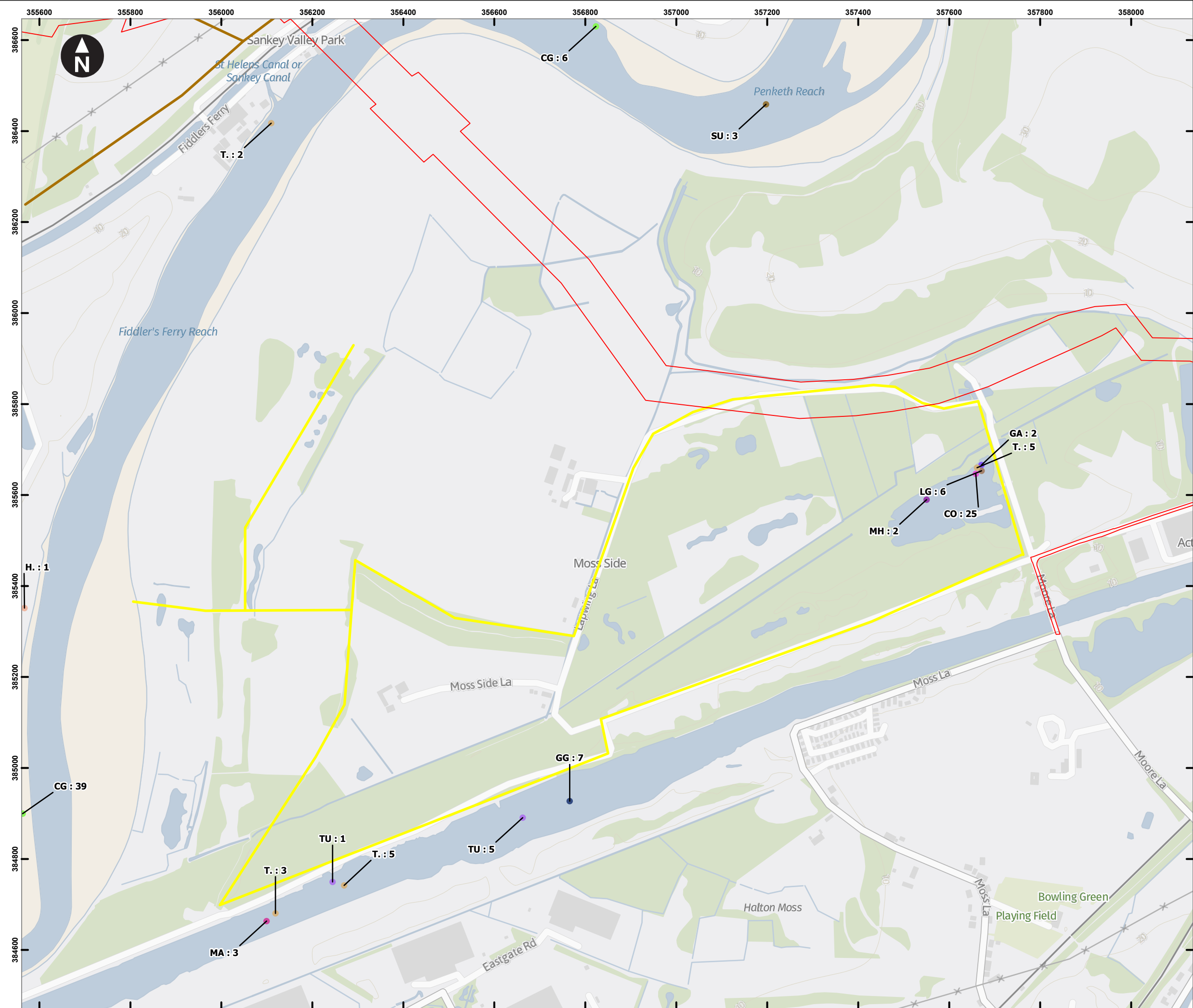
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 13b

Transect 14

Species

Canada Goose (CG)

Coot (CO)

Gadwall (GA)

Great crested grebe (GG)

Grey Heron (H.)

Little grebe (LG)

Mallard (MA)

Moorhen (MH)

Mute swan (MS)

Redshank (RK)

Tufted duck (TU)

Shelduck (SU)

Teal (T.)

0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

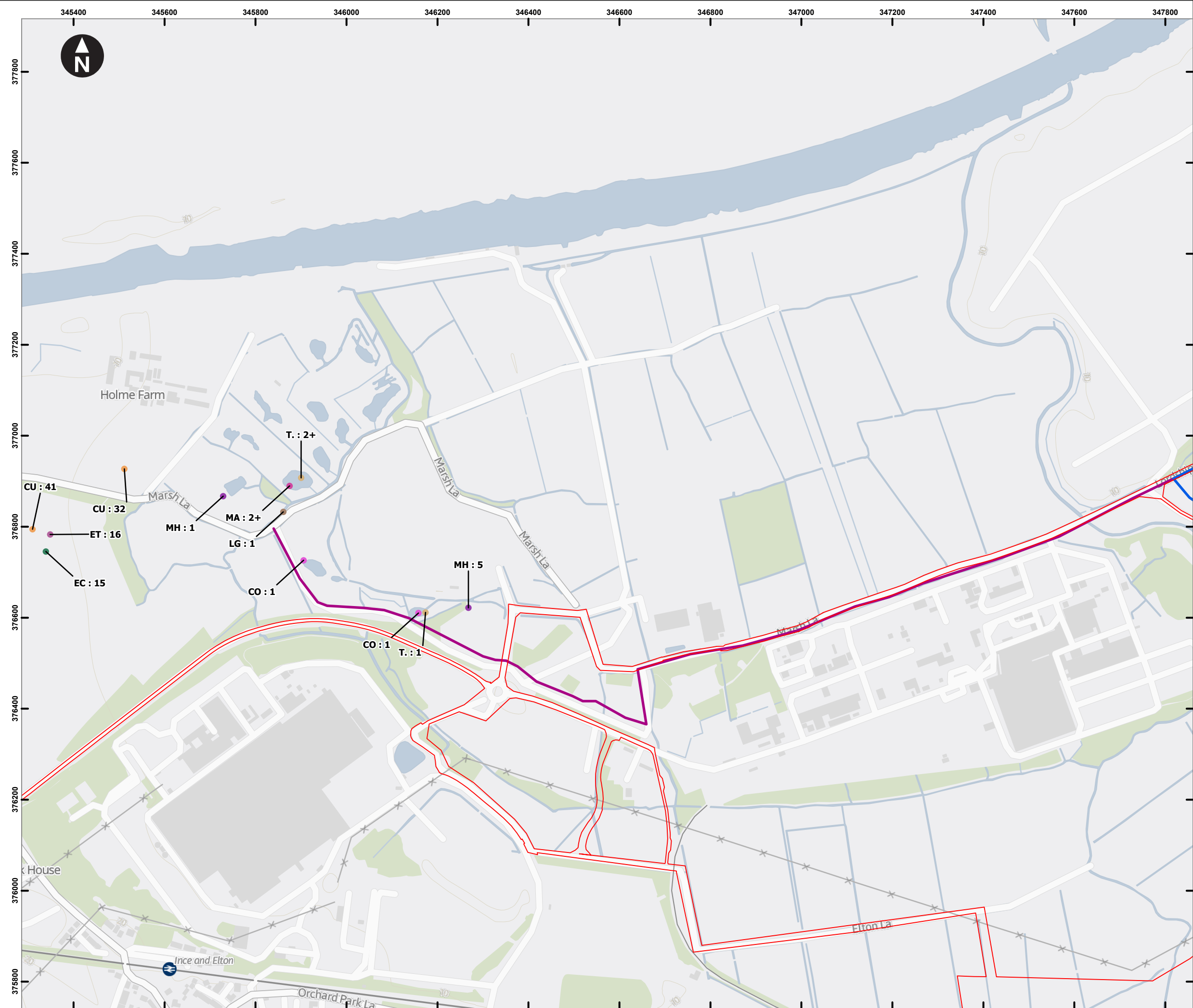
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Client

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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 5

Transect 6

Species

- Coot (CO)
- Curfew (CU)
- Cattle egret (EC)
- Little egret (ET)
- Little grebe (LG)
- Mallard (MA)
- Moorhen (MH)
- Teal (T.)

Scale at A3: 1:8,000

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Figure 5O.4

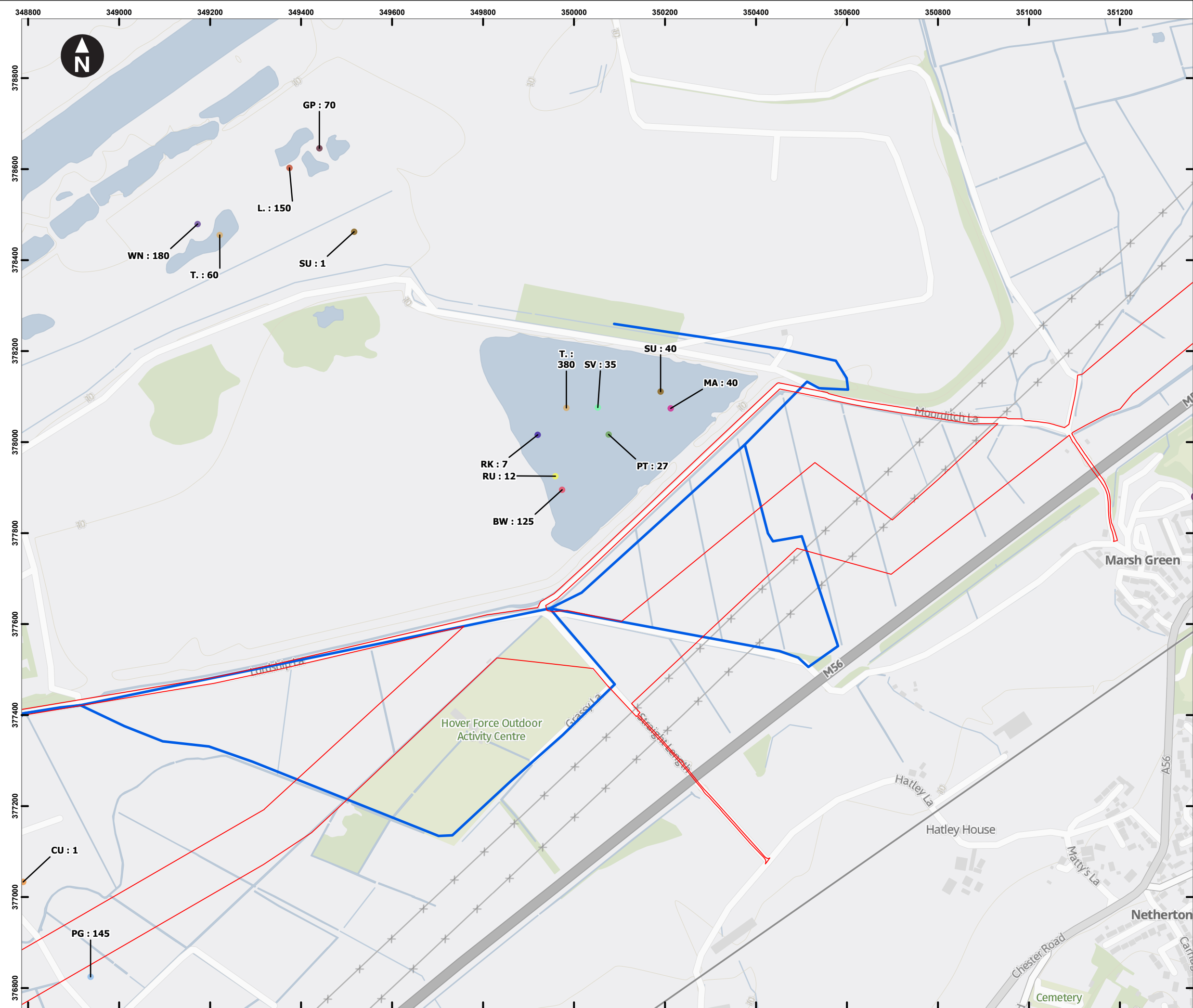
Non-Breeding Waterbird Survey Results

(Visit number: 2)

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wsp



Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

- Black-tailed godwit (BW)
- Coot (CO)
- Curfew (CU)
- Great crested grebe (GG)
- Golden plover (GP)
- Grey Heron (H.)
- Lapwing (L.)
- Mallard (MA)
- Moorhen (MH)
- Pintail (PT)
- Redshank (RK)
- Pink-footed goose (PG)
- Shelduck (SU)
- Shoveler (SV)
- Teal (T.)
- Wigeon (WN)
- Dunlin (DN)
- Ruff (RU)

Scale at A3: 1:8,000

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Figure 5O.4

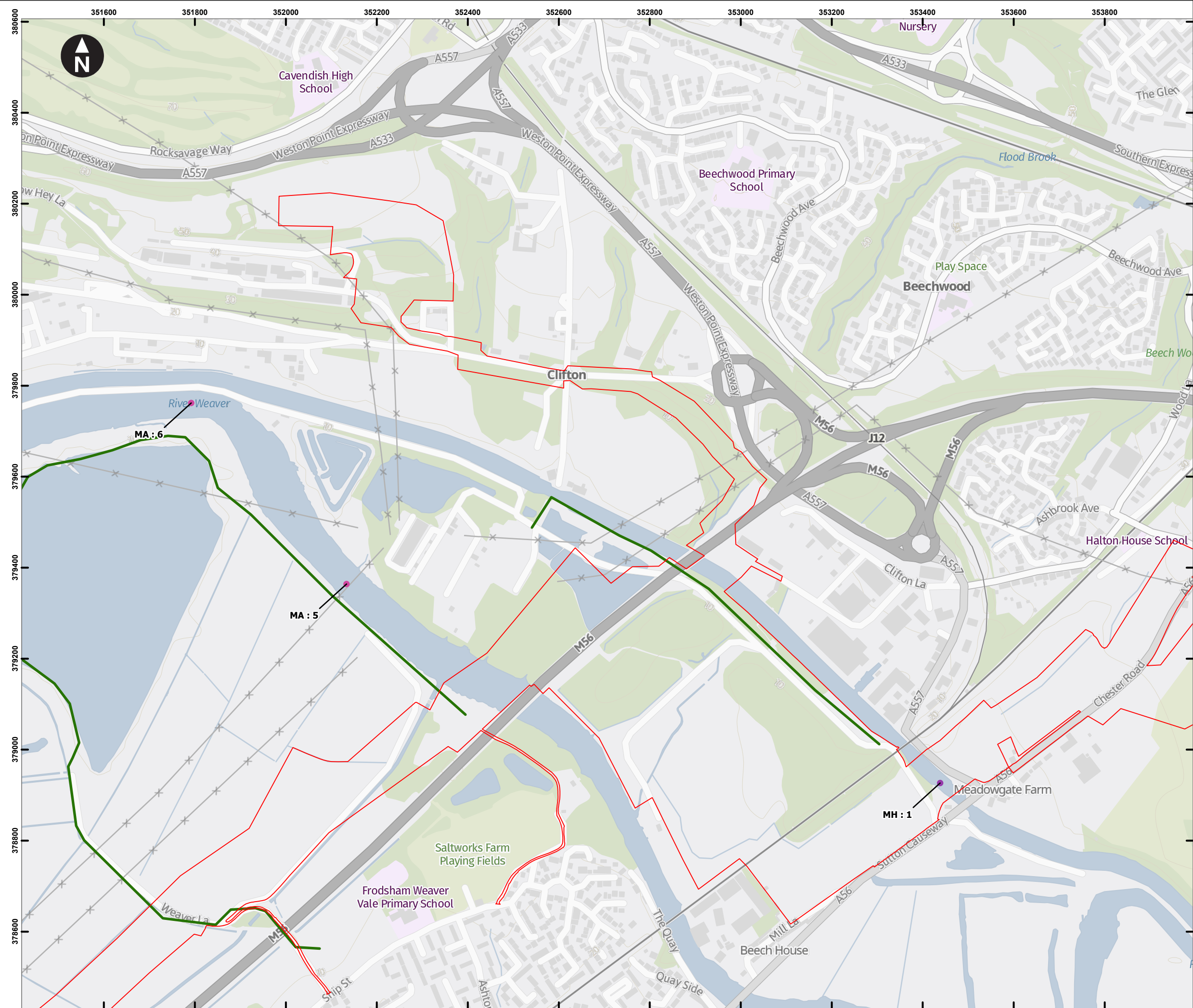
Non-Breeding Waterbird Survey Results

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Key

Draft Order Limits

Transect routes

Transect 7b

Species

Little egret (ET)

Great crested grebe (GG)

Grey Heron (H.)

Lapwing (L.)

Mallard (MA)

Moorhen (MH)

Redshank (RK)

Shelduck (SU)

Teal (T.)

