

## TECHNICAL APPENDIX 5.3

# Orkney Logistics Base (Hatston) Ornithological Technical Report



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# 1 INTRODUCTION

## 1.1 Terms of Reference

EnviroCentre was commissioned by Orkney Islands Council Harbour Authority (OICHA) to undertake Wintering Bird Surveys to inform an Environmental Impact Assessment for the development of Hatston Pier.

There is potential for this project to impact bird species during the construction period and effect bird species over the longer-term once the project is operational, especially the qualifying species of the North Orkney Special Protection Area (SPA).

## 1.2 Scope of Report

The aim of the surveys was to establish the ornithological baseline in terms of species present, with additional studies of bird behaviour and activity around the proposed site of Hatston Pier. These surveys would provide evidence of protected and notable species (the qualifying species of the North Orkney SPA) and inform assessments with regards to any potential impacts from the proposed development. The main objectives were as follows:

- Identify and map the presence of all bird species present on and adjacent to the sites;
- Provide counts of those species present within and adjacent to the proposed areas of development;
- Compile locations and behavioural traits of qualifying species of the SPA which were present in the survey area;

## 1.3 Site Location and Proposed Development

It is proposed to extend the existing outer quay by 300m (with minimum water depth of -10m Chart Datum (CD)) which would also form a 125m inner berth. This would create substantially more quayside which would be available for both current and future operations. In addition to the above, circa 7.5 hectares of additional land extending from the current shoreline outwards would be made available for harbour-related operations through reclamation. The design includes a ship lift, additional link span and fuel facility.

The development is designed to be built in three phases as noted below. These phases should not be considered consecutively but allow for a degree of flexibility which can be adapted to suit the requirements, budget and programme of OICHA.

### Phase 1

- Reclaim the area by depositing appropriate material to form a platform on the southeastern side of the current pier causeway and thereby create 3Ha of hard-core surfaced marshalling / storage area along with an HGV trailer park for the ferry service which will be covered by a reinforced concrete slab;
- A sheet pile wall is to be installed to allow a retained interface with the current suspended deck; and
- Place rock armour along the northern and eastern edges of the infill area.

## **Phase 2**

- Extend the current quay to the west by circa 300m with a 25m return and an inner berth to facilitate the proposed linkspan berth and fixed ramp. The extension will comprise a steel sheet pile wall and will initially interface with the alignment of the existing suspended deck on the north-west inner face before forming the new quay extension;
- Reinforced concrete slabs will form the new main deck areas;
- Reclaim the shoreline by depositing appropriate material to form a platform on the southwestern side of the current pier causeway to create an additional 3.71Ha to be used as a multi-use laydown/work area surfaced with hard-core, as well as establish a separate access road to the new quay extension;
- Place rock armour along the western edge of the infill area; and
- Dredge the approaches to the quay, after quay works complete.

## **Phase 3**

- Reclaim the shoreline to the south-west of Phase 2 to form a platform on the southwestern side of the current pier causeway to be used as a multi-use laydown/work area as well as create a ship lift;
- The ship lift will extend from the linkspan fixed ramp installed in Phase 2 and will comprise piles and reinforced concrete pads designed for the boatlift wheel-loads;
- The rest of the area will be infilled to provide extra yard / storage; and
- Place rock armour along the western edge of the infill area.

# **1.4 Ornithology Conservation Legislation & Policy**

## **1.4.1 General Nature Conservation Legislation & Policy**

European and national legislation and policy relevant to the proposed development in terms of nature conservation are listed below. Cognisance has been taken of these instruments in the preparation of this report.

- The Conservation of Natural Habitats and of Wild Flora and Fauna EC Directive (92/43);
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
- The Conservation of Wild Birds and their Habitats EC Directive (2009/147/EC);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Nature Conservation (Scotland) Act 2004;
- The Wildlife and Natural Environment (Scotland) Act 2011 (WANE);
- The British Standard for Biodiversity BS 42020:2013;
- Scottish Planning Policy (2014) sections 193 to 218;
- Scottish Biodiversity Strategy: Scotland's Biodiversity – It's In Our Hands (2004) and 2020 Challenge For Scotland's Biodiversity (2013);
- UK Biodiversity Action Plan (UK BAP); and
- The Scottish Biodiversity List (SBL).

## 1.4.2 Legislation & Policy Relating to Birds

Several bird species are protected under international and national legislation, and several instruments of national legislation protect all areas of nationally significant, natural heritage. The relevant legislation is described below:

The Wild Birds Directive, or European Directive 2009/147/EC (the codified version of EEC Directive 79/409/EEC as amended) and the Habitats Directive (EEC Directive 92/43/EEC), state that all wild bird populations within the UK are protected under European legislation. Through these Directives, which highlight key species within specifically detailed annexes, came the establishment of a Europe-wide network of designated conservation areas known as Natura 2000 (comprised of Special Protection Areas (SPA) from the Birds Directive and Special Areas of Conservation (SAC) from the Habitats Directive). It should be noted that any changes to European Directives following the UK withdrawal from the European Union do not apply in the UK from 1 January 2021.

The Wildlife and Countryside Act 1981 (as amended) is the primary legislation that protects wild birds within the UK. Through a series of Schedules, this Act makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy their nests or eggs. It is also an offence to intentionally or recklessly disturb the nest building, nests that contain eggs or young, or to disturb or take the dependent young of birds on the Schedule 1 list, which are offered the highest level of protection.

The Nature Conservation (Scotland) Act 2004 imposes a wide-ranging duty to conserve biodiversity and protect the nation's natural heritage. Implementation is linked to a national biodiversity strategy that is endorsed by the Scottish Government.

On a local level or for particular species, Scottish Planning Policy (Scottish Government 2014) states that areas should be safeguarded, and the character of the habitat enhanced, species diversity, rarity and extent must be established, and the species requirements must be fully factored into the planning and design of the development.

## 1.5 Report Usage

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## 2 METHODS

### 2.1 Desk Study

A desk study of published data was undertaken to inform the bird surveys from 2020-2022. The results of the desk study were used to identify if the development could potentially impact upon any notable or protected species; to inform the field survey; and to provide information to guide actions and priorities for any ecological mitigation and enhancement.

The main data source for the desk study was:

- NatureScot Sitelink website<sup>1</sup> for statutory designated sites within a 5 kilometre radius (e.g. Special Protection Areas (SPA), Special Areas of Conservation (SAC), Sites Special of Scientific Interest (SSSI) and Ramsar Sites.

### 2.2 Bird Conservation Criteria

The criteria used to define the current conservation status of UK bird populations are BAPs at national and local levels, and the Red, Amber and Green lists of Birds of Conservation Concern (BoCC)<sup>2</sup>.

Both the UKBAP and the network of Local BAPs were initialised in response to the 1992 Convention of Biological Diversity<sup>3</sup> signed in Rio de Janeiro (also referred to as the Rio Convention). Implemented through the Biodiversity Steering Group, the BAPs identified both the habitat types and species that were of conservation concern. Plans were then drawn up to aid protection and conservation of these priority habitats and species.

Taking account of the Scottish Biodiversity Strategy, the conservation status of the species recorded during the bird survey were evaluated by their inclusion on the UKBAP and by using the RSPB / BTO Conservation Status Criteria from the lists of BoCC, which is a simple 'traffic light' method to gauge conservation importance for those species which are not afforded protection under international or national legislation. The criteria used to evaluate this conservation concern are listed below:

#### Red-listed criteria

- Globally threatened;
- Historical population decline in UK during 1800 – 1995;
- Rapid ( $\geq 50\%$ ) decline in UK breeding population over last 25 years; and
- Rapid ( $\geq 50\%$ ) contraction of UK breeding range over last 25 years.

#### Amber-listed criteria

- Moderate (25-49%) decline in UK breeding population over last 25 years;
- Moderate (25-49%) contraction of UK breeding range over last 25 years;

<sup>1</sup> NatureScot SiteLink website. Available at <https://sitelink.nature.scot/map> (Accessed 2013, 2015, 2016, 2017 & 2022)

<sup>2</sup> Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds*, **114**, 723-747. Or online at <https://www.bto.org/our-science/publications/birds-conservation-concern/status-our-bird-populations-fifth-birds> (Accessed November 2022)

<sup>3</sup> Rio Convention: <http://www.cbd.int/> (Accessed October 2021)



- Moderate (25-49%) decline in UK non-breeding population over last 25 years;
- European Red List of Birds Species (ERLOB) that have been categorised as Critically Endangered, Endangered or Vulnerable;
- Five year mean of 1-300 breeding pairs in UK;
- ≥50% of UK breeding population in 10 or fewer sites, but not rare breeders;
- ≥50% of UK non-breeding population in 10 or fewer sites;
- ≥20% of European breeding population in UK; and
- ≥20% of NW European (wildfowl), East Atlantic Flyway (waders) or European (others) non-breeding population in UK.

### **Green-listed criteria**

No identified threat to the population's status.

In addition to the UKBAP and the BoCC criteria, the Scottish Biodiversity List (SBL) was also used in the evaluation process. The SBL is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. It is based on the aims of the Scottish Biodiversity Strategy and the UKBAP and refers to the international importance of conserving certain species.

## **2.3 Field Surveys**

### **2.3.1 Low Tide Counts**

Low tide counts were undertaken in line with the national Wetland Bird Survey (WeBS) programme. WeBS Core Counts are made using so-called 'look-see' methodology, whereby the observer, familiar with the species involved, surveys the whole of a predefined area. Counts were made at all wetland habitats, including sections of open coast as is the case at Hatston. Numbers of waterbird species, including divers, grebes, cormorants, herons, swans, geese, ducks, waders and kingfisher were counted. Counts of gulls and terns were optional.

For the Hatston site, counts were made once per month throughout the year, ideally eight days after the predetermined 'priority dates' defined in the WeBS guidance to cover the optimal low-tide period to ensure all foraging waders were included in the counts. This included potential intertidal areas to be lost during the proposed construction of the Hatston site.

Any terrestrial species present (Rock Pipit, Pied Wagtail, corvids, etc) within the survey were also recorded to ensure all bird activity is included within the data.

### **2.3.2 Vantage Point Surveys**

Vantage Point (VP) surveys were undertaken to record the bird activity around the Hatston Pier site where the most construction activity will occur, and where the highest number of SPA bird species are most likely to be observed.

The VP surveys were conducted for Hatston pier, with the site split up into north and south in the centre of the proposed works area which offers an excellent panorama of the vicinity and water of the Bay of Kirkwall to both the north and south.

The VP surveys provided a spread over the full daylight period available (from official local sunrise to sunset times) and also through a range of tide heights and sea states.

From the VP, the visible sea area within a 180° arc is divided into 10 sectors. This area is scanned for target species over a (maximum) 2-hour period, with all bird activity recorded.

Appendix A details the Vantage Point locations used.

## **2.4 HiDef Survey Data from Winter 2021/22**

NatureScot has provided Orkney Island Council with data collected during inshore wintering waterbird surveys in the North Orkney SPA undertaken by HiDef aerial surveying limited under contract to NatureScot in partnership with Marine Scotland and Orkney Islands Council.

It is noted that the data provided is to be used solely for the purposes of informing impact assessments for the Hatston Pier development. It is also acknowledged that the report (from which the data extracts have been provided) has not yet been through NatureScot's quality assurance process. As such information and data provided may be subject to change.

## **2.5 Bird/Boat Interactions**

During vantage point watches, observations of bird behaviour from boat/vessel movements were undertaken.

## **2.6 Survey Conditions**

Tables 1 and 2 below detail the survey timings and conditions for the low tide counts and vantage point surveys.

**Table 1: Survey Timings and Conditions during Low Tide Counts Surveys 2020-2022**

DATE	SURVEY TIME	LOW TIDE TIME	WIND DIRECTION*	WIND SPEED (/12)**	PRECIPITATION (/3)***	SURVEYOR###
27/10/2020	14:30 – 15:20	13:47	SSE	3	0	AU
20/11/2020	09:25 – 09:55	07:36	SE	5	0	AU
20/12/2020	09:35 – 10:05	07:58	S	6	0	AU
26/01/2021	15:55 – 16:30	15:02	E	1-2	0	AU
26/02/2021	15:35 – 16:15	15:59	S	1-2	0	AU
21/03/2021	09:25 – 09:55	09:12	WNW	3	0	AU
23/04/2021	14:20 – 14:55	14:27	N-E	2	0	AU
17/05/2021	08:25 – 08:55	08:28	SW-SE	2-3	0	AU
26/06/2021	18:05 – 18:35	18:32	NW	2-3	0	AU
16/07/2021	08:20 – 09:15	08:39	S	3	0	AU
24/08/2021	18:20 – 18:50	18:27	NW	3	0	AU
22/10/2021	17:50 - 18:10	18:11	W	2	0	AU
25/11/2021	09:25 – 09:55	07:09	NW	4-5	0	AU
17/12/2021	15:15 – 15:45	15:22	S - W	0 - 3	0	AU
26/01/2022	10:00 – 10:30	10:06	SW	5-6	0	AU
19/02/2022	16:40 – 17:10	18:15	SW	3-2	0	AU
14/03/2022	15:05 – 15:35	14:27	S	3-4	0	AU
23/04/2022	10:30 – 10:55	10:17	N	3	0	AU

21/05/2022	08:55 – 09:20	09:17	SW-W	3-4	0	AU
26/06/2022	15:35 – 16:10	15:43	SE	5-6	0	AU
28/07/2022	17:30 – 18:00	17:26	SE	4-5	0	AU
27/08/2022	16:35 – 17:10	17:38	S-NE	2-3	0	AU

**Table 2: Survey Timings and Conditions for Vantage Point Surveys during Winter 2022/23**

Date	Count	Times	Wind	Force	Sea State	Cloud (out of 8)	Precipitation	Tide	Surveyor
25/10/2022	S pier	12:55-14:27	S	2-3	1-2	4 - 6	none	falling	AU
25/10/2022	N pier	14:36-16:04	S	3	1-2	6	none	falling	AU
29/10/2022	S pier	09:59-11:25	S	1- 2	1-2	2	none	rising	AU
29/10/2022	N pier	11:37-13:24	S	2	1-2	1	none	rising	AU
08/11/2022	S pier	12:40-13:55	S	4-5	3	5 - 7	none	falling	AU
08/11/2022	N pier	10:27-12:25	SSE - S	3-4	2-4	3 - 5	none	falling	AU
24/11/2022	S pier	08:50-11:30	SSW - S	5 -3	2-4	2	none	falling	AU
24/11/2022	N pier	11:45-14:05	S	4-5	2-3	1 - 4	none	falling	AU
05/12/2022	S pier	11:15-12:25	N	3-4	3-4	7 - 6	none	falling	AU
05/12/2022	N pier	08:40-10:50	W - N	2-4	1-4	7	none	falling	AU
16/12/2022	S pier	10:20–11:45	W	1	1-2	3	none	rising	AU
16/12/2022	N pier	12:05–14:10	S	1	1	3	none	rising	AU

12/01/2023	S pier	13:25-14:55	SE	3-4	1-3	6-7	none	rising	AU
12/01/2023	N pier	10:50-13:05	SE	1-3	2-3	8	none	falling	AU
20/01/2023	S pier	15:30-16:20	W-SW	1-3	2-1	2	none	Low	AU
20/01/2023	N pier	13:55-15:25	SW	1-2	1	3	none	rising	AU
06/02/2023	S pier	14:45-15:45	SW	4	2-3	1	none	falling	AU
06/02/2023	N pier	15:50-17:15	SW	5-6	3-4	1	none	falling	AU
18/02/2023	S pier	11:55-13:00	W	2-3	2	3	none	falling	AU
18/02/2023	N pier	09:10-11:50	W	2-3	2	3	none	falling	AU
02/03/2023	S pier	17:15-17:55	E	2	2	2	none	rising	AU
02/03/2023	N pier	15:20-17:10	ENE	2-3	2-3	3	none	rising	AU
08/03/2023	S pier	10:00-12:05	N	2-3	2-3	2	none	high	AU
08/03/2023	N pier	12:20-13:45	N	2-3	2-3	3	none	falling	AU

## 3 RESULTS

### 3.1 Desk Study

The desk study found three SPAs within 5km of Hatston. These are detailed below.

#### 3.1.1 North Orkney SPA

The North Orkney Special Protection Area (SPA) lies to the north of Mainland in the Orkney Islands, extending from Deerness in the east to Eynhallow in the west. The site includes Wide Firth and several large sheltered bays, such as Deer Sound, Inganess Bay and Bay of Firth. North Orkney SPA also encompasses Shapinsay Sound and tidal channels among the islands of Gairsay, Rousay, Egilsay and Wyre, including Rousay Sound and Eynhallow Sound. Water depths are generally less than 20m. Sediments are primarily mixtures of mud, sand and gravel but become coarser in areas where tidal currents are stronger and there are extensive maerl beds in the sounds around Rousay. The varied marine habitats support a rich and varied invertebrate fauna, including polychaete worms, crustaceans and bivalve molluscs, many of which are important prey species for marine birds. These rich sheltered waters support large numbers of waterfowl, particularly in the winter months when frequent storms affect the surrounding North Sea and eastern Atlantic.

The North Orkney SPA qualifies under Article 4.1 by regularly supporting a non-breeding population of European importance of the following Annex 1 species: Great Northern Diver (*Gavia immer*) (a mean peak annual non-breeding population of 308 birds (12.3% of the Great Britain population) for the years 2006/07 to 2008/09) and Slavonian Grebe (*Podiceps auritus*) (a mean peak annual non-breeding population of 120 birds (10.9% of the Great Britain population) for the years 2007/08-2008/9). The site also qualifies under Article 4.1 by regularly supporting a population of European importance of the following Annex 1 species during the breeding season: Red-throated Diver (*Gavia stellata*) (up to 47 pairs (3.7% of the Great Britain population) for the year of 2006). The site further qualifies under Article 4.2 by regularly supporting a population of European importance of the following migratory species: Velvet Scoter (*Melanitta fusca*) (a mean peak annual non-breeding population of 147 birds (5.9% of the Great Britain population) for the years of 2006/07 to 2008/09).

#### 3.1.2 Orkney Mainland Moors SPA

Orkney Mainland Moors SPA comprises four areas of moorland on Mainland; at its closest point, it lies within 5km of Hatston Pier. The predominant habitats include extensive areas of blanket bog, heaths and mires, with these upland areas supporting 5.9% of the UK's breeding and 2% of the UK's overwintering Hen Harrier (*Circus cyaneus*) population, 2% of the UK's breeding Short-eared Owl (*Asio flammeus*) population. In both cases one of very few sites to support such dense and significant numbers. The area also supports 2% of the UK's breeding Red-throated Diver (*Gavia stellata*) population. This site's boundaries also correspond to Keelylang Hill and Swartaback Burn Site of Special Scientific Interest (SSSI) which is designated for breeding Hen Harrier.

#### 3.1.3 Scapa Flow SPA

The Scapa Flow SPA comprises a total area of 371km<sup>2</sup> located within Scapa Flow -an enclosed sea area, sheltered by Mainland Orkney to the north, Hoy, South Walls and Flotta to the west and south, and Burray and South Ronaldsay to the east. The Flow is linked to the Pentland Firth in the south through the Sound of Hoxa, and to the Atlantic Ocean in the west through Hoy Sound. The site also

includes nearshore waters to the east of Orkney, extending from South Ronaldsay to Deerness, and including the sheltered shallow waters of Holm Sound, between Burray and East Mainland. Prior to construction of the Churchill Barriers in World War II, there were openings between Scapa Flow and Holm Sound to the North Sea.

The Scapa Flow SPA qualifies under Article 4.1 by regularly supporting a non-breeding population of European importance of the following Annex 1 species: Great Northern Diver (a mean peak annual non-breeding population of 505 birds (20.2% of the GB population) for the years 1998/99-2006/7), Black-throated Diver (*Gavia arctica*) (a mean peak annual non-breeding population of 57 birds (9.5% of the GB population) for the years 1998/99-2006/7) and Slavonian Grebe (a mean peak annual non-breeding population of 135 birds (12.3% of the GB population) for the years 1998/99-2006/7). The site also qualifies under Article 4.1 by regularly supporting a population of European importance of the following Annex 1 species during the breeding season: Red-throated Diver (up to 76 pairs (6.1% of the GB population) in 2006). The site further qualifies under Article 4.2 by regularly supporting populations of European importance of the following migratory species: Common Eider (*Somateria mollissima*) (a mean peak annual non-breeding population of 1997 birds (3.6% of the GB population) for the years of 1998/99 to 2006/07), Long-tailed Duck (*Clangula hyemalis*) (a mean peak annual non-breeding population of 1,395 birds (12.7% of the GB population) for the years of 1998/99 to 2006/07), Red-breasted Merganser (*Mergus serrator*) (a mean peak annual non-breeding population of 539 birds (6.4% of the GB population) for the years of 1998/99 to 2006/07), and European Shag (*Phalacrocorax aristotelis*) (a mean peak annual non-breeding population of 2927 birds (1.5% of the biogeographic population) for the years of 1998/99 to 2006/07).

