XD Route_Kincardine Tower XD130

Shadow Habitat Regulations Appraisal Statement

Document:	**BOWS17_66 XD Route_Kincardine Tower XD130**			
Version	Date	Prepared by	Technical Reviewer	Approved by
DRAFT	10/12/2024	Alice Helyar, *Principal Ecologist*	Emma Robson *Principal Ecologist*	Emma Robson *Principal Ecologist*
FINAL				
V1				
V2				
V3				

Contents

1 Introduction

Background

1.1 Bowland Ecology Ltd. was commissioned by Scottish Power Energy Networks (SPEN) to undertake an assessment to inform a Habitats Regulations Appraisal (HRA) for the proposed refurbishment of the reinforced concrete foundations of tower XD130.

1.2 The HRA is required because the works area is located close to the Firth of Forth Special Protection Area (SPA), an internationally important area for nature conservation that could potentially be impacted by the works.

1.3 The aim of this document is to provide the information required to conduct a HRA of the proposed development and it considers the potential effects of the proposed works on the integrity of the Firth of Forth SPA.

HRA Procedure

1.4 Under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (more commonly referred to as the 'Habitats Regulations'), all competent authorities must consider whether any plan or project, which is not directly connected with or necessary to the conservation of a European site, could affect a European site before it can be authorised or carried out. This includes considering whether it will have a 'likely significant effect' on a European site, and if so, they must carry out an 'appropriate assessment' (AA). This process is known as Habitats Regulations Appraisal (HRA).

1.5 The Habitats Regulations set out a step-by-step sequence of statutory procedures to be followed for HRA. An initial screening assessment is carried out to determine, in view of best available scientific knowledge, whether a plan or project, either alone or in combination with other plans or projects, could have likely[1] significant effects[2] on a European site, in view of that site's conservation objectives. Any mitigation measures that have been included in a proposal specifically to avoid harmful effects cannot be taken into account at this stage and should be considered within the appropriate assessment.

1.6 Where a plan or project is considered to have a likely significant effect on the qualifying interest(s) of a European site an appropriate assessment is required. An appropriate assessment is a scientific appraisal of the potential impacts of a plan or project on the qualifying interest(s) of a European site. The appraisal should consider the potential impacts on each qualifying interest and their conservation objectives, including the magnitude and duration of effects and any cumulative effects from other plans or projects. The appraisal should determine whether any of the conservation objectives could be undermined by the proposal. Clear reasons should be provided for any conclusions made. Mitigation to remove or reduce impacts of the proposal can be considered at this stage.

Description of Proposal

1.7 The proposed works involve the refurbishment of the reinforced concrete foundations of tower XD130 (Appendix A). This will include the setting up of a site compound

[1] 'Likely', in this context, means whether a significant effect can objectively be ruled out.
[2] The test of significance considers whether a plan or project could undermine the site's conservation objectives.

(accommodation, offices and welfare) and access to the works area and enable a water supply. Floating/suspended scaffolding will be erected at the foundation access jetty and around two number dolphins at XD130 tower. Monarflex sheeting/debris netting protection will be erected around work areas, along with a debris capture and spent water containment bund below the work area, to minimise hydrodemolition and spray concrete entering the watercourse. This protection will be lifted at the end of each shift in case of inclement weather outwith site hours.

1.8 A siltbuster/filtration and pH adjust unit will be set up so that spent water can be filtered and cleaned prior to release into the environment. Fuel will be stored in bunded containers remotely from works area and refuelling will also occur remotely from the work area.

1.9 The surfaces of the foundation access jetty and two number dolphins will be power washed using 4000 psi power washer. This will enable a condition survey of the structures so that the extent of the concrete repairs can be assessed and marked up. Works will be planned on a daily/weekly basis with consideration of tide times and shipping movements.

1.10 The areas of concrete requiring repair will be saw cut to 10 mm depth and then hydrodemolition to 20 mm minimum behind reinforcement to Dolphins and jetty deck soffit and crosshead/pile locations.

1.11 At regular intervals during hydrodemolition, operatives will remove concrete debris into 0.5 ton bags to ensure there is no build up of material which could compromise the platform structure. The debris will be removed from the platform and placed in a skip for disposal by an approved waste carrier. Spent water will be captured and pumped through a pH adjust and filtration unit before being released into the watercourse.

1.12 Once the hydrodemolition operations have been completed, the damaged edges of repairs will be sawcut using 5" angle grinder and trimmed using a medium duty electric breaker. Any concrete 'shadows' left behind the reinforcements will be removed. The reinforcement will then be thoroughly cleaned using grit blasting methods, using natural media and then immediately coated with a protective coating. Patch Guard anodes will be installed (drilled into the concrete) around the repair area and connected to the rebar.

1.13 Concrete repairs will be through spray operations into a temporary formwork, which will determine the appropriate profile. The spray concrete operations will require connection to a potable water main and air pump. The spray concrete will be applied and then finished off to required profile by striking off and float finishing to provide a dense sealed surface. Finally, a curing agent will be applied.

1.14 On completion of the jetty approach works and dolphin works, the scaffolding will be dismantled and the site will be demobilised.

1.15 The works are estimated to start approximately mid-March 2025 with a working window of a maximum period of 33 weeks, being completed by the end of October 2025, however, the build time is anticipated to last approximately 16 weeks.

1.16 The operational phase of the development is anticipated to be unchanged from the current state as there is to be no change to the structure and power of the overhead lines supported by the tower foundations.

European Site Details

1.17 The Firth of Forth SPA is a complex of estuarine and coastal habitats in southeast Scotland stretching from Alloa to the coasts of Fife and East Lothian. It is also designated as a Site of Special Scientific Interest (SSSI) and Wetland of International Importance (Ramsar). The boundary of the SPA mostly follows that of the Firth of Forth SSSI and overlaps with Ramsar site (Appendix B).

1.18 The Firth of Forth SPA is designated for regularly supporting wintering and passage populations of European importance of a number of species of waterfowl and seabird listed on Annex I of the EU Birds Directive. The SPA also qualifies for supporting wintering populations of both European and international importance of migratory waterfowl species and a large overwintering waterfowl assemblage of national importance. The Firth of Forth Ramsar is similarly important for wintering waders and wildfowl which occur in nationally and internationally important numbers.

1.19 A list of the qualifying bird populations for these designated sites is provided in Table 1 below.

Table 1. *Qualifying bird populations for the Firth of Forth SPA and Ramsar site.*

Common name	Scientific name	SPA population at classification	Designated site
Wintering Annex 1 species for which the SPA is classified under Article 4.1 of the EU Birds Directive (79/409/EEC)			
Red-throated diver	*Gavia stellata*	90 individuals, 2% of the GB population	SPA
Slavonian grebe	*Podiceps auritus*	84 individuals, 21% of the GB population	SPA, Ramsar
Golden plover	*Pluvialis apricaria*	2,949 individuals, 1% of the GB population	SPA
Bar-tailed godwit	*Limosa lapponica*	1,974 individuals, 4% of the GB population	SPA, Ramsar
Passage Annex 1 species for which the SPA is classified under Article 4.1 of the EU Birds Directive (79/409/EEC)			
Sandwich tern	*Sterna sandvicensis*	1,617 individuals, 6% of the GB population	SPA
Wintering migratory species for which the SPA is classified under Article 4.2 of the EU Birds Directive (79/409/EEC)			
Pink-footed goose	*Anser brachyrhynchus*	10,852 individuals, 6% of the Eastern Greenland/Iceland/UK biogeographic population	SPA, Ramsar
Shelduck	*Tadorna tadorna*	4,509 individuals, 2% of the North-western Europe biogeographic population	SPA, Ramsar
Knot	*Calidris canutus*	9,258 individuals, 3% of the North-eastern Canada/Greenland/Iceland/North-western Europe biogeographic population	SPA, Ramsar
Redshank	*Tringa totanus*	4,341 individuals, 3% of the Eastern Atlantic biogeographic population	SPA, Ramsar
Turnstone	*Arenaria interpres*	860 individuals, 1% of the Western Palearctic biogeographic population	SPA, Ramsar
Wintering assemblage exceeding 20,000 individuals (species additional to above) for which the SPA is classified under Article 4.2 of the EU Birds Directive (79/409/EEC)			
Scaup	*Aythya marila*	437 individuals, 4% of the GB population	SPA
Great crested grebe	*Podiceps cristatus*	720 individuals, 7% of the GB population	SPA
Cormorant	*Phalacrocorax carbo*	682 individuals, 5% of the GB population	SPA
Curlew	*Numenius arquata*	1,928 individuals, 2% of the GB population	SPA
Eider	*Somateria mollissima*	9,400 individuals, 13% of the GB population	SPA (non-breeding only)
Long-tailed duck	*Clangula hyemalis*	1,045 individuals, 4% of the GB population	SPA
Common scoter	*Melanitta nigra*	2,880 individuals, 8% of the GB population	SPA
Velvet scoter	*Melanitta fusca*	635 individuals, 21% of the GB population	SPA
Goldeneye	*Bucephala clangula*	3,004 individuals, 18% of the GB population	SPA, Ramsar

Red-breasted merganser	*Mergus serrator*	3,004 individuals, 18% of the GB population	SPA
Oystercatcher	*Haematopus ostralegus*	3,004 individuals, 18% of the GB population	SPA
Ringed plover	*Charadrius hiaticula*	328 individuals, 1% of the GB population	SPA (non-breeding only)
Grey plover	*Pluvialis squatarola*	724 individuals, 2% of the GB population	SPA
Dunlin	*Calidris alpina alpina*	9,514 individuals, 2% of the GB population	SPA
Assemblage additionally included - nationally important populations greater than 2,000 individuals			
Mallard	*Anas platyrhynchos*	2,564 individuals, 0.5% of the GB population	SPA
Lapwing	*Vanellus vanellus*	4,148 individuals, 0.3% of the GB population	SPA
Wigeon	*Anas penelope*	2,139 individuals, 0.78% of the GB population	SPA

1.20 The conservation objectives of the Firth of Forth SPA are to:

- avoid deterioration of the habitats of the qualifying species (listed in table above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

- ensure that the following are maintained for qualifying species in the long term:
  - population of the species as a viable component of the site;
  - distribution of the species within the site;
  - distribution and extent of habitats supporting the species; and
  - structure, function and supporting processes of habitats supporting.

2 Baseline Data

2.1 This statement uses results of an extended Phase 1 Habitat Survey (Bowland Ecology, 2024), a Wetland Bird Survey (Bowland Ecology, 2022-2023) and Noise Impact Assessment (WSP, 2024).

Extended Phase 1 Habitat Survey

2.2 The Extended Phase 1 Habitat Survey was carried out by Bowland Ecology on the 25th November 2020 and updated in April 2023 and again in May 2024 (Bowland Ecology 2024). Habitats within the site boundary were identified and mapped, along with a short description and notes on key features of wildlife interest. The location of habitats recorded during the Extended Phase 1 Habitat Survey is shown in Appendix C.

2.3 Tower XD130 is located immediately to the east of A876 Kincardine Bridge in Fife. It is situated in the River Forth where it begins to widen into an estuary, the Firth of Forth, at this location (Appendix C). Here the river is tidal with slow and brackish water. The riverbanks and substrate are mainly composed of alluvial silt and sand, and boulders, although the northern bank has a sloping masonry part of which is above Mean High-Water Springs. A narrow strip of boulders/rocks colonised by brown algae is present below the sloping masonry of the River Forth northern bank at the tower. A concrete platform and a bridge enabling access to this platform is present at tower XD130 and sloping masonry is present on the adjoining northern river bank next to the tower.

2.4 Semi-improved neutral grassland occurs on the sloping ground to the north-east of tower XD130. It is unmanaged with a tall dense sward, dominated by false-oat grass (*Arrhenatherum elatius*) with other grass species present such as; cock's-foot grass (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*) and couch (*Elytrigia repens*). Large patches of tall ruderals and low-lying bramble (*Rubus fruticosa*) scrub are present within the grassland at tower XD130 (refer to Bowland Ecology, 2024).

Winter Walkover and Ornithological Survey

2.5 Winter walkover bird surveys were carried out by Bowland Ecology between October 2022 to March 2023 inclusive, with two visits undertaken each month. The surveys involved walking a transect at a slow, ambling pace, stopping to scan priority habitats/features as appropriate. The survey was undertaken for an associated project, on land to the north of tower XD130, however it also covered the area of estuary in which XD130 is located and therefore remains valid for this HRA. All species encountered on the site and adjacent land were recorded; the approximate locations of bird species were plotted on a site map together with behavioural notation where appropriate.

2.6 A total of 51 bird species were recorded during the winter walkover surveys. Of these, 12 species recorded are listed as qualifying species of the Firth of Forth SPA (Table 2; a maximum count for each species is bolded). These birds were predominantly recorded either in flight or foraging within mudflats and saltmarsh to the north west and south east of the site. Curlew and pink-footed geese were also recorded foraging in the arable fields to the north. Relevant survey results are illustrated in Appendix D.