Dunlin (DN)

0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

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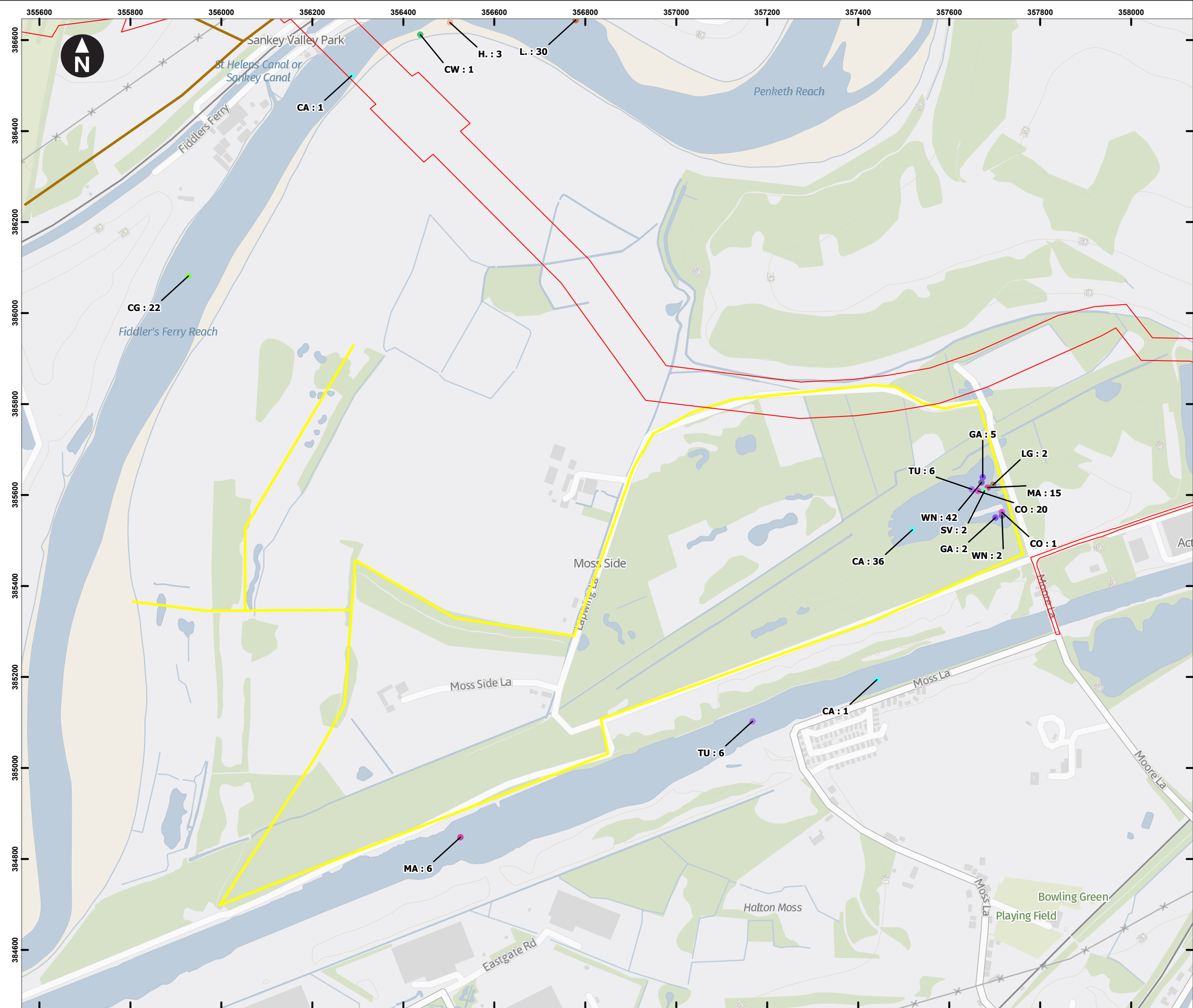
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Client

HyNet North West Hydrogen Pipeline Project
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 13b

Transect 14

Species

- Cormorant (CA)
- Canada Goose (CG)
- Coot (CO)
- Cetti's Warbler (CW)
- Gadwall (GA)
- Great crested grebe (GG)
- Grey Heron (H.)
- Little grebe (LG)
- Lapwing (L.)
- Mallard (MA)
- Moorhen (MH)
- Tufted duck (TU)
- Shoveler (SV)
- Wigeon (WN)
- Goldeneye (GN)

Scale at A3: 1:8,000

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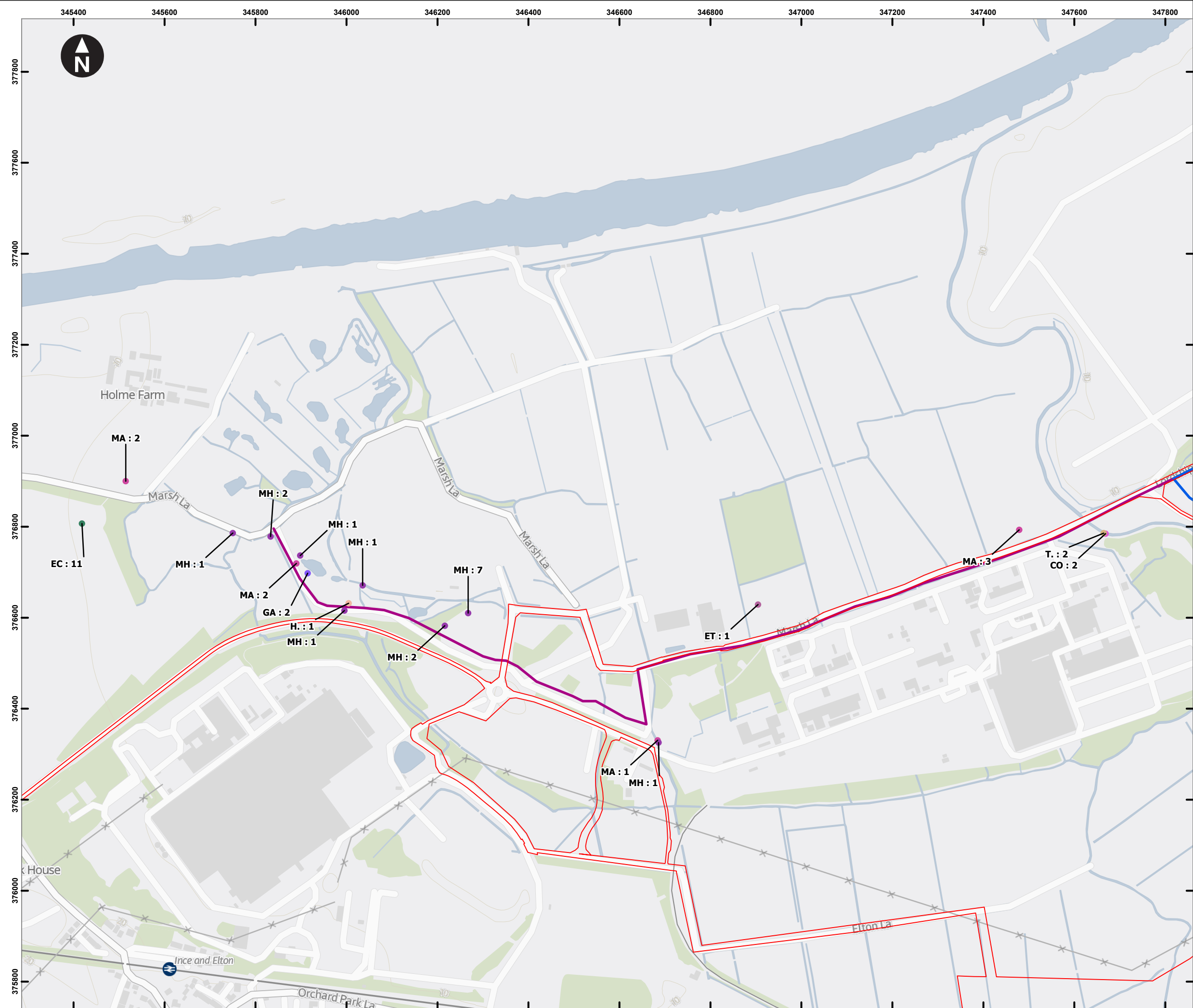
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

- Transect 5
- Transect 6

Species

- Coot (CO)
- Curfew (CU)
- Gadwall (GA)
- Cattle egret (EC)
- Little egret (ET)
- Grey Heron (H.)
- Mallard (MA)
- Moorhen (MH)
- Mute swan (MS)
- Teal (T.)

Scale at A3: 1:8,000

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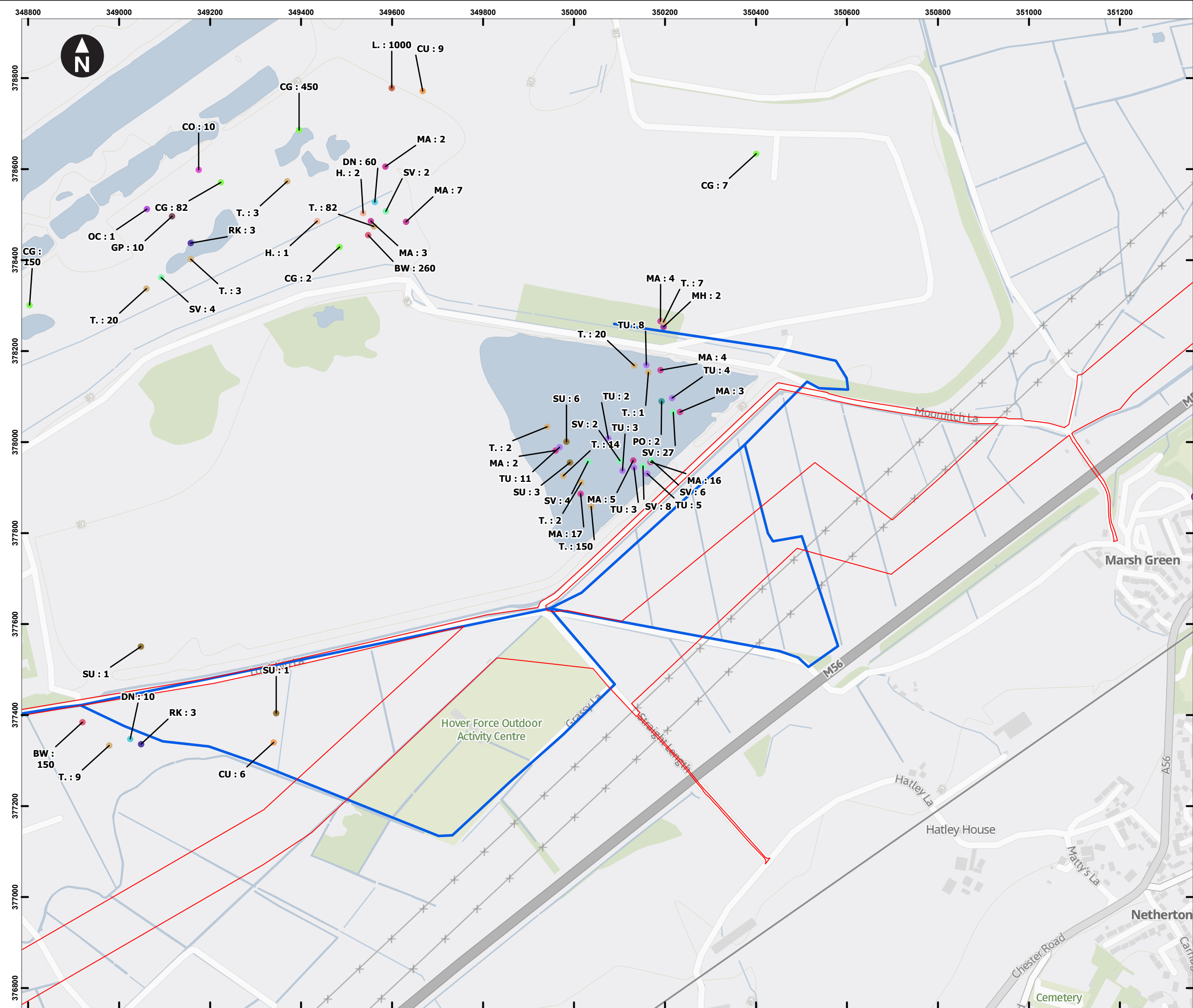
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

Black-tailed godwit (BW)

Cormorant (CA)

Canada Goose (CG)

Coot (CO)

Curfew (CU)

Gadwall (GA)

Little egret (ET)

Great crested grebe (GG)

Golden plover (GP)

Grey Heron (H.)

Lapwing (L.)

Mallard (MA)

Moorhen (MH)

Oystercatcher (OC)

Redshank (RK)

Pochard (PO)

Tufted duck (TU)

Shelduck (SU)

Shoveler (SV)

Teal (T.)

Wigeon (WN)

Dunlin (DN)

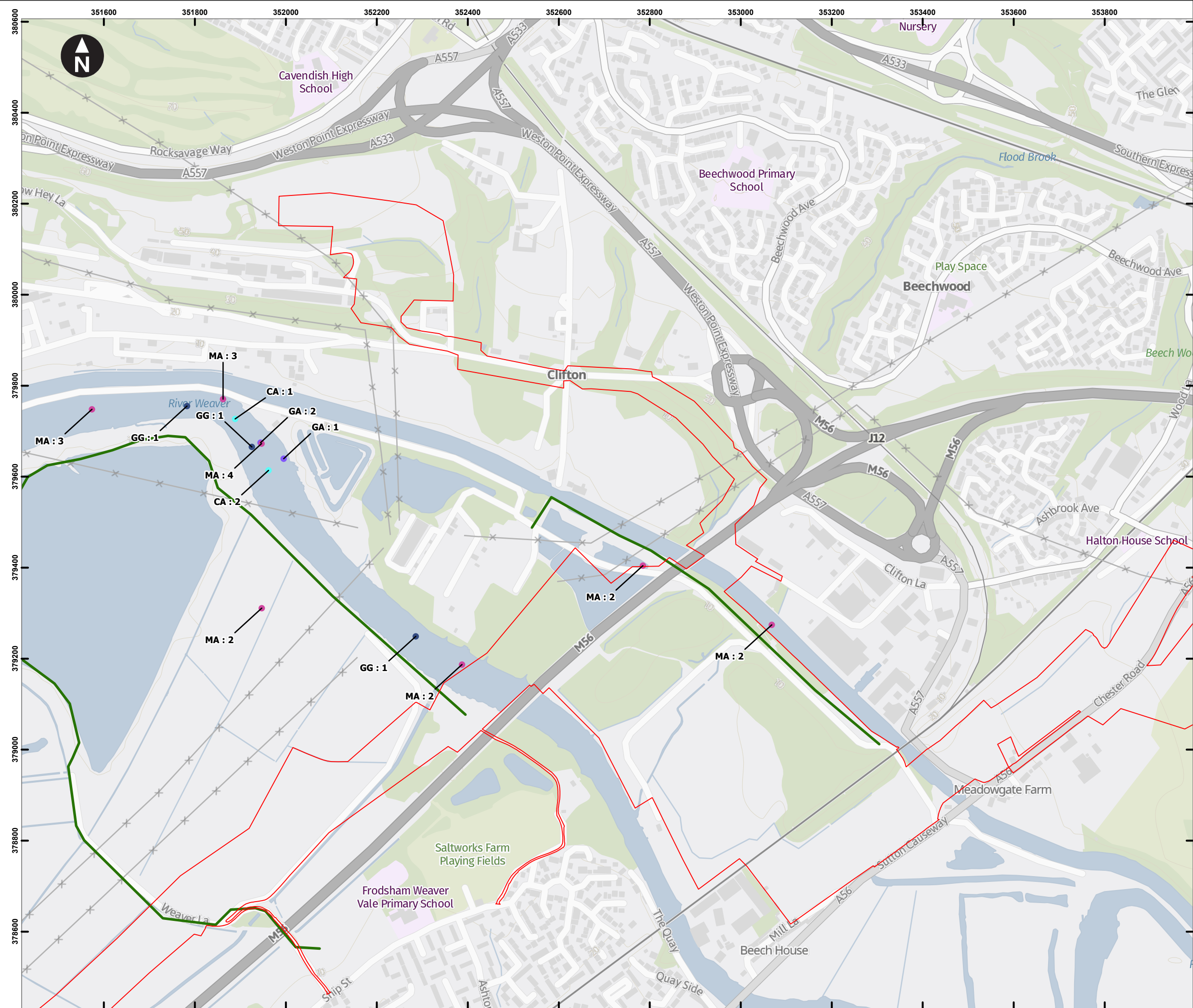
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 7b

Species

- Cormorant (CA)
- Canada Goose (CG)
- Coot (CO)
- Gadwall (GA)
- Little egret (ET)
- Great crested grebe (GG)
- Grey Heron (H.)
- Lapwing (L.)
- Mallard (MA)
- Redshank (RK)
- Shelduck (SU)
- Teal (T.)
- Avocet (AV)

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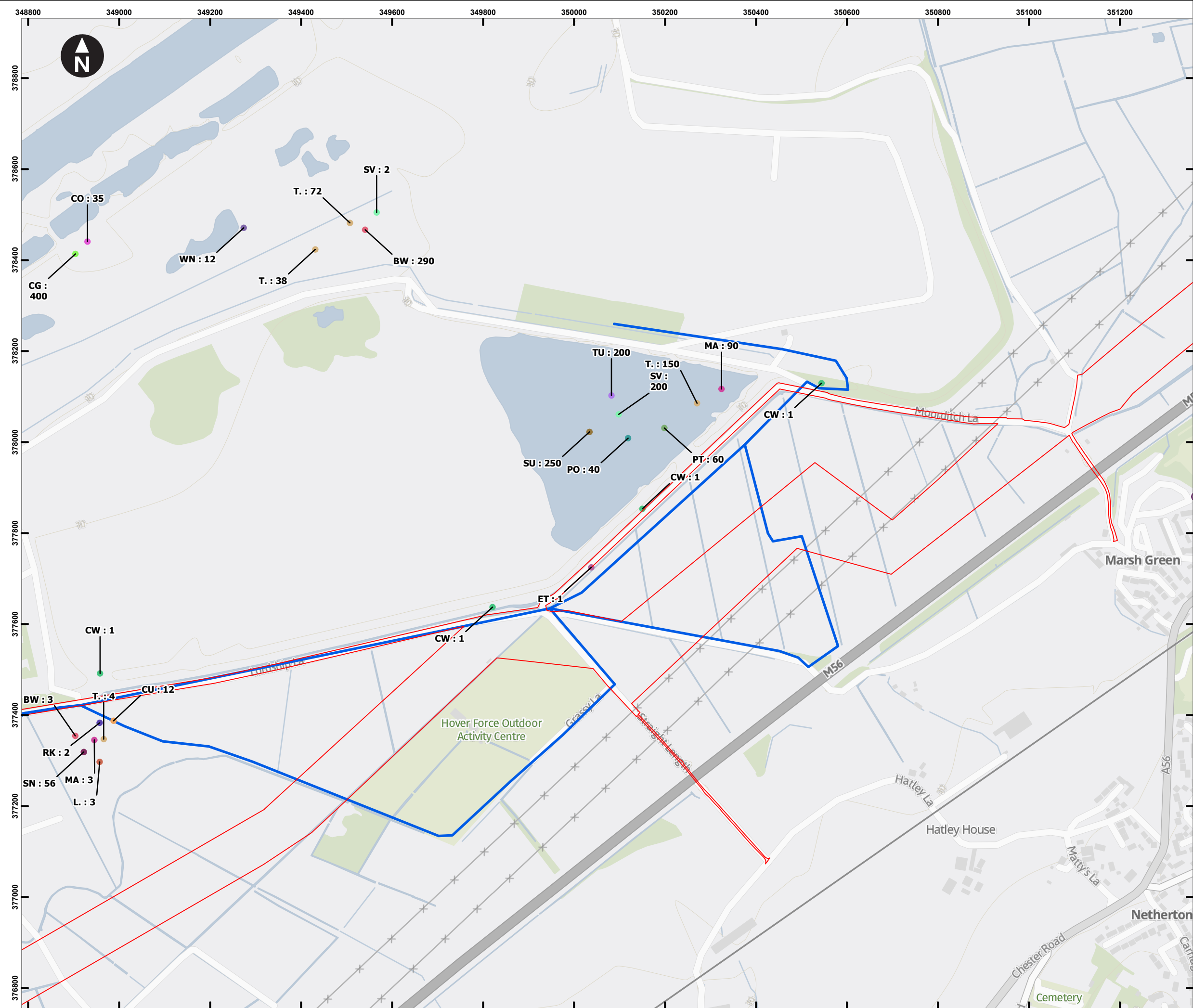
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Figure 50.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

Black-tailed godwit (BW)

Cormorant (CA)

Canada Goose (CG)

Coot (CO)

Curfew (CU)

Cetti's Warbler (CW)

Gadwall (GA)

Little egret (ET)

Lapwing (L.)