### 3.2 Field Surveys

From all the surveys undertaken, a total of 45 species have been recorded from Hatston Pier, listed in alphabetical order below in Table 3. The table provides the legal protection status and conservation status of each species recorded during the survey. All 45 species constituted birds resident on Orkney throughout the year or those which regularly breed or overwinter on Orkney.

**Table 3: Legal Protection and Conservation Status of Species Recorded**

Species Name	Scientific Name	Legal Protection		Conservation Status				
		Annex 1	Schedule 1	UK BAP	SBL	Red	Amber	Green
Arctic Tern	<i>Sterna paradisaea</i>	X			X		X	
Black Guillemot	<i>Cephus grylle</i>						X	
Black-headed Gull	<i>Chroicocephalus ridibundus</i>				X		X	
Black-throated Diver	<i>Gavia arctica</i>	X	X	X	X		X	
Common Gull	<i>Larus canus</i>						X	

Species Name	Scientific Name	Legal Protection		Conservation Status				
		Annex 1	Schedule 1	UK BAP	SBL	Red	Amber	Green
Common Tern	<i>Sterna hirundo</i>	X			X		X	
Cormorant	<i>Phalacrocorax carbo</i>							X
Curlew	<i>Numenius arquata</i>			X	X	X		
Eider	<i>Somateria mollissima</i>						X	
Fulmar	<i>Fulmarus glacialis</i>						X	
Golden Plover	<i>Pluvialis apricaria</i>	X			X			X
Great Black-backed Gull	<i>Larus marinus</i>						X	
Great Northern Diver	<i>Gavia immer</i>	X	X		X		X	
Grey Heron	<i>Ardea cinerea</i>							X
Guillemot	<i>Uria aalge</i>						X	
Herring Gull	<i>Larus argentatus</i>			X	X	X		
Hooded Crow	<i>Corvus cornix</i>				X			X
Iceland Gull	<i>Larus glaucooides</i>						X	
Jackdaw	<i>Corvus monedula</i>							X
Lapwing	<i>Vanellus</i>			X	X	X		
Little Auk	<i>Alle</i>							X
Little Gull	<i>Hydrocoloeus minutus</i>							X
Long-tailed Duck	<i>Clangula hyemalis</i>		X			X		
Kittiwake	<i>Rissa tridactyla</i>					X		
Mallard	<i>Anas platyrhynchos</i>						X	
Mute Swan	<i>Cygnus olor</i>							X
Oystercatcher	<i>Haematopus ostralegus</i>						X	
Razorbill	<i>Alca torda</i>						X	



Species Name	Scientific Name	Legal Protection		Conservation Status				
		Annex 1	Schedule 1	UK BAP	SBL	Red	Amber	Green
Red-breasted Merganser	<i>Mergus serrator</i>						X	
Redshank	<i>Tringa totanus</i>						X	
Red-throated Diver	<i>Gavia stellata</i>	X	X		X		X	
Ringed Plover	<i>Charadrius hiaticula</i>					X		
Rock Dove / Feral Pigeon	<i>Columba livia</i>							X
Rock Pipit	<i>Anthus petrosus</i>							X
Rook	<i>Corvus frugilegus</i>						X	
Sand Martin	<i>Riparia</i>							X
Shag	<i>Phalacrocorax aristotelis</i>					X		
Short-eared Owl	<i>Asio flammeus</i>	X			X		X	
Slavonian Grebe	<i>Podiceps auritus</i>	X	X		X	X		
Snipe	<i>Gallinago gallinago</i>						X	
Starling	<i>Sturnus vulgaris</i>			X	X	X		
Turnstone	<i>Arenaria interpres</i>						X	
Velvet Scoter	<i>Melanitta fusca</i>					X		
Whooper Swan	<i>Cygnus</i>	X	X		X		X	
Wigeon	<i>Anas penelope</i>						X	

### 3.2.1 Low Tide Count Surveys

The Low Tide Counts showed a diverse number of species being present through the two-year survey period, including some large accumulations of wader and gull species which roost to the south of Hatston pier, on the rocky foreshore.

Notable counts of roosting Curlew included 169 on 27<sup>th</sup> October 2020, 275 on 20<sup>th</sup> December 2020, 169 on 25<sup>th</sup> November 2021 and 156 on 26<sup>th</sup> January 2022

A large flock of 226 Golden Plover was recorded on 27<sup>th</sup> October 2020, but such numbers were not subsequently recorded during the remainder of the survey period.

Large roosts of gulls were recorded, with post-breeding numbers highest, where numbers of Herring Gulls and Greater Black-backed Gulls were recorded in their hundreds.

Accumulations of duck, auks and other marine species remained low at all sites. Slavonian Grebe was recorded using the inshore waters to the west of Hatston Pier on 26<sup>th</sup> January 2021.

Maps detailing bird species and numbers for each survey visit can be found in Appendix B.

### **3.2.2 Vantage Point Surveys (including HiDef Data for winter 2021/22)**

#### *3.2.2.1 North Orkney SPA Qualifying Species*

##### Velvet Scoter

Velvet Scoter was recorded during all months of the Vantage Point Surveys over the winter 2022/23 period. With a peak count of 37 on 20<sup>th</sup> January 2023. This species was exclusively recorded in sectors 8,9 and 10 off the north pier, in the mouth of the Bay of Kirkwall. No Velvet Scoter were recorded in inshore waters.

No Velvet Scoter were recorded within the Bay of Kirkwall during the HiDef surveys over winter 2021/22.

Appendix C details the densities of Velvet Scoter, in the form of heat maps, across the survey area.

##### Great Northern Diver

From the North Pier vantage point, Great Northern Diver was recorded during all months, peaking with 31 on 16<sup>th</sup> December 2022. The majority of birds were recorded in sectors 8, 9 and 10, in the mouth of the Bay of Kirkwall. However, a peak count of 9 was also recorded within sector 5, close to the fish cages.

From the southern pier vantage point, small numbers were recorded, with a peak of 8 birds on 16<sup>th</sup> December 2022. Birds were predominately recorded in sectors 3 and 6, out towards Iceland Skerry.

Great Northern Diver was also recorded in all months during the HiDef survey over winter 2021/22., with a peak count of 18 birds in January 2022. As with winter 2022/23, the majority of birds were recorded at the mouth of the Bay of Kirkwall.

Appendix C details the densities of Great Northern Diver, in the form of heat maps, across the survey area.

##### Slavonian Grebe

From the North Pier vantage point, small numbers were recorded each month, with a peak of 7 birds on 16<sup>th</sup> December 2022. All birds were exclusively recorded from sectors 7,8 and 9 close to the mouth of the Bay of Kirkwall and beyond the fish cages within the bay.

No birds were recorded from the southern pier.

Slavonian Grebe was recorded intermittently during the HiDef surveys of 2021/22, with birds only recorded in November 2021 (one bird) and January 2022 (five birds). Records were from across the Bay of Kirkwall, including the inner bay.

Appendix C details the densities of Slavonian Grebe, in the form of heat maps, across the survey area.

#### 3.2.2.2 *Other notable species*

##### Red-throated Diver

Small numbers were recorded in early winter 2021, with 8 birds from the north pier on 29<sup>th</sup> October 2021 and 7 on 8<sup>th</sup> November 2021. Records were scattered across the Bay of Kirkwall.

Appendix C details the densities of Red-throated Diver, in the form of heat maps, across the survey area.

##### Black-throated Diver

Two Black-throated Divers were recorded within sector 2 from the south pier vantage point on 24<sup>th</sup> November 2022 and a single bird from sector 8 off the north pier vantage point on 16<sup>th</sup> December 2022.

No Black-throated Diver were recorded within the Bay of Kirkwall during the HiDef surveys over winter 2021/22.

Appendix C details the densities of Black-throated Diver, in the form of heat maps, across the survey area.

##### Long-tailed Duck

Good numbers of Long-tailed Duck were recorded each month, particularly from the north pier vantage point where large flocks were seen in the vicinity of the fish cages and beyond. A total of 313 birds were recorded here on 24<sup>th</sup> November, 432 on 16<sup>th</sup> December 2022 and 393 on 20<sup>th</sup> January 2023.

Smaller numbers were seen from the southern pier vantage point. With a peak of 73 on 16<sup>th</sup> December 2022. Flocks were widely dispersed within the inner bay, however the main area was between Hatston pier and Iceland Skerry.

During the HiDef surveys in 2021/22, smaller numbers were present, with a peak of 72 birds in January 2022.

Appendix C details the densities of Long-tailed Duck, in the form of heat maps, across the survey area.

##### Eider

Large numbers of Eider were recorded from the north pier vantage point on 24<sup>th</sup> November 2022 (1149 birds), 16<sup>th</sup> December 2022 (1570 birds) and 20<sup>th</sup> January 2023 (1502 birds). The vast majority of these birds were recorded within sectors 3, 4 and 5, associated with the fish cages present in this area.

Small numbers were recorded from the south pier vantage point, typically up to 20 birds. The exception was on the 24<sup>th</sup> of November when 139 birds were present, predominately off Crow Ness.

During the Hidef surveys in 2021/22, smaller numbers were present, with a peak of 44 birds in January 2022.

Appendix C details the densities of Eider, in the form of heat maps, across the survey area.

### Red-breasted Merganser

Small numbers were recorded every month of the vantage point surveys, with a peak count of 24 from the south pier vantage point on 12<sup>th</sup> January 2023. These birds were located just north of Bay of Weyland, predominately close to shore.

During the Hidef surveys in 2021/22, small numbers were also present, with a peak of 41 birds in January 2022.

Appendix C details the densities of Red-breasted Merganser, in the form of heat maps, across the survey area.

### Shag

Small numbers were recorded from the south pier vantage point, with a peak of 34 birds on 12<sup>th</sup> January 2023. The majority of records were from sectors 6 and 7 towards Iceland Skerry and north of the Bay of Weyland.

Similar numbers were recorded from the north pier vantage point, with a peak of 50 birds on 29<sup>th</sup> October 2022. Records were spread out across the Bay of Kirkwall, although birds were regularly recorded around the fish cages in sectors 4 and 8.

The HiDef survey during the 2021/22 winter period produced similar numbers of birds, with a peak of 24 in November 2021.

Appendix C details the densities of Shag, in the form of heat maps, across the survey area.

## **3.3 Bird/Boat Interactions**

A total of 63 vessel movements and interactions were recorded, with the majority of vessel movements eliciting no discernible change in bird behaviour.

Examples of changes in behaviour were swimming away or diving a distance away from vessels. In the most extreme cases, vessel movements elicited a flight response, sometimes with birds alighting back at their original position but also some birds flying over 1km or more away. These instances are as follows:

- 25<sup>th</sup> October 2022- A tug boat (moving slowly) causing 12 Long-tailed Ducks to fly up before returning to their original position.
- 24<sup>th</sup> November 2022- The Shapinsay ferry moving quite fast causing a Great Northern Diver to take off and fly out of the Bay of Kirkwall.
- 24<sup>th</sup> November 2022 – A sailing yacht moving quite fast causing a Red-throated Diver to fly 1.5km away.
- 5<sup>th</sup> December 2022 – A workboat, moving slowly caused a single Long tailed Duck to take flight. However, the rest of the flock remained unmoved.
- 20<sup>th</sup> January 2023 – The Earl Thorfinn ferry, moving quite fast, caused a flock of 6 Long-tailed Duck to take flight. The birds were likely to have been directly in the path of the ferry.

- 20<sup>th</sup> January 2023 – A workboat and larger workboat, moving at various speeds, caused a dense flock of ~100 Long-tailed Duck to take flight in all directions. Most alighted back on the water 1km west or 1km south-east of their original position.

Appendix D details the findings of the bird /boat interactions.

## 4 SYNOPSIS

The surveys undertaken between October 2020 and March 2023 have provided a baseline for any potential impacts to be assessed.

The Low Tide Count surveys identified a regular winter roost site for Curlew, and occasionally used by wintering Golden Plover as well as a roost site for large numbers of gulls (predominately Herring Gull and Great Black-backed Gull). This area is situated just south-east of Hatston Pier and will be lost as a result of the development. However, suitable habitat exists along that coastline towards Crow Ness, and it is anticipated that these birds will move further south to utilise these areas during and post-construction.

The Vantage Point Surveys, along with the HiDef surveys from 2021/22 have identified numbers and favoured area used by bird species, particularly those species which are qualifying features of the North Orkney SPA. These are detailed below:

- Velvet Scoter – A peak of 37 birds which represents 25% of the non-breeding population in North Orkney SPA. All records were of birds in the mouth of the Bay of Kirkwall, between 1km and 2km from Hatston pier.
- Great Northern Diver – A peak of 31 birds which represents 10% of the non-breeding population in North Orkney SPA. The majority of birds were recorded between 1km and 2km+ from Hatston pier.
- Slavonian Grebe – A peak of 7 birds which represents 6% of the non-breeding population of the North Orkney SPA. Records were almost exclusively of birds in the mouth of the Bay of Kirkwall, between 1km and 2km from Hatston pier, although one bird was recorded in the inshore waters around Hatston pier during a Low Tide Count survey.

Observations made of bird and boat interactions indicate that an evasive response elicited in birds (with the most extreme example being taking flight to distance over 1.5km) most often occurred with interactions with work boats, tug boats or recreational vessels such as yachts. The observations also indicate that ferries, using established vessel routes and agreed speeds, seldom caused a flight response in birds, and in particular qualifying species of the SPA.

# APPENDICES

# **A VANTAGE POINT SURVEY LOCATIONS**



# Hatston 2022/23 - suggested VPs and count sectors



sight line to outer edges of VP areas

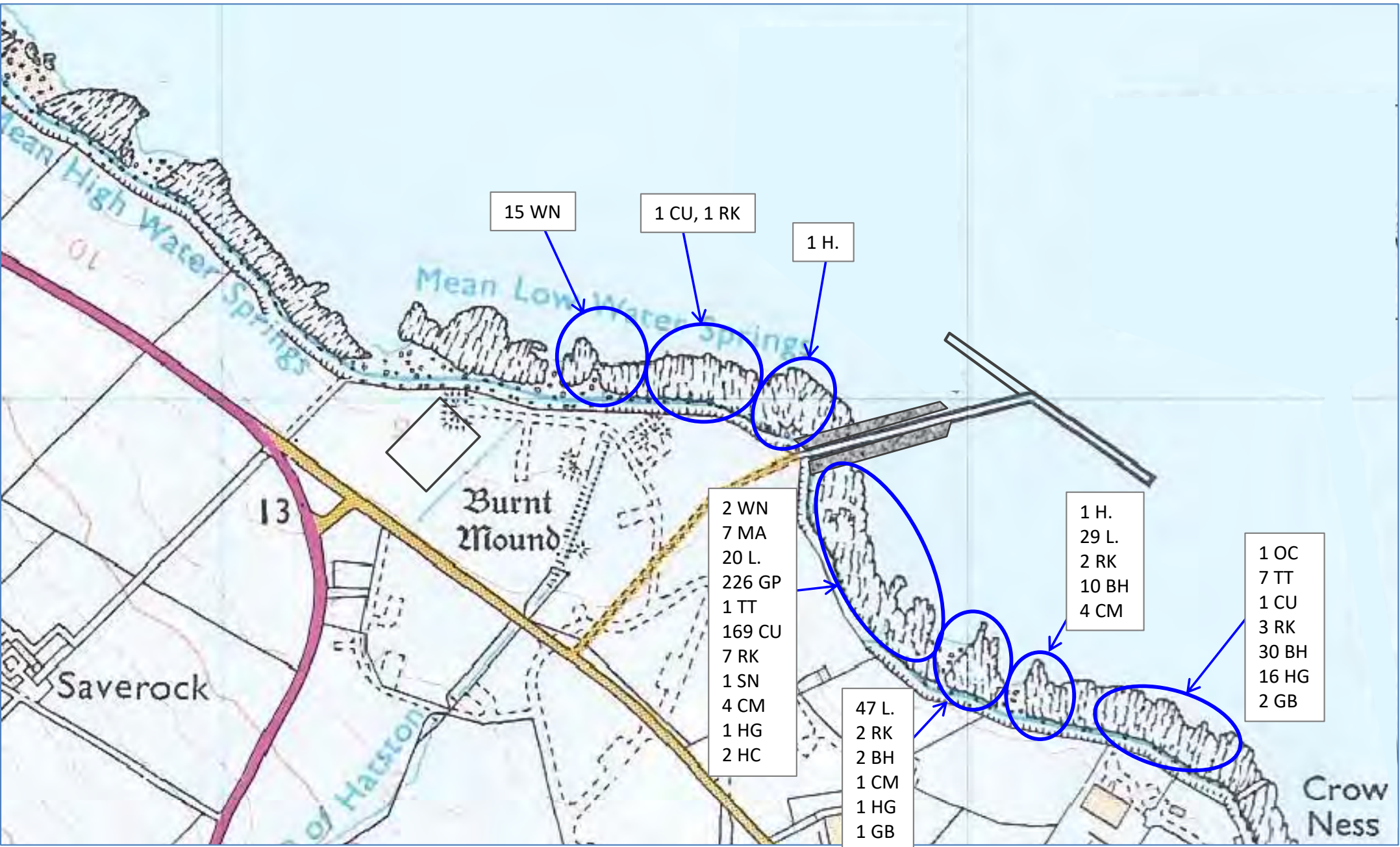


water within 2km out of view from VPs



# **B      LOW TIDE COUNT DATA**





15 WN

1 CU, 1 RK

1 H.

13

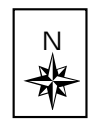
Burnt Mound

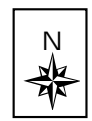
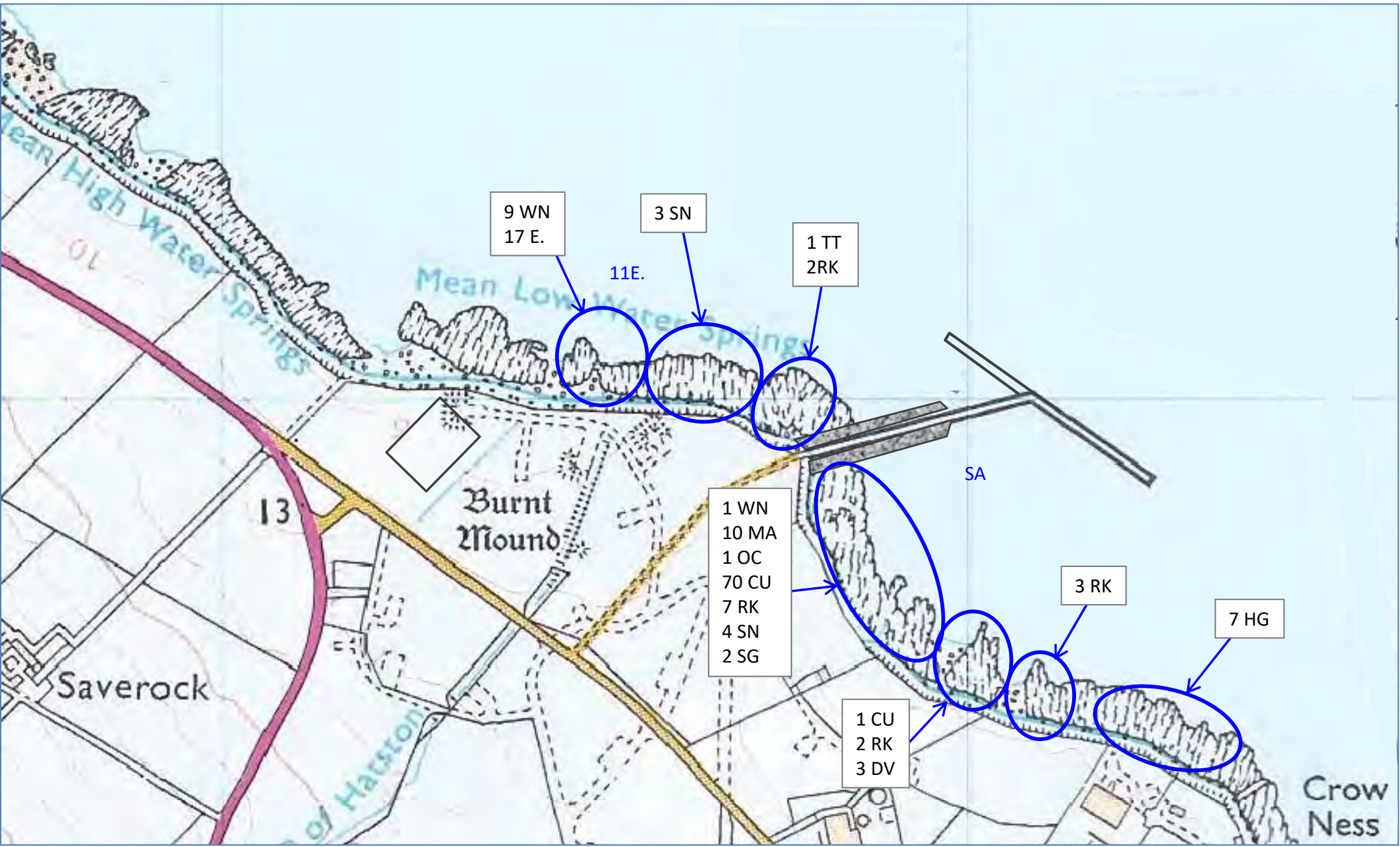
2 WN  
7 MA  
20 L.  
226 GP  
1 TT  
169 CU  
7 RK  
1 SN  
4 CM  
1 HG  
2 HC