2.7 Species recorded within or close to (within 150 m of the site) the working area include; oystercatcher (*Haematopus ostralegus*), redshank (*Tringa totanus*), curlew (*Numenius*

arquata), pied wagtail (*Motacilla alba*), redwing (*Turdus iliacus*), teal (*Anas crecca*), red breasted merganser (*Mergus serrator*), black headed gull (*Chroicocephalus ridibundus*), wren (*Troglodytes troglodytes*), starling (*Sturnus vulgaris*), robin (*Erithacus rubecula*), song thrush (*Turdus philomelos*), magpie (*Pica pica*), grey heron (*Ardea cinerea*), kestrel (*Falco tinnunculus*) and feral pigeon (*Columba livia*).

Limitations

2.8 Ecological surveys are limited by factors that affect the presence of animals such as the time of year, migration patterns and behaviour. Therefore, the surveys of the study area have not produced a complete list of bird species. Other qualifying bird species of the Firth of Forth SPA may be present as suitable habitats are present in the wider area.

Table 2: *Summary of qualifying bird species recorded during the winter walkover surveys.*

Species (BTO Code)	**Bird count**												
	27/10/22	**31/10/22**	**18/11/22**	**30/11/22**	**13/12/22**	**19/12/22**	**04/01/23**	**16/01/23**	**17/02/23**	**24/02/23**	**10/03/23**	**30/03/23**	**Percentage of SPA population (%)**
Bar-tailed godwit (BA)	0	0	0	0	0	**1**	0	0	0	0	0	0	**0.05**
Pink-footed goose (PG)	**204**	91 (2 foraging in mudflats to the west)	151 (5 foraging in northern fields)	62	0	0	0	7 (6 flew over the substation)	0	5 (5 foraging in northern fields)	46 (46 flew over northern fields)	0	**1.88** (0.42 – northern fields; 0.02 - mudflats)
Redshank (RK)	6 (5 foraging in mudflats to the west)	4 (4 foraging in mudflats to the west)	3 (3 foraging in mudflats to the west)	6 (6 foraging in mudflats to the west)	17 (1 foraging in mudflats to the west)	24	6	**52** (40 foraging in mudflats to the west)	6 (2 foraging in mudflats to the west)	1	9 (9 foraging in mudflats to the west)	0	**1.20** (0.92 – mudflats)
Curlew (CU)	**44** (1 foraging in mudflats to the west)	27 (4 foraging in northern fields and 2 foraging in mudflats to the west)	18 (13 foraging in northern fields)	21 (19 foraging in northern fields)	5	1 (1 foraging in northern fields)	9	2	21 (5 foraging in mudflats to the west)	4 (4 foraging in northern fields)	13	42 (19 foraging in northern fields)	**2.28** (0.98 – northern field; 0.26 - mudflats)
Oystercatcher (OC)	3 (1 foraging in mudflats to the west)	5	4 (foraging in mudflats to the west)	2	5	4	5	2	1	2	**7**	1	**0.23** (0.13 – mudflats)

Lapwing (L.)	**52** (52 foraging in mudflats to the west)	46 (46 foraging in mudflats to the west)	0	0	0	0	41	**52** (1 foraging in mudflats to the west)	0	0	0	0	**1.25** (1.25 - mudflats)
Red-breasted merganser (RM)	0	0	0	0	2	2	5	**14** (2 foraging in mudflats to the west)	0	0	0	0	**0.47** (0.07 – mudflats)
Dunlin (DN)	0	0	9 (9 foraging in mudflats to the west)	2 (2 foraging in mudflats to the west)	2	**232**	0	0	69+ (9 foraging in mudflats to the west)	0	0	0	**2.44** (0.09 – mudflats)
Mallard (MA)	0	0	0	0	0	4	4	**13** (13 foraging in mudflats to the west)	0	0	0	0	**0.51** (0.51 – mudflats)
Wigeon (WN)	0	0	0	0	0	0	2 (2 foraging in mudflats to the west))	**4** (4 foraging in mudflats to the west)	0	0	0	0	**0.19** (0.19 – mudflats)
Shelduck (SU)	0	0	0	0	0	0	0	0	2 (2 foraging in mudflats to the west)	4 (2 foraging in mudflats to the west)	**23** (4 foraging in mudflats to the west)	**23** (23 foraging in mudflats to the west)	**0.53** (0.51 – mudflats)
Eider (I.)	0	0	0	0	0	0	0	0	0	0	0	**2**	**0.02**

Noise Impact Assessment

2.9 WSP undertook a noise assessment in relation to the proposed works in November 2024 (WSP 2024). The aim of the assessment was to determine the existing baseline acoustic climate, predict the sound levels due to the operation of the development, and to assess these levels against relevant guidance.

2.10 A background sound survey was undertaken on Tuesday 4th November 2024 at two locations that are considered to be representative of the terrestrial ecological receptors of the Firth of Forth SPA and Ramsar site (see Appendix E). The attended measurements were carried out between 10:00 and 16:00 hours. The first location (MP1) was north of Clackmanannashire Bridge and 50 m west of the A876 and 890 m north of Tower XD130. The second location (MP2) was situated to the north of Airth on Shore Road, approximately 120 m from the south bank of the River Forth and 1.8 km south west of tower XD130. Based upon the results, a daytime background noise level of between 56 and 62 dB $L_{Aeq,15min}$ for MP1 and 38-47 dB $L_{Aeq,15min}$ at MP2 were considered representative for the receptor sites.

2.11 The specific sound level (the sound level produced by a source, without corrections for acoustic features) at the source, emitted by the remedial works, considered to be worst case scenario is predicted to be 114 dB (overall corrected sound power level). It is assumed that the Firth of Forth is an acoustically reflective ground surface and the remaining surfaces are acoustically soft ground cover between the noise source and receptor. At a distance of approximately 350 m from the source (as shown in Appendix E), the predicted noise levels for typical construction activities associated with the proposed works, the noise levels fall below 55 dB $L_{Aeq,T.}$ Therefore, noise levels at the designated sites, which are located >350 m from the source, are anticipated to be below 55 dB $L_{Aeq,T.}$ It should be noted that as a worst case, the modelling assumed maximum noise levels generated by the hydrodemolition plant operating at full power. In practice, emissions are likely to be lower. No works will occur at night.

3 Screening Assessment

3.1 The potential impact sources from the proposed development at all stages (i.e., construction and operation) and pathways to the Firth of Forth SPA by which effects could arise on qualifying features are summarised in Table 3 below.

Table 3: *Potential impact sources and pathways for effects on Firth of Forth SPA from the proposed development.*

Potential Impact on SPA	Pathway to SPA	Potential for effect(s) on receptors[3]
Damage to intertidal habitat through sediment runoff or pollution from fuels and chemical spillages during construction works.	There is hydrological connectivity between the site and SPA. The tower (and therefore the working area) is located within the River Forth, which is directly hydrologically linked to the SPA.	Sediment or other pollutants in contaminated runoff water could enter the River Forth and harm prey species (plant, fish or invertebrate), and the habitats of their prey species and hence reduce the food available for qualifying features.
Temporary and permanent loss/deterioration of habitats (feeding or roosting sites) of the qualifying species outwith the SPA.	The site, including access routes and compound area, is located within connectivity distances of qualifying species of the Firth of Forth SPA (for most of the species it is considered up to 5 km expect pink-footed geese for which it is 20 km).	Reduced availability of food resources could cause displacement of the qualifying species to new feeding sites which might not have capacity to support extra birds, subsequently leading to higher winter mortality of birds.
Temporary disturbance during construction from noise, lighting and presence of people or machinery.	The site is located in close proximity to the Firth of Forth SPA. Estuaries can be particularly sensitive to visual and noise-based disturbance due to an exceptionally long visual reach; and sound can carry long distances over water.	Disturbance associated with hydrodemolition and construction works could temporarily displace qualifying bird species from using their feeding grounds, roosting sites or regular commuting routes between roosting sites and foraging areas. Disturbance at high-tide roost sites leads to increased energy expenditure subsequently making survival more difficult for overwintering birds. Artificial lighting makes night feeding birds more vulnerable to predators.
Permanent, intermittent, disturbance from noise, and presence of personnel for maintenance and operational purposes.	The site is located in close proximity to the Firth of Forth SPA. Estuaries can be particularly sensitive to visual and noise-based disturbance due to an exceptionally long visual reach; and sound can carry long distances over water.	Sustained or repeated disturbance may result in an area becoming unusable for qualifying species and effectively can lead to the long-term loss of an area of feeding or roosting habitat. Such disturbance may therefore cause a reduction in the number of birds that a site can support. Regular disturbance at roost sites may cause population declines even if sufficient food resources remain available in an area due to increased energy expenditure.

[3] Any qualifying feature of a European site or any other ecological feature (including other habitats, species or ecological processes) which support a qualifying feature.

4 Appropriate Assessment

4.1 An assessment follows of whether the potential scale or magnitude of any effects are likely to be significant alone or in combination.

Damage to Intertidal Habitat

4.2 It is not anticipated that there will be any direct destruction or disturbance to intertidal habitat as a result of the proposed development as the works are confined to a specific location above the surface of the estuary and outwith the boundary of the Firth of Forth SPA site. However, there is a hydrological connectivity between the site and SPA, via the River Forth. It is, therefore, possible that run-off containing debris and suspended solids or other pollutants such as fuels or oils could enter the Firth of Forth SPA.

4.3 Pollution from runoff and chemical spillages during the construction phase can change the habitat quality or functioning on a temporary or permanent basis, depending on the nature of the pollutant. Chemical spillages may result in the introduction of toxic substances into the intertidal habitats, resulting in the killing of plants, and killing and injury of micro and macro- organisms feeding on the substrates and vegetation, which could be passed up the food chain to the qualifying bird species. Changes in the availability of prey as a result of pollution events would impact on the distribution of qualifying bird species.

4.4 There is a risk of pollution being accidentally released during the repair works, particularly since the works are occurring directly above the estuary. Pollution can arise from accidental spills and run-off of sediment and debris from the works area. It is also possible that spillages of fuels or oils from vehicles/plants could happen and if not properly contained and cleaned, could travel in the water column of the River Forth and enter the SPA.

4.5 However, any aforementioned pollution events could be controlled through careful design, and siting and timing of works, coupled with good construction practise and SEPA licensing requirements. To avoid potential impacts resulting from pollution of the watercourses and estuarine habitats, contractors will produce a Pollution Prevention Plan that will detail protection of the water environment through surface water management, chemical accident/spillage response and management procedures, etc, and method statements for all activities with assessment of risks including environmental risks. For instance, the embedded design (as detailed in the Construction Environmental Management Plan/Works Method Statement) includes use of Monarflex sheeting screens and bunds to capture debris and water runoff, so it can be disposed of and cleaned appropriately. Since the works will incorporate the above measures, it is not expected to be a significant effect from pollution potentially arising during the proposed tower repairs on the Firth of Forth SPA.

4.6 During the operational phase of the development, potential sources of pollution may arise from hydrocarbons spills from vehicles accessing the site. However, there will only be low number of light vehicle movements (predicted to be less than 6 per month) meaning that potential for fuel or oil spills is low. Any spill which might potentially occur, would be relatively small due to the size and nature of the vehicles being used.

Loss of Functionally Linked Land

4.7 Estuary birds spend a proportion of their time away from the coast, at inland feeding sites and/or high-tide roosts; these predominantly comprise farmland pasture and cropland. Such land if used by SPA species is considered to be functionally linked because it supports the

functionality and integrity of a designated site for these species. Therefore, impacts to such land can have a significant effect upon the favourable conservation status of individual species for which the SPA was designated. For the purpose of this assessment, fields that had supported at least 1% of the qualifying population of the SPA on at least one survey visit are considered as being potentially important in supporting the waterbird assemblage of the Firth of Forth SPA.

4.8 Habitats within the land required to accommodate the repair works (access route and compound area) includes a dense sward of tall semi-improved neutral grassland with scattered scrub, which is not considered suitable for use by over wintering qualifying species. A bird assemblage characterised by locally common and widespread species, typical of farmland and scrub/woodland habitats was recorded during the winter walkover surveys in the footprint of the works. It is therefore concluded that there is no likely significant effect, on the Firth of Forth SPA functionally linked land as a result of the proposed repair works.

4.9 During the operational phase, vehicular access to the tower is gained via a pre-existing track and therefore impacts to the adjacent grassland habitat are not anticipated.

Disturbance

4.10 The development might cause a substantial level of disturbance, in particular, during the construction/repair works phase, which whilst are unlikely to extend into the winter months, may affect qualifying species that return early to the wintering sites (e.g. non-breeding birds). During the operation phase the magnitude of disturbance is expected to be reduced back to current levels experienced at the site.