Mallard (MA)

Moorhen (MH)

Mute swan (MS)

Pintail (PT)

Redshank (RK)

Pochard (PO)

Tufted duck (TU)

Snipe (SN)

Shelduck (SU)

Shoveler (SV)

Teal (T.)

Wigeon (WN)

Whooper swan (WS)

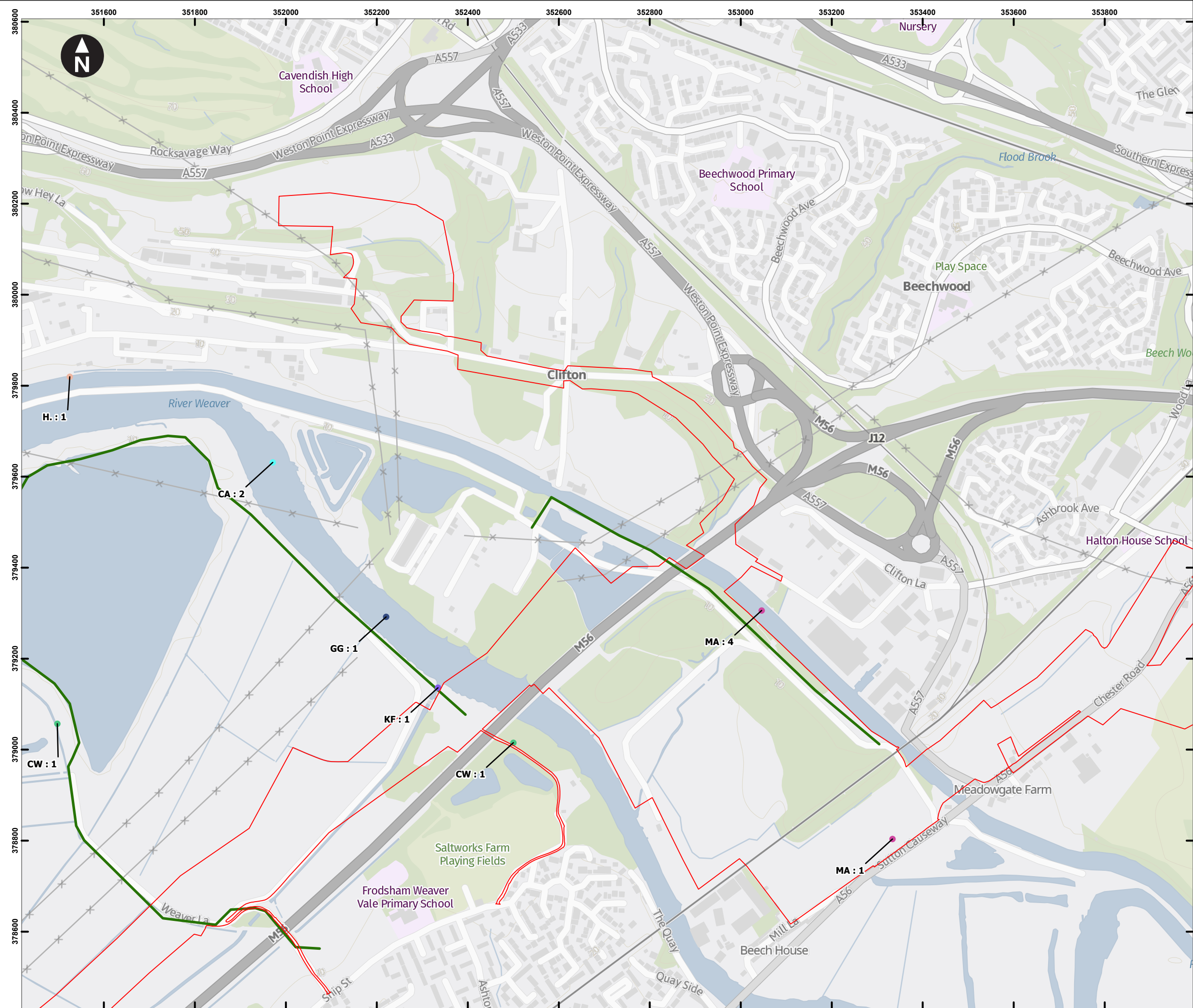
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 7b

Species

- Cormorant (CA)
- Canada Goose (CG)
- Coot (CO)
- Cetti's Warbler (CW)
- Gadwall (GA)
- Little egret (ET)
- Great crested grebe (GG)
- Grey Heron (H.)
- Lapwing (L.)
- Mallard (MA)
- Pintail (PT)
- Redshank (RK)
- Snipe (SN)
- Shelduck (SU)
- Teal (T.)
- Kingfisher (KF)

Scale at A3: 1:8,000

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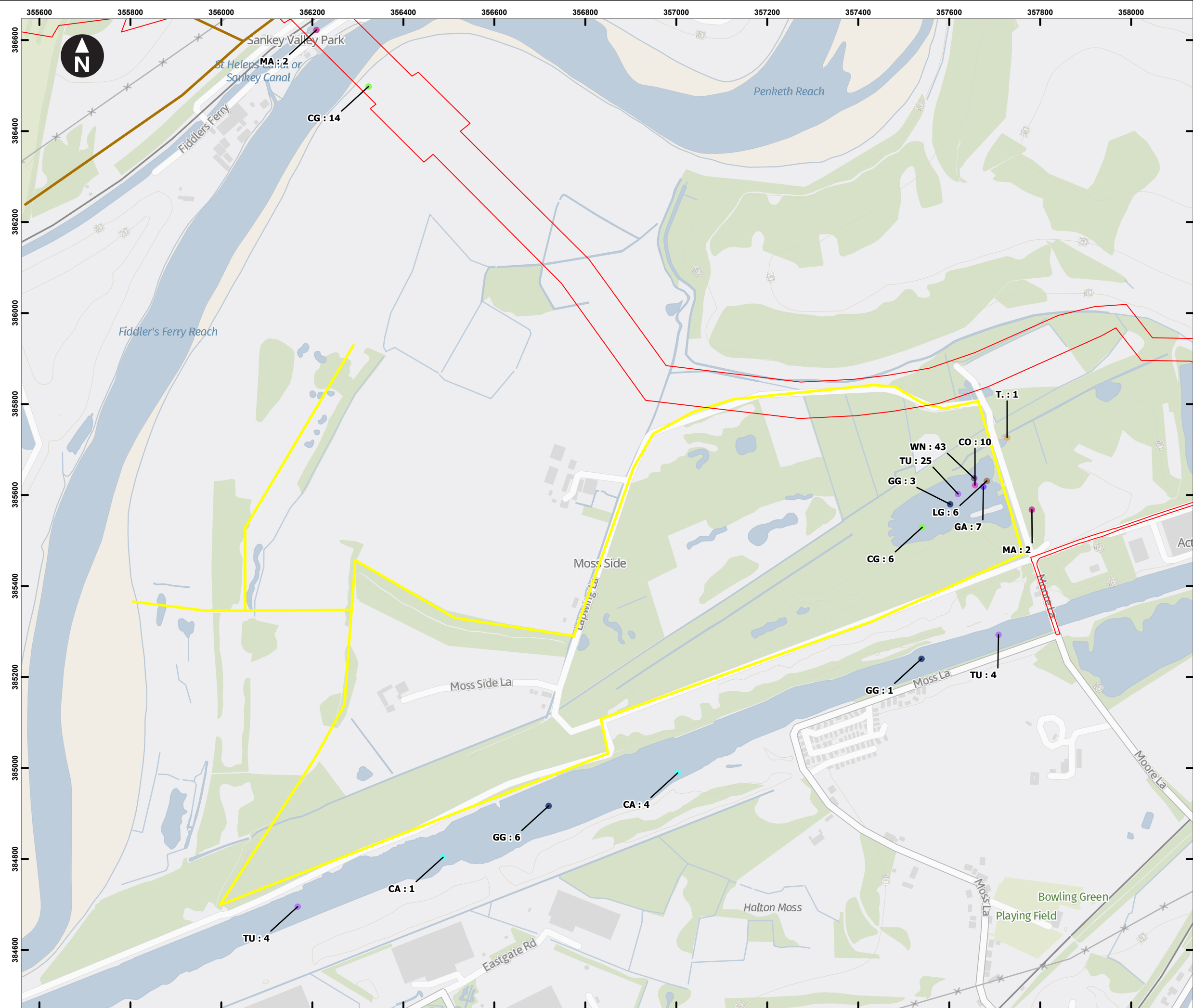
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

- Transect 13b
- Transect 14

Species

- Cormorant (CA)
- Canada Goose (CG)
- Coot (CO)
- Gadwall (GA)
- Great crested grebe (GG)
- Little grebe (LG)
- Mallard (MA)
- Moorhen (MH)
- Mute swan (MS)
- Tufted duck (TU)
- Teal (T.)
- Wigeon (WN)

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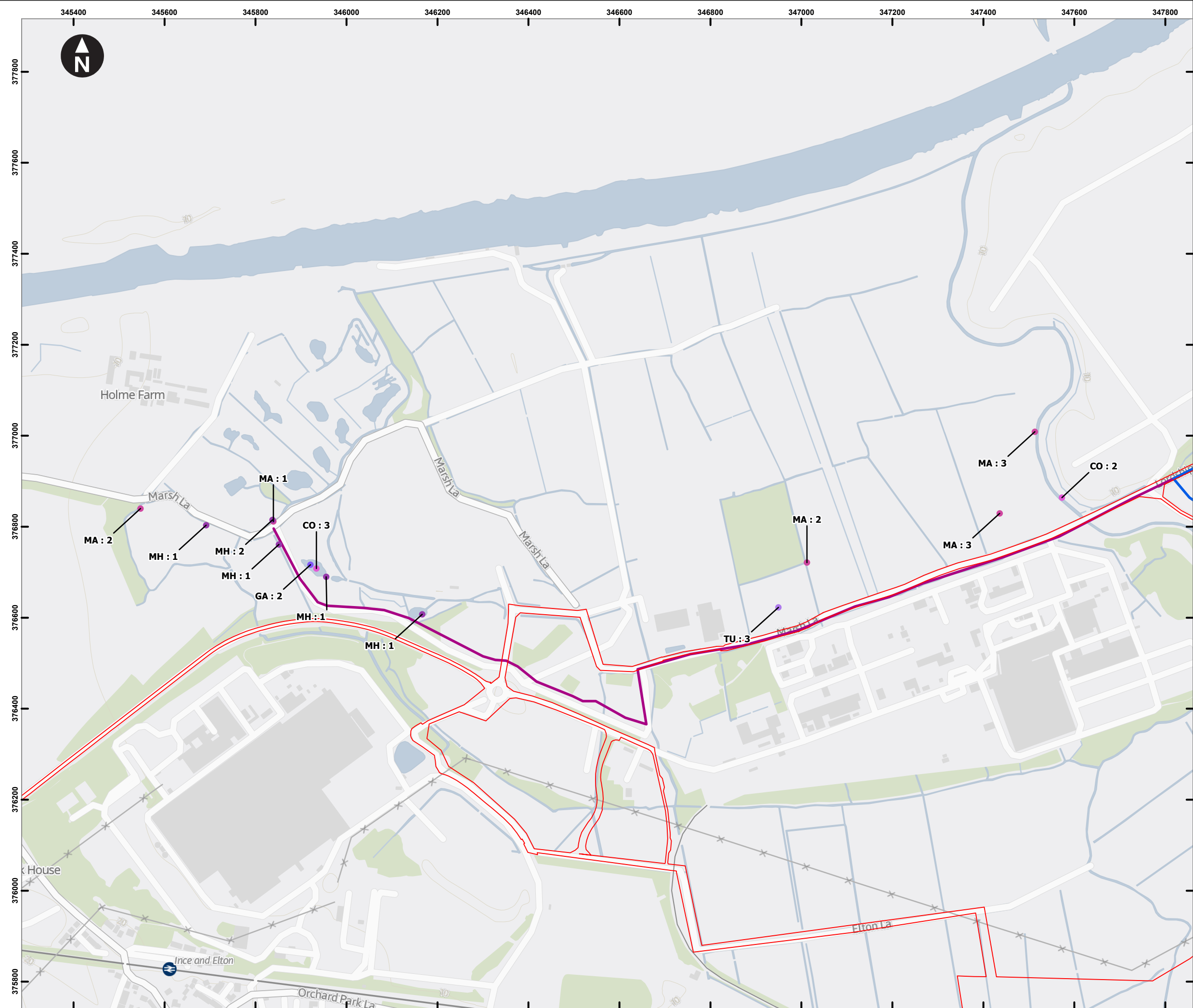
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 5

Transect 6

Species

- Coot (CO)
- Gadwall (GA)
- Mallard (MA)
- Moorhen (MH)
- Tufted duck (TU)

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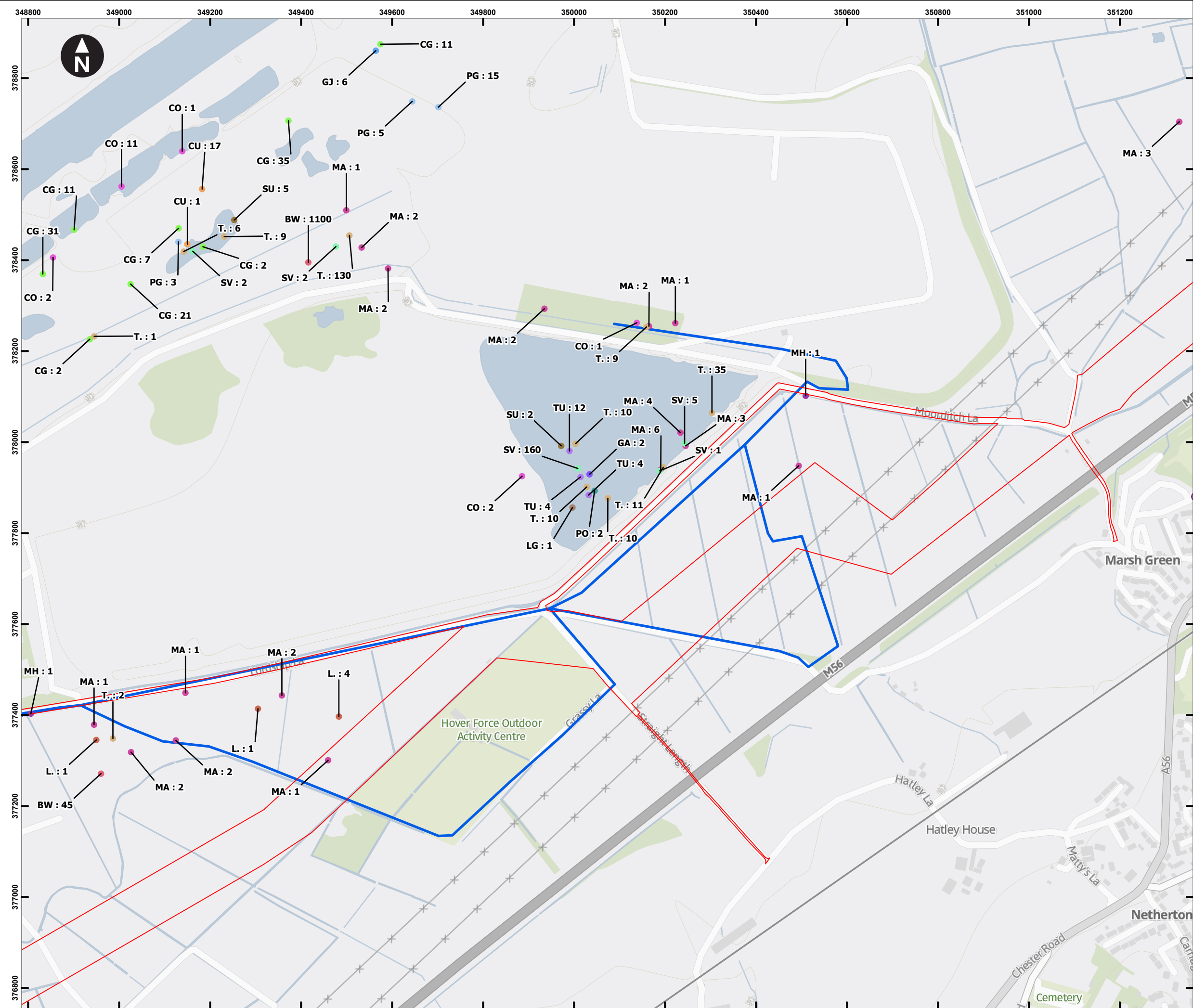
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

Black-tailed godwit (BW)

Canada Goose (CG)

Coot (CO)

Curfew (CU)

Gadwall (GA)

Great crested grebe (GG)

Greylag goose (GJ)

Golden plover (GP)

Grey Heron (H.)