1 H.  
29 L.  
2 RK  
10 BH  
4 CM

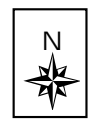
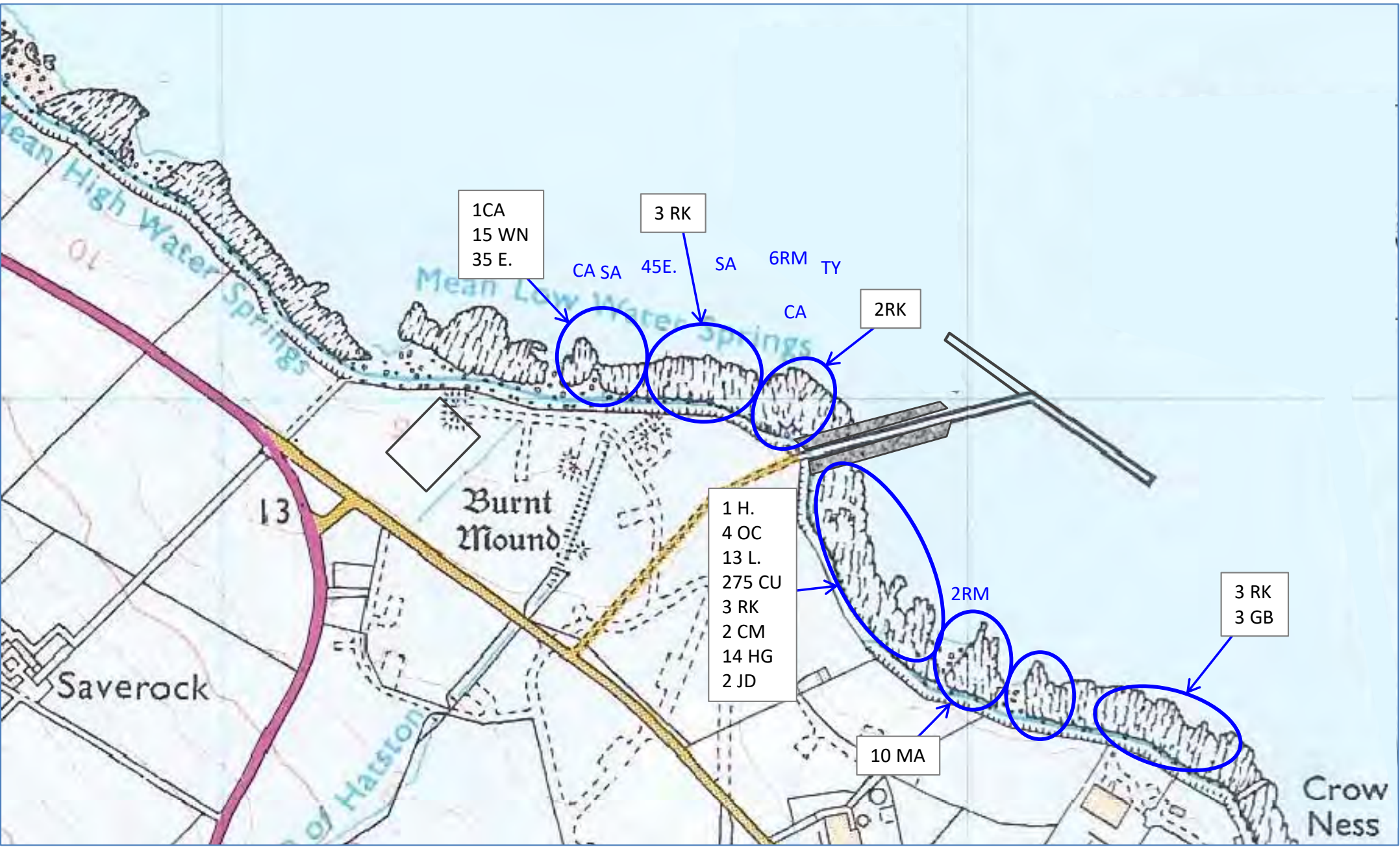
1 OC  
7 TT  
1 CU  
3 RK  
30 BH  
16 HG  
2 GB

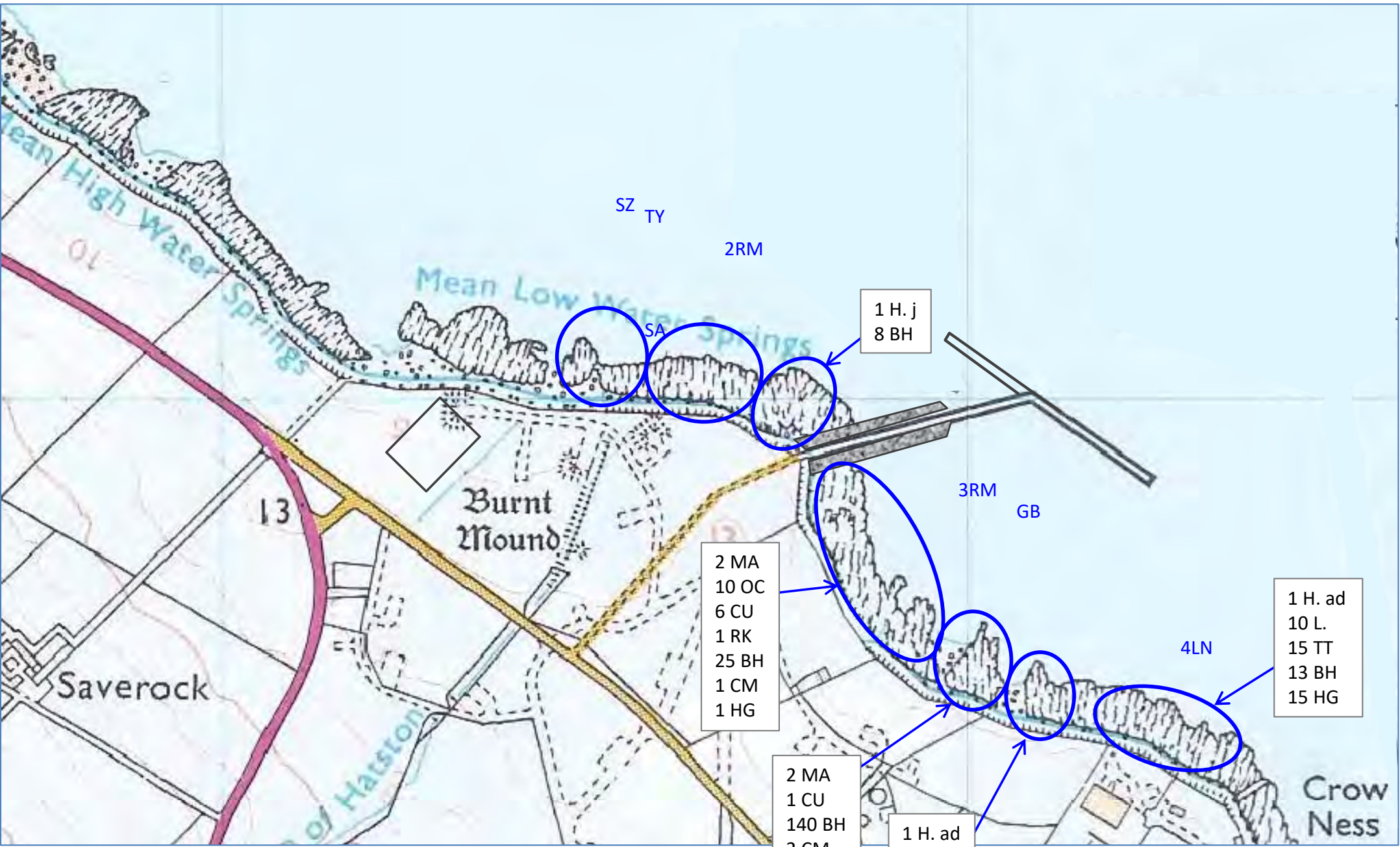
47 L.  
2 RK  
2 BH  
1 CM  
1 HG  
1 GB



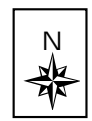






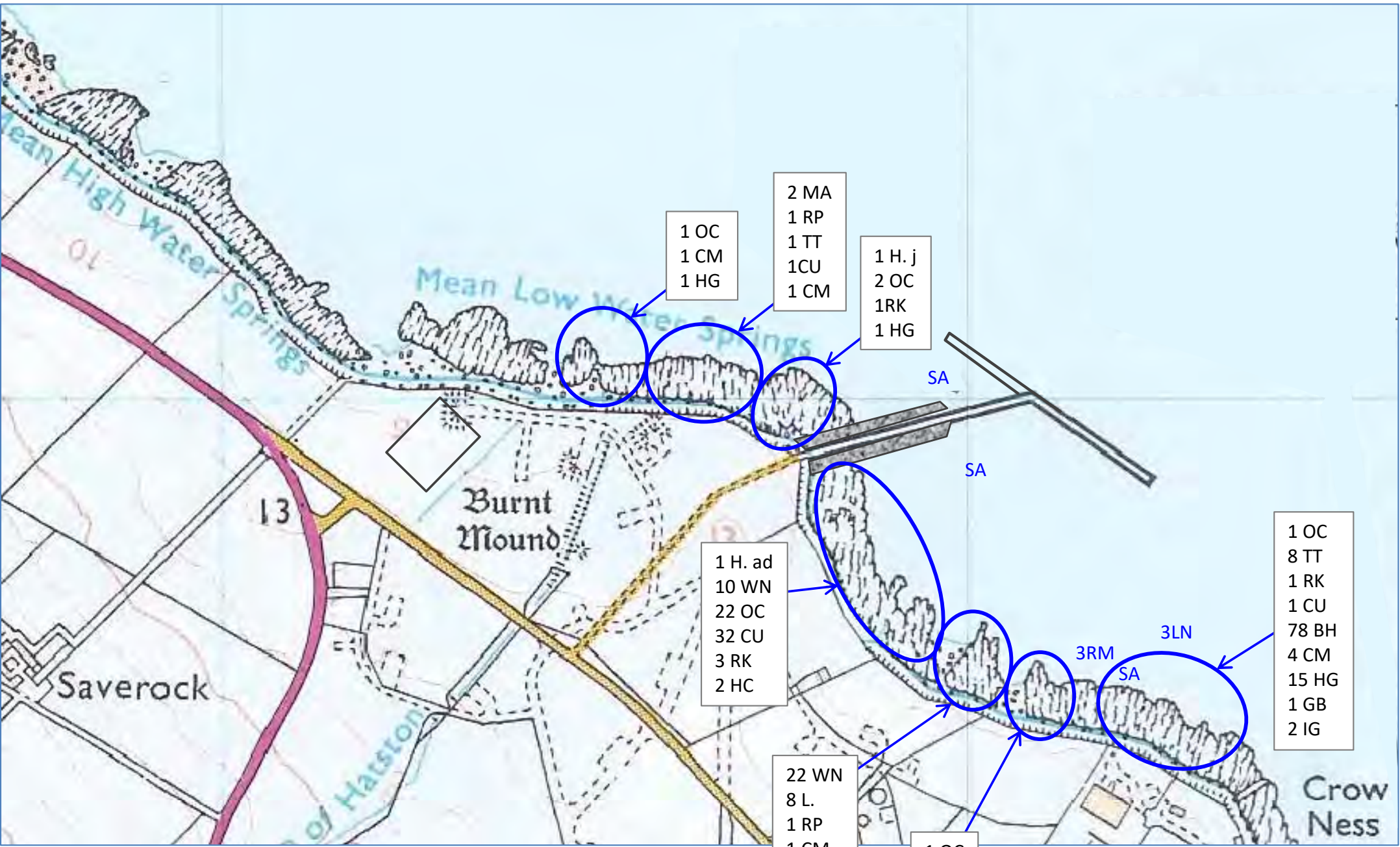


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Hatston Pier  
 26<sup>th</sup> Jan 2021 (15:55 – 16:30)





1 OC  
1 CM  
1 HG

2 MA  
1 RP  
1 TT  
1 CU  
1 CM

1 H. j  
2 OC  
1 RK  
1 HG

1 H. ad  
10 WN  
22 OC  
32 CU  
3 RK  
2 HC

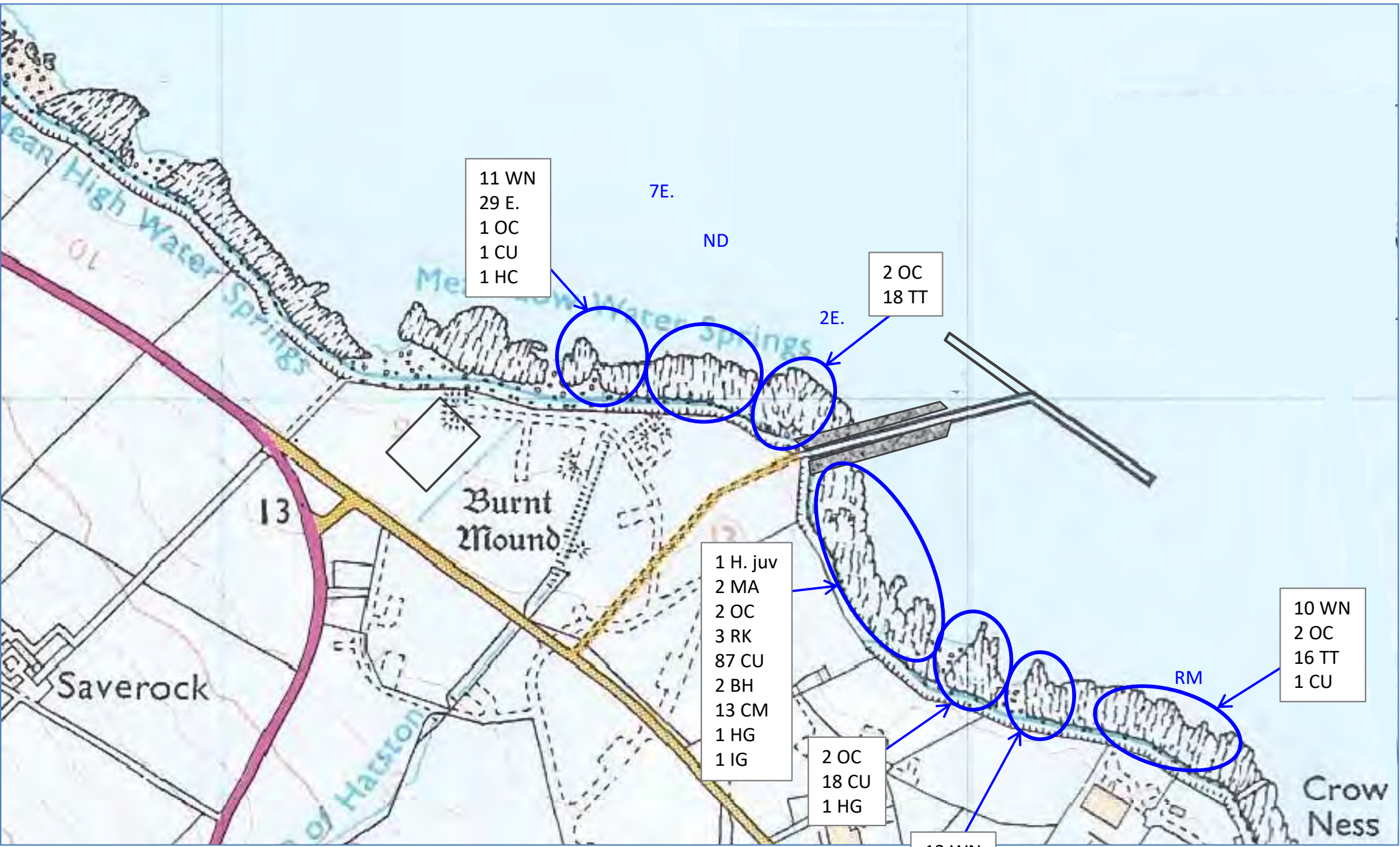
1 OC  
8 TT  
1 RK  
1 CU  
78 BH  
4 CM  
15 HG  
1 GB  
2 IG

22 WN  
8 L.  
1 RP  
1 CM  
1 HG

1 OC  
1 RK



Hatston Pier  
26<sup>th</sup> Feb 2021 (15:35 – 16:15)



11 WN  
29 E.  
1 OC  
1 CU  
1 HC

7E.  
ND

2 OC  
18 TT

2E.

1 H. juv  
2 MA  
2 OC  
3 RK  
87 CU  
2 BH  
13 CM  
1 HG  
1 IG

2 OC  
18 CU  
1 HG

10 WN  
2 OC  
16 TT  
1 CU

RM

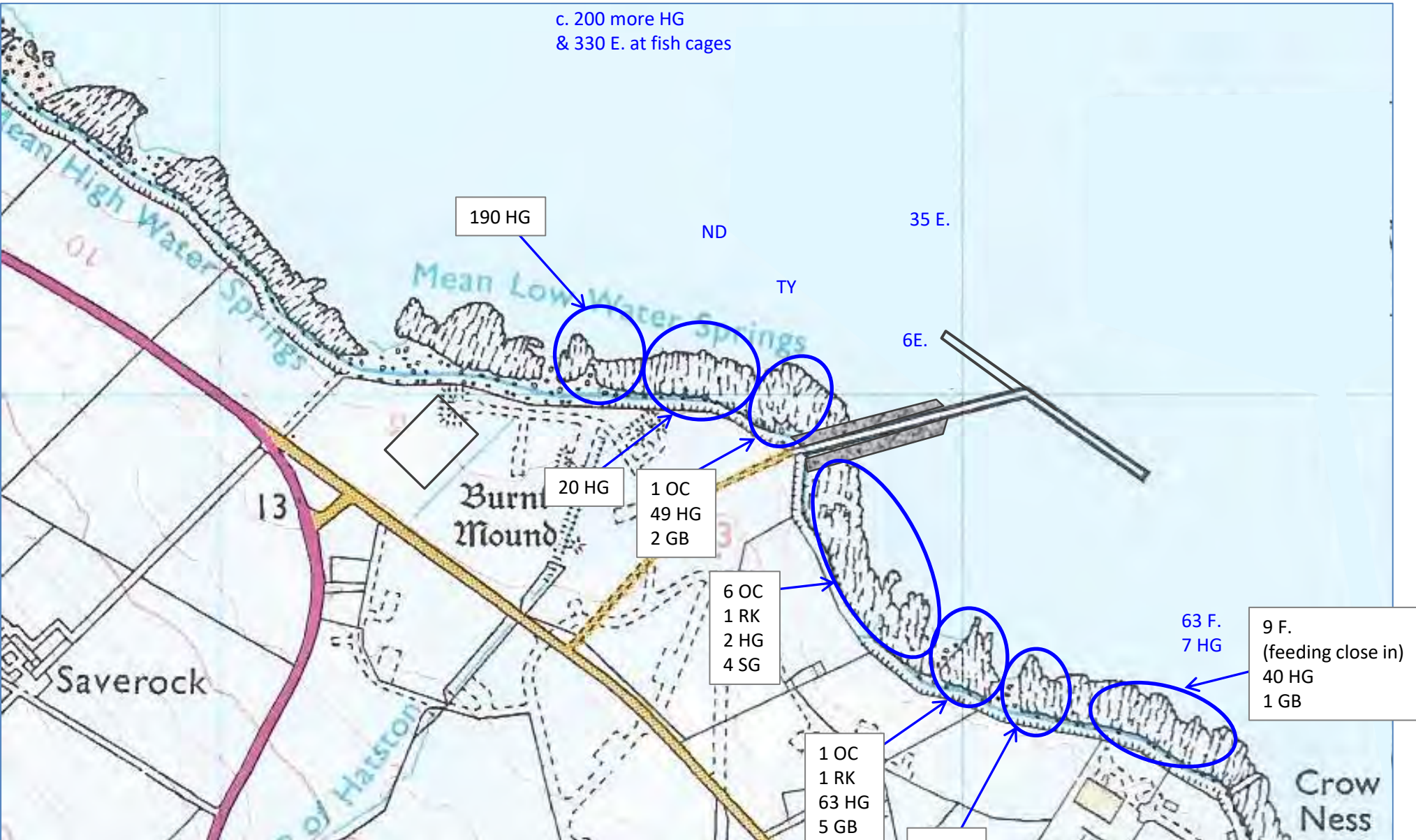
12 WN  
1 OC  
1 RK

Hatston Pier  
21<sup>st</sup> Mar 2021 (09:25 – 09:55)





c. 200 more HG  
& 330 E. at fish cages



190 HG

ND

35 E.

TY

6E.