4.11 Disturbance is defined as any event that disrupts behaviour of species communities or individuals and can occur from visual (e.g. lighting, and presence and movement of site personnel and vehicles) and aural stimuli. The impacts of disturbance on birds can vary depending upon the species and level of disturbance (Hockin et al., 1991); some species are more susceptible to disturbance than others and may be more sensitive at different times of year, e.g. nesting. Habituation to the presence of people and other disturbances may occur over time, and birds may, over time, become habituated to changes (increases) in disturbance levels.

Nosie disturbance

4.12 The Waterbird Disturbance Toolkit[4] (WDT), which is based upon studies around the Humber Estuary in England, indicates that at sudden noise event at 60dB (at the receptor – bird) or more prolonged noise over 72dB there is a flight response in waterfowl, while at levels below 55dB (at the bird) there is no response. The toolkit also identifies acceptable ambient dose levels up to 70dB at the receptor (bird) where might be occasionally induced a low-level behavioural response such as heads-up.

4.13 For noise-related disturbance, the hydrodemolition phase, is considered to be the noisiest element of the works period. An assessment of noise impacts has been undertaken for the project by WSP (WSP, 2024), which concluded that at 350 m from the source, noise levels are predicted to have attenuated to below 55 dB and therefore unlikely to have an adverse effect on species using the designated sites, which are located over 400 m from the source. Small numbers of SPA qualifying species were recoded within 200 m of the working areas during the

[4] TIDE toolbox - TIDE tools (tide-toolbox.eu)

winter walkover surveys, therefore they may may experience some limited disturbance due to noise levels up to 60 dB be disturbed by elevated noise levels. However, only the area within approximately 10 m of the tower will experience noise levels (>70 dB) that might cause a response in the ecological receptors.

4.14 Intertidal habitats within the Firth of Forth SPA and immediate east of the SPA site are at least 350 m from the nearest potential noise disturbance source from the XD130 repair works. At this distance, there is considered to be limited potential for the repair works, even when concrete breaking is being undertaken, to cause appreciable levels of disturbance to wintering birds within the SPA site. Moreover, the A876 road borders the XD130 works areas to the west, therefore, birds utilising surrounding land are habituated, to some degree, to noise disturbance. As such, the effects from noise disturbance are considered to be negligible.

4.15 Noise-related disturbance associated with the operational phase is not predicted to be above those noise levels currently experienced at the site. The tower will be subject to intermittent inspections and maintenance visits and only a low number of vehicle movements, predicted to be less than one per month, will be generated. It is therefore concluded that there is no likely significant effect, singularly or in-combination, on Firth of Forth SPA from noise disturbance during operation of the proposed development.

Visual disturbance

4.16 Visual impacts would lead to high levels of disturbance as a result of workers operating outside of plants/machinery, fast movement of plant, large plant and proximity to birds. The WDT indicates that a behavioural response might commence at around 300 m distance for the most sensitive species (e.g., curlew). This distance could be reduced where visibility of the construction activities is sufficiently screened.

4.17 The XD130 repair works that could cause visual disturbance will be confined to a small location outwith the boundary of the Firth of Forth SPA site. Visual disturbance could result from setting up the site compound, establishing the access to the tower and setting up the screens around the tower. On a daily basis, personnel movements to and from the tower, along with machinery movement and lowering and raising the screens at the start and end of each day. Small numbers of SPA qualifying species were recoded within or close to the working areas during the winter walkover surveys, therefore they may be disturbed by human presence. However, this is likely to be confined to the area on the landward footprint and works occurring within the tower structure will be screened from view.

4.18 Given that the A876 road borders the site to the west, and birds utilising surrounding land are likely to be habituated, to some degree, to disturbance from vehicular traffic and cyclists, visual disturbance during the XD130 repair works is considered to be negligible.

4.19 During the operational phase, the levels of visual disturbance will return to those experienced currently and are not considered likely to increase. The tower will be subject to intermittent inspections and maintenance visits and only a low number of vehicle movements, predicted to be less than one per month, will be generated. It is therefore concluded that there is no likely significant effect, singularly or in-combination, on Firth of Forth SPA from visual disturbance during operation of the proposed development.

Light pollution

4.20 Artificial light may act as a form of a visual disturbance causing direct mortality by attracting birds to the light source, disorientation or illumination of birds making them susceptible to predator attack. Artificial light/light pollution, however, may increase feeding time by allowing nocturnal feeding. UK bird species that are particularly sensitive to artificial lighting include long-eared owls, black-tailed godwit and curlew (Rodriguez et al., 2006).

4.21 It is anticipated that the works will occur during daylight hours only during summer months, therefore there should not be a requirement for additional lighting to enable working. Since there is currently no illumination of the site and in the unlikely event of additional being required, any lighting of the working area will increase levels of light in the area, and if not appropriately directed this may result in light pollution of the adjacent habitats. It is anticipated that any additional lighting would be contained and screened within the sheeted works area, minimising any potential impact of light spillage on the surrounding area.

4.22 During the operational phase, illumination of the tower will return to current levels and not cause any additional adverse effect on the surrounding habitat or qualifying species.

5 Conclusion

5.1 This assessment has identified potential impacts on the Firth of Forth SPA, Ramsar and their associated qualifying bird species and include pollution from runoff and chemical spillages during the construction phase. However, strict adherence to a Pollution Prevention Plan and task specific method statements will ensure that the risk of adverse impacts is maintained at low levels.

5.2 Noise and visual disturbance and light pollution are considered unlikely to adversely impact upon intertidal habitats and their associated bird species that form part of the qualifying interest of the SPA during construction and completed development.

5.3 It is therefore concluded that the proposed works are unlikely to have a significant adverse effect on the Firth of Forth SPA or the qualifying features and functionally linked land.

References

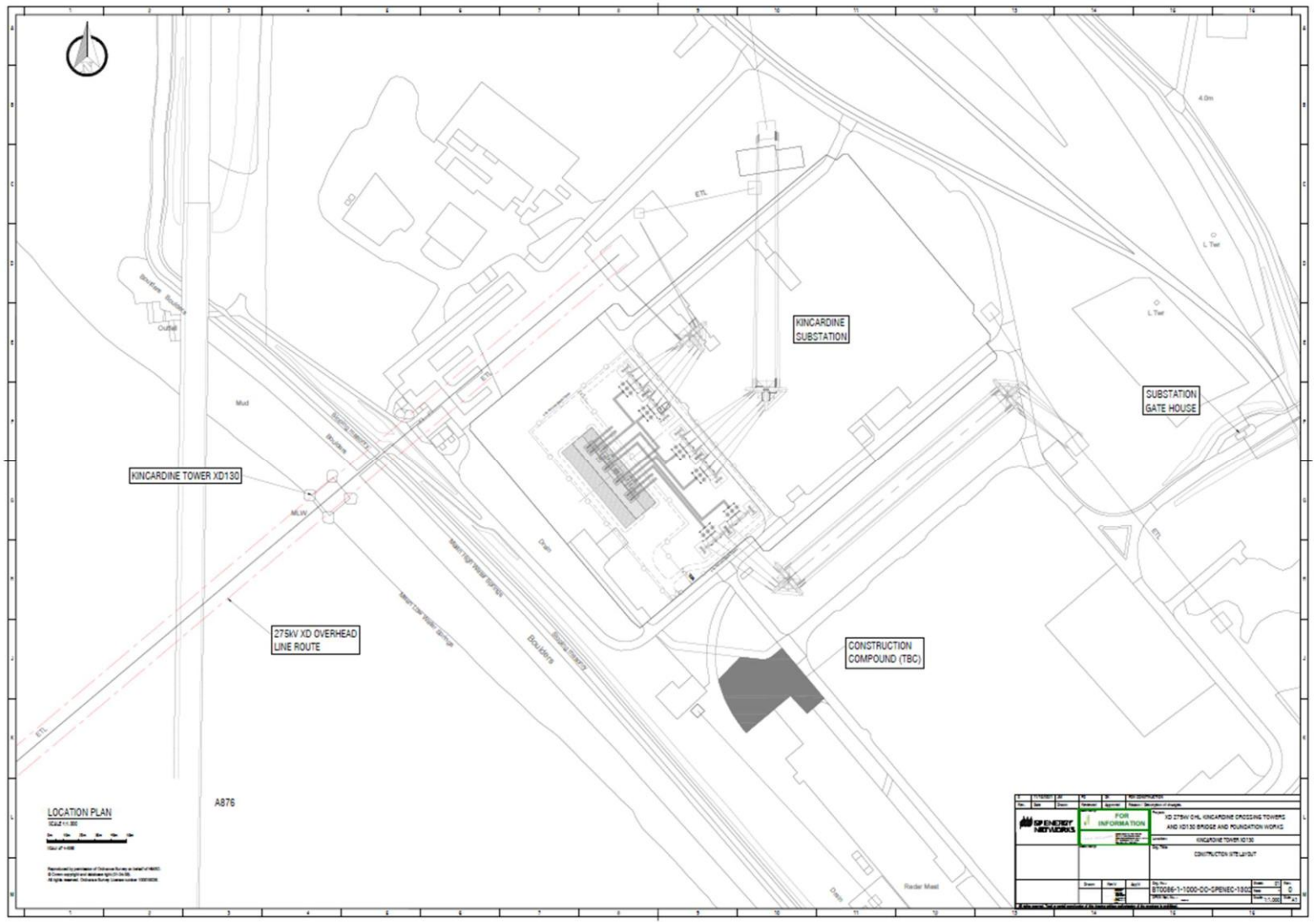
Bowland Ecology (2024) Towers XD128 – 131 Refurbishment; Ecological Appraisal Update 2024.

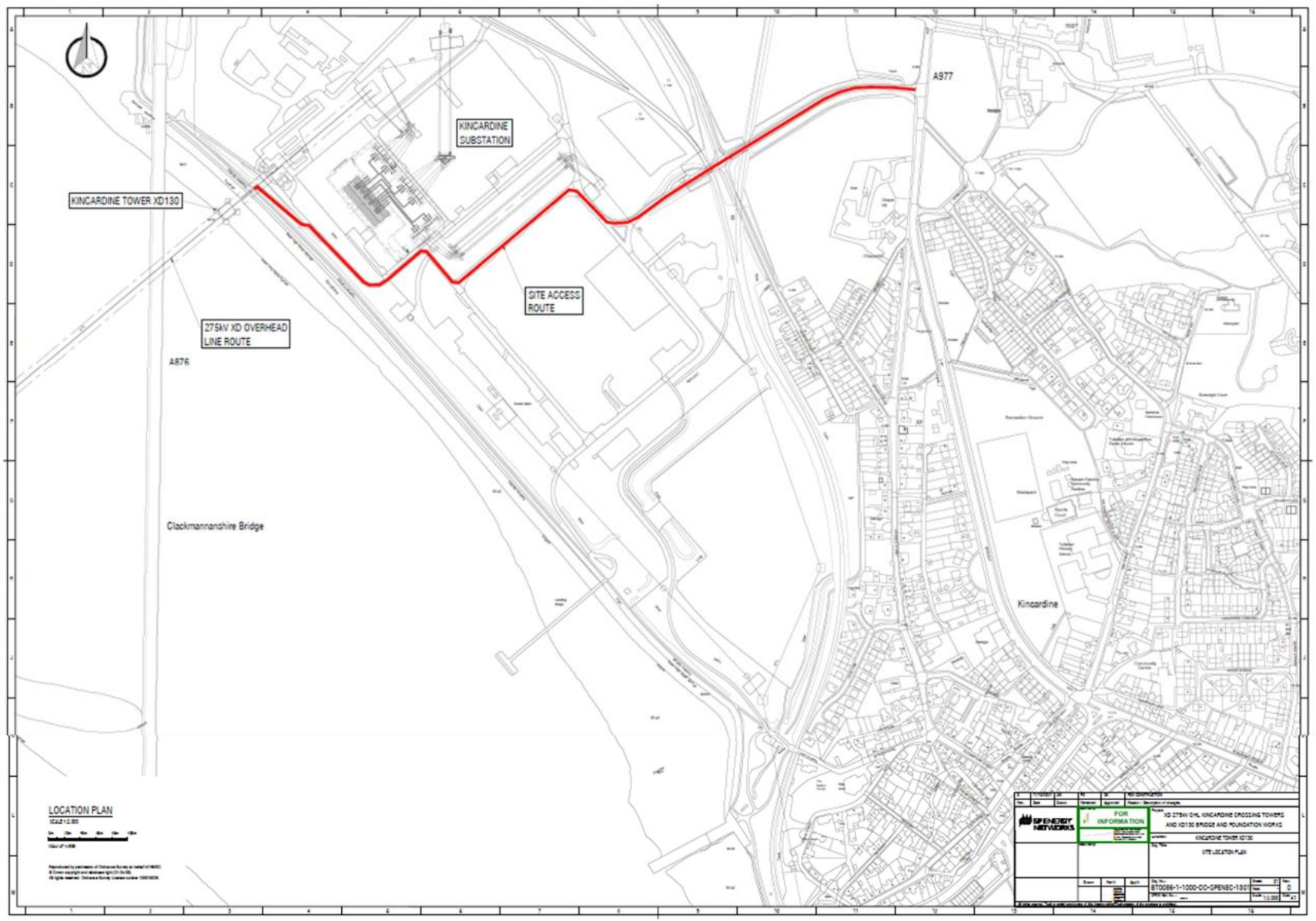
Rodriguez A., Garcia A.M., Cervera F. and Palacios V. (2006) Landscape and anti-predation determinants of nest site selection, nest distribution and productivity in Mediterranean population of Long-eared Owls, *Asio otus*. Ibis, 148(1), pp. 133-145.