Little grebe (LG)

Lapwing (L.)

Mallard (MA)

Moorhen (MH)

Pintail (PT)

Pink-footed goose (PG)

Pochard (PO)

Tufted duck (TU)

Shelduck (SU)

Shoveler (SV)

Teal (T.)

Whooper swan (WS)

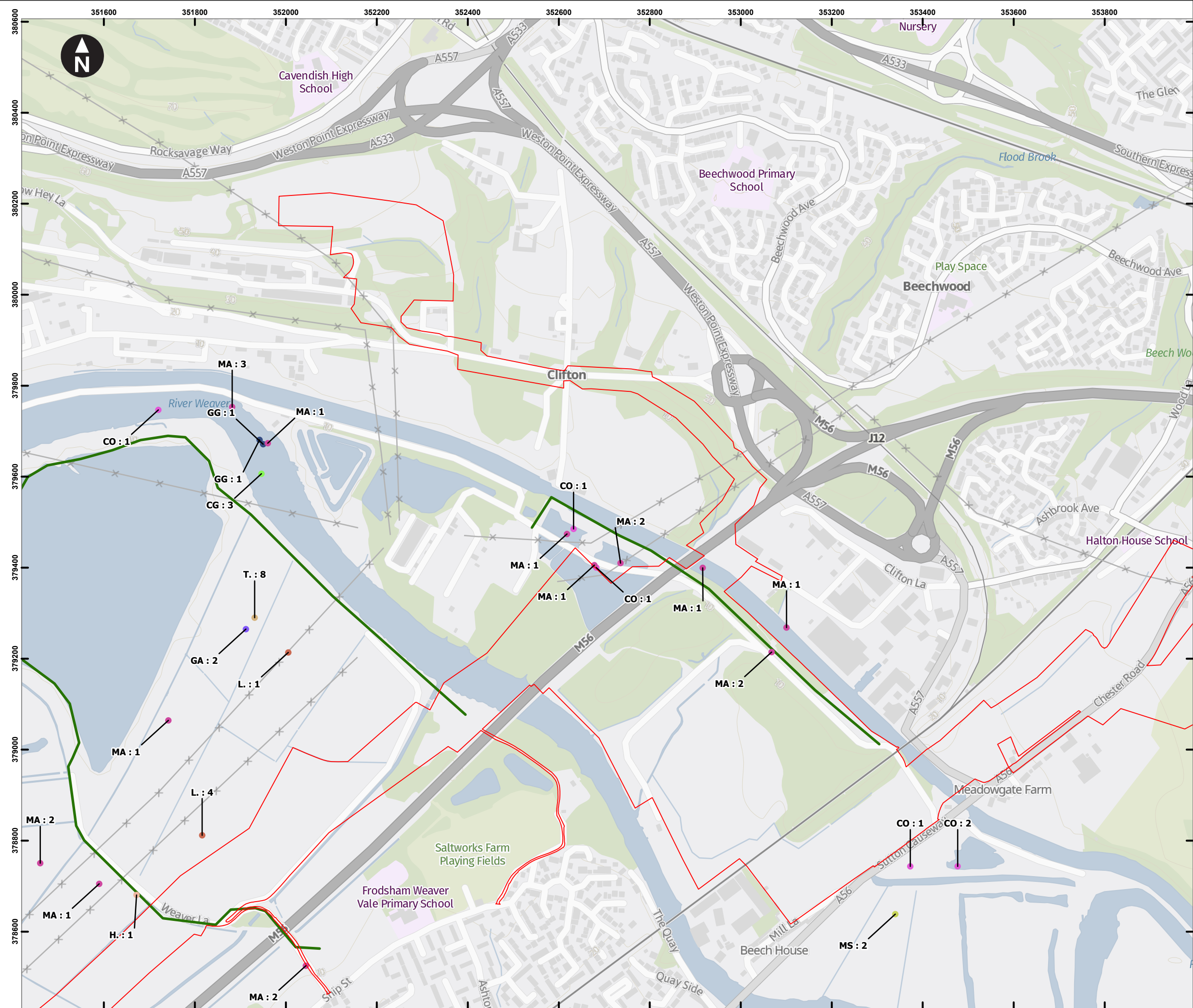
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Figure 50.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 7b

Species

- Canada Goose (CG)
- Coot (CO)
- Curfew (CU)
- Gadwall (GA)
- Great crested grebe (GG)
- Golden plover (GP)
- Grey Heron (H.)
- Lapwing (L.)
- Mallard (MA)
- Mute swan (MS)
- Oystercatcher (OC)
- Pintail (PT)
- Shelduck (SU)
- Teal (T.)

Scale at A3: 1:8,000

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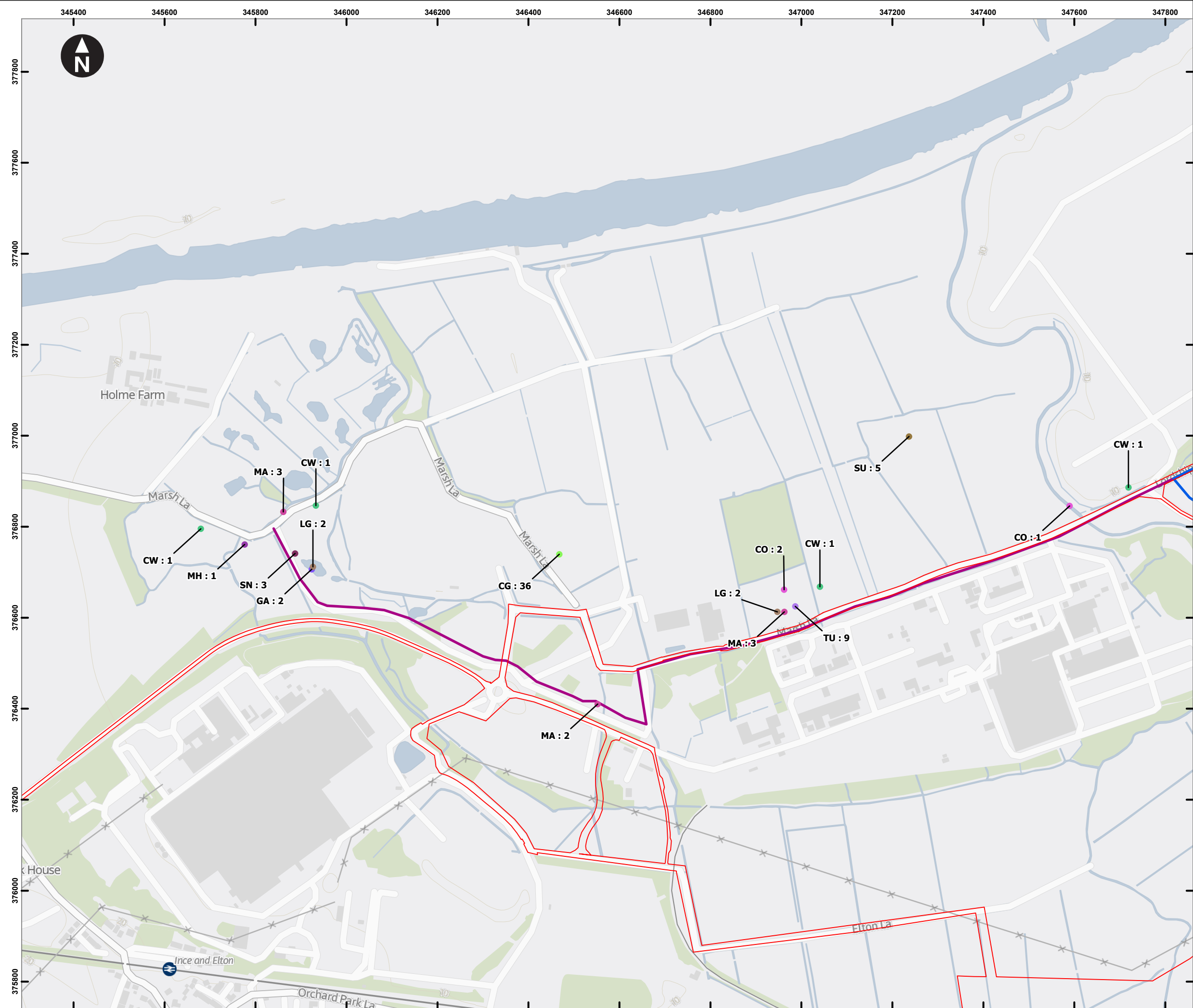
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 5

Transect 6

Species

Black-tailed godwit (BW)

Canada Goose (CG)

Coot (CO)

Curfew (CU)

Cetti's Warbler (CW)

Gadwall (GA)

Little grebe (LG)

Mallard (MA)

Moorhen (MH)

Mute swan (MS)

Tufted duck (TU)

Snipe (SN)

Shelduck (SU)

Whooper swan (WS)

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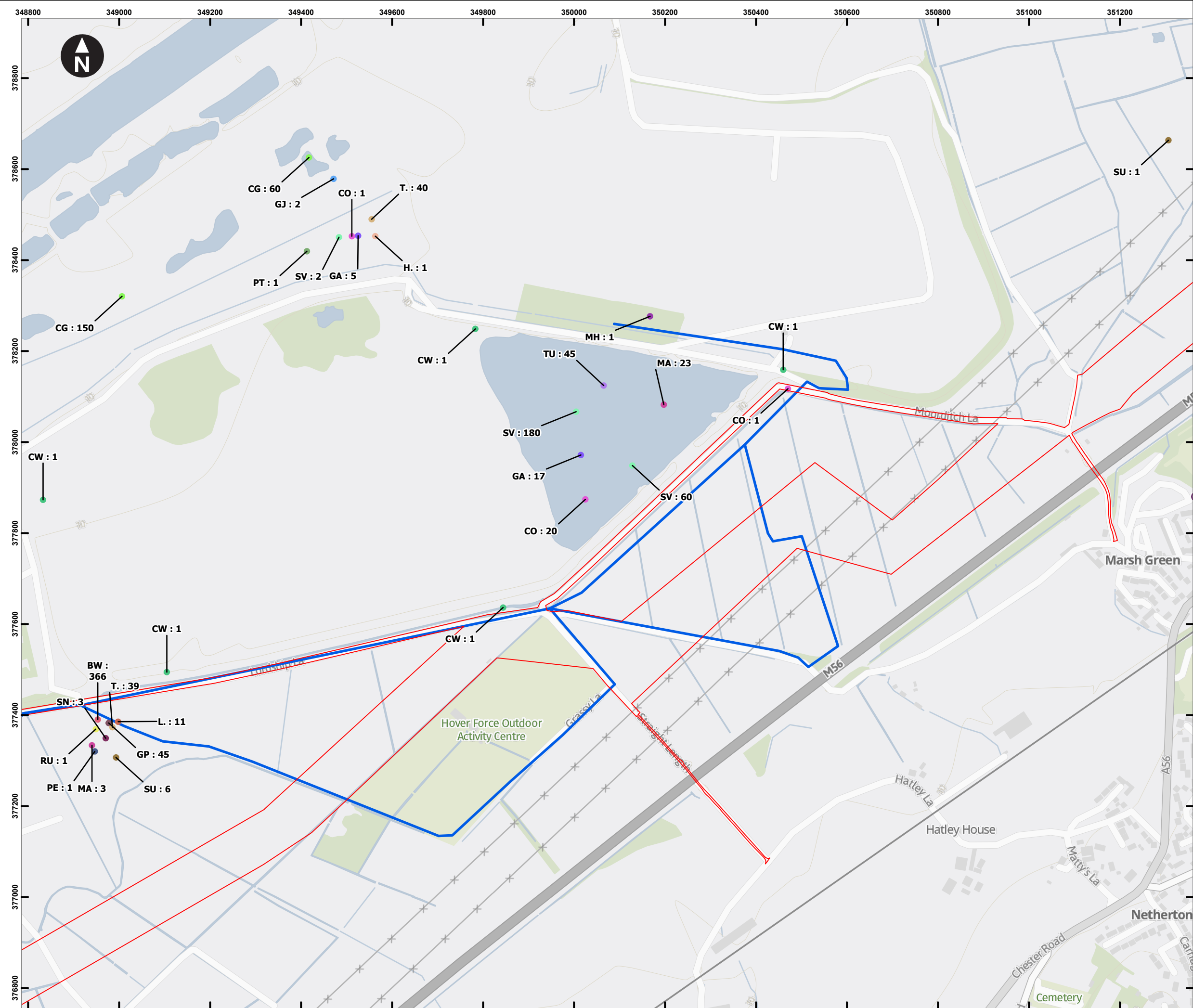
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

- Black-tailed godwit (BW)
- Cormorant (CA)
- Canada Goose (CG)
- Coot (CO)
- Cetti's Warbler (CW)
- Gadwall (GA)
- Little egret (ET)
- Greylag goose (GJ)
- Golden plover (GP)
- Grey Heron (H.)
- Lapwing (L.)
- Mallard (MA)
- Moorhen (MH)
- Mute swan (MS)
- Oystercatcher (OC)
- Pintail (PT)
- Redshank (RK)
- Tufted duck (TU)
- Snipe (SN)
- Shelduck (SU)
- Shoveler (SV)
- Teal (T.)
- Peregrine (PE)
- Ruff (RU)

Scale at A3: 1:8,000

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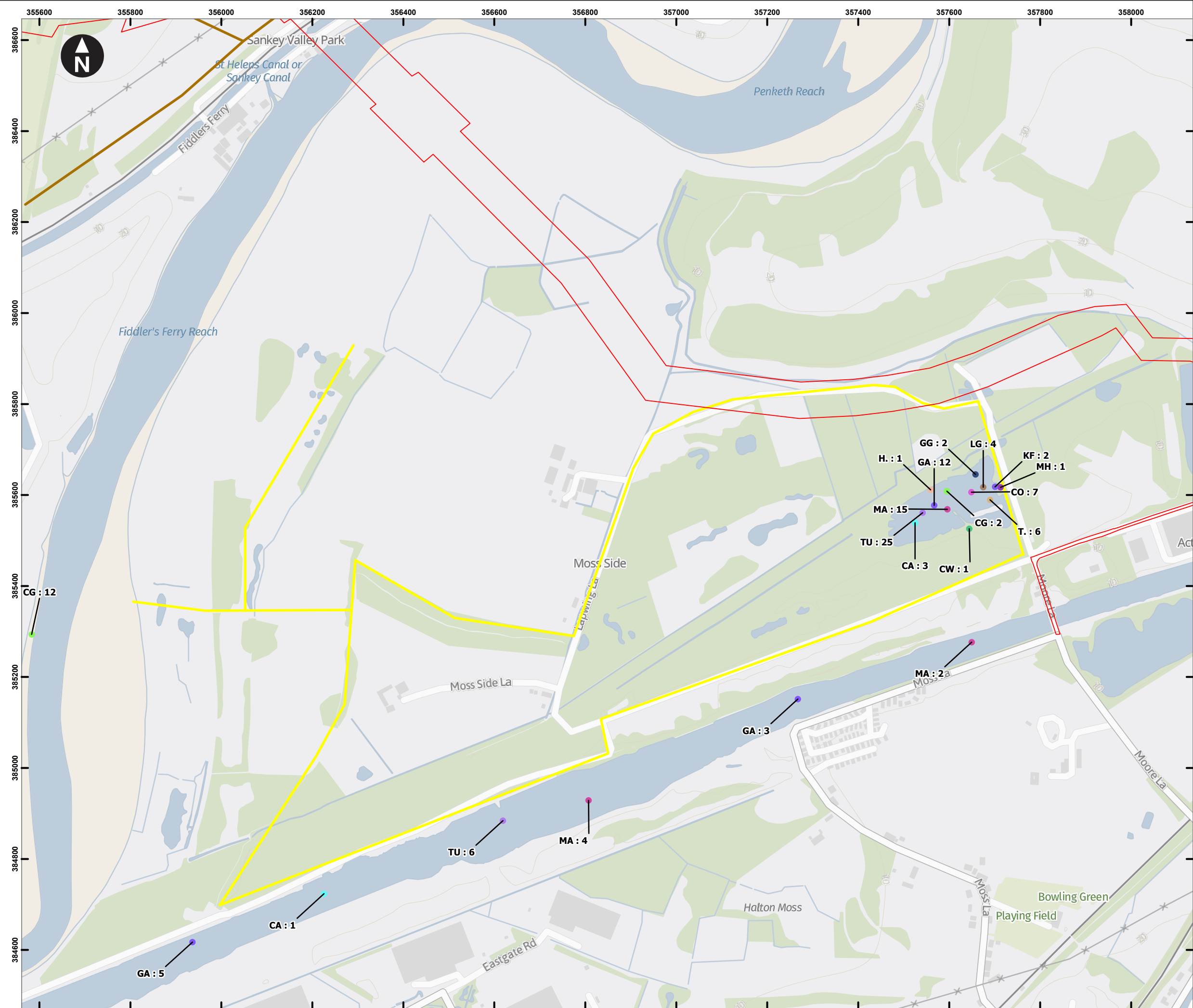
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Figure 50.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 13b

Transect 14

Species

Cormorant (CA)

Canada Goose (CG)

Coot (CO)

Cetti's Warbler (CW)

Gadwall (GA)

Great crested grebe (GG)

Grey Heron (H.)