20 HG

1 OC  
49 HG  
2 GB

6 OC  
1 RK  
2 HG  
4 SG

63 F.  
7 HG

9 F.  
(feeding close in)  
40 HG  
1 GB

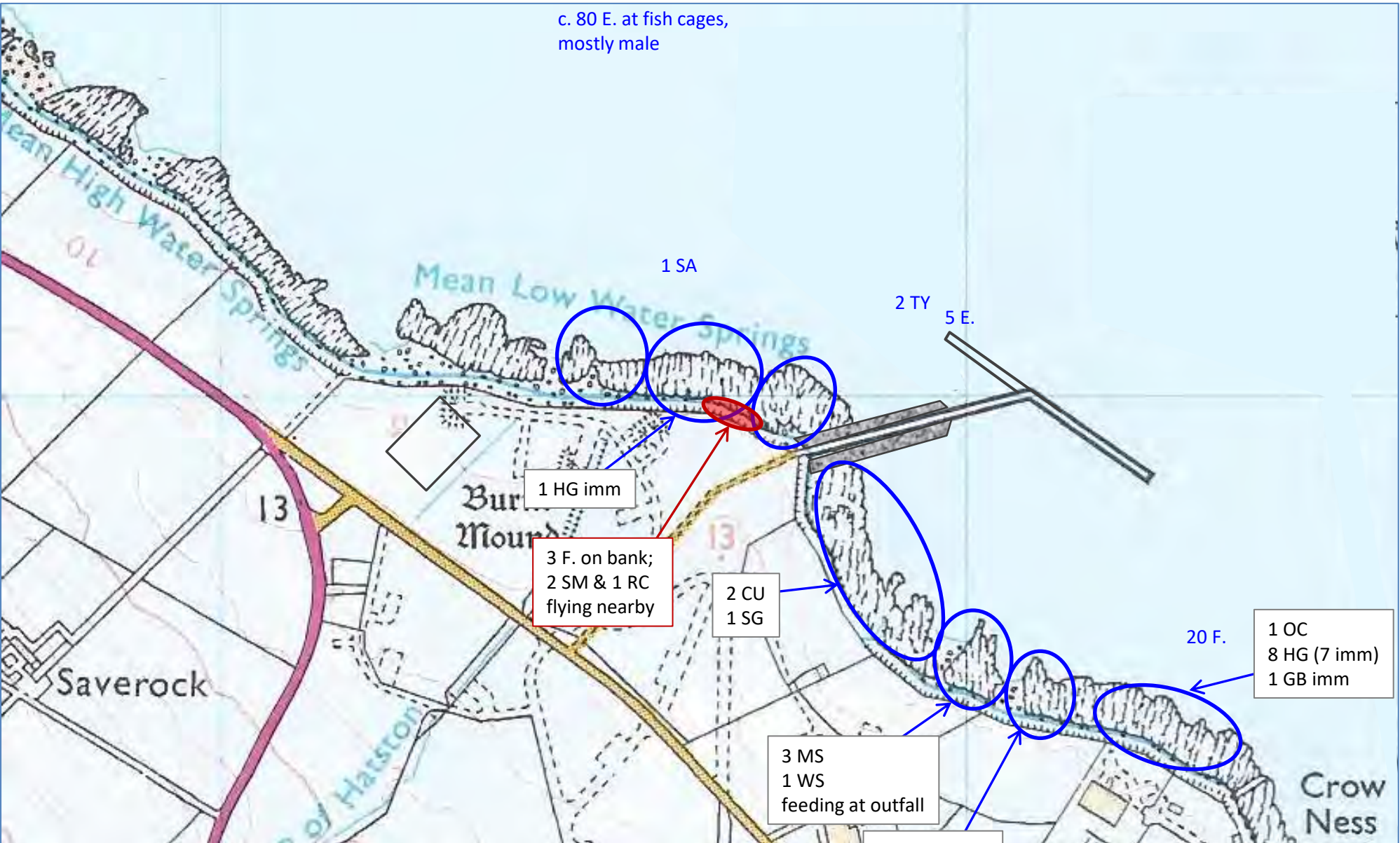
1 OC  
1 RK  
63 HG  
5 GB

10 HG



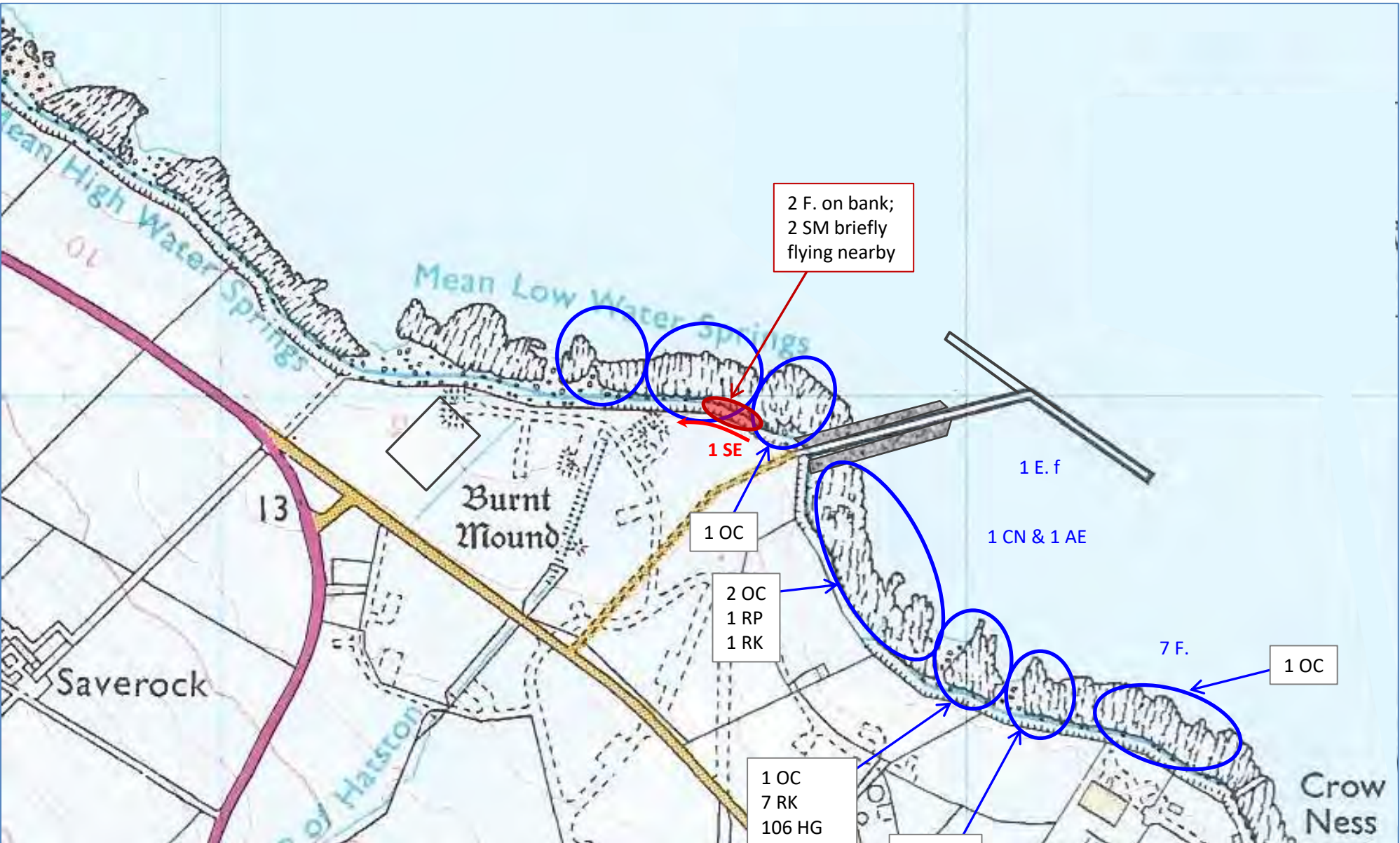
Hatston Pier  
23<sup>rd</sup> Apr 2021 (14:20 – 14:55)

c. 80 E. at fish cages,  
mostly male



Hatston Pier  
17<sup>th</sup> May 2021 (08:25 – 08:55)





2 F. on bank;  
2 SM briefly  
flying nearby

1 SE

1 OC

2 OC  
1 RP  
1 RK

1 OC  
7 RK  
106 HG  
1 GB imm

1 OC  
2 RK  
16 HG  
1 GB ad

1 E. f

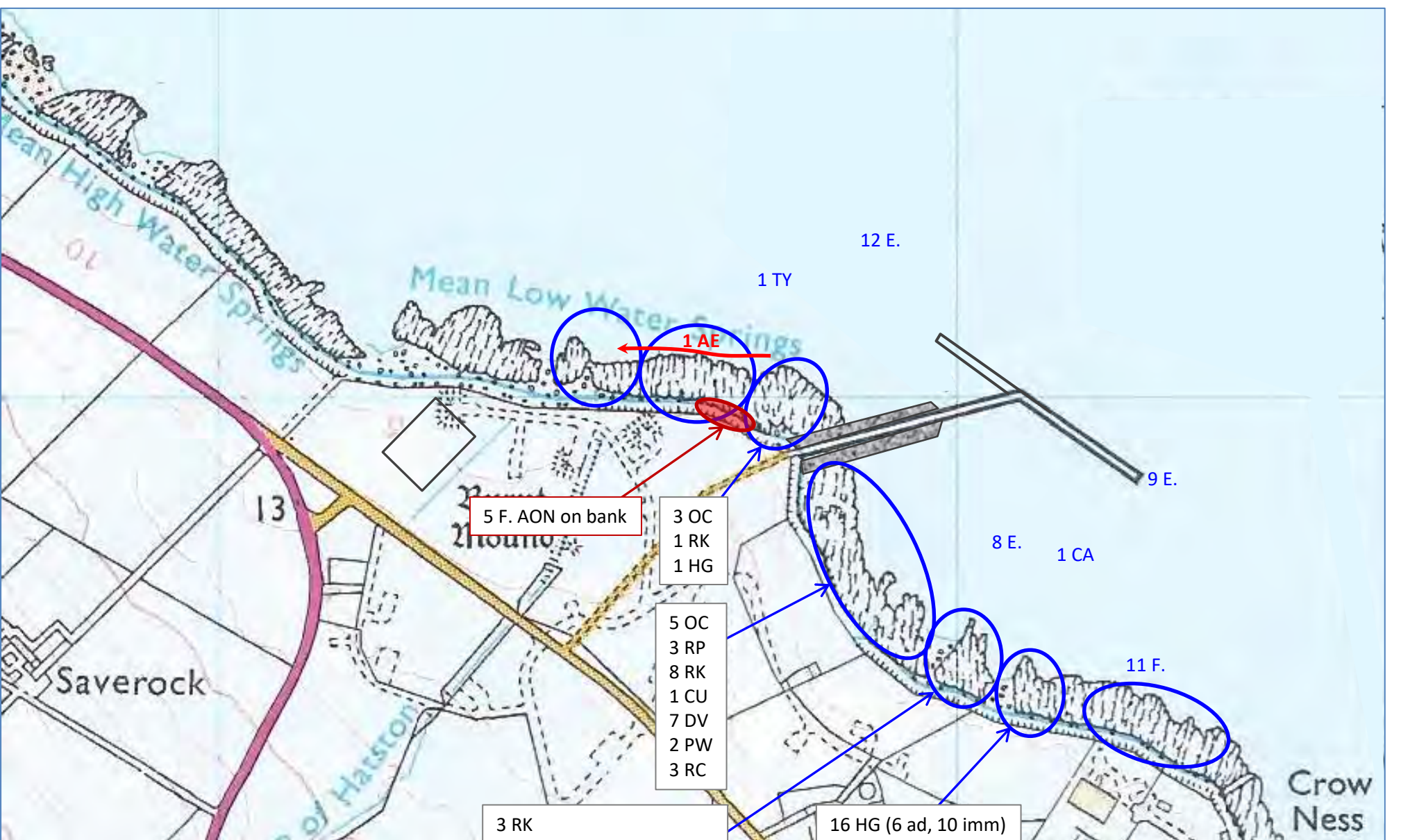
1 CN & 1 AE

7 F.

1 OC

Hatston Pier  
26<sup>th</sup> June 2021 (18:05 – 18:35)





5 F. AON on bank

3 OC  
1 RK  
1 HG

5 OC  
3 RP  
8 RK  
1 CU  
7 DV  
2 PW  
3 RC

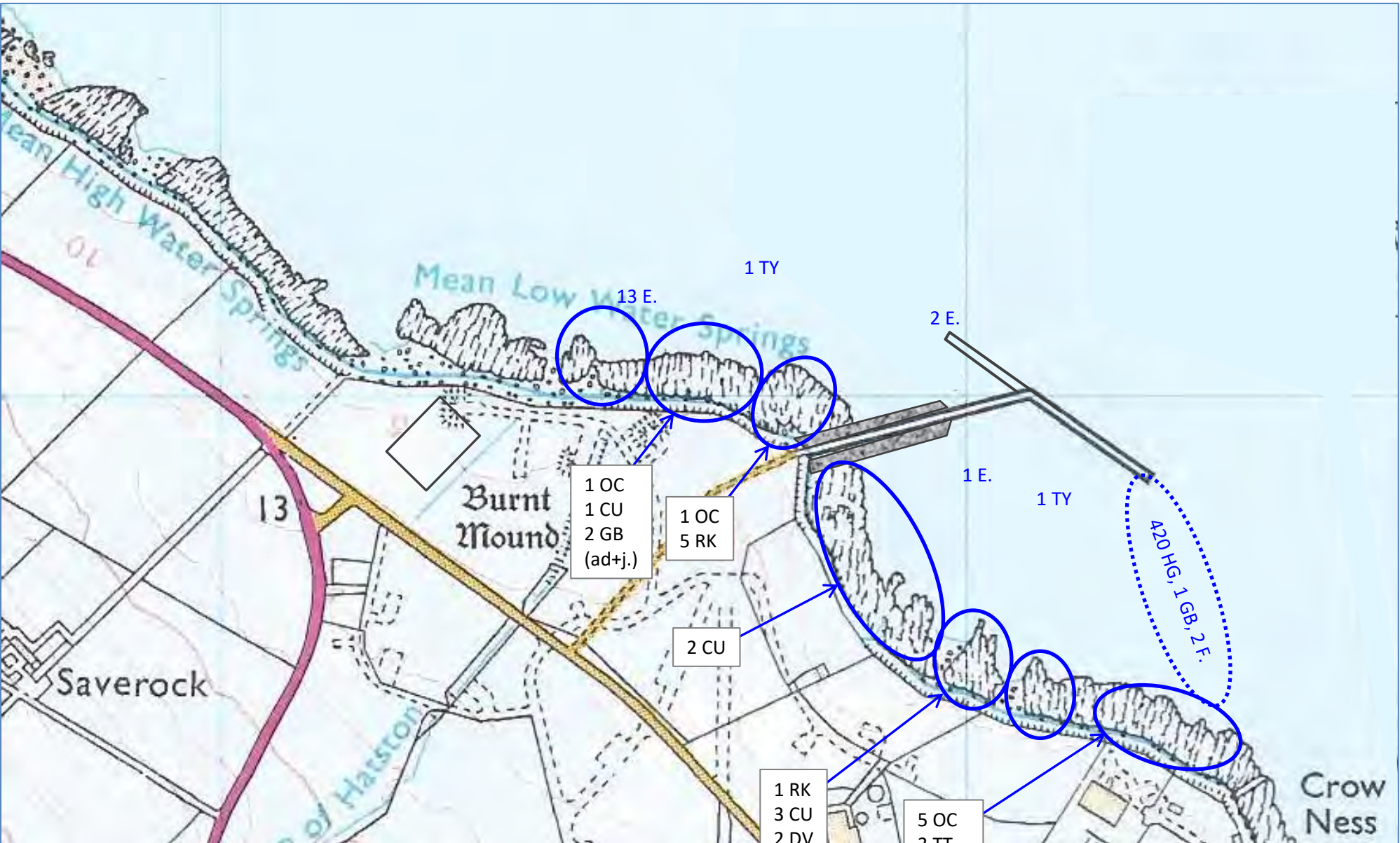
3 RK  
5 BH (1 ad, 4 j)  
3 CM (2 imm, 1 j)  
42 HG (15 ad, 27 imm, 0 j)  
2 GB (2 imm)  
1 PW

16 HG (6 ad, 10 imm)  
2 GB (2 imm)

Hatston Pier  
16<sup>th</sup> July 2021 (08:20 – 09:15)