SNH (2014) Natura Casework Guidance: How to consider plans and projects affecting Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

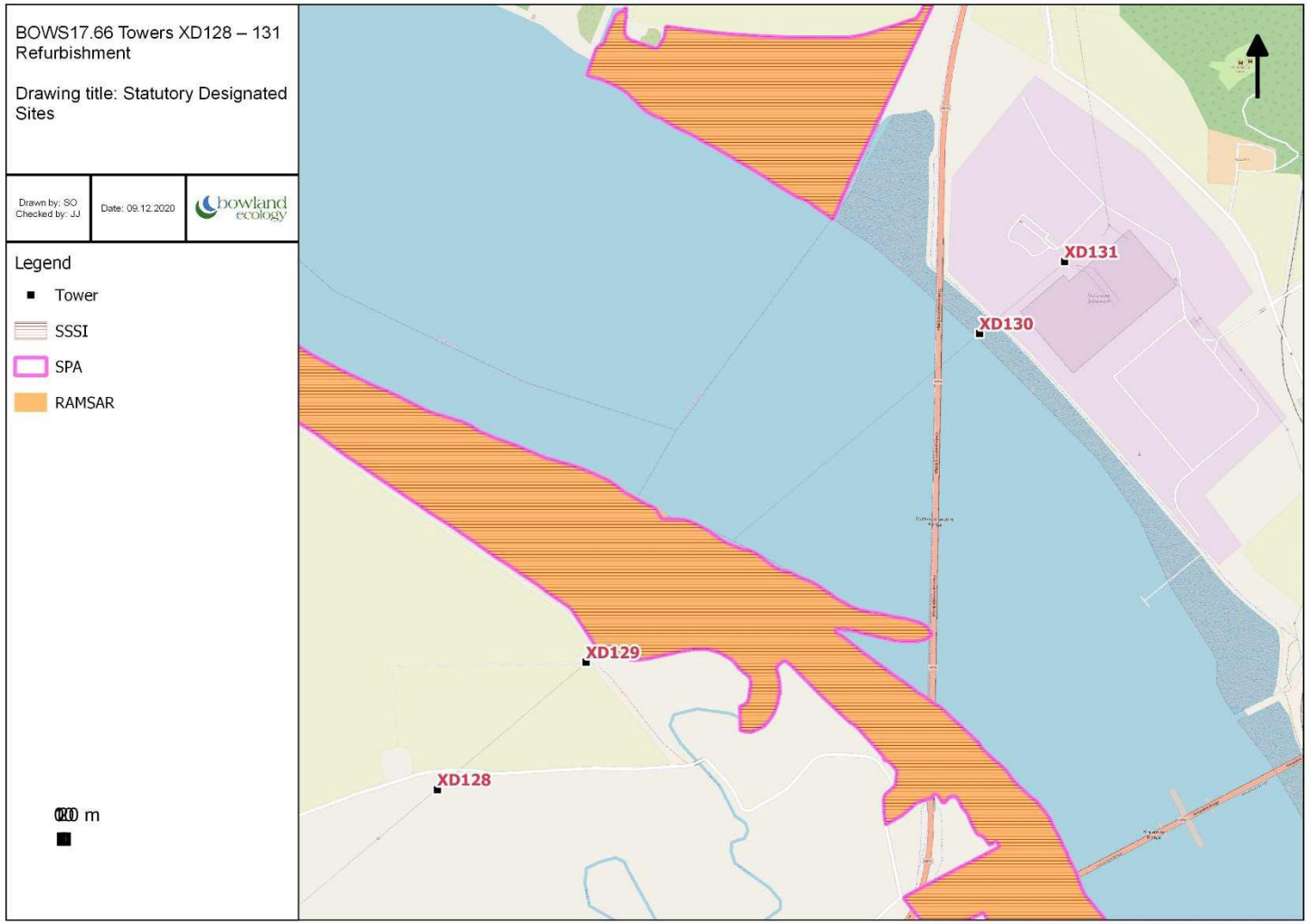
WSP (2024) Noise Impact Assessment Report; Kincardine Tower XD130 Foundations and Access Bridge. Technical Note 1.

Appendix A – Proposed Works Layout and Access Route

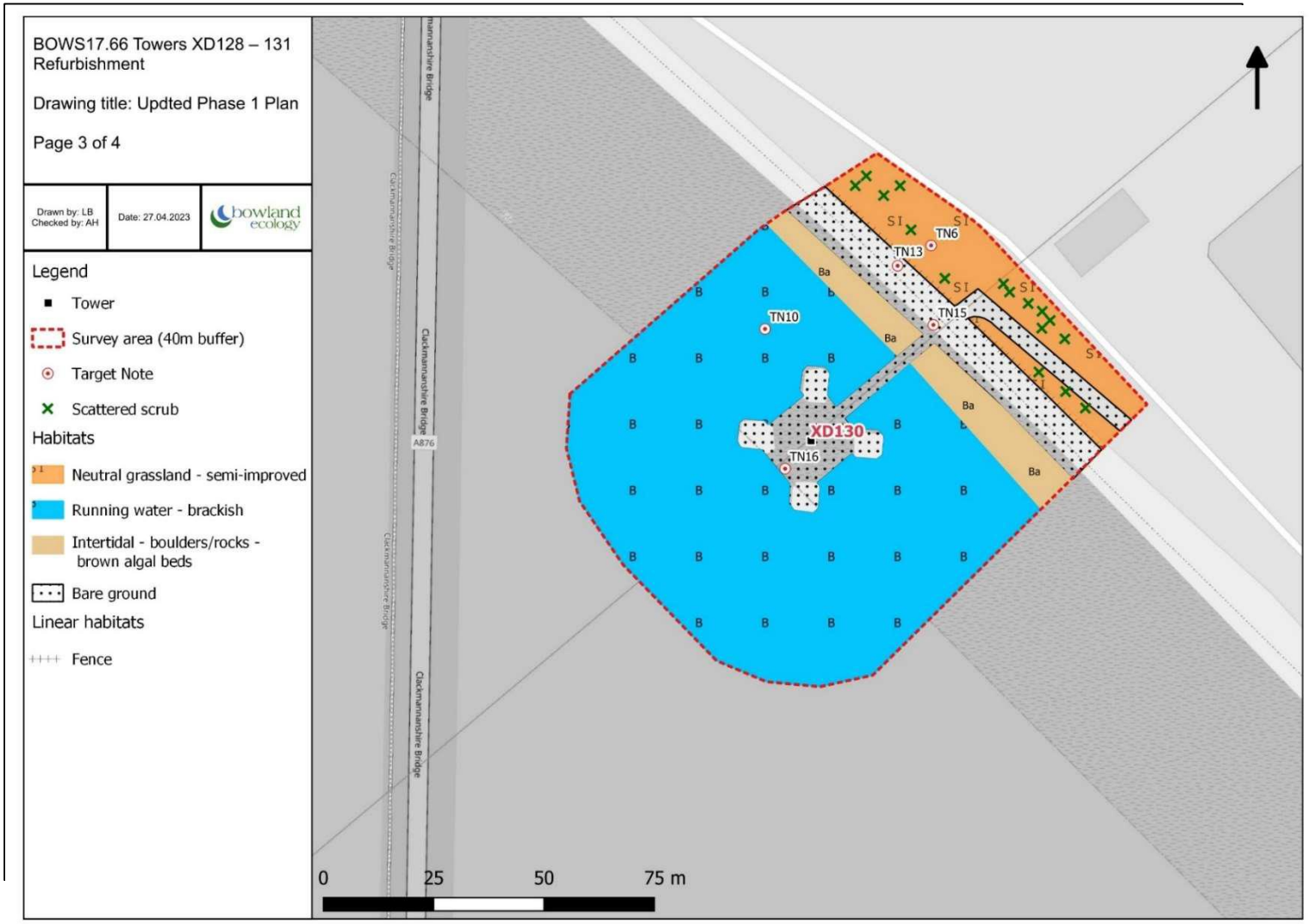



KINCARDINE SUBSTATION
KINCARDINE TOWER XD130
SITE ACCESS ROUTE
275kV XD OVERHEAD LINE ROUTE
A876
A977
Clackmannanshire Bridge
Kincardine
LOCATION PLAN
FOR INFORMATION
SP ENERGY NETWORKS
XD 275kV CHL KINCARDINE CROSSING TOWERS AND XD130 BRIDGE AND FOUNDATION WORKS
KINCARDINE TOWER XD130
SITE LOCATION PLAN
BT0086-1-1000-DO-SPENEC-1001