Little grebe (LG)

Mallard (MA)

Moorhen (MH)

Mute swan (MS)

Tufted duck (TU)

Teal (T.)

Kingfisher (KF)

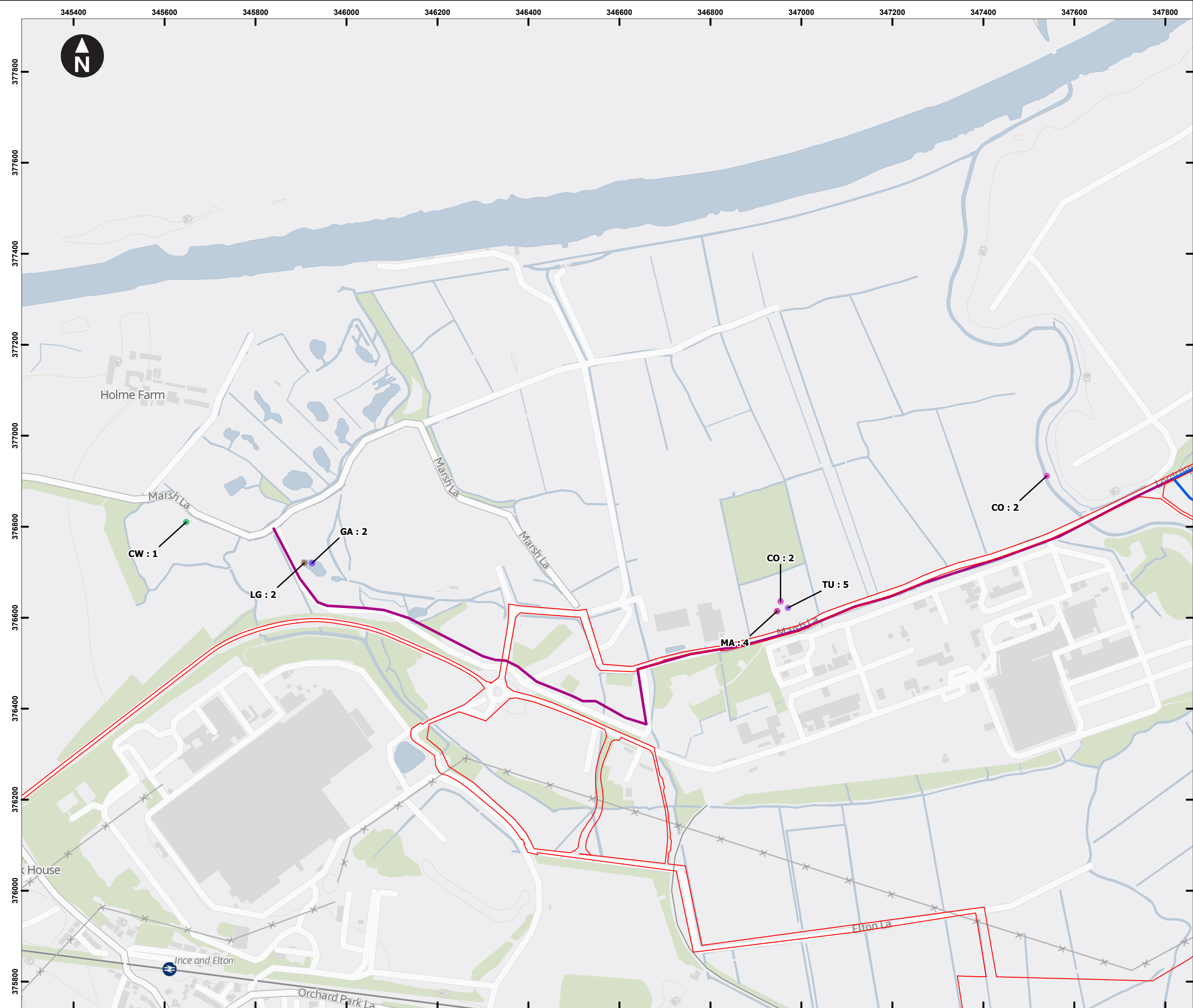
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

- Transect 5
- Transect 6

Species

- Coot (CO)
- Cetti's Warbler (CW)
- Gadwall (GA)
- Little grebe (LG)
- Mallard (MA)
- Tufted duck (TU)

0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

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Figure 5O.4
Non-Breeding Waterbird Survey Results
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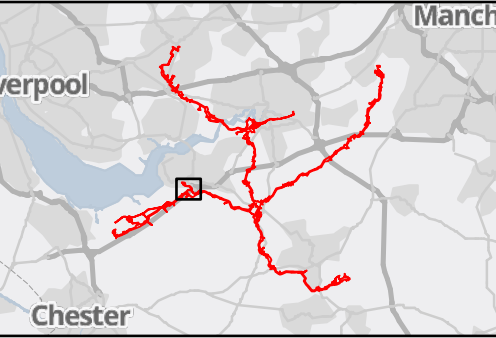


Key

Draft Order Limits

Transect routes

— Transect 7b



0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

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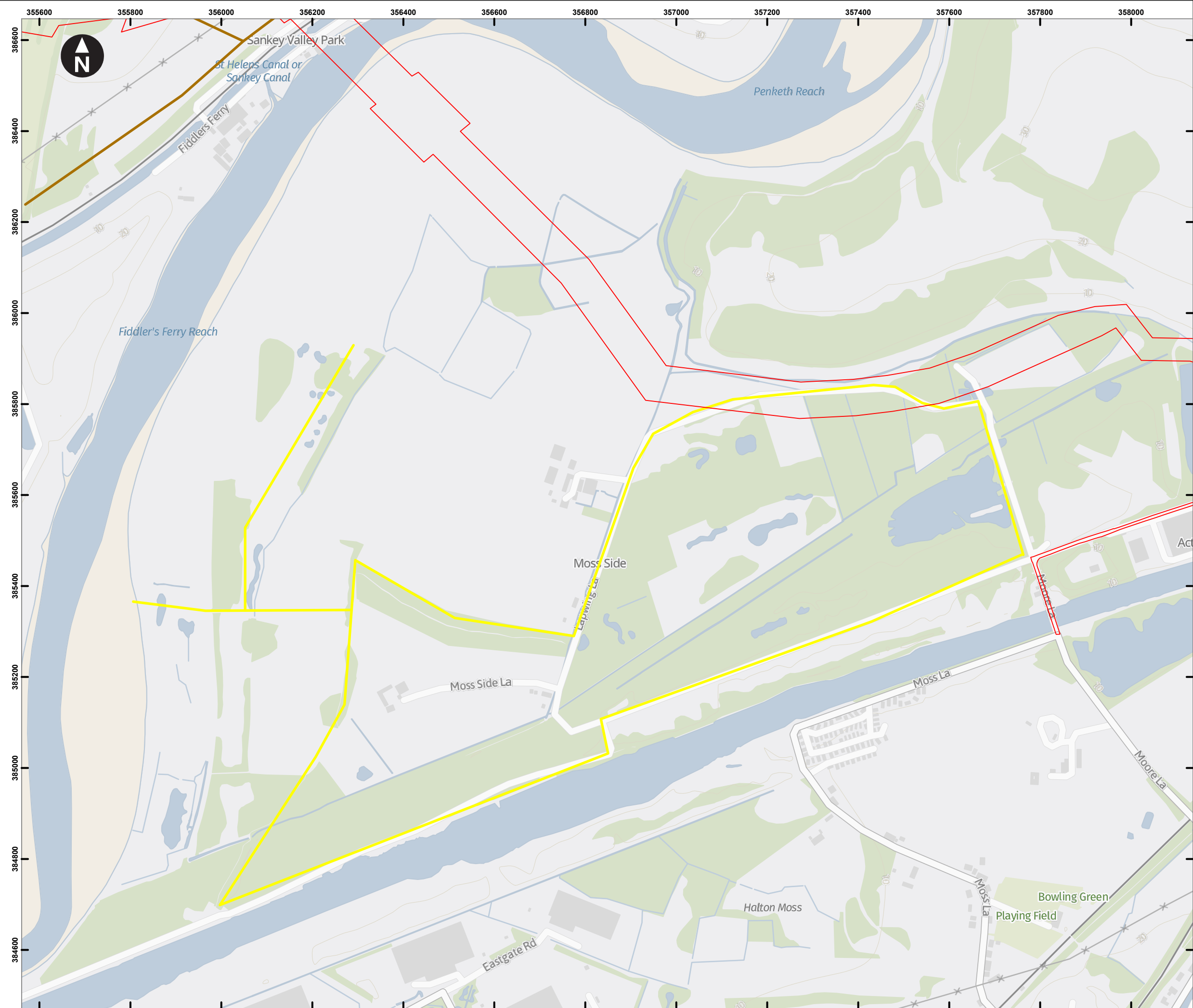
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 13b

Transect 14

0 0.15 0.3 0.45 Km

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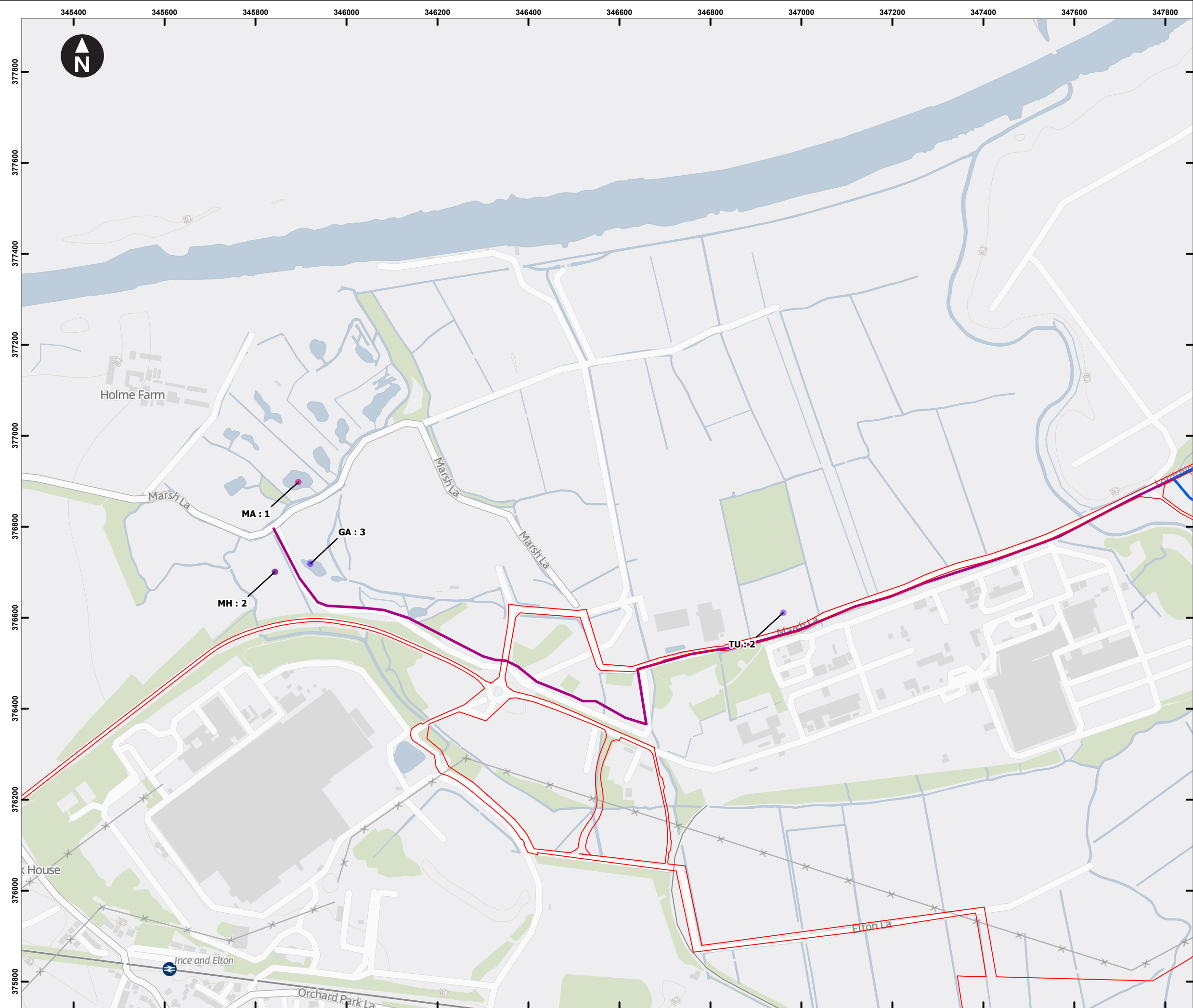
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Figure 5O.4
Non-Breeding Waterbird Survey Results
(Visit number: 7)
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Key

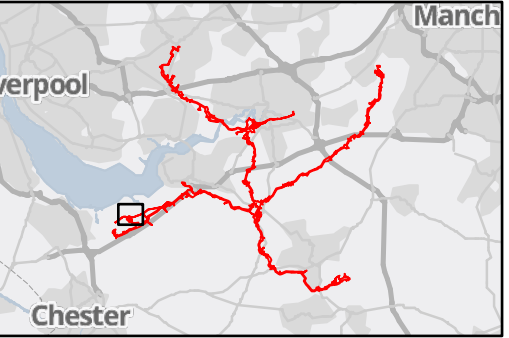
Draft Order Limits

Transect routes

- Transect 5
- Transect 6

Species

- Gadwall (GA)
- Mallard (MA)
- Moorhen (MH)
- Tufted duck (TU)



0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

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Client

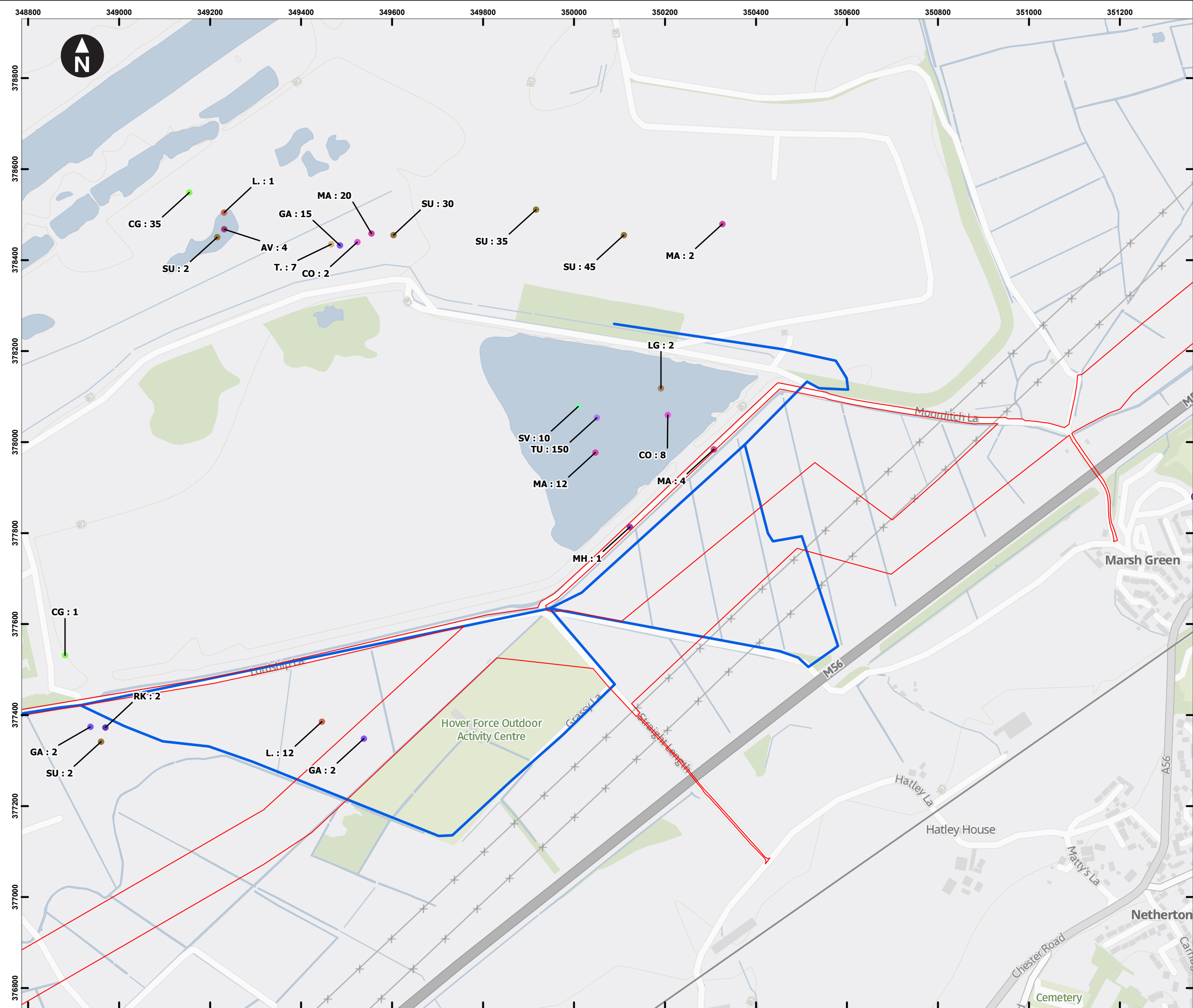
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

- Transect 6
- Transect 7b

Species

- Canada Goose (CG)
- Coot (CO)
- Gadwall (GA)
- Little grebe (LG)
- Lapwing (L.)
- Mallard (MA)
- Moorhen (MH)
- Redshank (RK)
- Tufted duck (TU)
- Shelduck (SU)
- Shoveler (SV)
- Teal (T.)
- Avocet (AV)