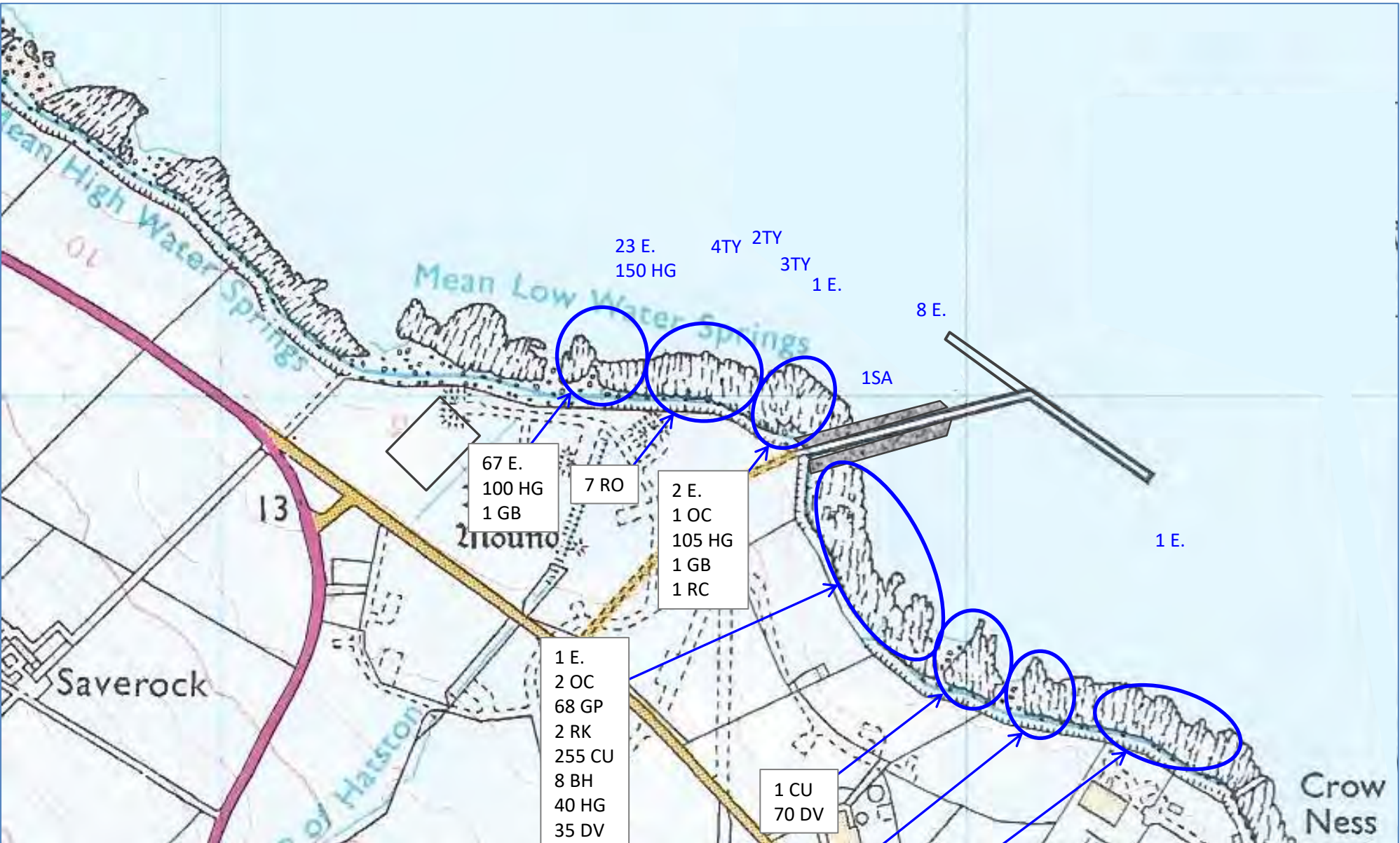




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**Hatston Pier**  
 24<sup>th</sup> Aug 2021 (18:20 – 18:50)



23 E.  
150 HG  
4TY 2TY  
3TY 1 E.

8 E.

1SA

1 E.

67 E.  
100 HG  
1 GB

7 RO

2 E.  
1 OC  
105 HG  
1 GB  
1 RC

1 E.  
2 OC  
68 GP  
2 RK  
255 CU  
8 BH  
40 HG  
35 DV  
2 HC  
1 RO  
1 SG

1 CU  
70 DV

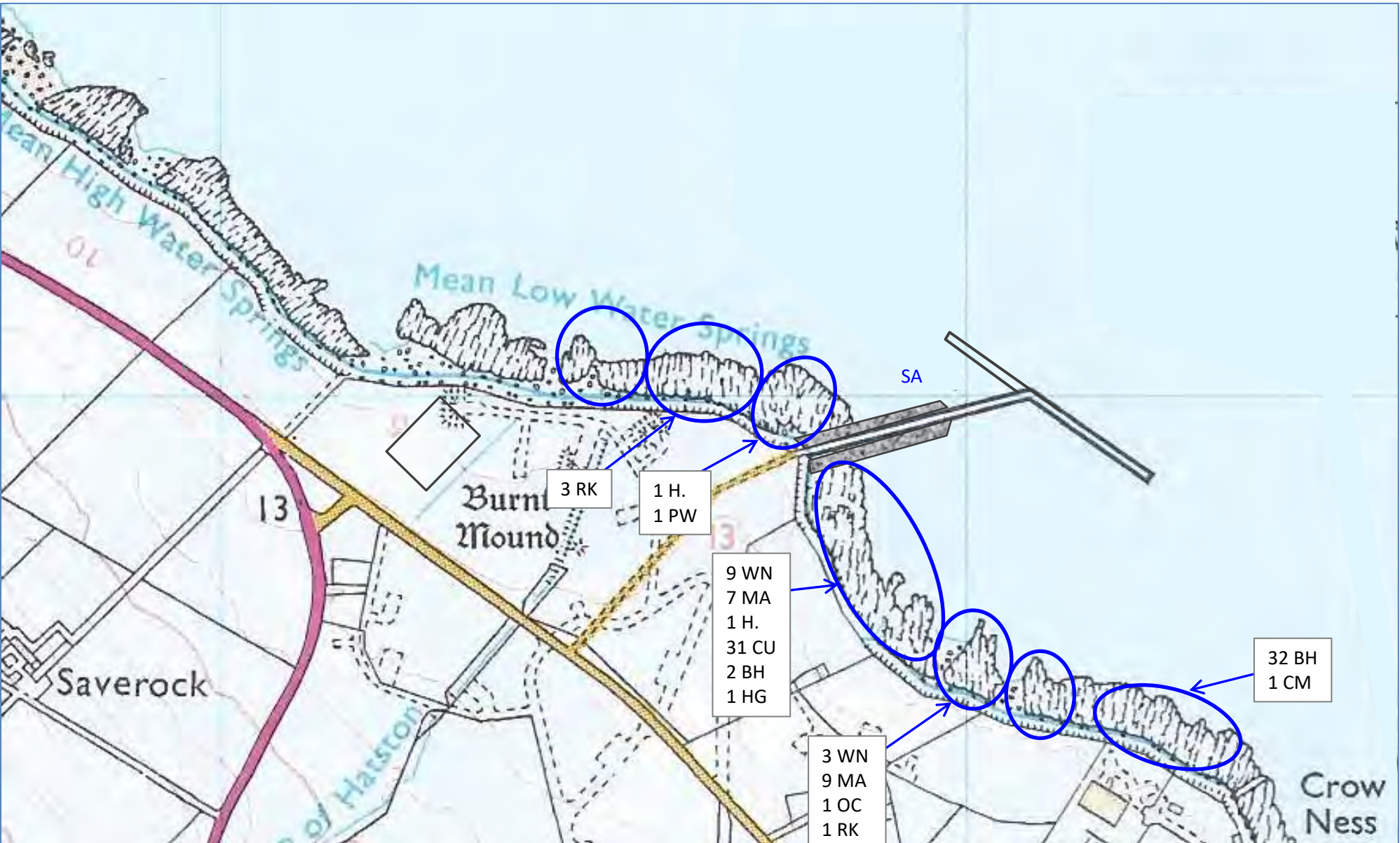
1 RK  
1 HG  
30 DV

3 RO

Hatston Pier  
29<sup>th</sup> Sept 2021 (09:20 – 10:00)







3 RK

1 H.  
1 PW

9 WN  
7 MA  
1 H.  
31 CU  
2 BH  
1 HG

3 WN  
9 MA  
1 OC  
1 RK  
1 CU  
16 BH

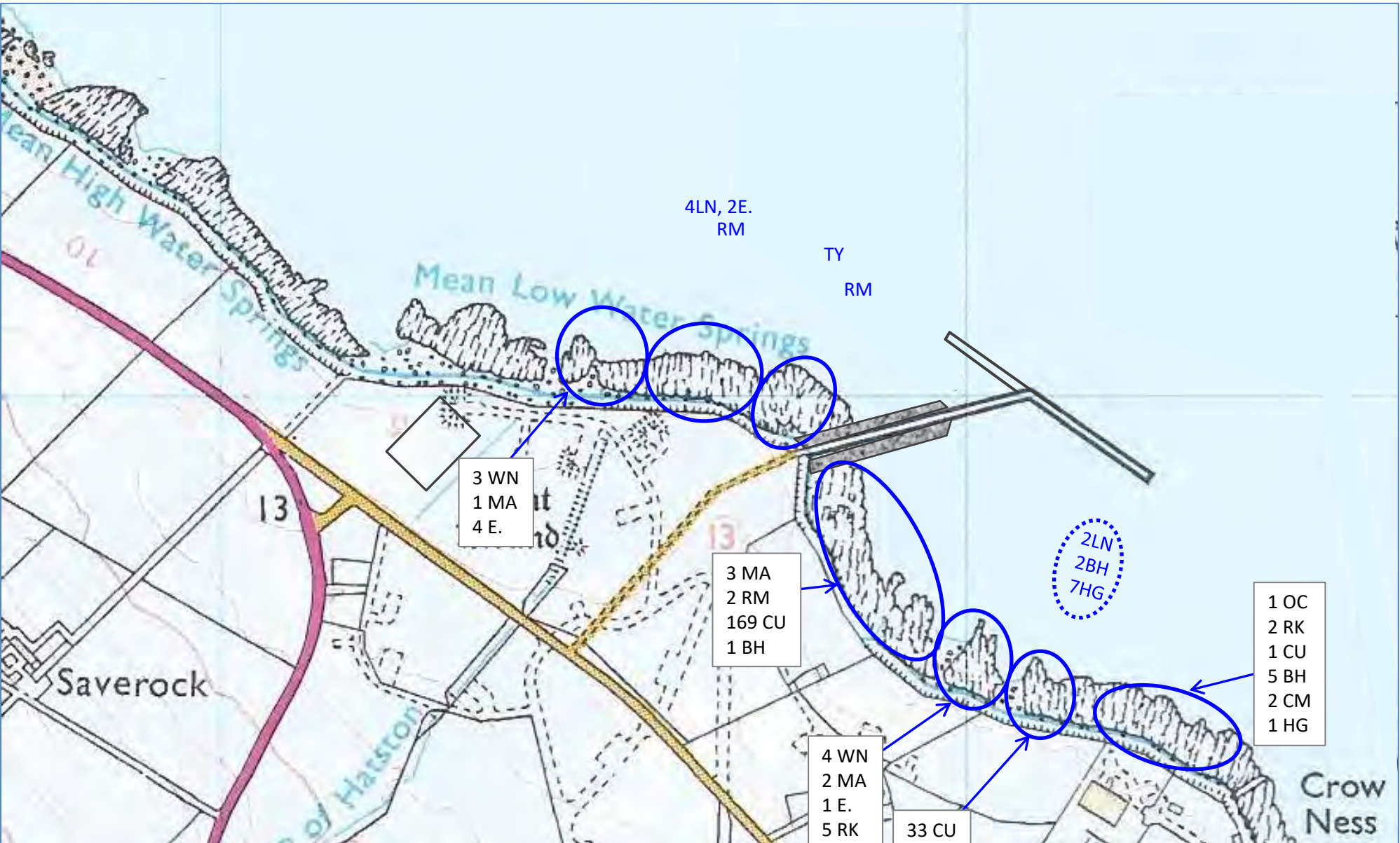
32 BH  
1 CM

SA

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Hatston Pier  
22<sup>nd</sup> Oct 2021 (17:50 – 18:10)  
**at dusk**



4LN, 2E.  
RM

TY  
RM

3 WN  
1 MA  
4 E.

3 MA  
2 RM  
169 CU  
1 BH

2LN  
2BH  
7HG

1 OC  
2 RK  
1 CU  
5 BH  
2 CM  
1 HG

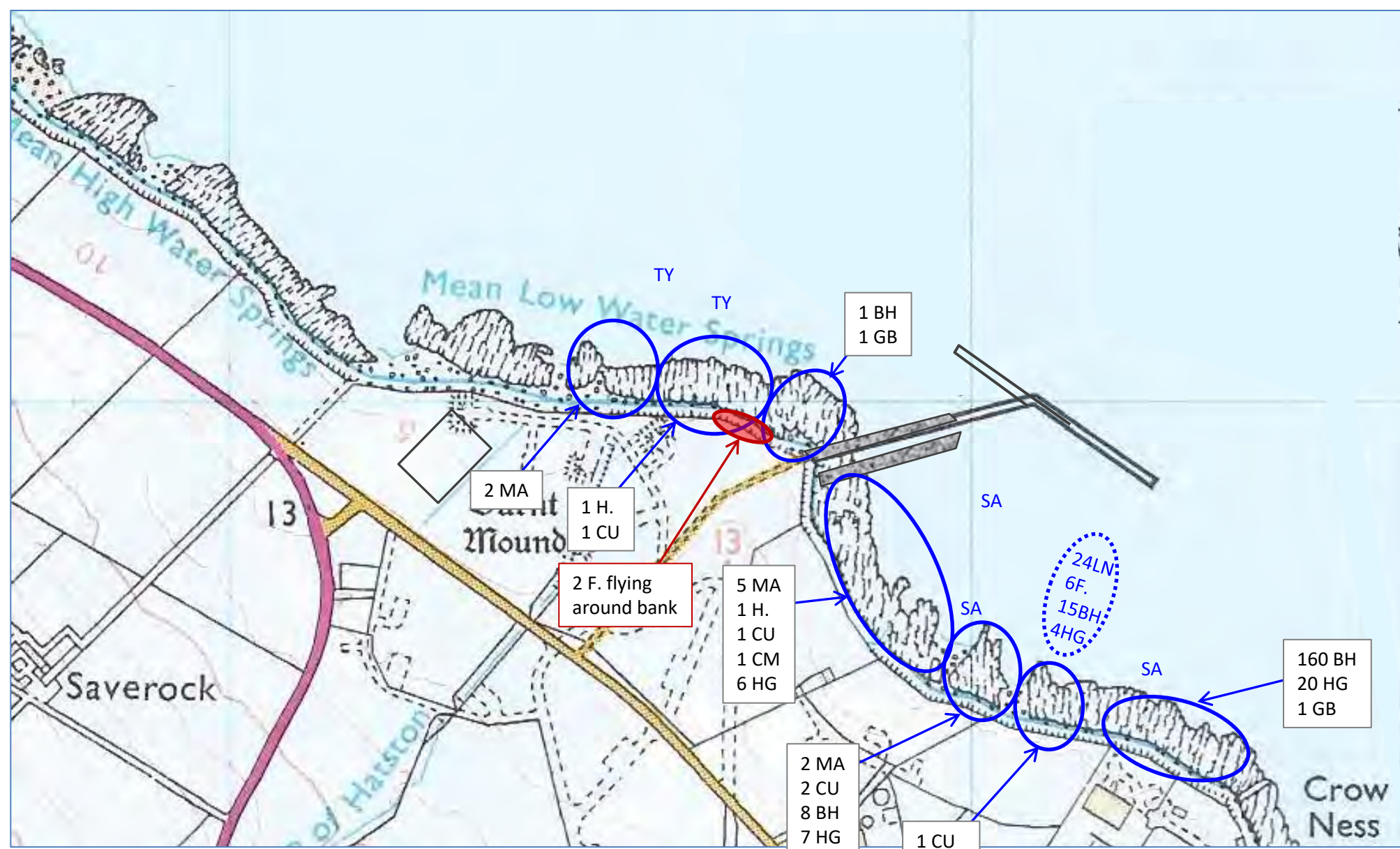
4 WN  
2 MA  
1 E.  
5 RK  
6 CU

33 CU  
3 BH  
2 HG  
5 DV



Hatston Pier  
25<sup>th</sup> Nov 2021 (09:25 – 09:55)





2 MA

1 H.  
1 CU

2 F. flying  
around bank

5 MA  
1 H.  
1 CU  
1 CM  
6 HG

2 MA  
2 CU  
8 BH  
7 HG

1 CU  
10 BH  
8 HG

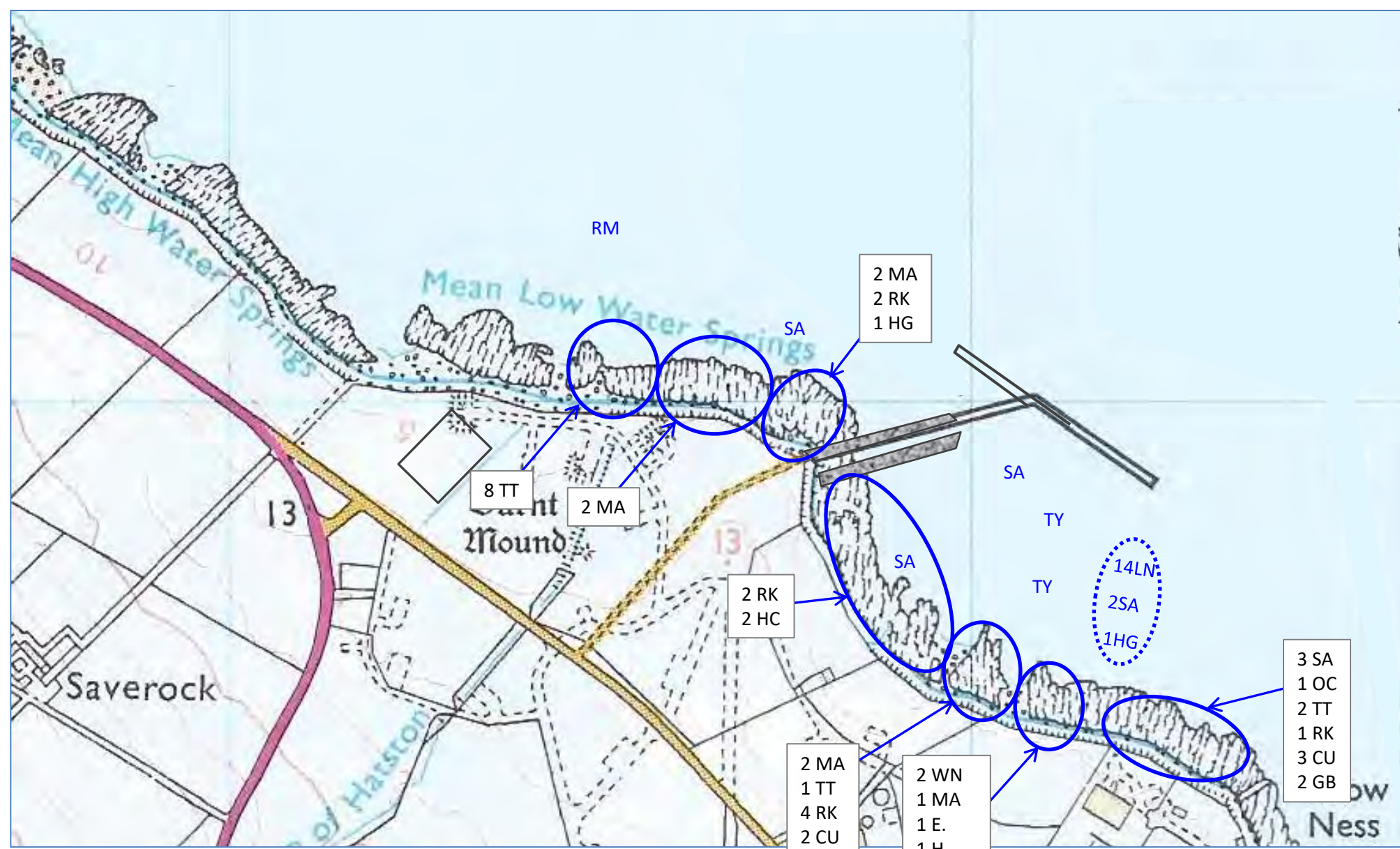
1 BH  
1 GB

24LN  
6F.  
15BH  
4HG

160 BH  
20 HG  
1 GB



Hatston Pier  
17<sup>th</sup> Dec 2021 (15:15 – 15:45)