Appendix B – Designated Sites Plan

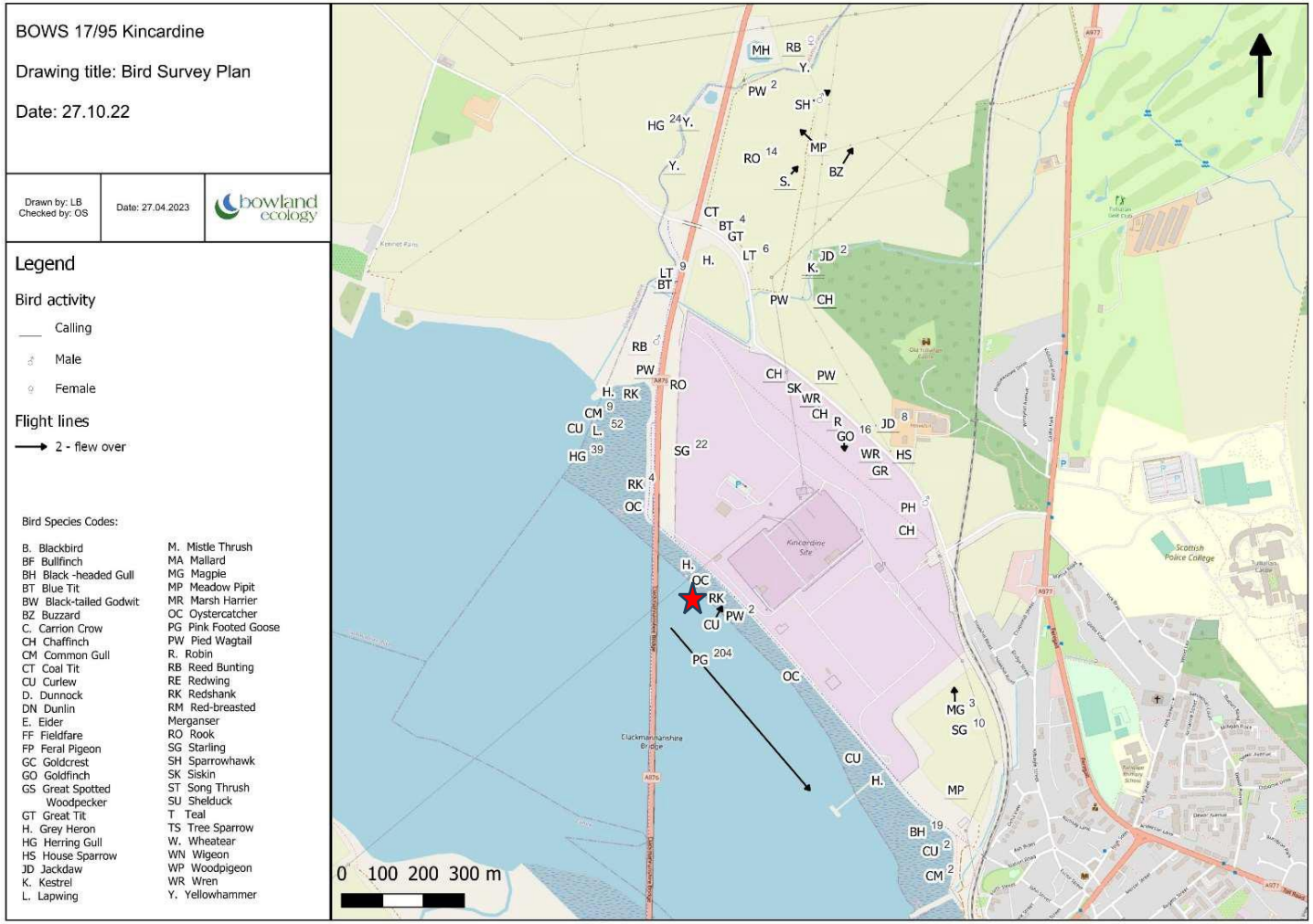


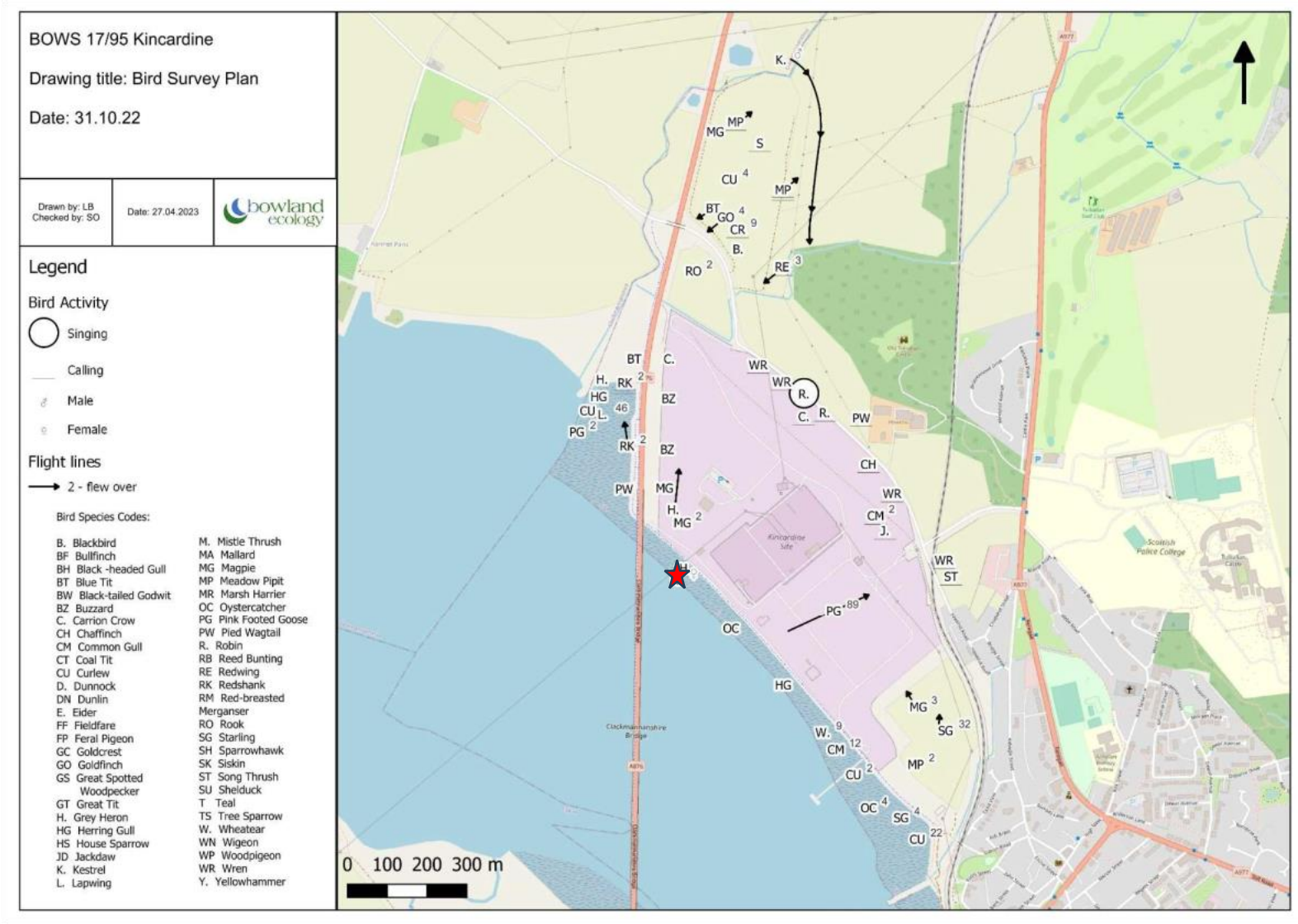
Appendix C – Extended Phase 1 Habitat Plan



Appendix D – Winter Walkover Survey Data

(Red star indicates tower location)




BOWS 17/95 Kincardine
Drawing title: Bird Survey Plan
Date: 31.10.22
Drawn by: LB
Checked by: SO
Date: 27.04.2023
bowland ecology
Legend
Bird Activity
Singing
Calling
Male
Female
Flight lines
2 - flew over
Bird Species Codes:
B. Blackbird
BF Bullfinch
BH Black -headed Gull
BT Blue Tit
BW Black-tailed Godwit
BZ Buzzard
C. Carrion Crow
CH Chaffinch
CM Common Gull
CT Coal Tit
CU Curlew
D. Dunnock
DN Dunlin
E. Eider
FF Fieldfare
FP Feral Pigeon
GC Goldcrest
GO Goldfinch
GS Great Spotted Woodpecker
GT Great Tit
H. Grey Heron
HG Herring Gull
HS House Sparrow
JD Jackdaw
K. Kestrel
L. Lapwing
M. Mistle Thrush
MA Mallard
MG Magpie
MP Meadow Pipit
MR Marsh Harrier
OC Oystercatcher
PG Pink Footed Goose
PW Pied Wagtail
R. Robin
RB Reed Bunting
RE Redwing
RK Redshank
RM Red-breasted Merganser
RO Rook
SG Starling
SH Sparrowhawk
SK Siskin
ST Song Thrush
SU Shelduck
T Teal
TS Tree Sparrow
W. Wheatear
WN Wigeon
WP Woodpigeon
WR Wren
Y. Yellowhammer
0 100 200 300 m