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Key

Draft Order Limits

Transect routes

— Transect 7b

0 0.15 0.3 0.45 Km

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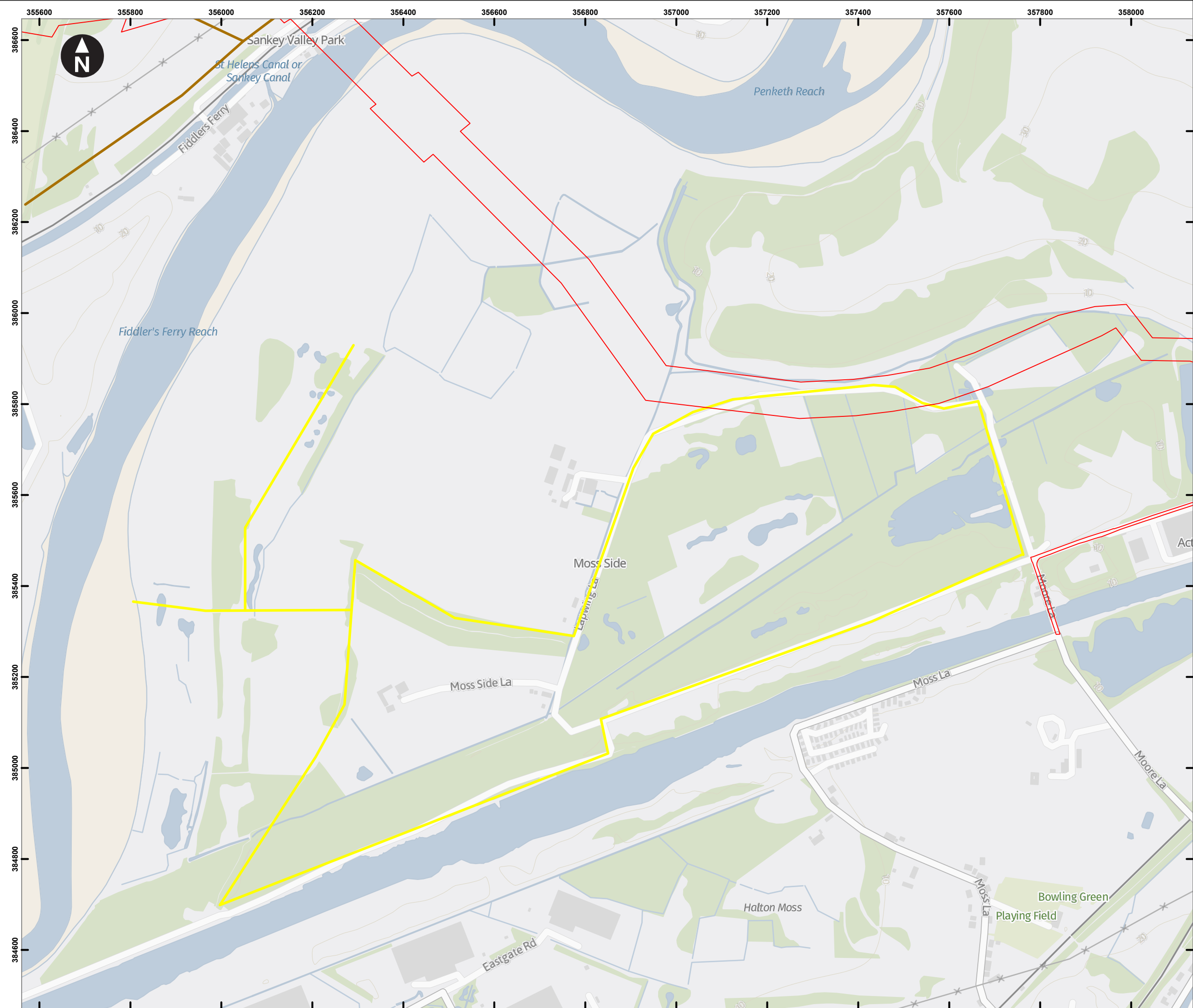
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Key

Draft Order Limits

Transect routes

Transect 13b

Transect 14

0 0.15 0.3 0.45 Km

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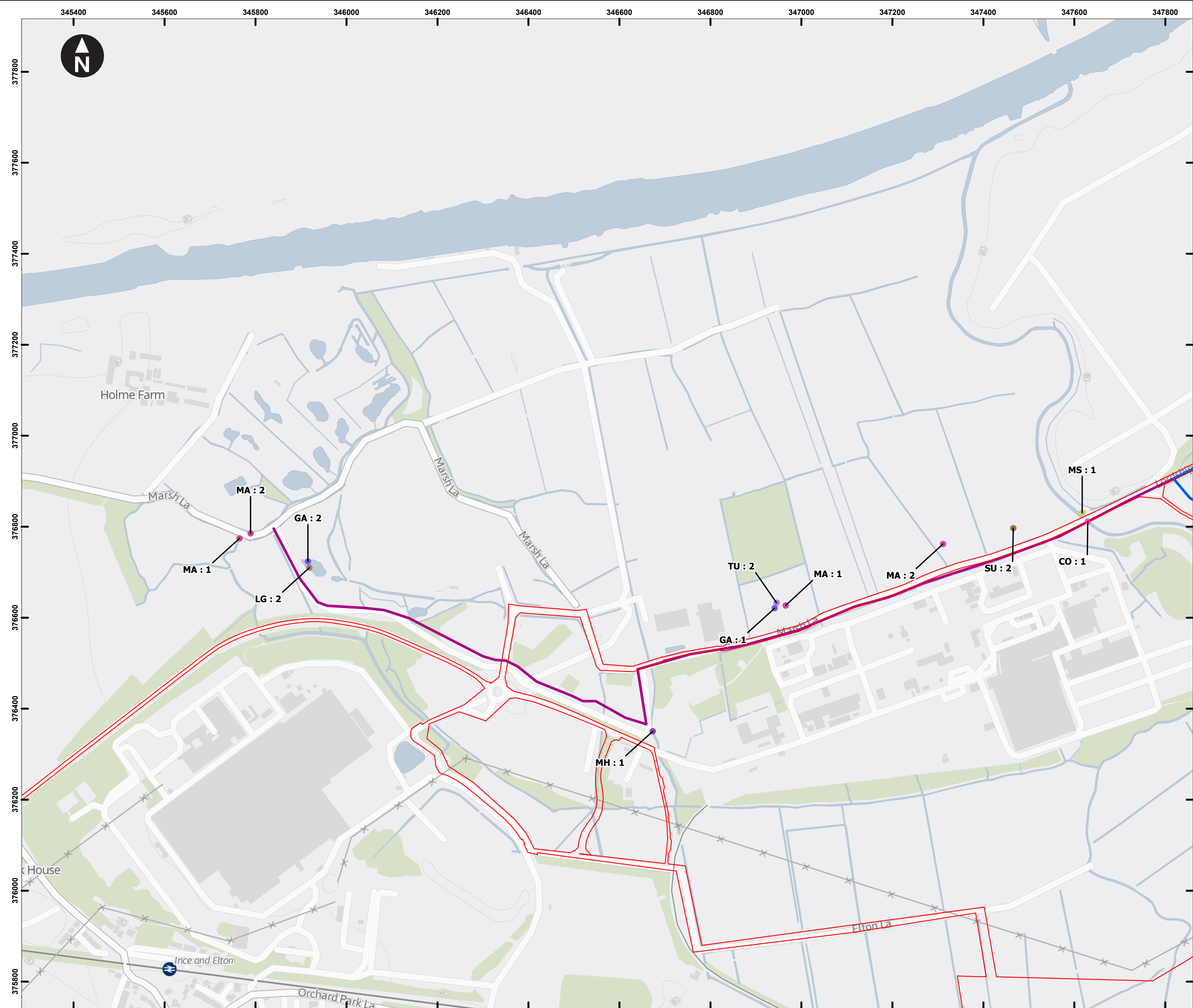
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Key

Draft Order Limits

Transect routes

- Transect 5
- Transect 6

Species

- Coot (CO)
- Gadwall (GA)
- Little grebe (LG)
- Mallard (MA)
- Moorhen (MH)
- Mute swan (MS)
- Tufted duck (TU)
- Shelduck (SU)

0 0.15 0.3 0.45 Km

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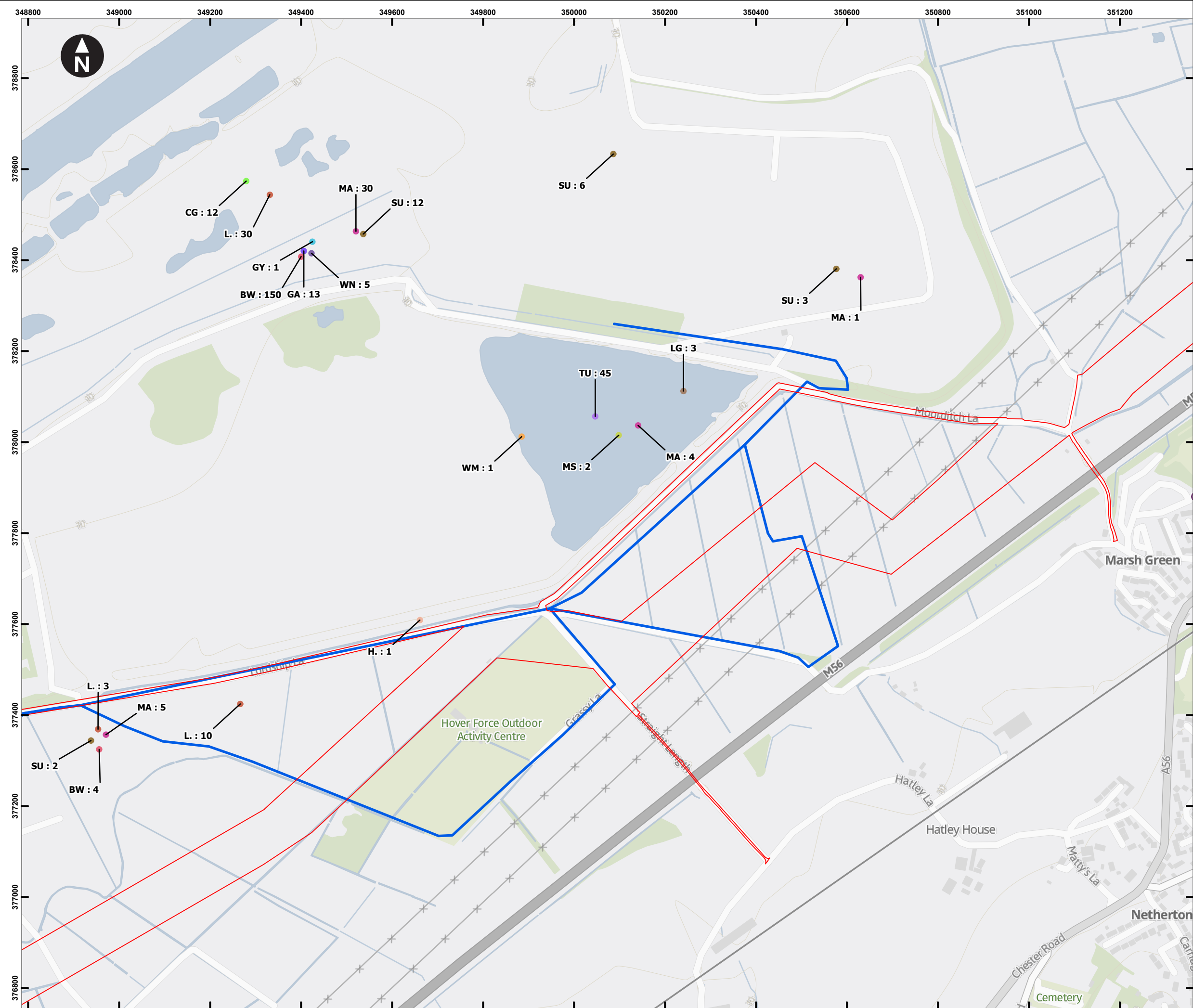
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Figure 5O.4
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Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

- Black-tailed godwit (BW)
- Canada Goose (CG)
- Coot (CO)
- Gadwall (GA)
- Garganey (GY)
- Grey Heron (H.)
- Little grebe (LG)
- Lapwing (L.)
- Mallard (MA)
- Mute swan (MS)
- Tufted duck (TU)
- Shelduck (SU)
- Shoveler (SV)
- Whimbrel (WM)
- Wigeon (WN)

Scale at A3: 1:8,000

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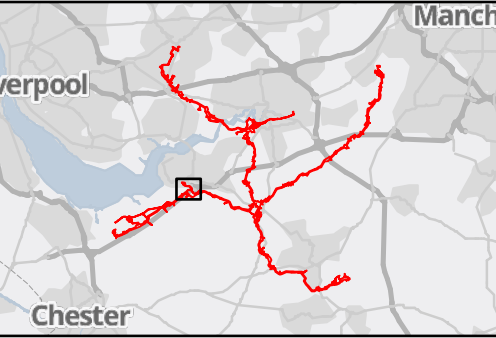


Key

Draft Order Limits

Transect routes

— Transect 7b



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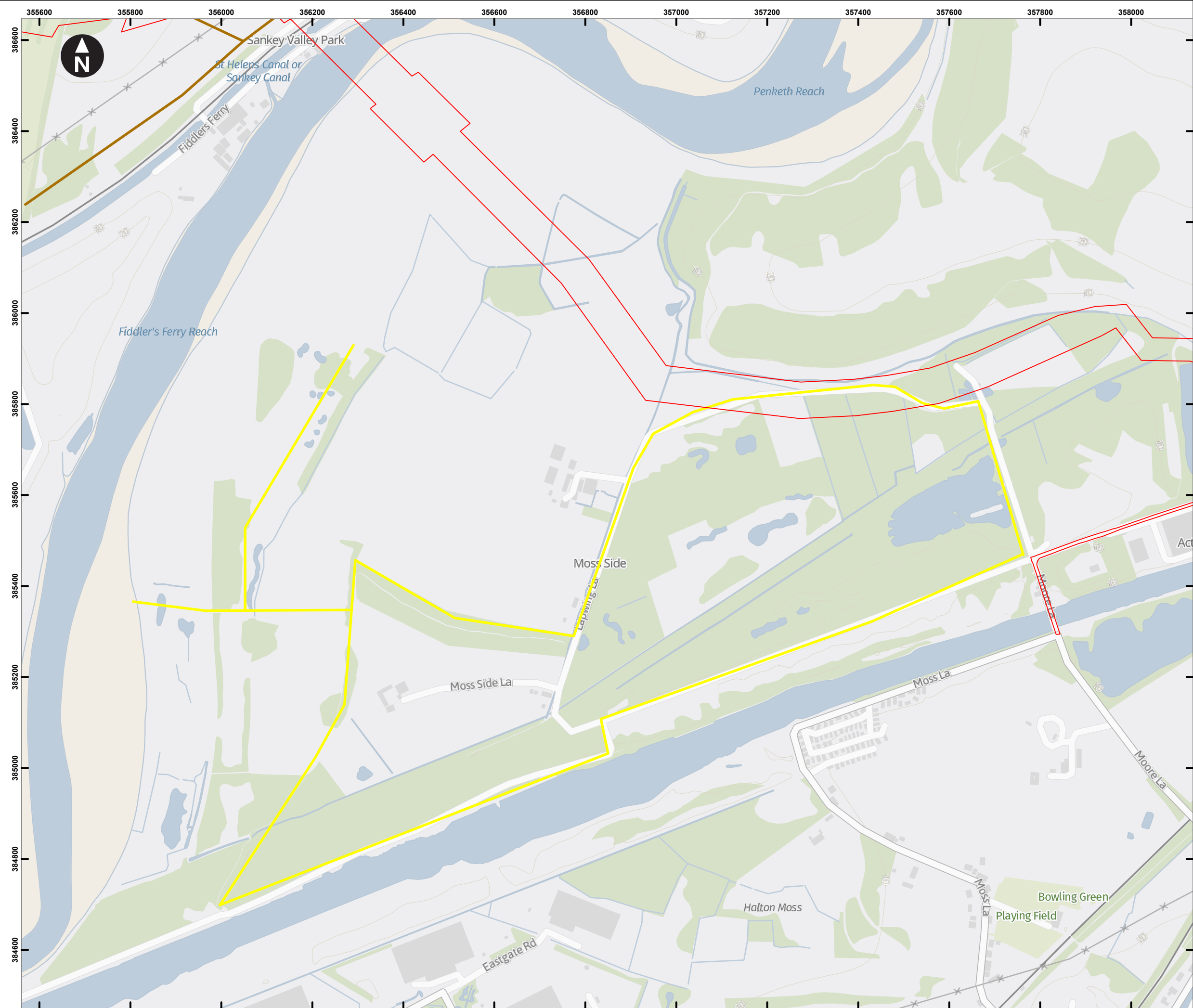
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Key