RM

2 MA  
2 RK  
1 HG

SA

8 TT

2 MA

2 RK  
2 HC

SA

TY

TY

14LN  
2SA  
1HG

3 SA  
1 OC  
2 TT  
1 RK  
3 CU  
2 GB

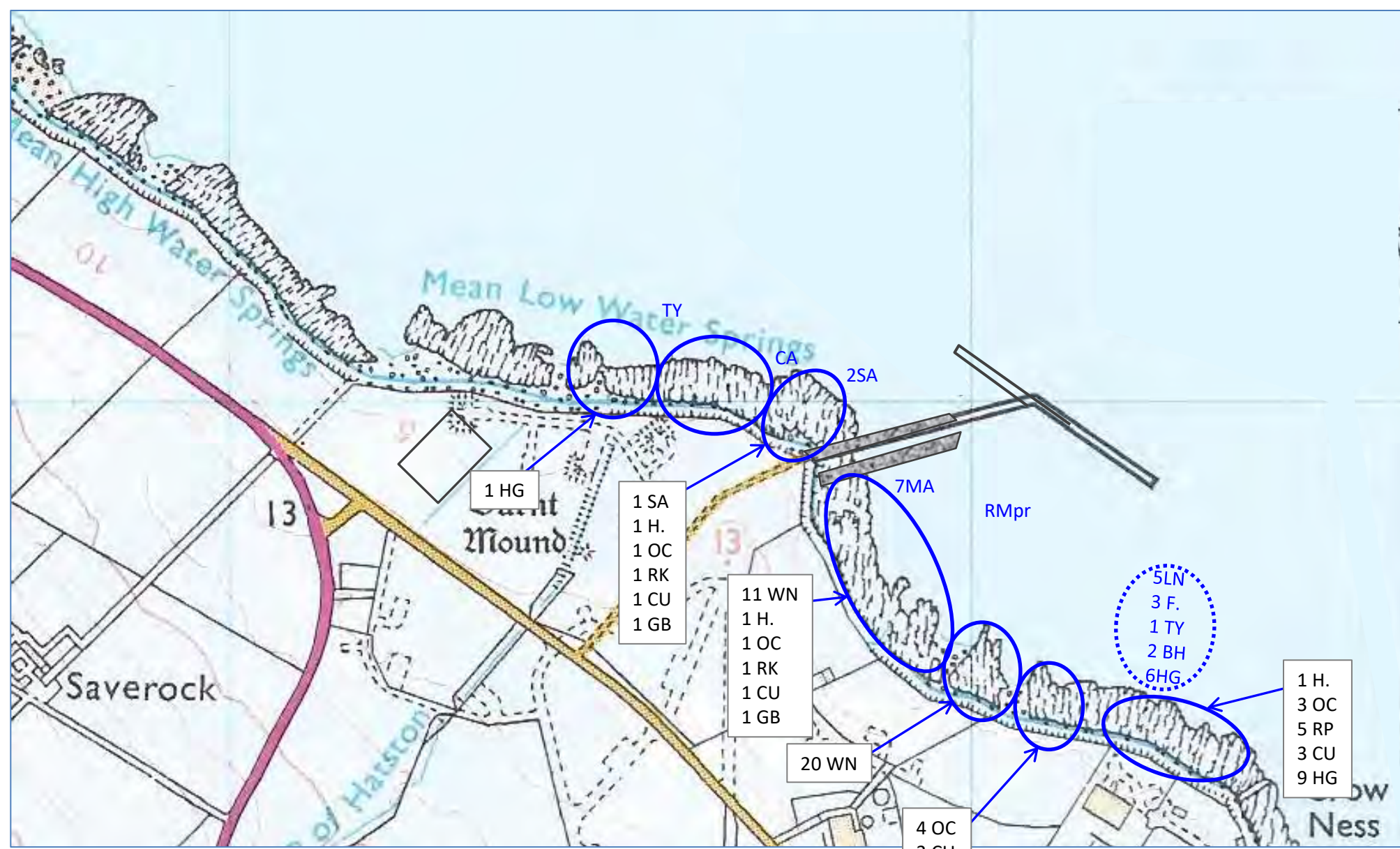
2 MA  
1 TT  
4 RK  
2 CU

2 WN  
1 MA  
1 E.  
1 H.  
13 L.  
1 TT  
2 RK  
156 CU  
1 HG

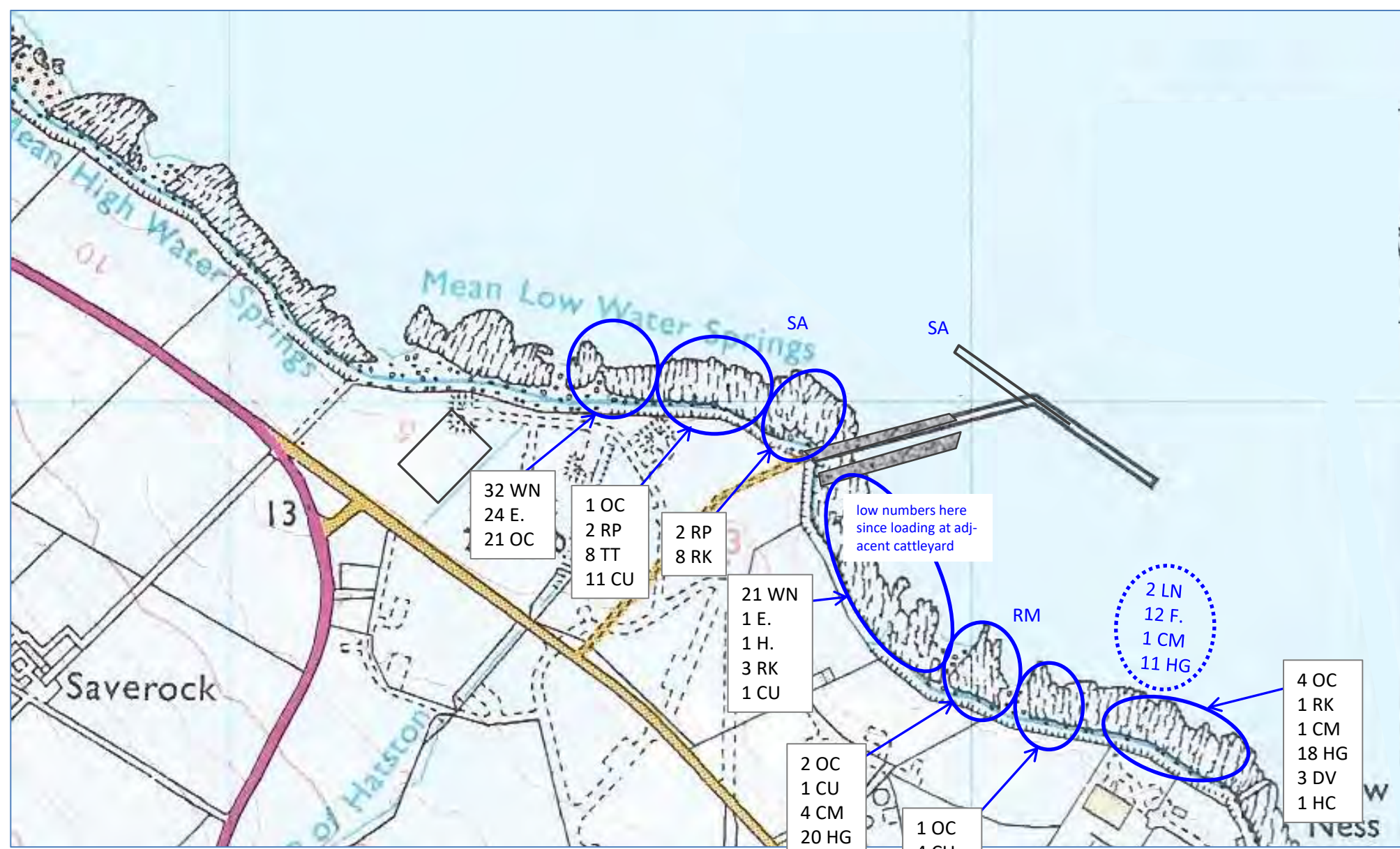
Hatston Pier  
26<sup>th</sup> Jan 2022 (10:00 – 10:30)







Hatston Pier  
 19<sup>th</sup> Feb 2022 (16:40 – 17:10)



32 WN  
24 E.  
21 OC

1 OC  
2 RP  
8 TT  
11 CU

2 RP  
8 RK

21 WN  
1 E.  
1 H.  
3 RK  
1 CU

2 OC  
1 CU  
4 CM  
20 HG

1 OC  
4 CU  
1 BH  
24 HG  
1 GB

low numbers here  
since loading at adjacent  
cattleyard

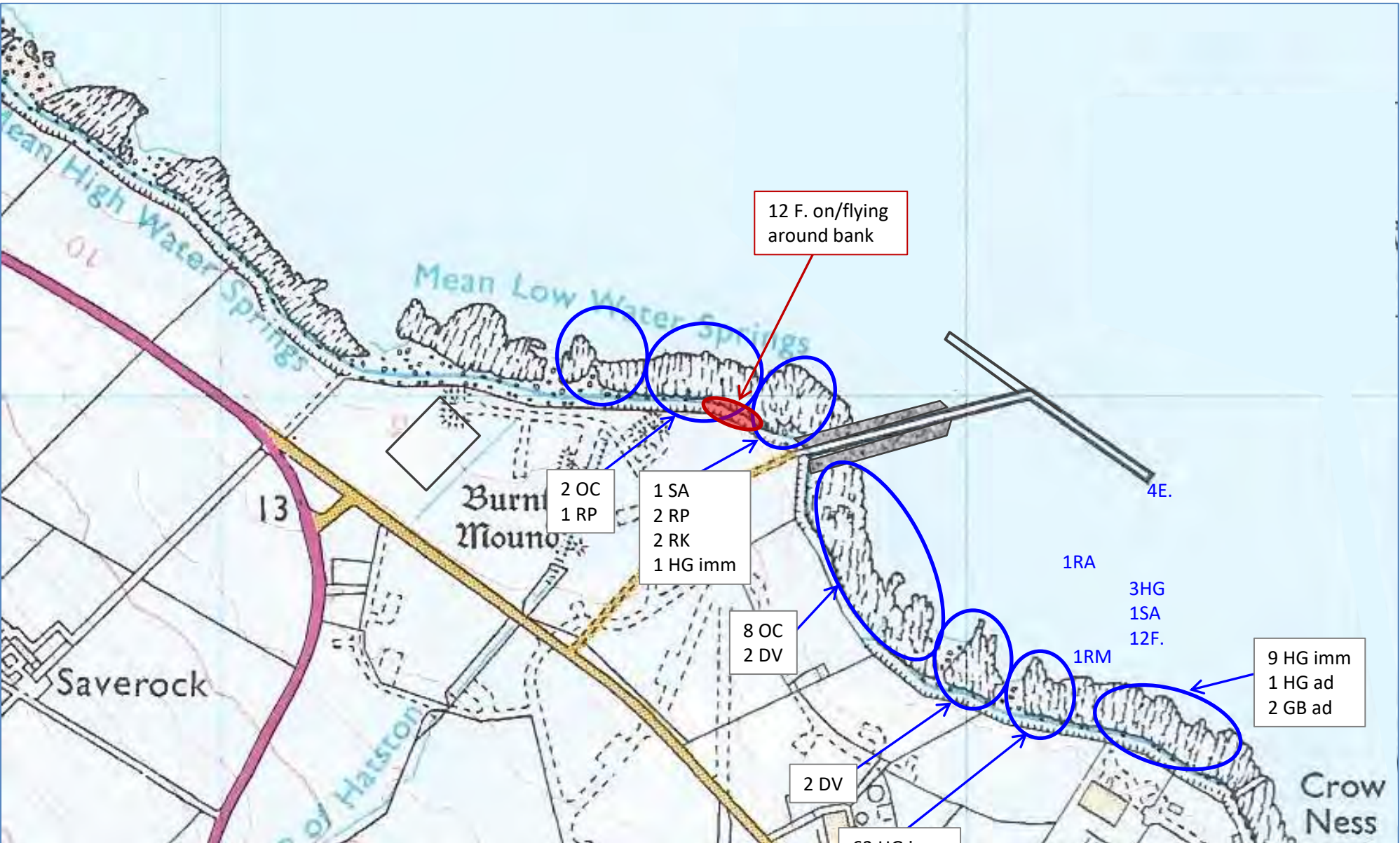
2 LN  
12 F.  
1 CM  
11 HG

4 OC  
1 RK  
1 CM  
18 HG  
3 DV  
1 HC



Hatston Pier  
14<sup>th</sup> Mar 2022 (15:05 – 15:35)





12 F. on/flying  
around bank

2 OC  
1 RP

1 SA  
2 RP  
2 RK  
1 HG imm

8 OC  
2 DV

1RA

3HG  
1SA  
12F.

1RM

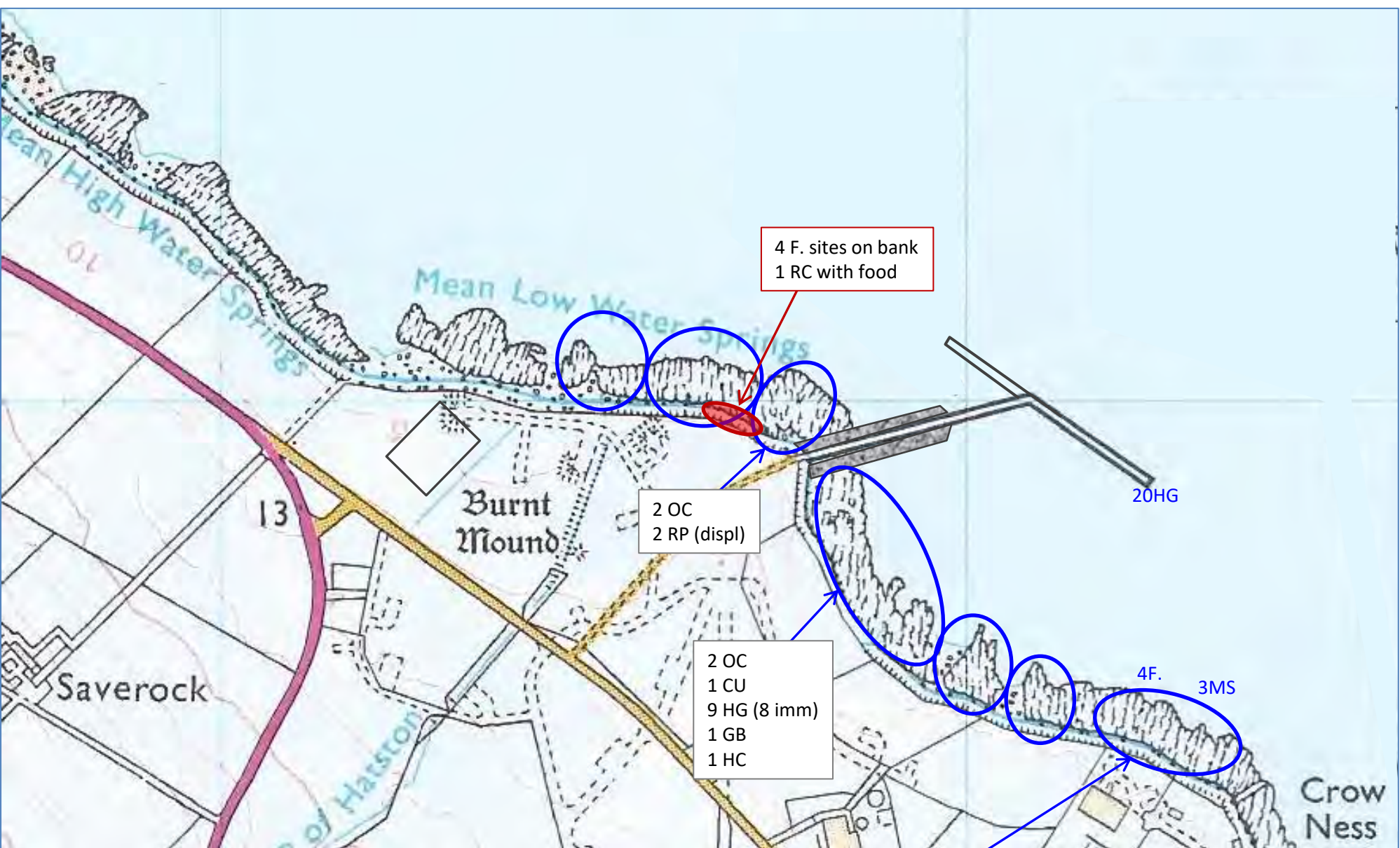
9 HG imm  
1 HG ad  
2 GB ad

2 DV

63 HG imm  
10 HG ad  
1 GB imm  
1 DV

Hatston Pier  
23<sup>rd</sup> April 2022 (10:30 – 10:55)





4 F. sites on bank  
1 RC with food

2 OC  
2 RP (displ)

2 OC  
1 CU  
9 HG (8 imm)  
1 GB  
1 HC

20HG

4F.

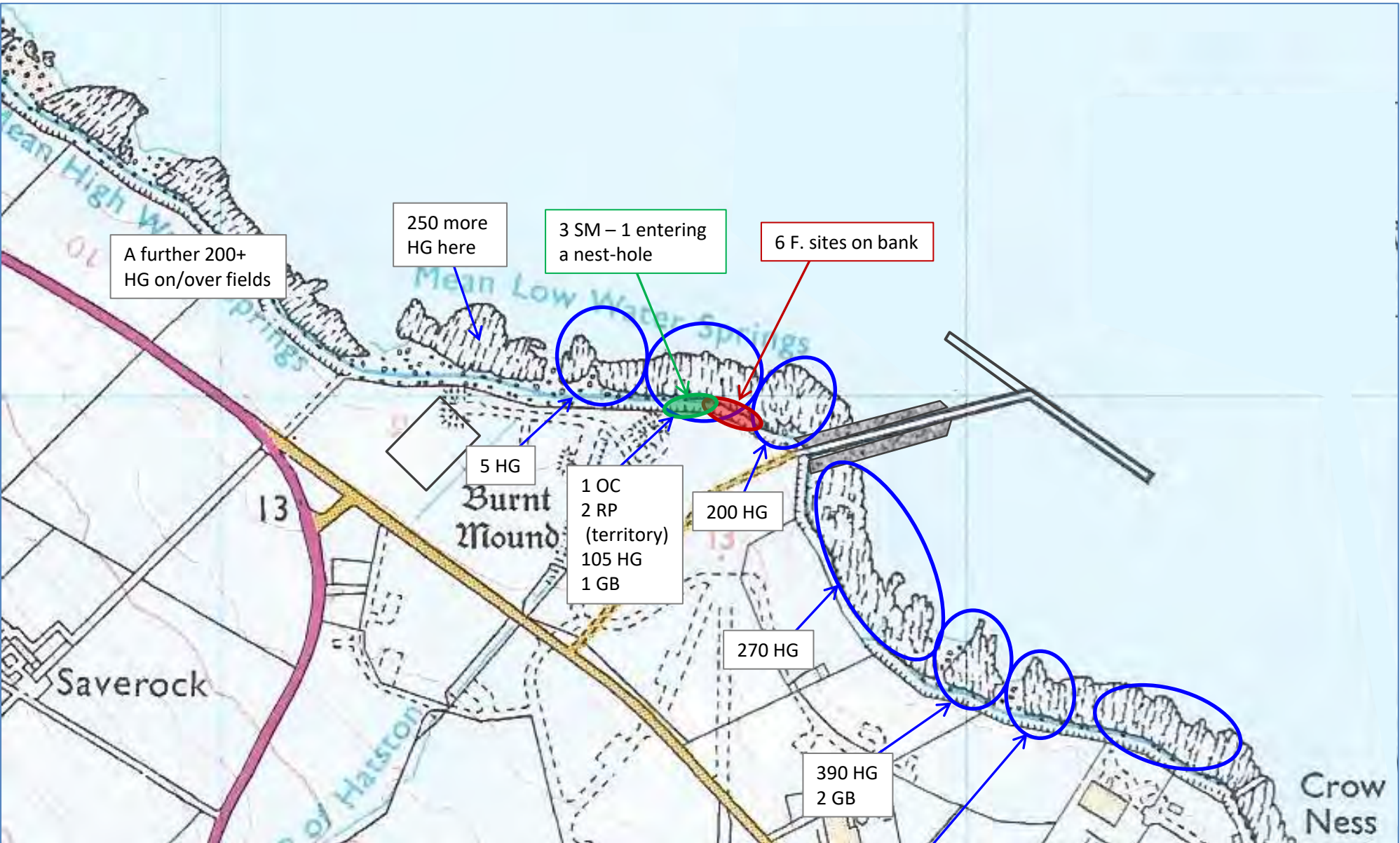
3MS

49 HG (45 imm)  
1 CM imm

Hatston Pier  
21<sup>st</sup> May 2022 (08:55 – 09:20)