BOWS 17/95 Kincardine

Drawing title: Bird Survey Plan

Date: 18.11.22

Drawn by: LB
Checked by: OS

Date: 27.04.2023

bowland ecology

Legend

Bird activity

Calling

♂ Male

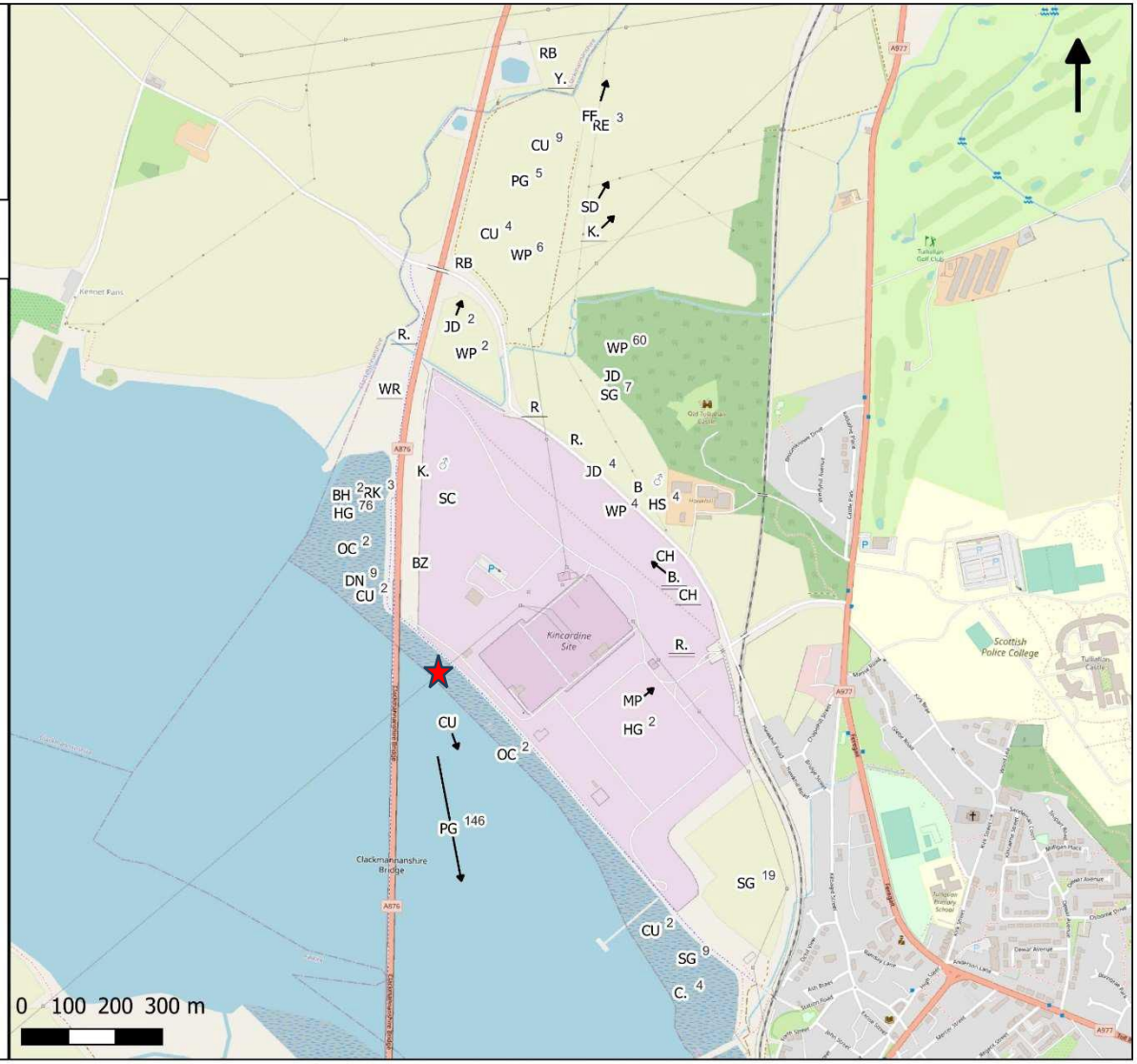
♀ Female

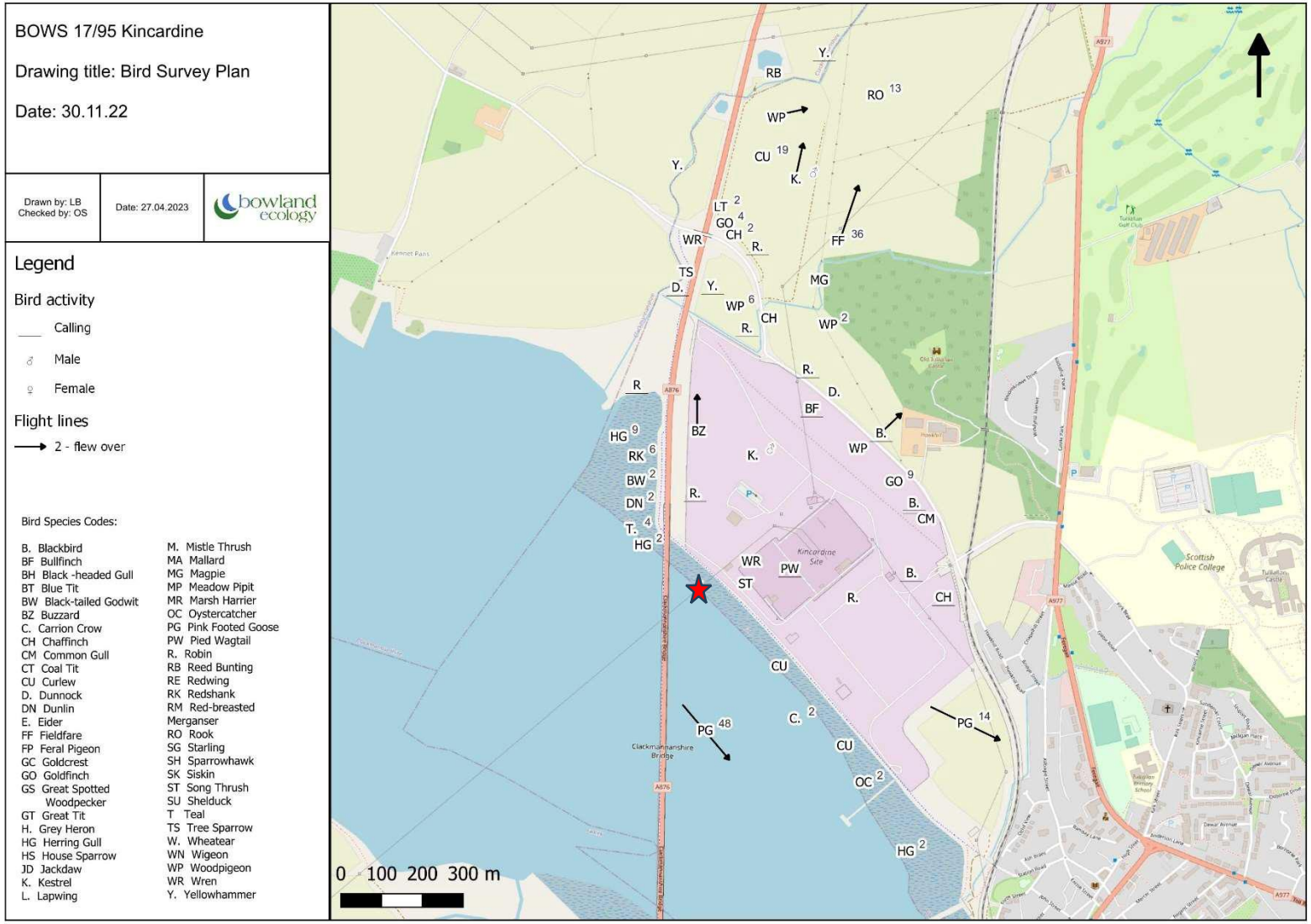
Flight lines

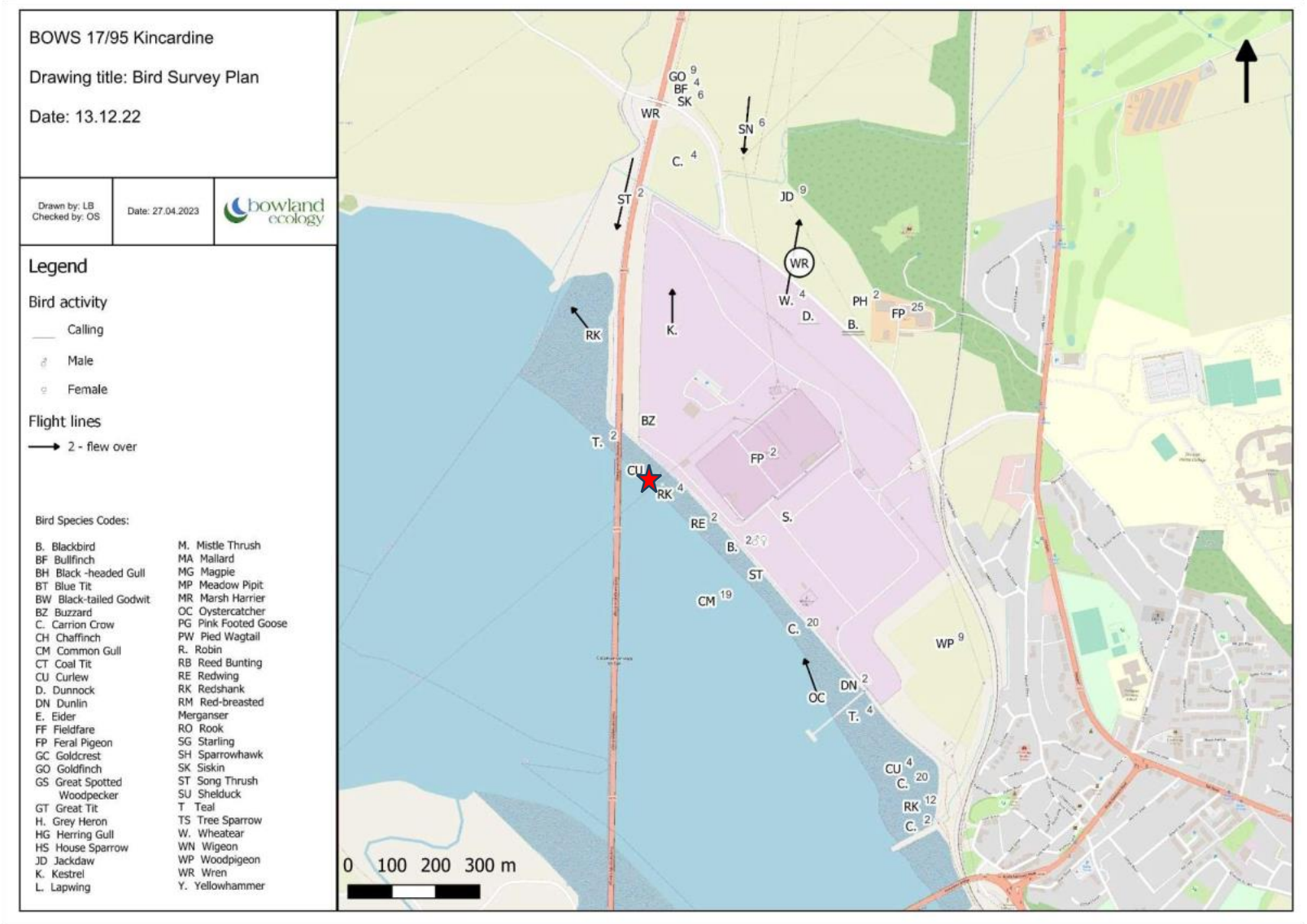
2 - flew over

Bird Species Codes:

B. Blackbird	M. Mistle Thrush
BF Bullfinch	MA Mallard
BH Black -headed Gull	MG Magpie
BT Blue Tit	MP Meadow Pipit
BW Black-tailed Godwit	MR Marsh Harrier
BZ Buzzard	OC Oystercatcher
C. Carrion Crow	PG Pink Footed Goose
CH Chaffinch	PW Pied Wagtail
CM Common Gull	R. Robin
CT Coal Tit	RB Reed Bunting
CU Curlew	RE Redwing
D. Dunnock	RK Redshank
DN Dunlin	RM Red-breasted Merganser
E. Eider	RO Rook
FF Fieldfare	SG Starling
FP Feral Pigeon	SH Sparrowhawk
GC Goldcrest	SK Siskin
GO Goldfinch	ST Song Thrush
GS Great Spotted Woodpecker	SU Shelduck
GT Great Tit	T Teal
H. Grey Heron	TS Tree Sparrow
HG Herring Gull	W. Wheatear
HS House Sparrow	WN Wigeon
JD Jackdaw	WP Woodpigeon
K. Kestrel	WR Wren
L. Lapwing	Y. Yellowhammer




BOWS 17/95 Kincardine
Drawing title: Bird Survey Plan
Date: 30.11.22
Drawn by: LB
Checked by: OS
Date: 27.04.2023
bowland ecology
Legend
Bird activity
Calling
Male
Female
Flight lines
2 - flew over
Bird Species Codes:
B. Blackbird
BF Bullfinch
BH Black -headed Gull
BT Blue Tit
BW Black-tailed Godwit
BZ Buzzard
C. Carrion Crow
CH Chaffinch
CM Common Gull
CT Coal Tit
CU Curlew
D. Dunnock
DN Dunlin
E. Eider
FF Fieldfare
FP Feral Pigeon
GC Goldcrest
GO Goldfinch
GS Great Spotted Woodpecker
GT Great Tit
H. Grey Heron
HG Herring Gull
HS House Sparrow
JD Jackdaw
K. Kestrel
L. Lapwing
M. Mistle Thrush
MA Mallard
MG Magpie
MP Meadow Pipit
MR Marsh Harrier
OC Oystercatcher
PG Pink Footed Goose
PW Pied Wagtail
R. Robin
RB Reed Bunting
RE Redwing
RK Redshank
RM Red-breasted Merganser
RO Rook
SG Starling
SH Sparrowhawk
SK Siskin
ST Song Thrush
SU Shelduck
T Teal
TS Tree Sparrow
W. Wheatear
WN Wigeon
WP Woodpigeon
WR Wren
Y. Yellowhammer
Kincardine Site
Scottish Police College
0 100 200 300 m


BOWS 17/95 Kincardine
Drawing title: Bird Survey Plan
Date: 13.12.22
Drawn by: LB
Checked by: OS
Date: 27.04.2023
bowland ecology
Legend
Bird activity
Calling
Male
Female
Flight lines
2 - flew over
Bird Species Codes:
B. Blackbird
BF Bullfinch
BH Black -headed Gull
BT Blue Tit
BW Black-tailed Godwit
BZ Buzzard
C. Carrion Crow
CH Chaffinch
CM Common Gull
CT Coal Tit
CU Curlew
D. Dunnock
DN Dunlin
E. Eider
FF Fieldfare
FP Feral Pigeon
GC Goldcrest
GO Goldfinch
GS Great Spotted Woodpecker
GT Great Tit
H. Grey Heron
HG Herring Gull
HS House Sparrow
JD Jackdaw
K. Kestrel
L. Lapwing
M. Mistle Thrush
MA Mallard
MG Magpie
MP Meadow Pipit
MR Marsh Harrier
OC Oystercatcher
PG Pink Footed Goose
PW Pied Wagtail
R. Robin
RB Reed Bunting
RE Redwing
RK Redshank
RM Red-breasted Merganser
RO Rook
SG Starling
SH Sparrowhawk
SK Siskin
ST Song Thrush
SU Shelduck
T Teal
TS Tree Sparrow
W. Wheatear
WN Wigeon
WP Woodpigeon
WR Wren
Y. Yellowhammer
0 100 200 300 m

BOWS 17/95 Kincardine

Drawing title: Bird Survey Plan

Date: 19.12.22

Drawn by: LB
Checked by: OS

Date: 27.04.2023

bowland ecology

Legend

Bird activity

Calling

Alarm

♂ Male

♀ Female

Flight lines

2 - flew over

Bird Species Codes:

B. Blackbird	M. Mistle Thrush
BF Bullfinch	MA Mallard
BH Black -headed Gull	MG Magpie
BT Blue Tit	MP Meadow Pipit
BW Black-tailed Godwit	MR Marsh Harrier
BZ Buzzard	OC Oystercatcher
C. Carrion Crow	PG Pink Footed Goose
CH Chaffinch	PW Pied Wagtail
CM Common Gull	R. Robin
CT Coal Tit	RB Reed Bunting
CU Curlew	RE Redwing
D. Dunnock	RK Redshank
DN Dunlin	RM Red-breasted Merganser
E. Eider	RO Rook
FF Fieldfare	SG Starling
FP Feral Pigeon	SH Sparrowhawk
GC Goldcrest	SK Siskin
GO Goldfinch	ST Song Thrush
GS Great Spotted Woodpecker	SU Shelduck
GT Great Tit	T Teal
H. Grey Heron	TS Tree Sparrow
HG Herring Gull	W. Wheatear
HS House Sparrow	WN Wigeon
JD Jackdaw	WP Woodpigeon
K. Kestrel	WR Wren
L. Lapwing	Y. Yellowhammer