Draft Order Limits

Transect routes

— Transect 13b

— Transect 14

0 0.15 0.3 0.45 Km

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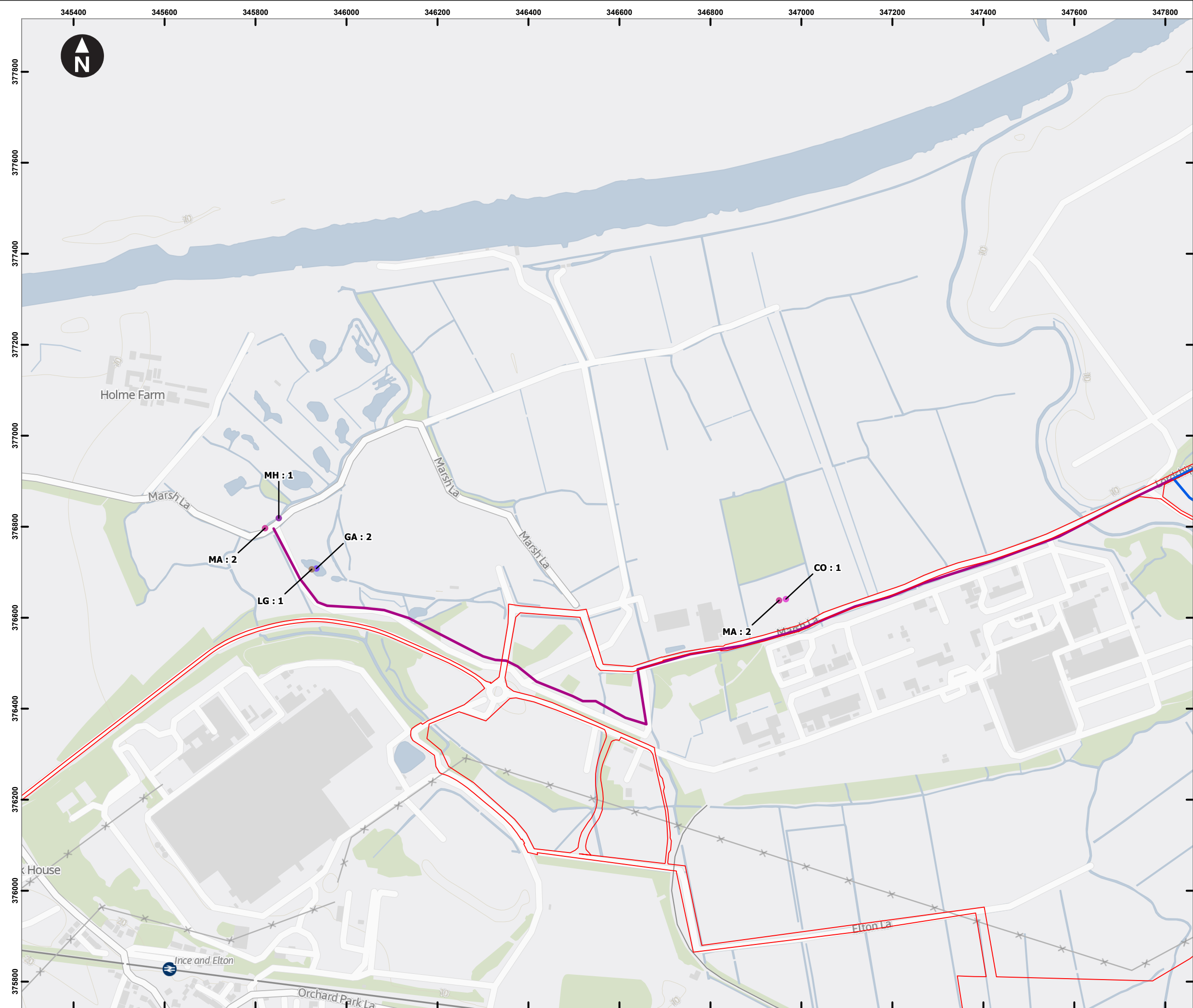
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Key

Draft Order Limits

Transect routes

- Transect 5
- Transect 6

Species

- Coot (CO)
- Gadwall (GA)
- Little grebe (LG)
- Mallard (MA)
- Moorhen (MH)

0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

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Client

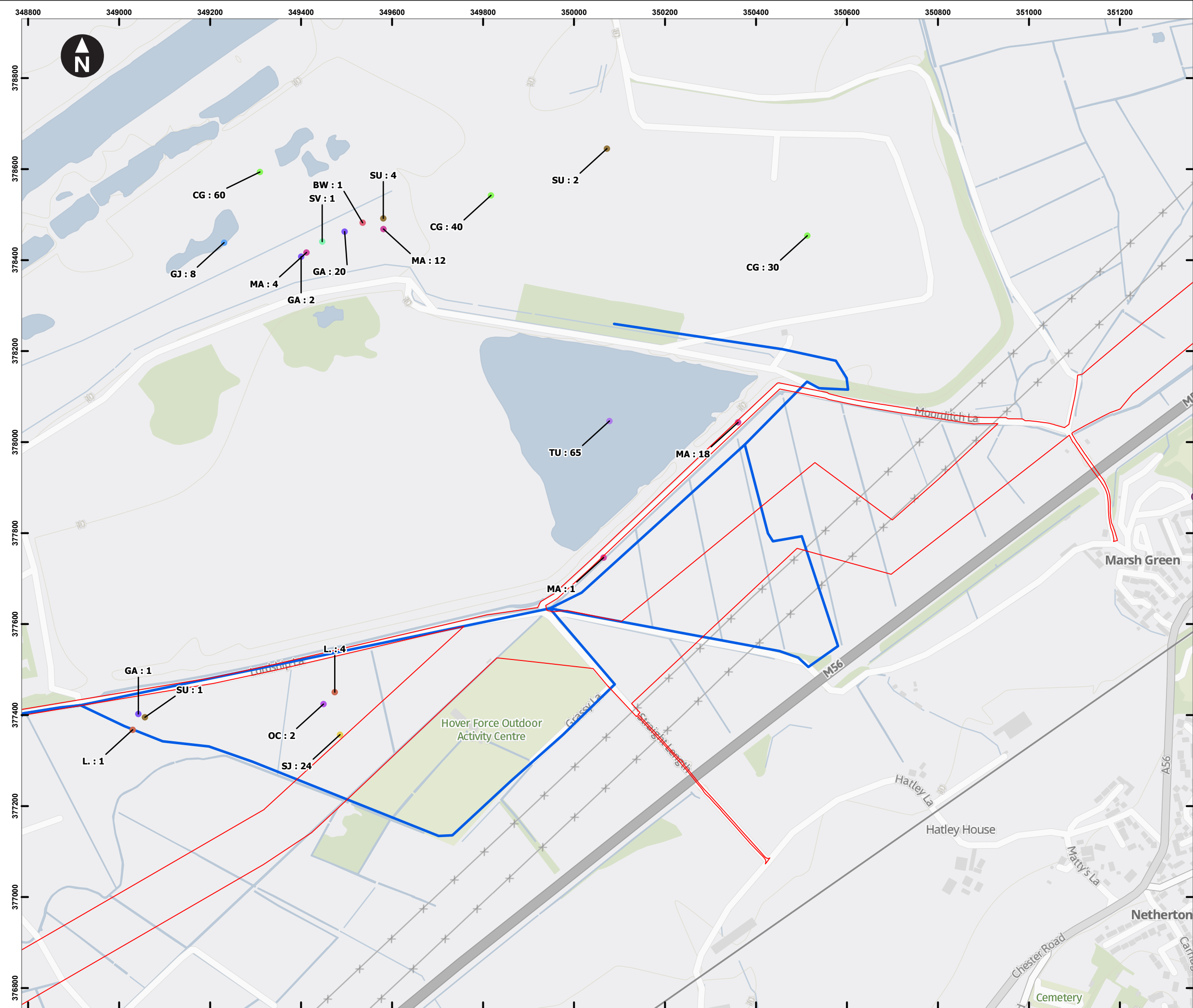
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Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

- Black-tailed godwit (BW)
- Canada Goose (CG)
- Coot (CO)
- Gadwall (GA)
- Greylag goose (GJ)
- Lapwing (L.)
- Mallard (MA)
- Oystercatcher (OC)
- Tufted duck (TU)
- Snow goose (SJ)
- Shelduck (SU)
- Shoveler (SV)

Scale at A3: 1:8,000

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Key

Draft Order Limits

Transect routes

— Transect 7b

0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

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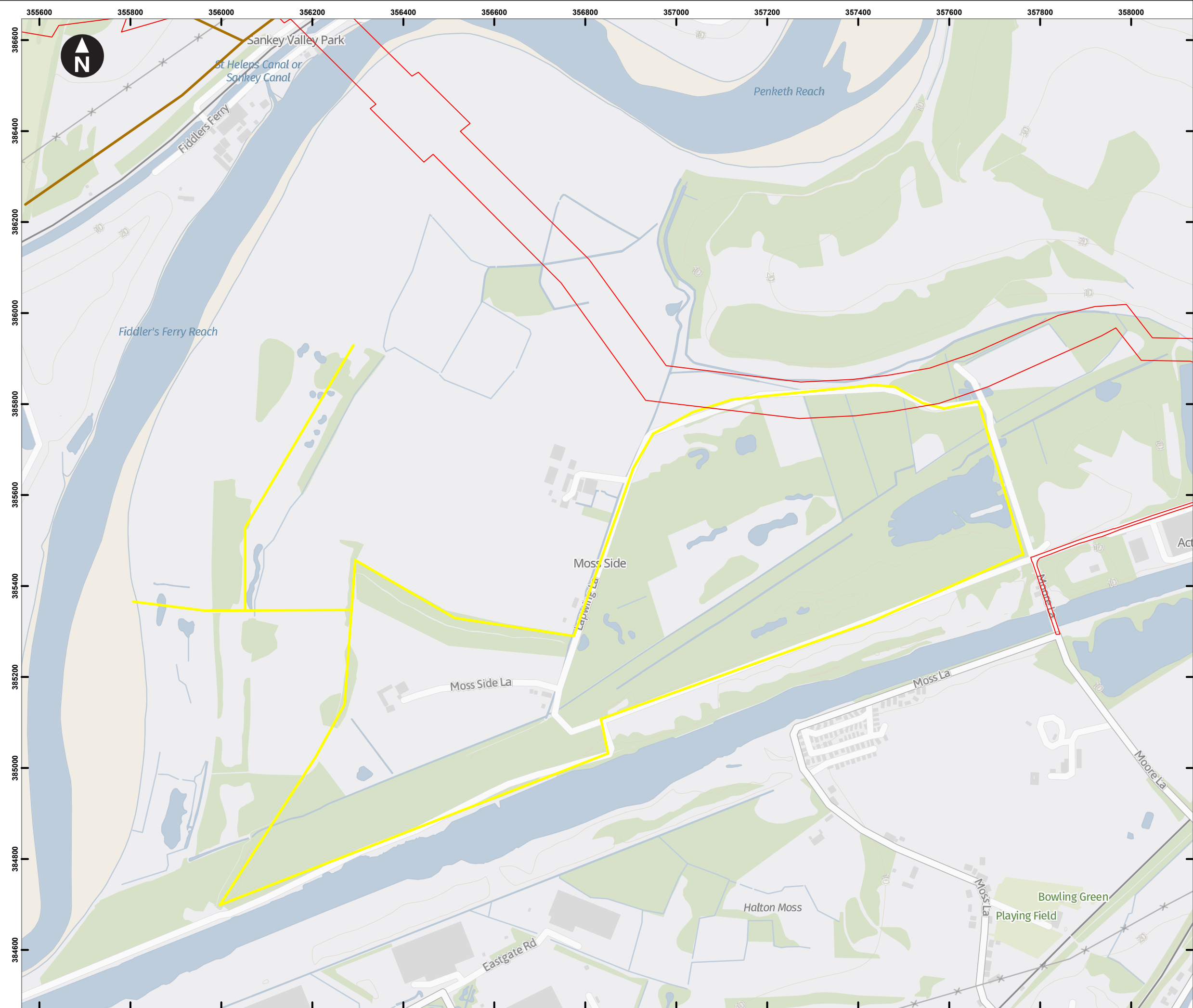
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Key

Draft Order Limits

Transect routes

Transect 13b

Transect 14

0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

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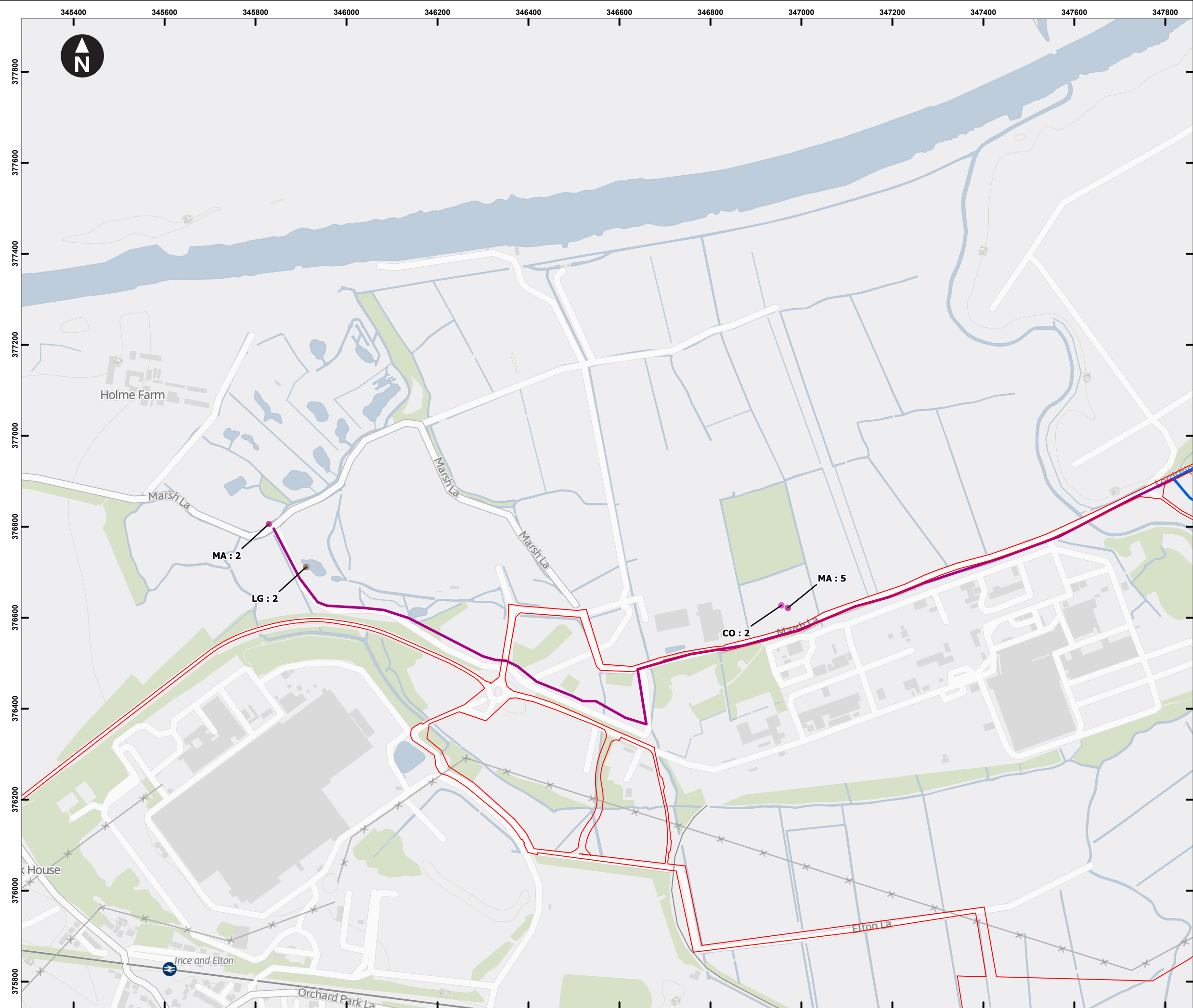
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Figure 5O.4
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Key

Draft Order Limits

Transect routes

- Transect 5
- Transect 6

Species

- Coot (CO)
- Little grebe (LG)
- Mallard (MA)

0 0.15 0.3 0.45 Km

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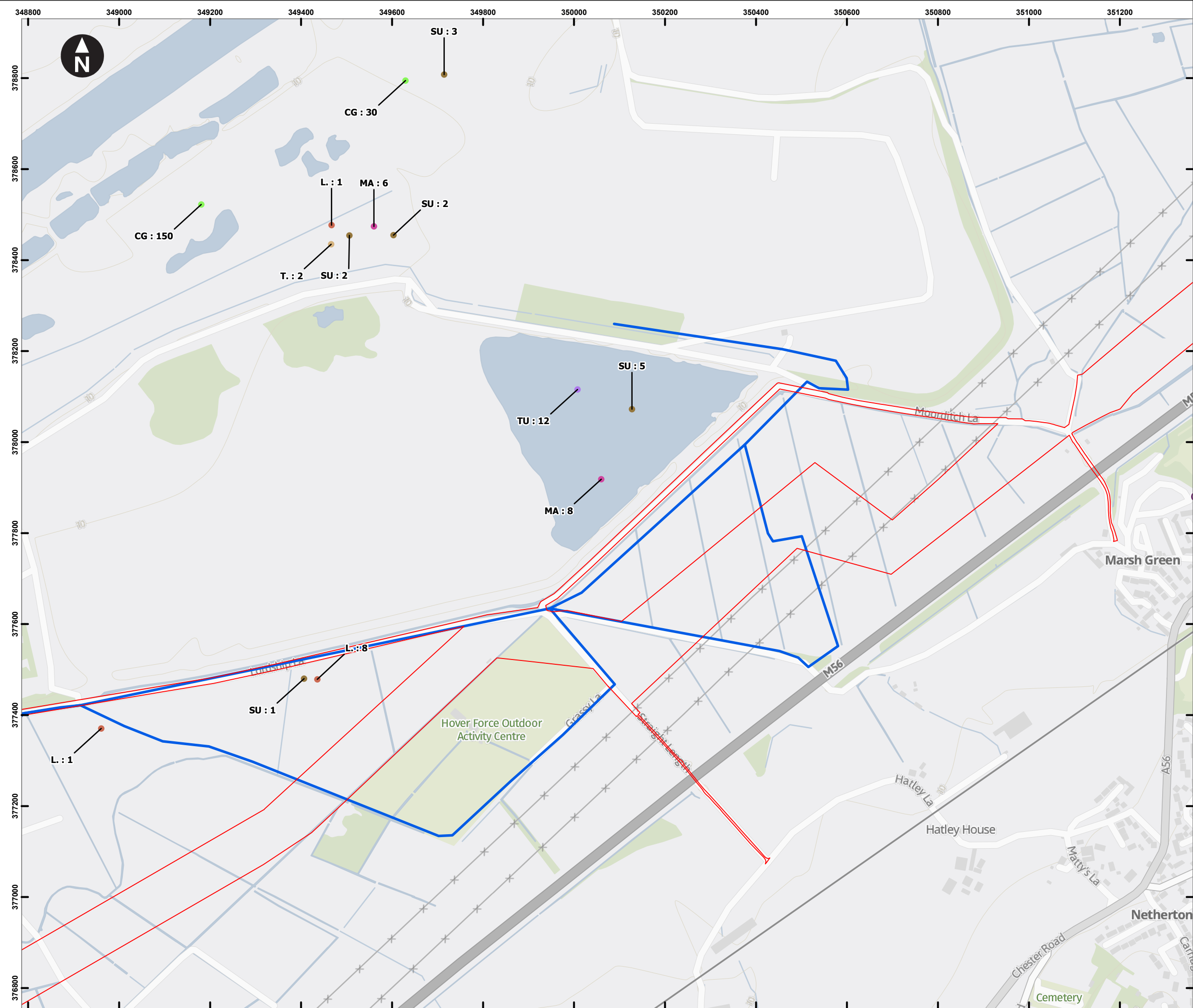
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Figure 5O.4
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Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

- Canada Goose (CG)
- Coot (CO)
- Gadwall (GA)
- Lapwing (L.)
- Mallard (MA)
- Mute swan (MS)
- Tufted duck (TU)
- Shelduck (SU)
- Teal (T.)