A further 200+ HG on/over fields

250 more HG here

3 SM – 1 entering a nest-hole

6 F. sites on bank

5 HG

1 OC  
2 RP (territory)  
105 HG  
1 GB

200 HG

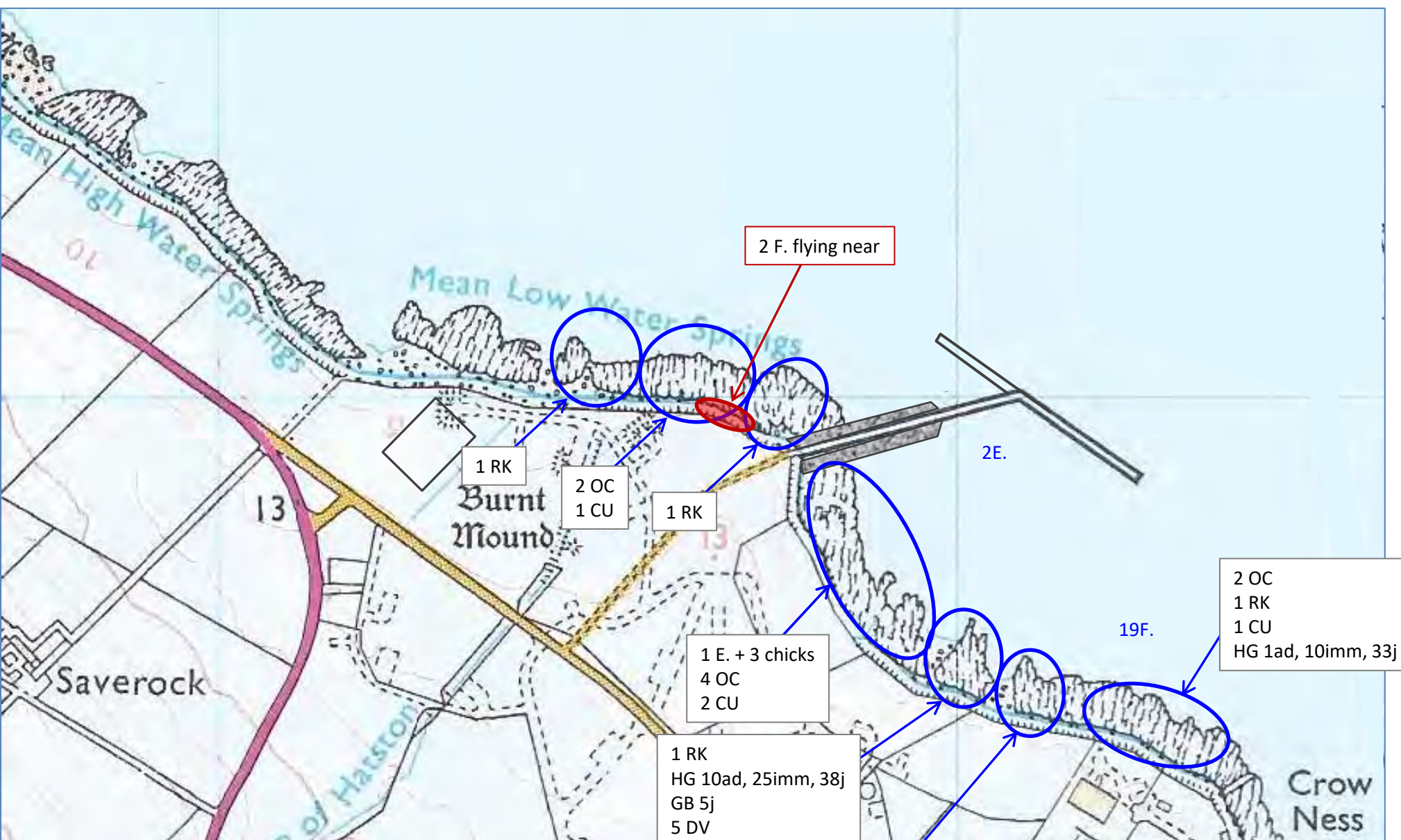
270 HG

390 HG  
2 GB

10 HG

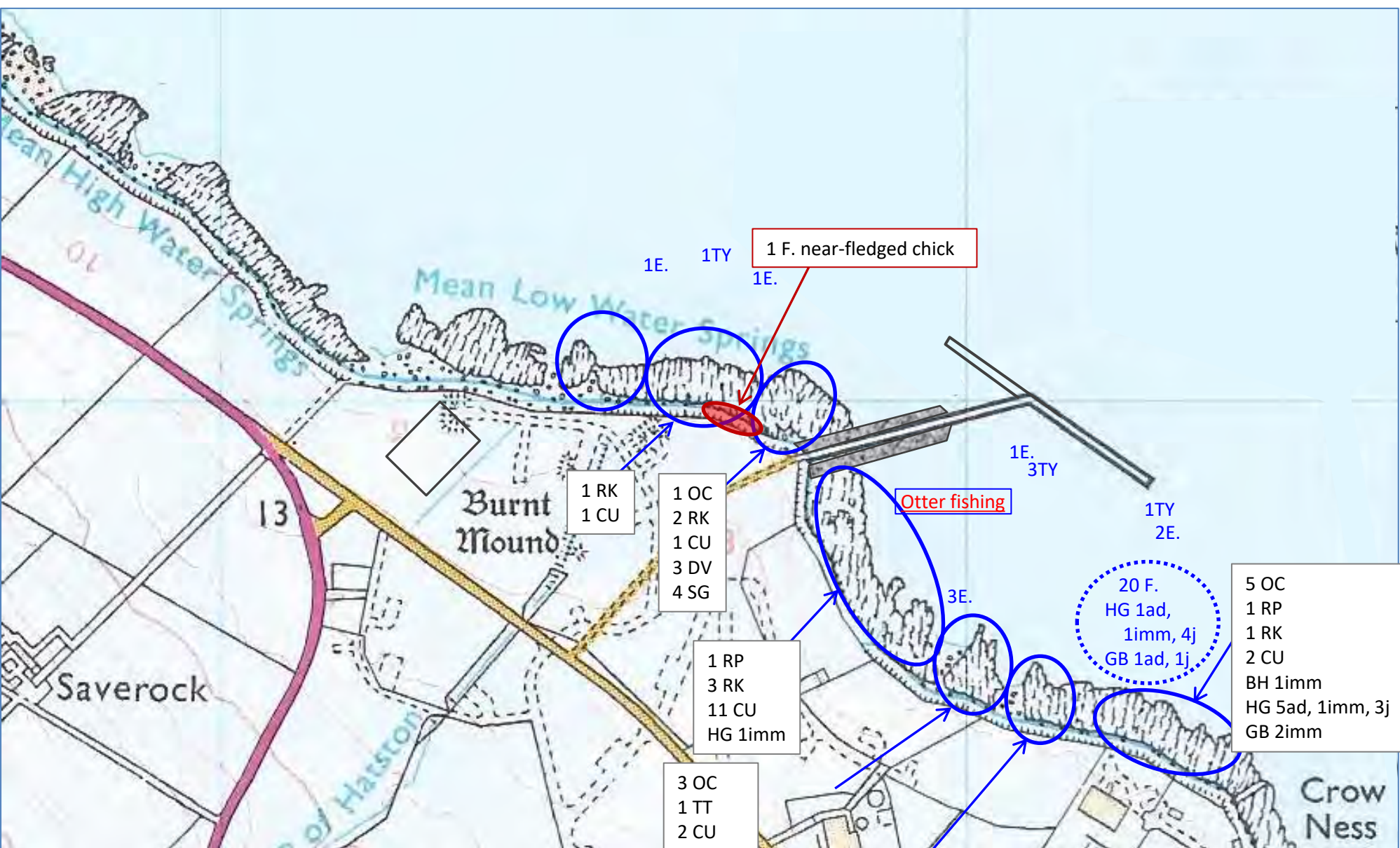


Hatston Pier  
26<sup>th</sup> June 2022 (15:35-16:10)



Hatston Pier  
 28<sup>th</sup> July 2022 (17:30-18:00)





3 OC  
 1 TT  
 2 CU  
 CM 1ad  
 HG 1ad  
 7 DV

2 CU  
 HG 1j

1 RP  
 3 RK  
 11 CU  
 HG 1imm

1 OC  
 2 RK  
 1 CU  
 3 DV  
 4 SG

1 RK  
 1 CU

20 F.  
 HG 1ad,  
 1imm, 4j  
 GB 1ad, 1j

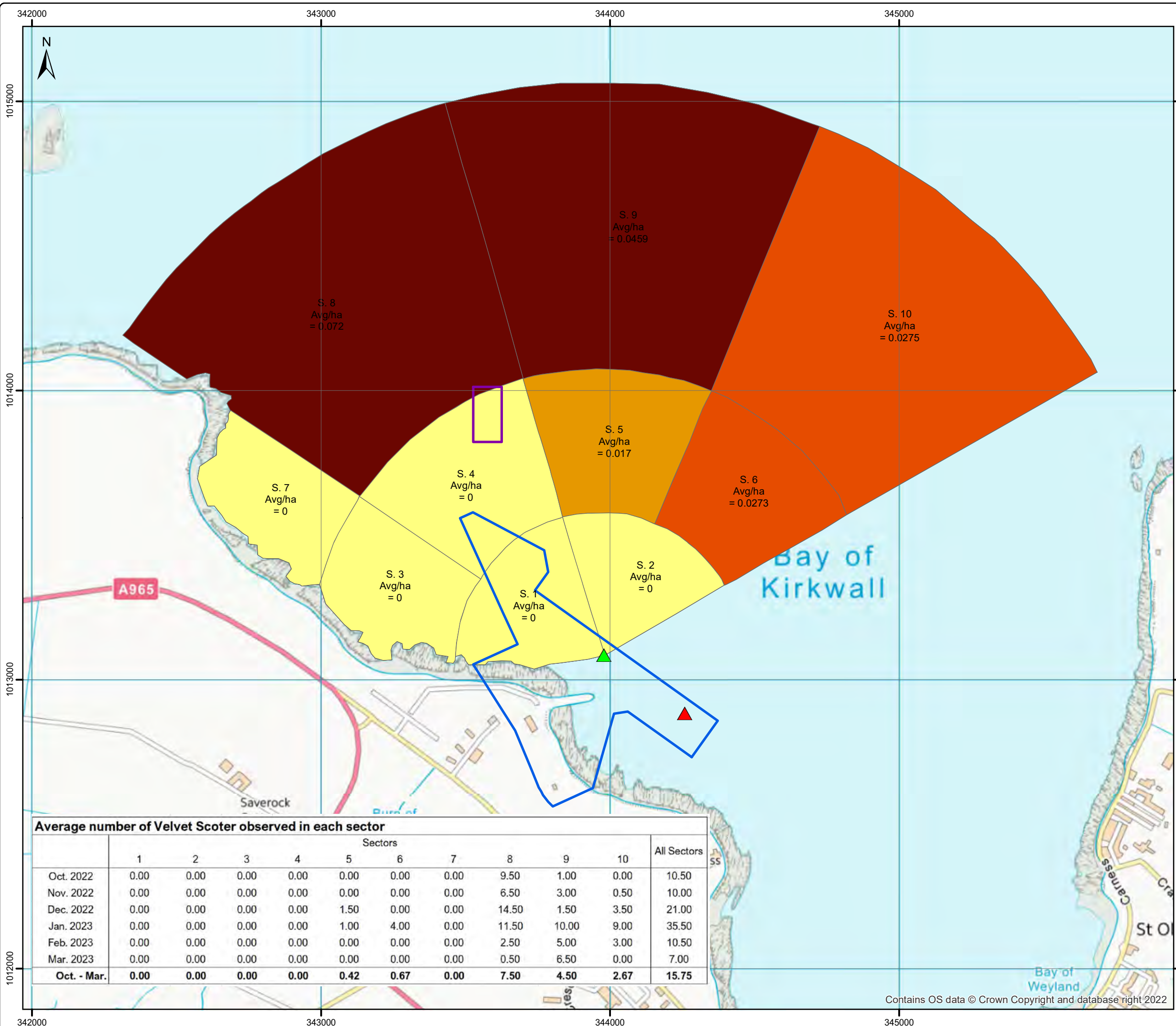
5 OC  
 1 RP  
 1 RK  
 2 CU  
 BH 1imm  
 HG 5ad, 1imm, 3j  
 GB 2imm

Hatston Pier  
 27<sup>th</sup> August 2022 (16:35 – 17:10)

Otter fishing

1 F. near-fledged chick

# **C HEAT MAPS FOR SELECTED SPECIES**



**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors
- Fish Cage

Average Bird Count Density per ha

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map

**Client**  
Orkney Islands Council Harbour Authority

**Project**  
Orkney Haston Pier

**Title**  
Velvet Scoter Observations  
Northern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS100	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
1:12,500 @A3

Rev	Date	Amendment	Initials
-	-	-	-

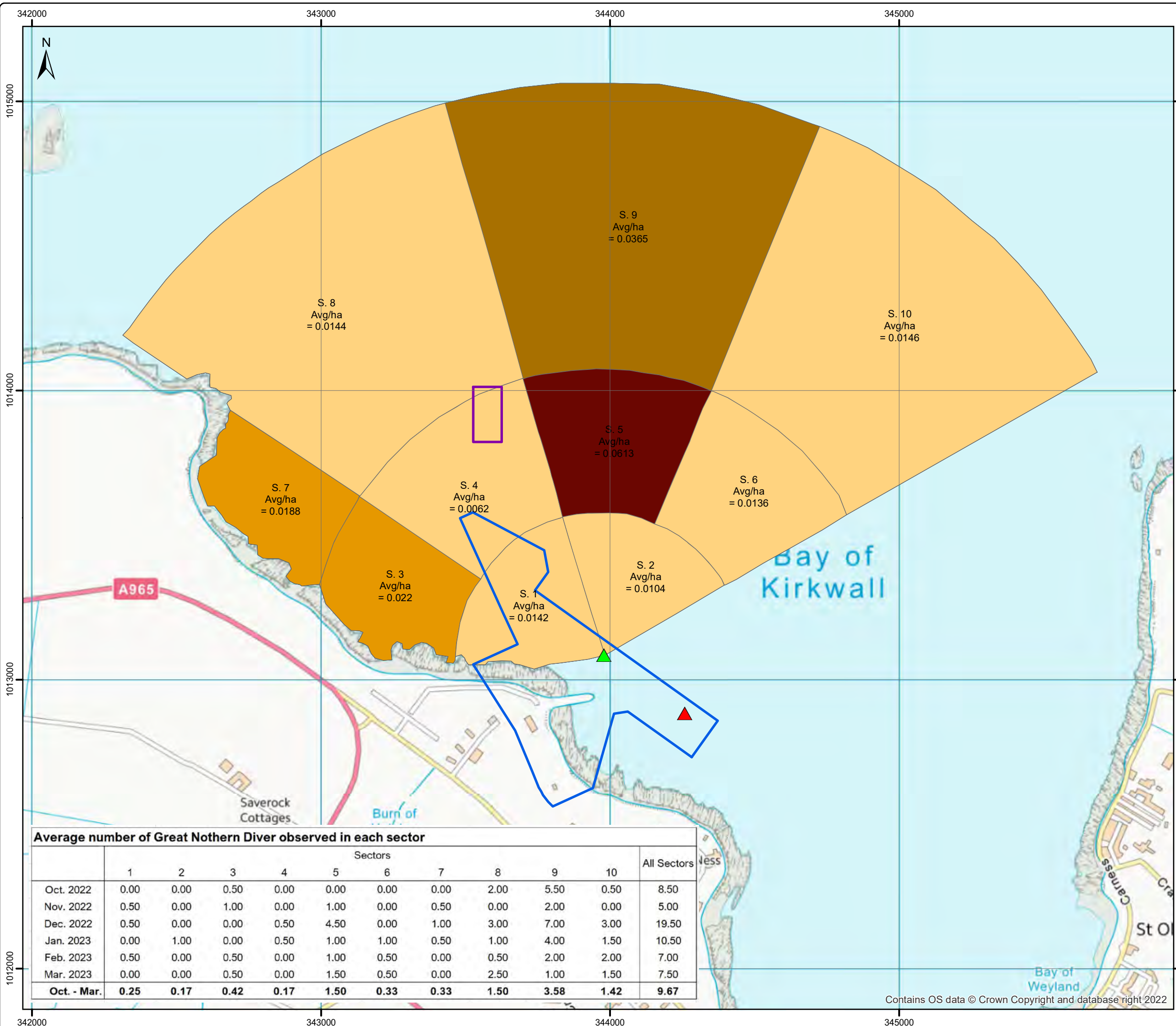
**Average number of Velvet Scoter observed in each sector**

	Sectors										All Sectors
	1	2	3	4	5	6	7	8	9	10	
Oct. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.50	1.00	0.00	10.50
Nov. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.50	3.00	0.50	10.00
Dec. 2022	0.00	0.00	0.00	0.00	1.50	0.00	0.00	14.50	1.50	3.50	21.00
Jan. 2023	0.00	0.00	0.00	0.00	1.00	4.00	0.00	11.50	10.00	9.00	35.50
Feb. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	5.00	3.00	10.50
Mar. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	6.50	0.00	7.00
<b>Oct. - Mar.</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.42</b>	<b>0.67</b>	<b>0.00</b>	<b>7.50</b>	<b>4.50</b>	<b>2.67</b>	<b>15.75</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors
- Fish Cage

Average Bird Count Density per ha

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map

**Client**  
Orkney Islands Council Harbour Authority

**Project**  
Orkney Haston Pier

**Title**  
Great Northern Diver Observations  
Northern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS088	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
1:12,500 @A3

Rev	Date	Amendment	Initials
-	-	-	-

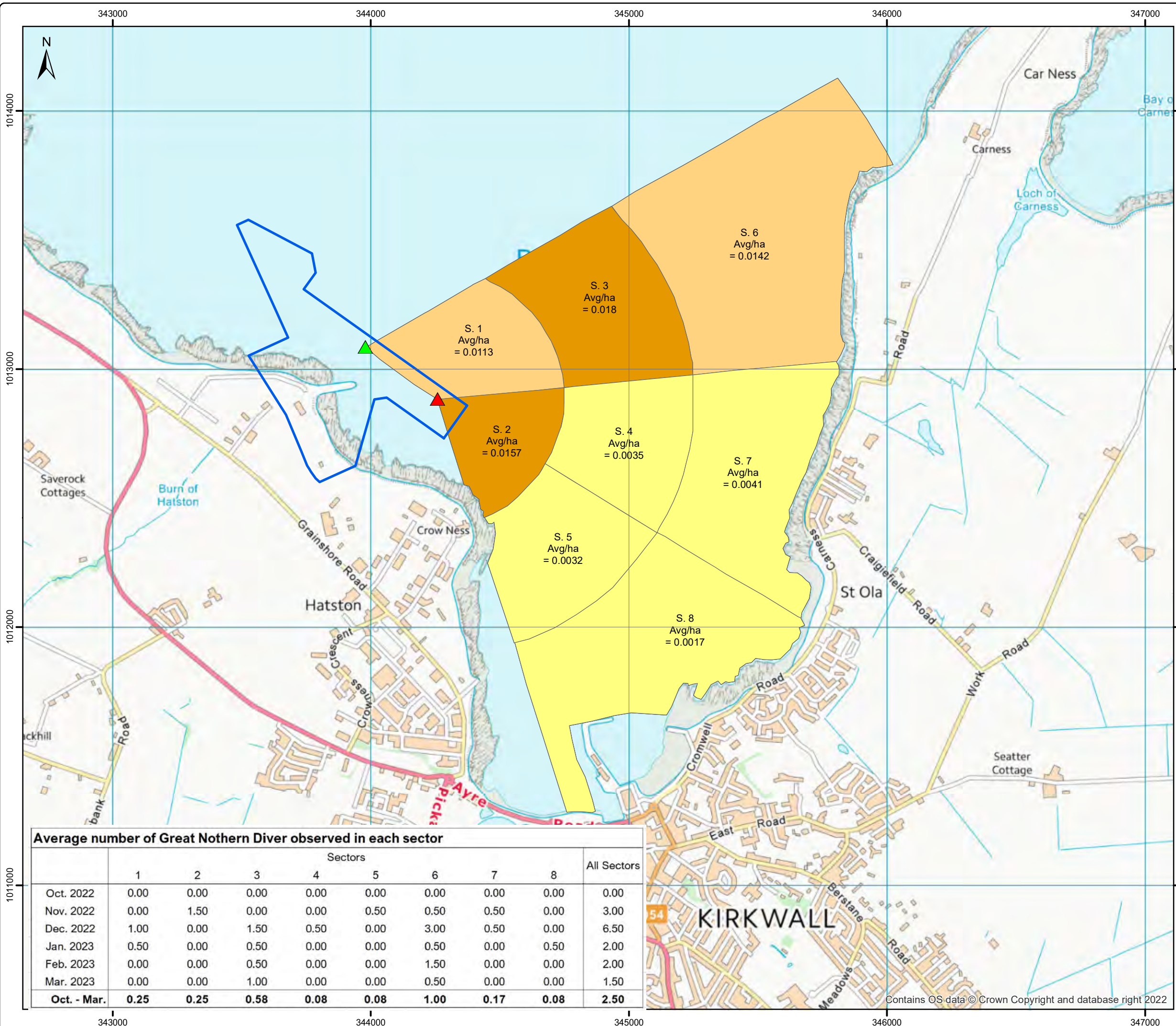
**Average number of Great Nothern Diver observed in each sector**