BOWS 17/95 Kincardine

Drawing title: Bird Survey Plan

Date: 04.01.23

Drawn by: LB
Checked by: OS

Date: 27.04.2023

bowland ecology

Legend

Bird activity

Calling

♂ Male

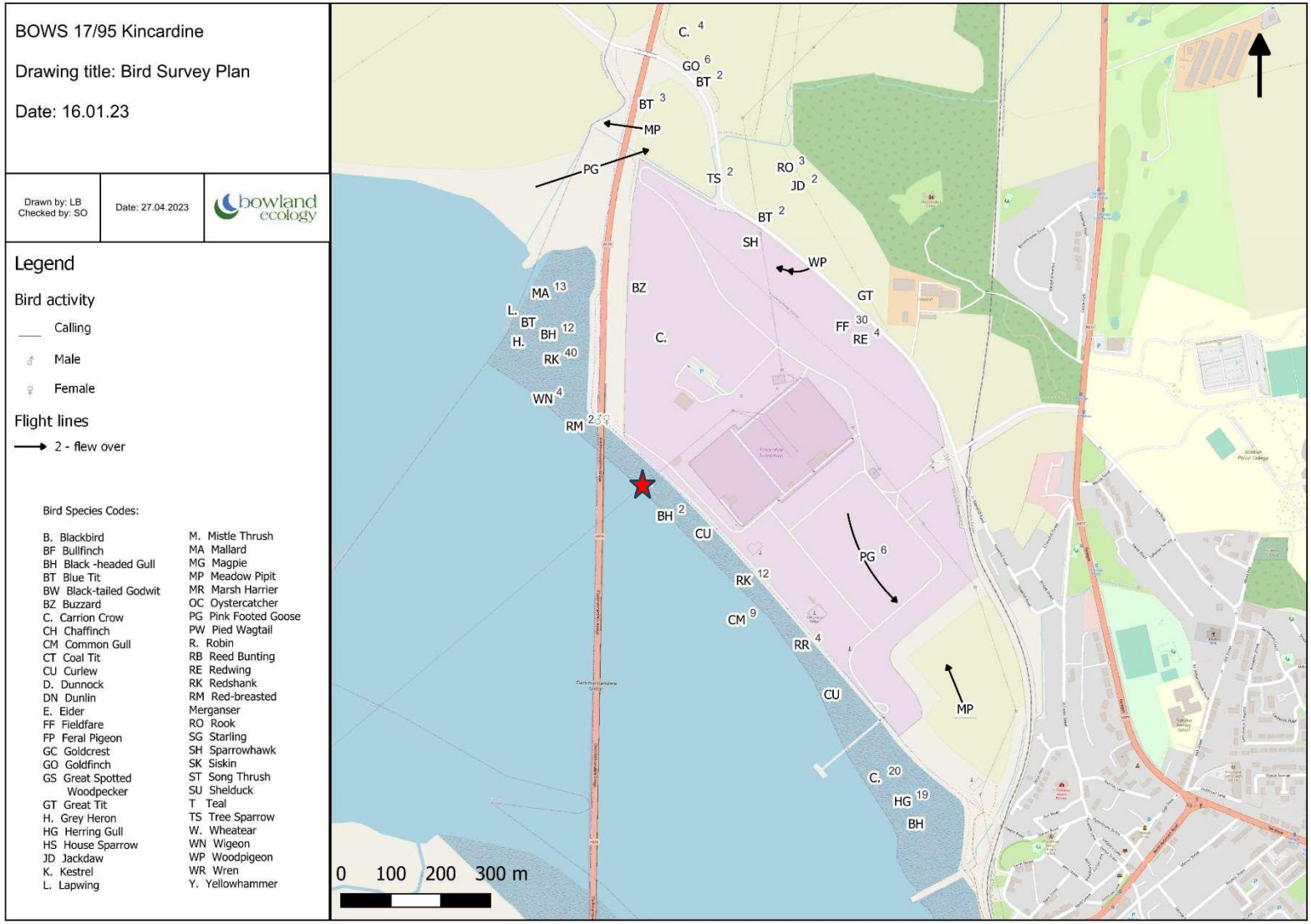
♀ Female

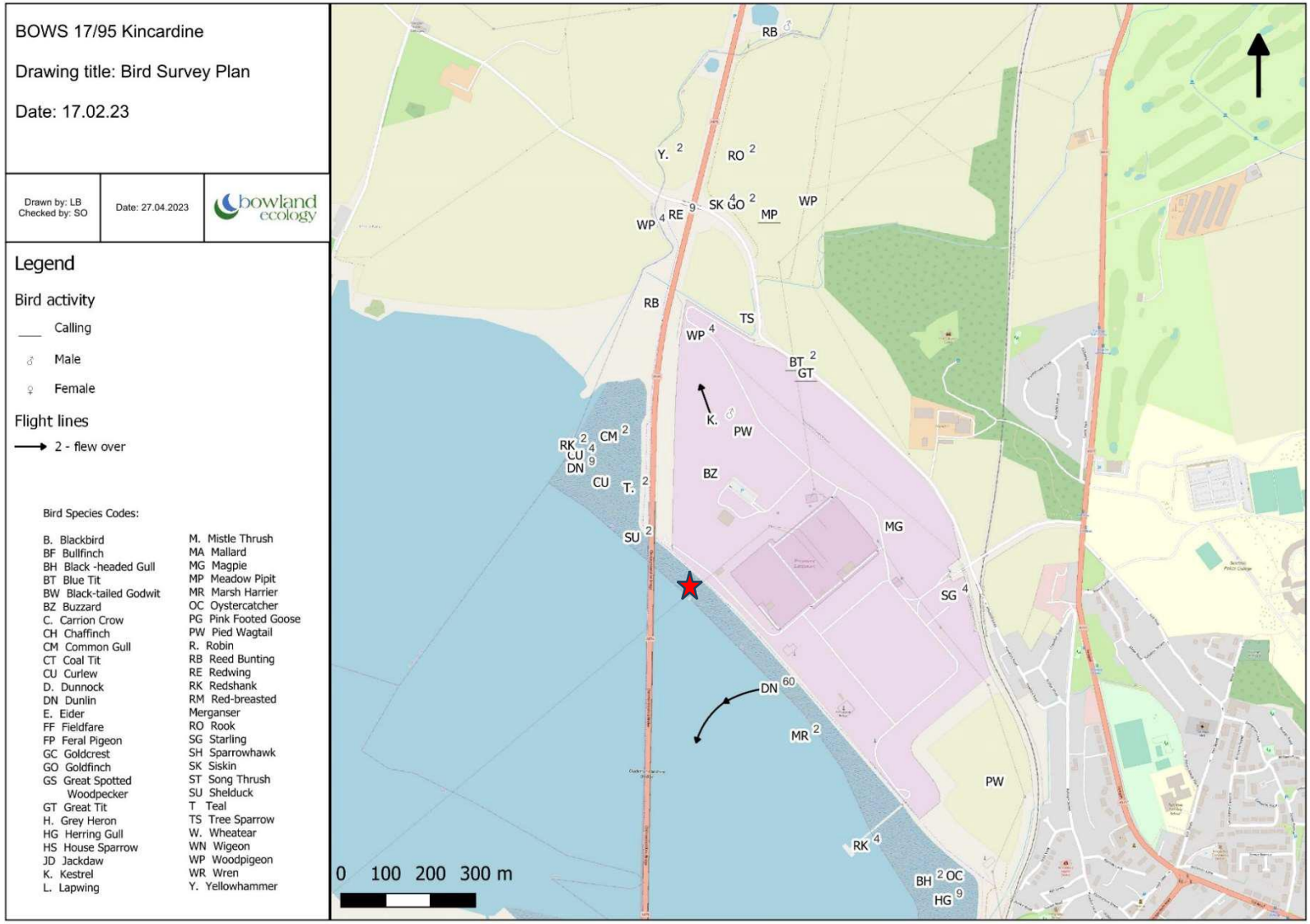
Flight lines

2 - flew over

Bird Species Codes:

B. Blackbird	M. Mistle Thrush
BF Bullfinch	MA Mallard
BH Black -headed Gull	MG Magpie
BT Blue Tit	MP Meadow Pipit
BW Black-tailed Godwit	MR Marsh Harrier
BZ Buzzard	OC Oystercatcher
C. Carrion Crow	PG Pink Footed Goose
CH Chaffinch	PW Pied Wagtail
CM Common Gull	R. Robin
CT Coal Tit	RB Reed Bunting
CU Curlew	RE Redwing
D. Dunnock	RK Redshank
DN Dunlin	RM Red-breasted Merganser
E. Eider	RO Rook
FF Fieldfare	SG Starling
FP Feral Pigeon	SH Sparrowhawk
GC Goldcrest	SK Siskin
GO Goldfinch	ST Song Thrush
GS Great Spotted Woodpecker	SU Shelduck
GT Great Tit	T Teal
H. Grey Heron	TS Tree Sparrow
HG Herring Gull	W. Wheatear
HS House Sparrow	WN Wigeon
JD Jackdaw	WP Woodpigeon
K. Kestrel	WR Wren
L. Lapwing	Y. Yellowhammer


BOWS 17/95 Kincardine
Drawing title: Bird Survey Plan
Date: 16.01.23
Drawn by: LB
Checked by: SO
Date: 27.04.2023
bowland ecology
Legend
Bird activity
Calling
Male
Female
Flight lines
2 - flew over
Bird Species Codes:
B. Blackbird
BF Bullfinch
BH Black -headed Gull
BT Blue Tit
BW Black-tailed Godwit
BZ Buzzard
C. Carrion Crow
CH Chaffinch
CM Common Gull
CT Coal Tit
CU Curlew
D. Dunnock
DN Dunlin
E. Eider
FF Fieldfare
FP Feral Pigeon
GC Goldcrest
GO Goldfinch
GS Great Spotted Woodpecker
GT Great Tit
H. Grey Heron
HG Herring Gull
HS House Sparrow
JD Jackdaw
K. Kestrel
L. Lapwing
M. Mistle Thrush
MA Mallard
MG Magpie
MP Meadow Pipit
MR Marsh Harrier
OC Oystercatcher
PG Pink Footed Goose
PW Pied Wagtail
R. Robin
RB Reed Bunting
RE Redwing
RK Redshank
RM Red-breasted Merganser
RO Rook
SG Starling
SH Sparrowhawk
SK Siskin
ST Song Thrush
SU Shelduck
T Teal
TS Tree Sparrow
W. Wheatear
WN Wigeon
WP Woodpigeon
WR Wren
Y. Yellowhammer
0 100 200 300 m


BOWS 17/95 Kincardine
Drawing title: Bird Survey Plan
Date: 17.02.23
Drawn by: LB
Checked by: SO
Date: 27.04.2023
bowland ecology
Legend
Bird activity
Calling
Male
Female
Flight lines
2 - flew over
Bird Species Codes:
B. Blackbird
BF Bullfinch
BH Black -headed Gull
BT Blue Tit
BW Black-tailed Godwit
BZ Buzzard
C. Carrion Crow
CH Chaffinch
CM Common Gull
CT Coal Tit
CU Curlew
D. Dunnock
DN Dunlin
E. Eider
FF Fieldfare
FP Feral Pigeon
GC Goldcrest
GO Goldfinch
GS Great Spotted Woodpecker
GT Great Tit
H. Grey Heron
HG Herring Gull
HS House Sparrow
JD Jackdaw
K. Kestrel
L. Lapwing
M. Mistle Thrush
MA Mallard
MG Magpie
MP Meadow Pipit
MR Marsh Harrier
OC Oystercatcher
PG Pink Footed Goose
PW Pied Wagtail
R. Robin
RB Reed Bunting
RE Redwing
RK Redshank
RM Red-breasted Merganser
RO Rook
SG Starling
SH Sparrowhawk
SK Siskin
ST Song Thrush
SU Shelduck
T Teal
TS Tree Sparrow
W. Wheatear
WN Wigeon
WP Woodpigeon
WR Wren
Y. Yellowhammer
0 100 200 300 m