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Key

Draft Order Limits

Transect routes

— Transect 7b

0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

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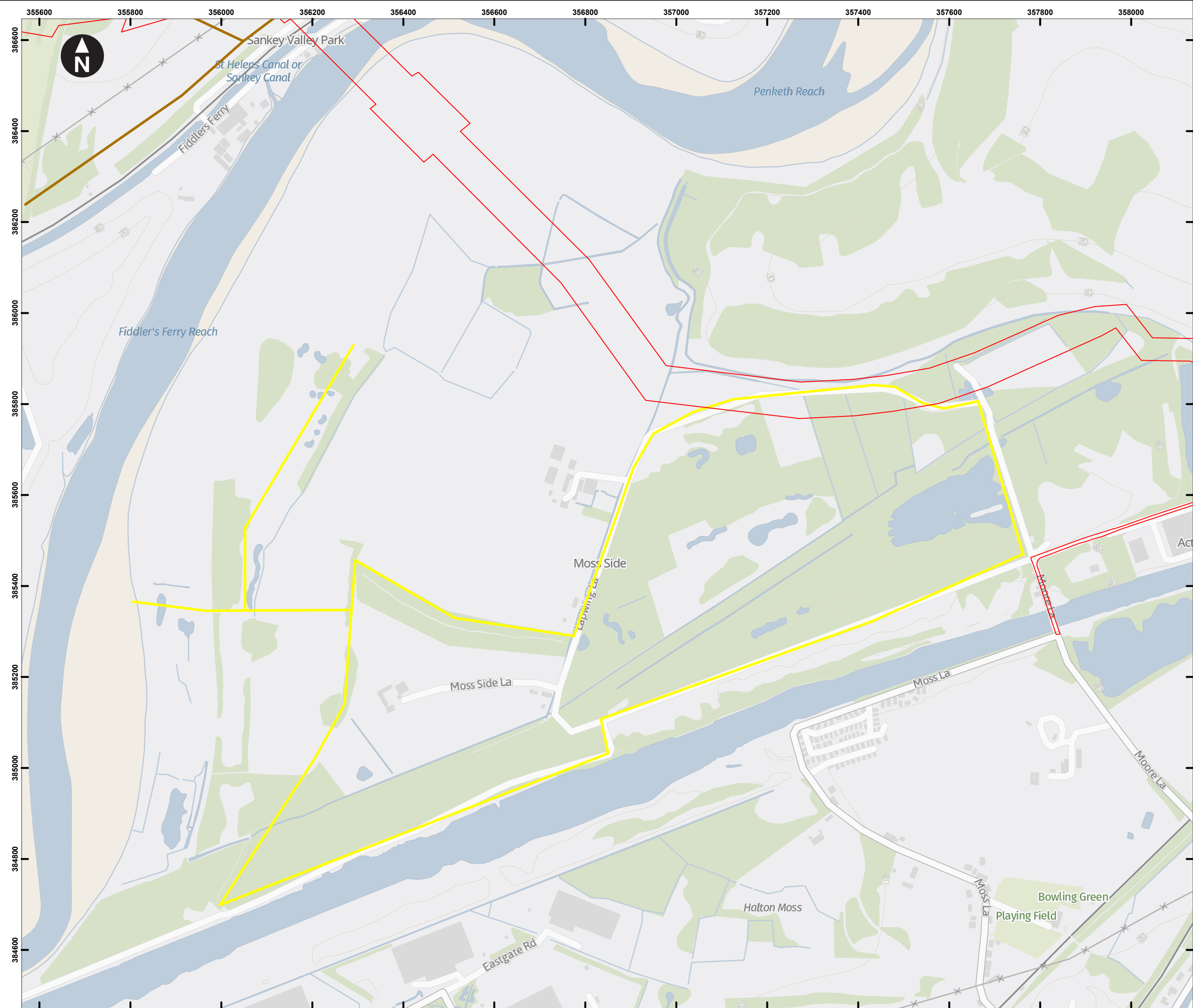
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Key

Draft Order Limits

Transect routes

Transect 13b

Transect 14

Scale at A3: 1:8,000

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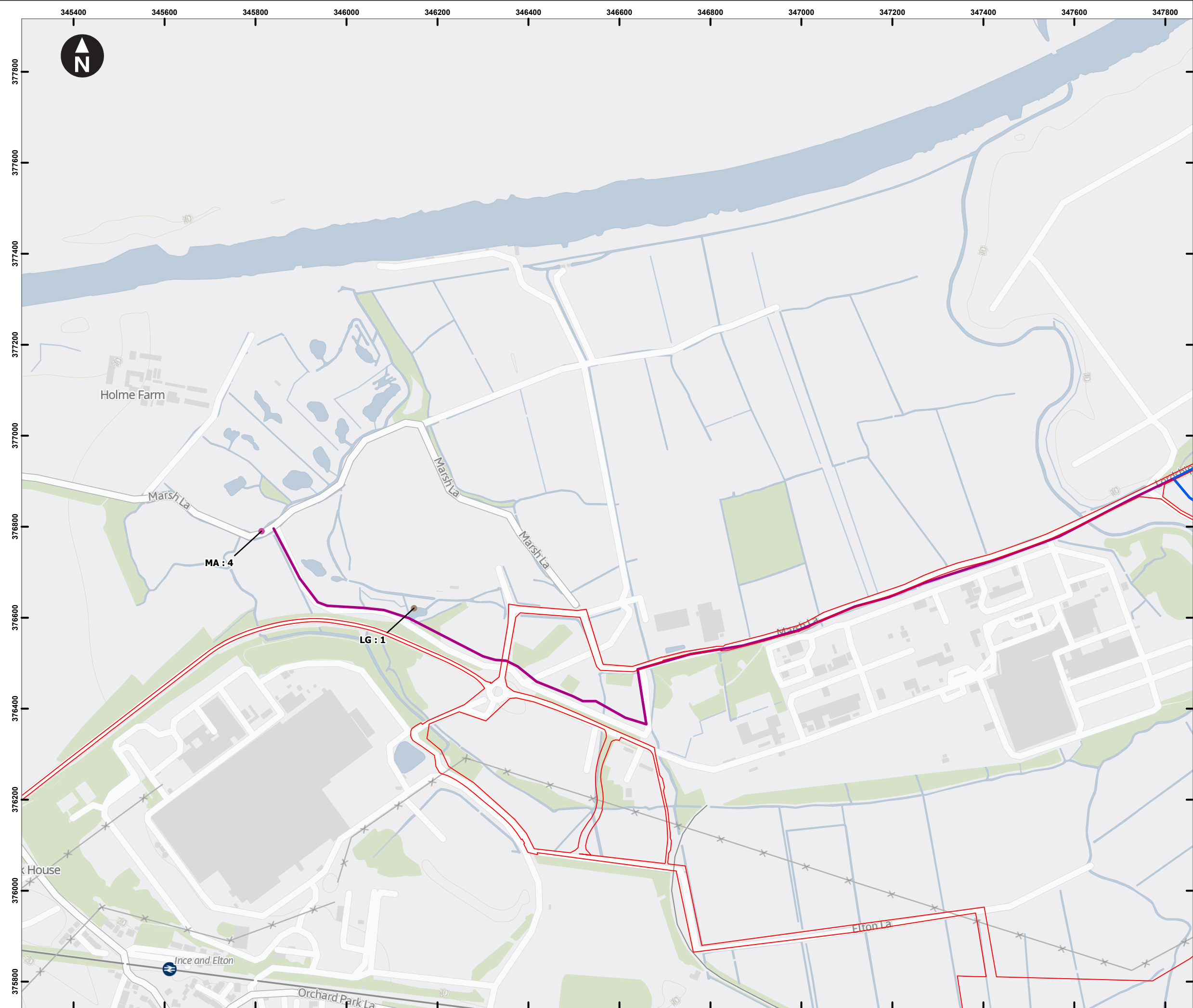
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Figure 5O.4
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Key

- Draft Order Limits

Transect routes

- Transect 5
- Transect 6

Species

- Little grebe (LG)
- Mallard (MA)

0 0.15 0.3 0.45 Km

Scale at A3: 1:8,000

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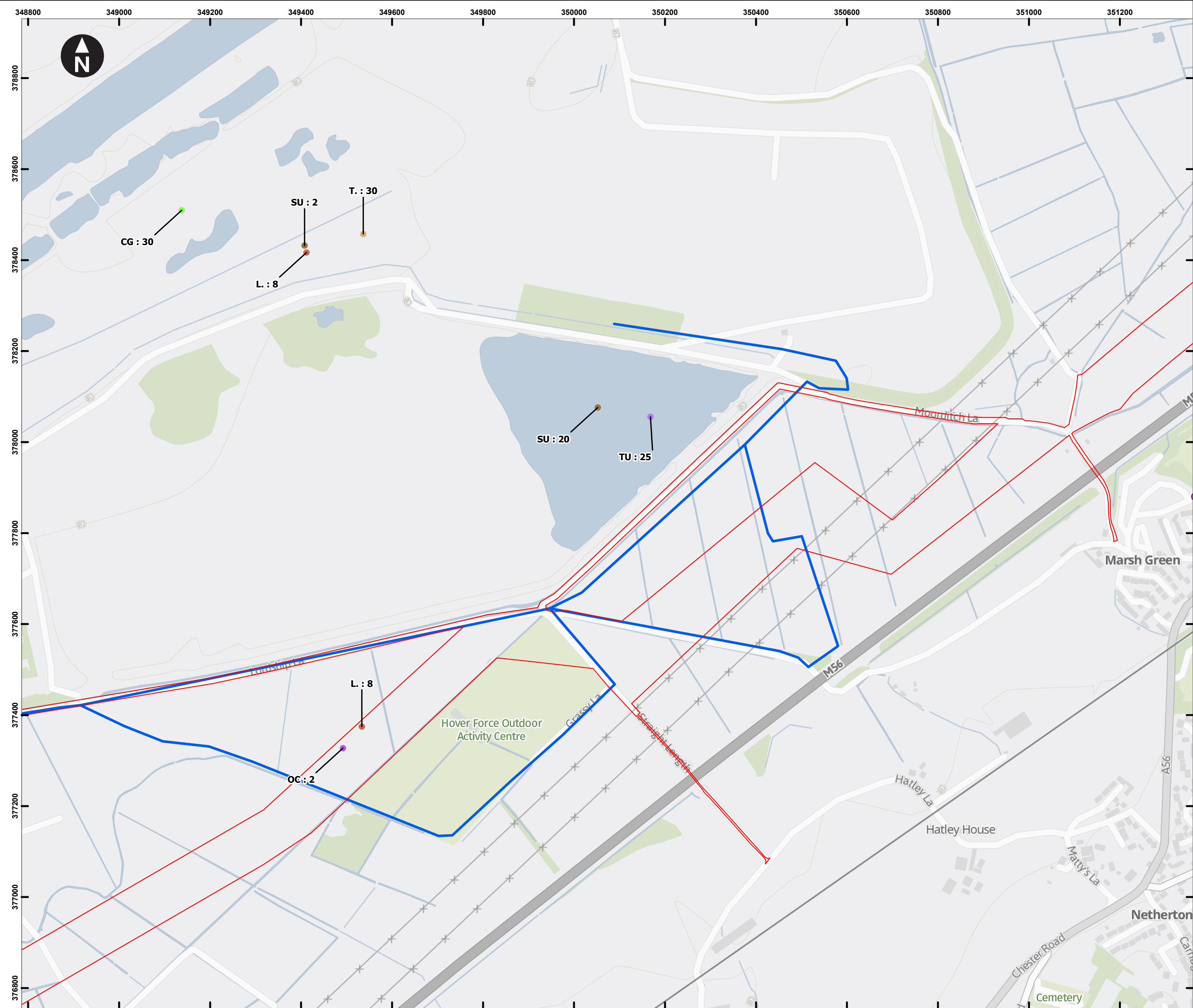
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Figure 5O.4
Non-Breeding Waterbird Survey Results
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Key

Draft Order Limits

Transect routes

Transect 6

Transect 7b

Species

Canada Goose (CG)

Coot (CO)

Lapwing (L.)

Mallard (MA)

Moorhen (MH)

Oystercatcher (OC)

Tufted duck (TU)

Shelduck (SU)

Teal (T.)

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Figure 5O.4
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Key

Draft Order Limits

Transect routes

Transect 7b

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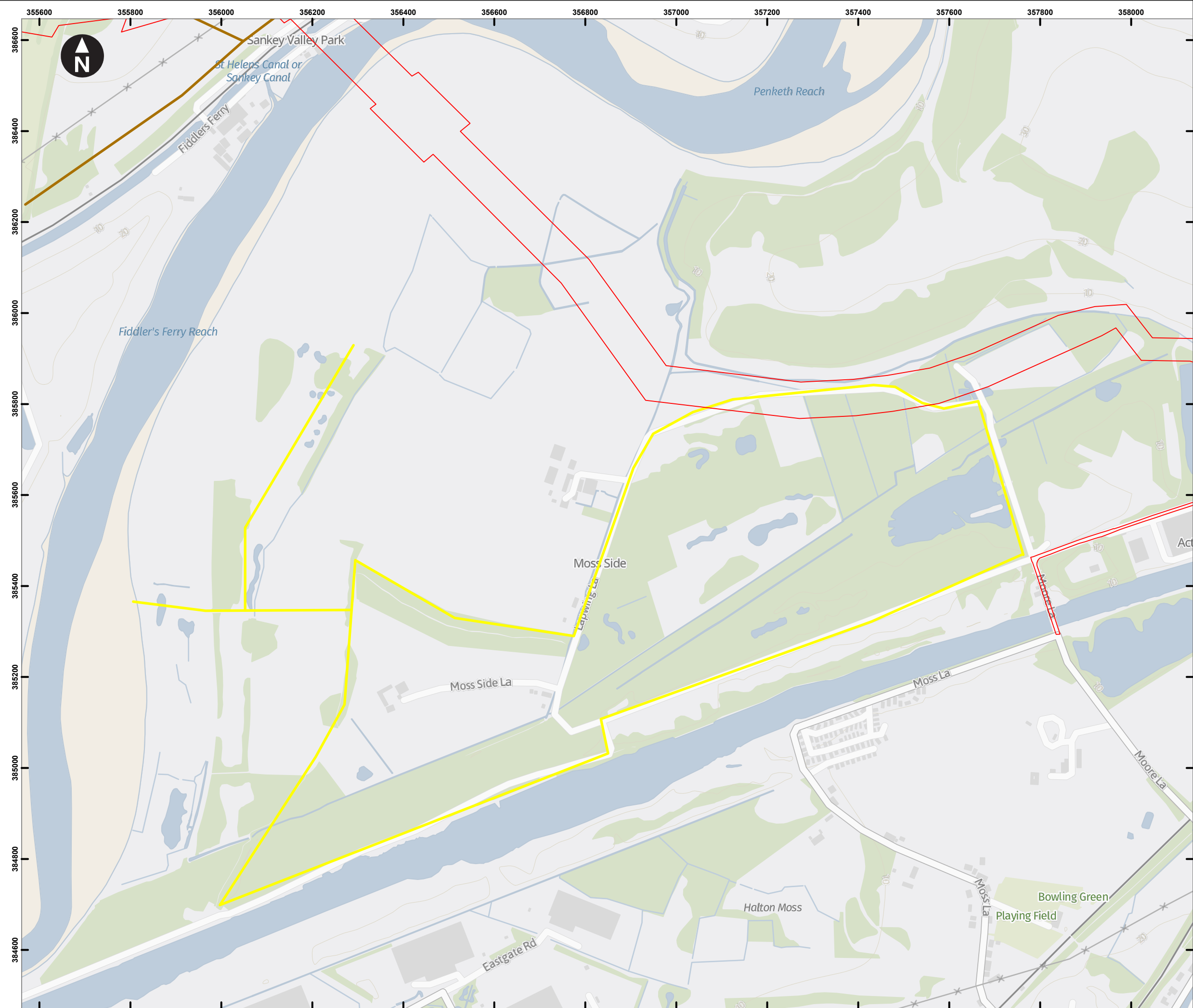
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Figure 50.4
Non-Breeding Waterbird Survey Results
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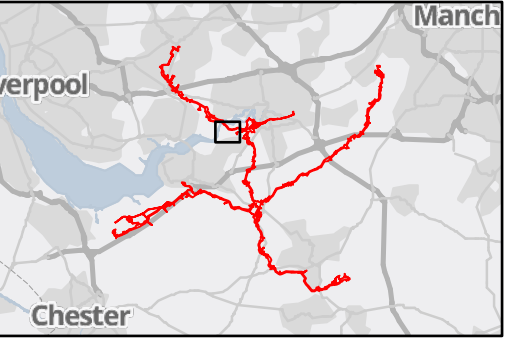
Key

Draft Order Limits

Transect routes

— Transect 13b

— Transect 14



0 0.15 0.3 0.45 Km

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