BOWS 17/95 Kincardine

Drawing title: Bird Survey Plan

Date: 24.02.23

Drawn by: LB
Checked by: SO

Date: 27.04.2023

bowland ecology

Legend

Bird Activity

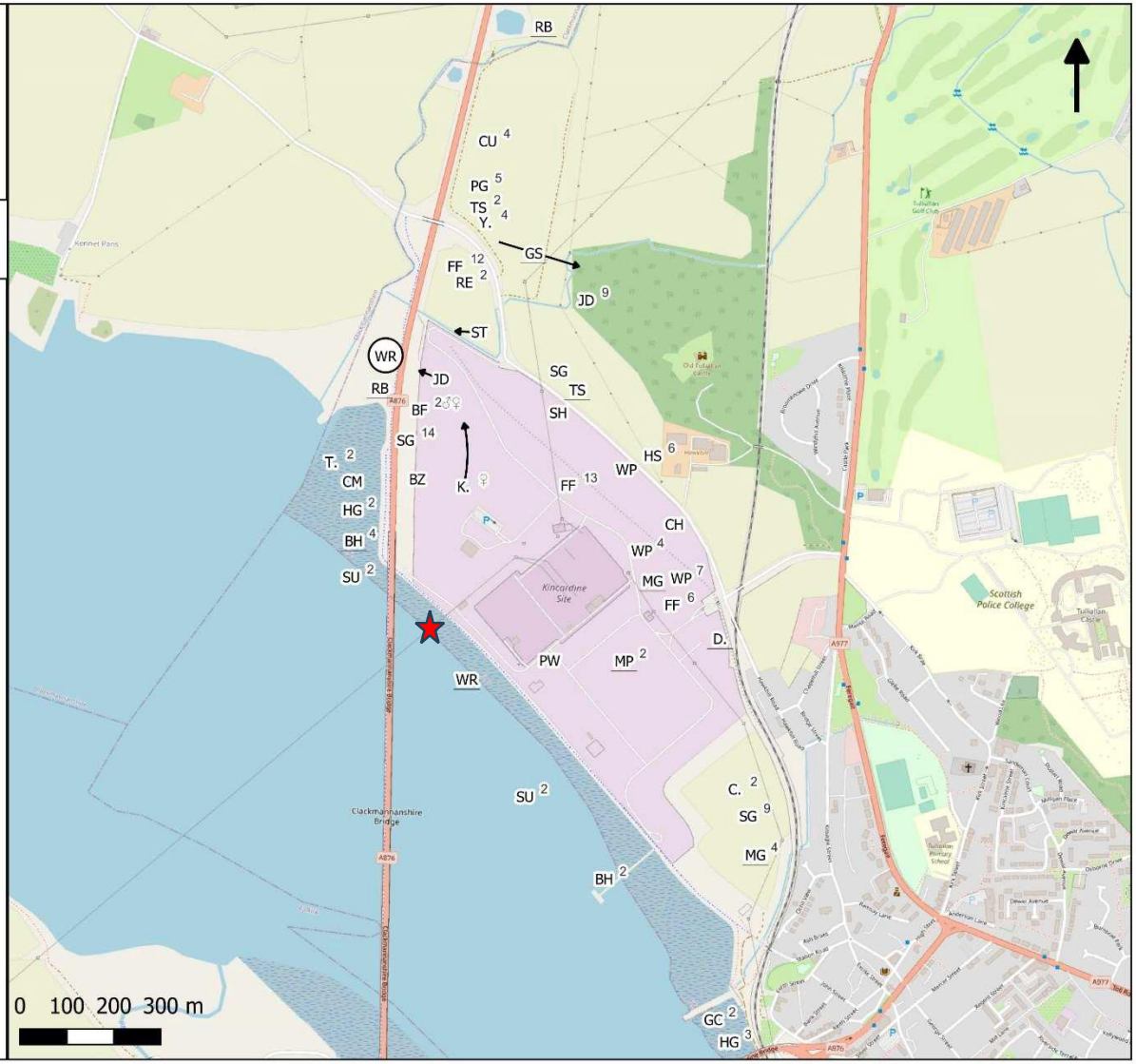
- Singing
- Calling
- ♂ Male
- ♀ Female

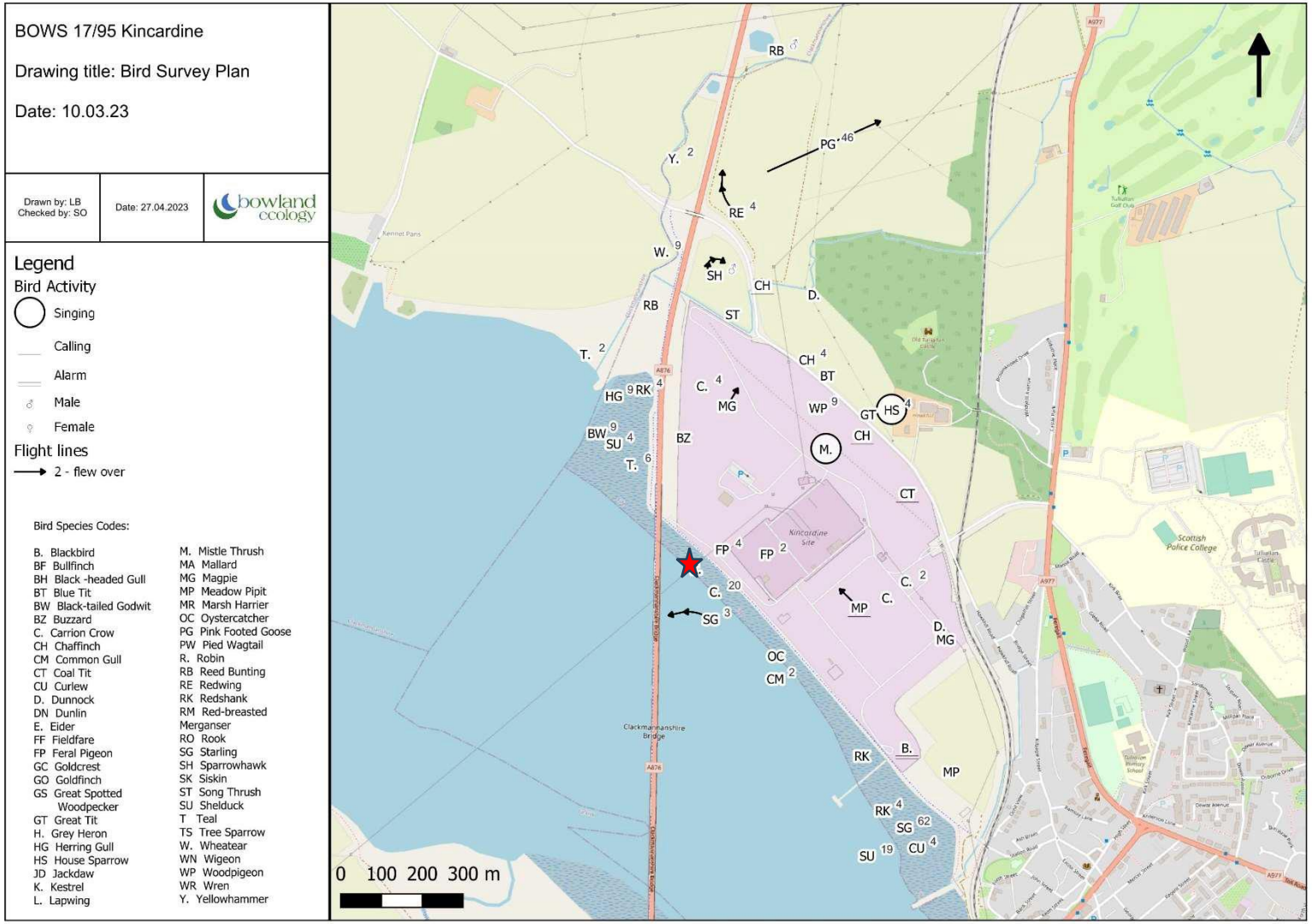
Flight lines

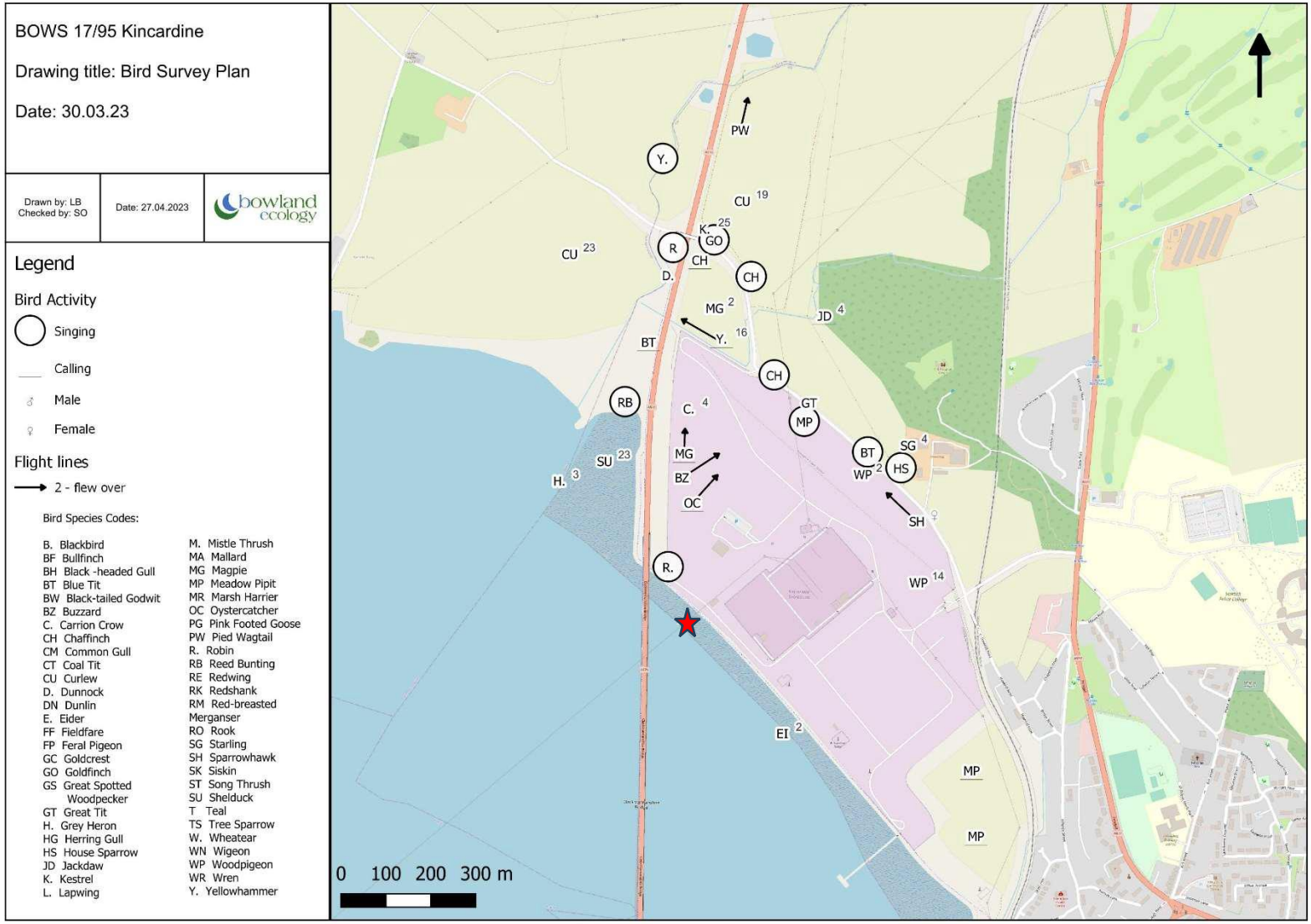
- 2 - flew over

Bird Species Codes:

B. Blackbird	M. Mistle Thrush
BF Bullfinch	MA Mallard
BH Black -headed Gull	MG Magpie
BT Blue Tit	MP Meadow Pipit
BW Black-tailed Godwit	MR Marsh Harrier
BZ Buzzard	OC Oystercatcher
C. Carrion Crow	PG Pink Footed Goose
CH Chaffinch	PW Pied Wagtail
CM Common Gull	R. Robin
CT Coal Tit	RB Reed Bunting
CU Curlew	RE Redwing
D. Dunnock	RK Redshank
DN Dunlin	RM Red-breasted Merganser
E. Eider	RO Rook
FF Fieldfare	SG Starling
FP Feral Pigeon	SH Sparrowhawk
GC Goldcrest	SK Siskin
GO Goldfinch	ST Song Thrush
GS Great Spotted Woodpecker	SU Shelduck
GT Great Tit	T Teal
H. Grey Heron	TS Tree Sparrow
HG Herring Gull	W. Wheatear
HS House Sparrow	WN Wigeon
JD Jackdaw	WP Woodpigeon
K. Kestrel	WR Wren
L. Lapwing	Y. Yellowhammer




BOWS 17/95 Kincardine
Drawing title: Bird Survey Plan
Date: 10.03.23
Drawn by: LB
Checked by: SO
Date: 27.04.2023
bowland ecology
Legend
Bird Activity
Singing
Calling
Alarm
Male
Female
Flight lines
2 - flew over
Bird Species Codes:
B. Blackbird
BF Bullfinch
BH Black -headed Gull
BT Blue Tit
BW Black-tailed Godwit
BZ Buzzard
C. Carrion Crow
CH Chaffinch
CM Common Gull
CT Coal Tit
CU Curlew
D. Dunnock
DN Dunlin
E. Eider
FF Fieldfare
FP Feral Pigeon
GC Goldcrest
GO Goldfinch
GS Great Spotted Woodpecker
GT Great Tit
H. Grey Heron
HG Herring Gull
HS House Sparrow
JD Jackdaw
K. Kestrel
L. Lapwing
M. Mistle Thrush
MA Mallard
MG Magpie
MP Meadow Pipit
MR Marsh Harrier
OC Oystercatcher
PG Pink Footed Goose
PW Pied Wagtail
R. Robin
RB Reed Bunting
RE Redwing
RK Redshank
RM Red-breasted Merganser
RO Rook
SG Starling
SH Sparrowhawk
SK Siskin
ST Song Thrush
SU Shelduck
T Teal
TS Tree Sparrow
W. Wheatear
WN Wigeon
WP Woodpigeon
WR Wren
Y. Yellowhammer
0 100 200 300 m


BOWS 17/95 Kincardine
Drawing title: Bird Survey Plan
Date: 30.03.23
Drawn by: LB
Checked by: SO
Date: 27.04.2023
bowland ecology
Legend
Bird Activity
Singing
Calling
Male
Female
Flight lines
2 - flew over
Bird Species Codes:
B. Blackbird
BF Bullfinch
BH Black -headed Gull
BT Blue Tit
BW Black-tailed Godwit
BZ Buzzard
C. Carrion Crow
CH Chaffinch
CM Common Gull
CT Coal Tit
CU Curlew
D. Dunnock
DN Dunlin
E. Eider
FF Fieldfare
FP Feral Pigeon
GC Goldcrest
GO Goldfinch
GS Great Spotted Woodpecker
GT Great Tit
H. Grey Heron
HG Herring Gull
HS House Sparrow
JD Jackdaw
K. Kestrel
L. Lapwing
M. Mistle Thrush
MA Mallard
MG Magpie
MP Meadow Pipit
MR Marsh Harrier
OC Oystercatcher
PG Pink Footed Goose
PW Pied Wagtail
R. Robin
RB Reed Bunting
RE Redwing
RK Redshank
RM Red-breasted Merganser
RO Rook
SG Starling
SH Sparrowhawk
SK Siskin
ST Song Thrush
SU Shelduck
T Teal
TS Tree Sparrow
W. Wheatear
WN Wigeon
WP Woodpigeon
WR Wren
Y. Yellowhammer
0 100 200 300 m

Appendix E – Noise Map (WSP, 2024)

Figure 2: Predicted noise levels for the proposed remedial works of the Kincardine Tower XD130