	Sectors										All Sectors
	1	2	3	4	5	6	7	8	9	10	
Oct. 2022	0.00	0.00	0.50	0.00	0.00	0.00	0.00	2.00	5.50	0.50	8.50
Nov. 2022	0.50	0.00	1.00	0.00	1.00	0.00	0.50	0.00	2.00	0.00	5.00
Dec. 2022	0.50	0.00	0.00	0.50	4.50	0.00	1.00	3.00	7.00	3.00	19.50
Jan. 2023	0.00	1.00	0.00	0.50	1.00	1.00	0.50	1.00	4.00	1.50	10.50
Feb. 2023	0.50	0.00	0.50	0.00	1.00	0.50	0.00	0.50	2.00	2.00	7.00
Mar. 2023	0.00	0.00	0.50	0.00	1.50	0.50	0.00	2.50	1.00	1.50	7.50
<b>Oct. - Mar.</b>	<b>0.25</b>	<b>0.17</b>	<b>0.42</b>	<b>0.17</b>	<b>1.50</b>	<b>0.33</b>	<b>0.33</b>	<b>1.50</b>	<b>3.58</b>	<b>1.42</b>	<b>9.67</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors

**Average Bird Count Density per ha**

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map  
**Client**  
 Orkney Islands Council Harbour Authority

**Project**  
 Orkney Hatston Pier

**Title**  
 Great Northern Diver Observations  
 Southern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS089	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:14,000 @A3

Rev	Date	Amendment	Initials
-	-	-	-

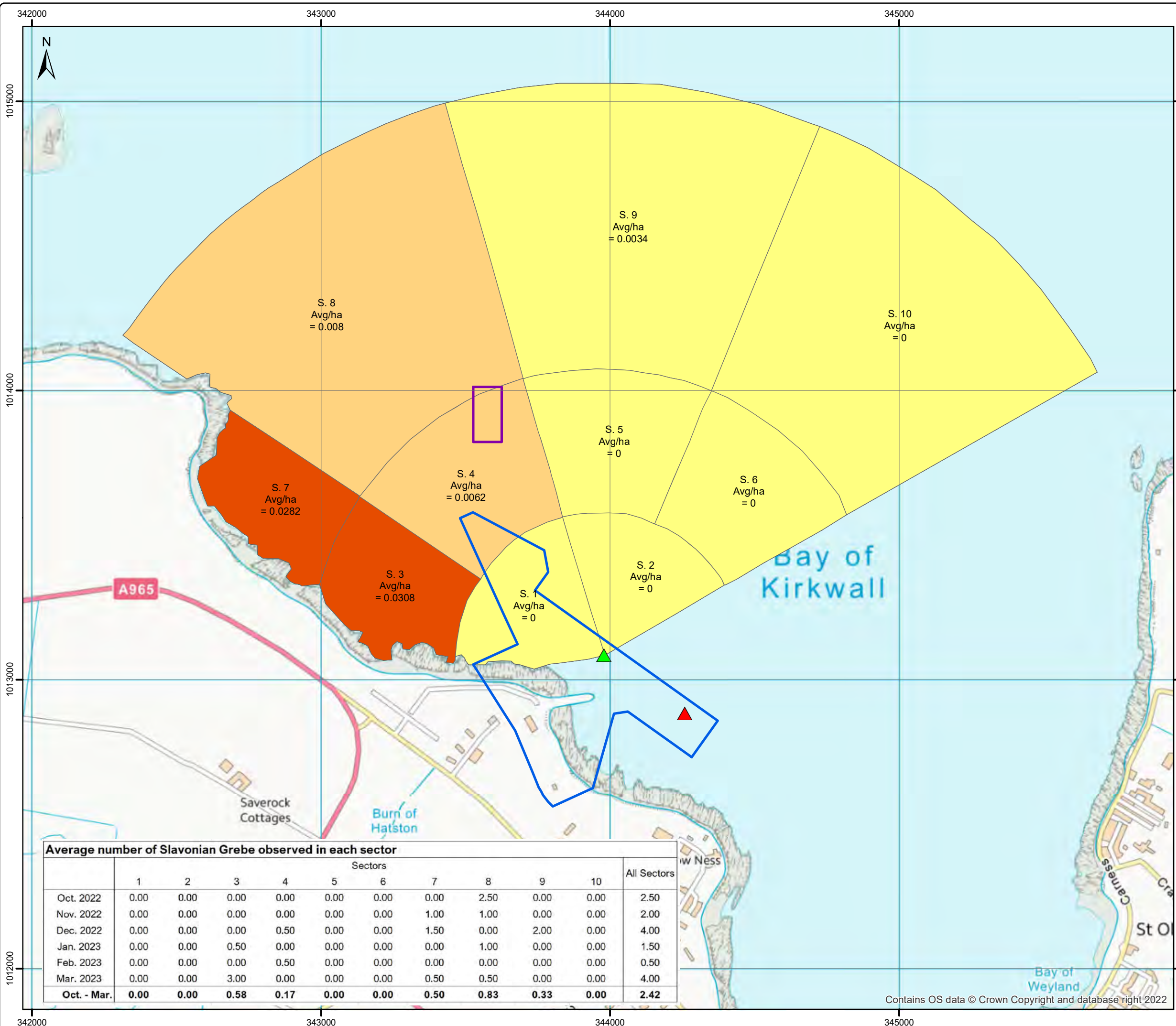
**Average number of Great Northern Diver observed in each sector**

	Sectors								All Sectors
	1	2	3	4	5	6	7	8	
Oct. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov. 2022	0.00	1.50	0.00	0.00	0.50	0.50	0.50	0.00	3.00
Dec. 2022	1.00	0.00	1.50	0.50	0.00	3.00	0.50	0.00	6.50
Jan. 2023	0.50	0.00	0.50	0.00	0.00	0.50	0.00	0.50	2.00
Feb. 2023	0.00	0.00	0.50	0.00	0.00	1.50	0.00	0.00	2.00
Mar. 2023	0.00	0.00	1.00	0.00	0.00	0.50	0.00	0.00	1.50
<b>Oct. - Mar.</b>	<b>0.25</b>	<b>0.25</b>	<b>0.58</b>	<b>0.08</b>	<b>0.08</b>	<b>1.00</b>	<b>0.17</b>	<b>0.08</b>	<b>2.50</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors
- Fish Cage

Average Bird Count Density per ha

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map

**Client**  
Orkney Islands Council Harbour Authority

**Project**  
Orkney Haston Pier

**Title**  
Slavonian Grebe Observations  
Northern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS092	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

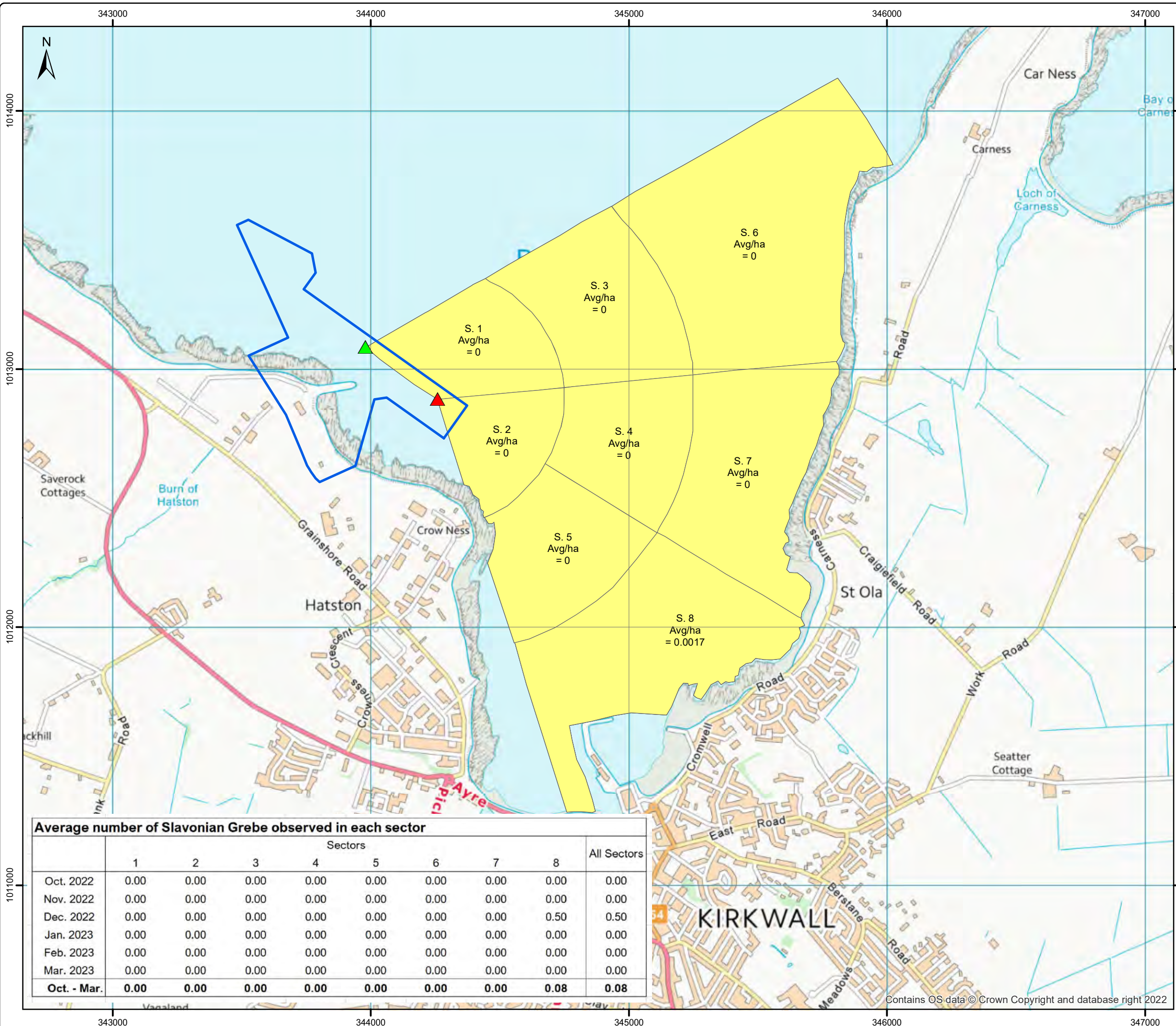
**Scale**  
1:12,500 @A3

0 62.5 125 250 375 Metres

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors

**Average Bird Count Density per ha**

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map  
**Client**  
 Orkney Islands Council Harbour Authority

**Project**  
 Orkney Hatston Pier

**Title**  
 Slavonian Grebe Observations  
 Southern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS093	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:14,000 @A3

Rev	Date	Amendment	Initials
-	-	-	-

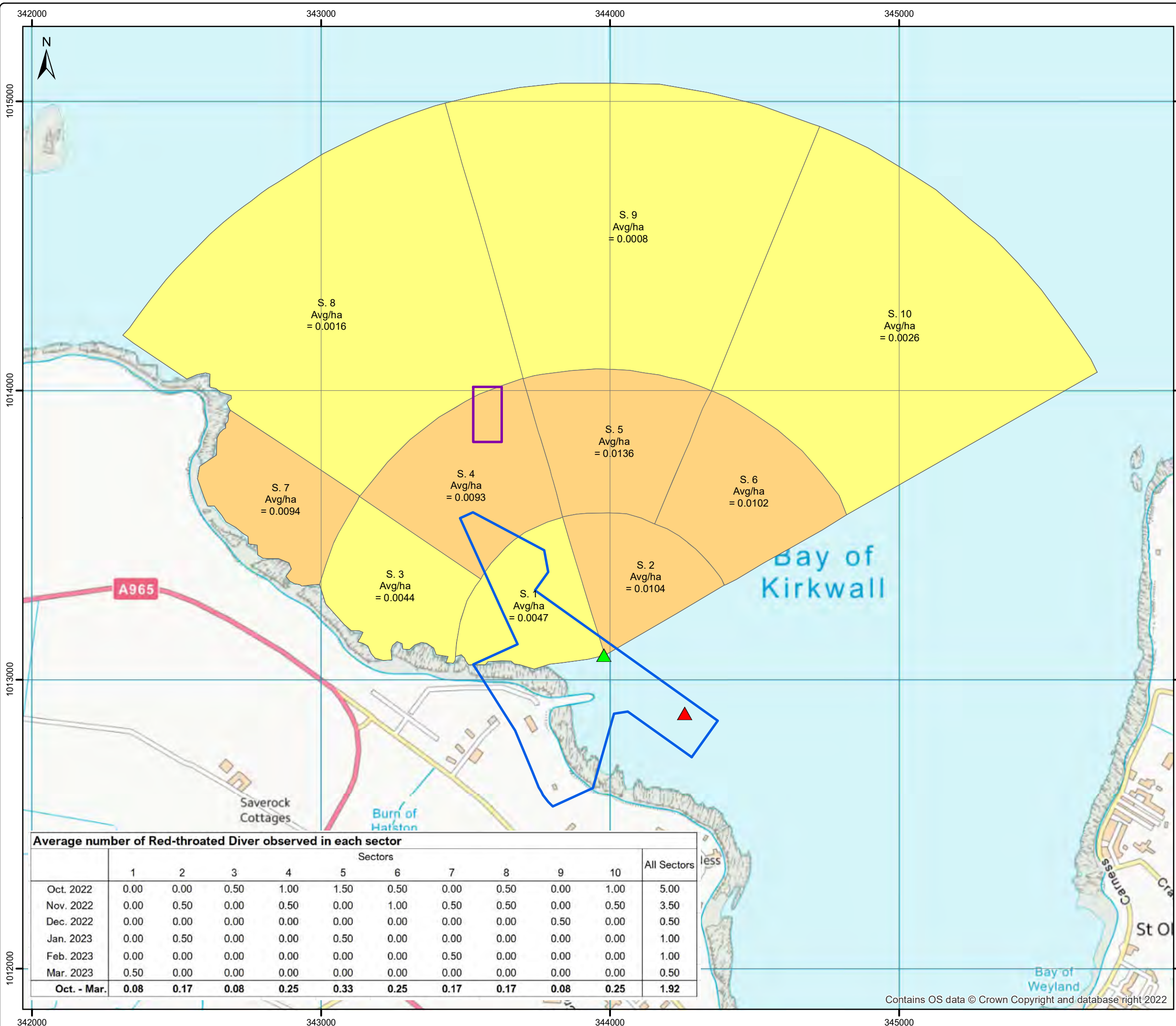
**Average number of Slavonian Grebe observed in each sector**

	Sectors								All Sectors
	1	2	3	4	5	6	7	8	
Oct. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.50
Jan. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Feb. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Oct. - Mar.</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.08</b>	<b>0.08</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors
- Fish Cage

Average Bird Count Density per ha

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

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**Client**  
 Orkney Islands Council Harbour Authority

**Project**  
 Orkney Haston Pier

**Title**  
 Red-throated Diver Observations  
 Northern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS094	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:12,500 @A3

Rev	Date	Amendment	Initials
-	-	-	-

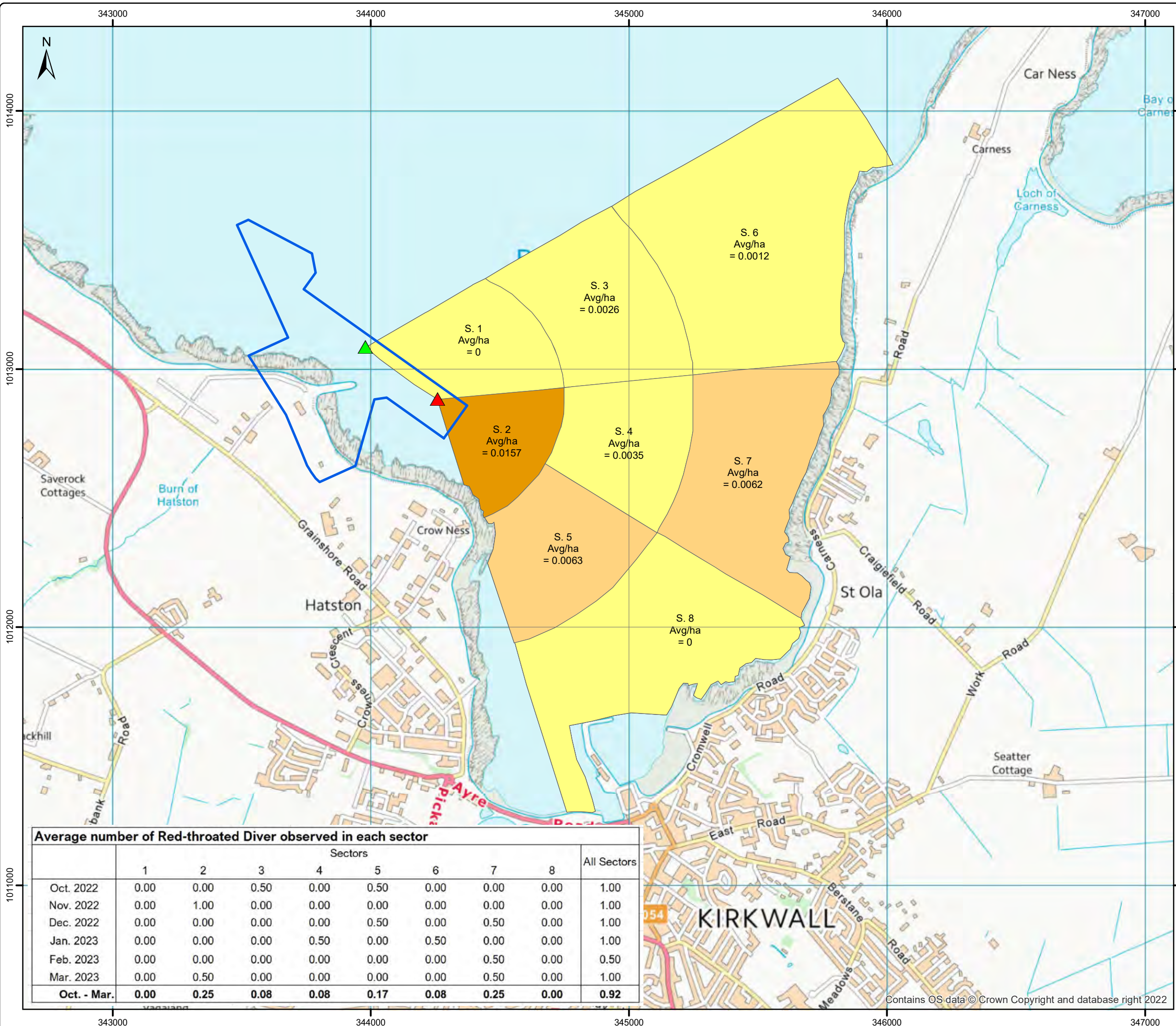
**Average number of Red-throated Diver observed in each sector**

	Sectors										All Sectors
	1	2	3	4	5	6	7	8	9	10	
Oct. 2022	0.00	0.00	0.50	1.00	1.50	0.50	0.00	0.50	0.00	1.00	5.00
Nov. 2022	0.00	0.50	0.00	0.50	0.00	1.00	0.50	0.50	0.00	0.50	3.50
Dec. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.50
Jan. 2023	0.00	0.50	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	1.00
Feb. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	1.00
Mar. 2023	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
<b>Oct. - Mar.</b>	<b>0.08</b>	<b>0.17</b>	<b>0.08</b>	<b>0.25</b>	<b>0.33</b>	<b>0.25</b>	<b>0.17</b>	<b>0.17</b>	<b>0.08</b>	<b>0.25</b>	<b>1.92</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors

**Average Bird Count Density per ha**

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map

**Client**  
Orkney Islands Council Harbour Authority

**Project**  
Orkney Hatston Pier

**Title**  
Red-throated Diver Observations  
Southern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS095	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
1:14,000 @A3

Rev	Date	Amendment	Initials
-	-	-	-

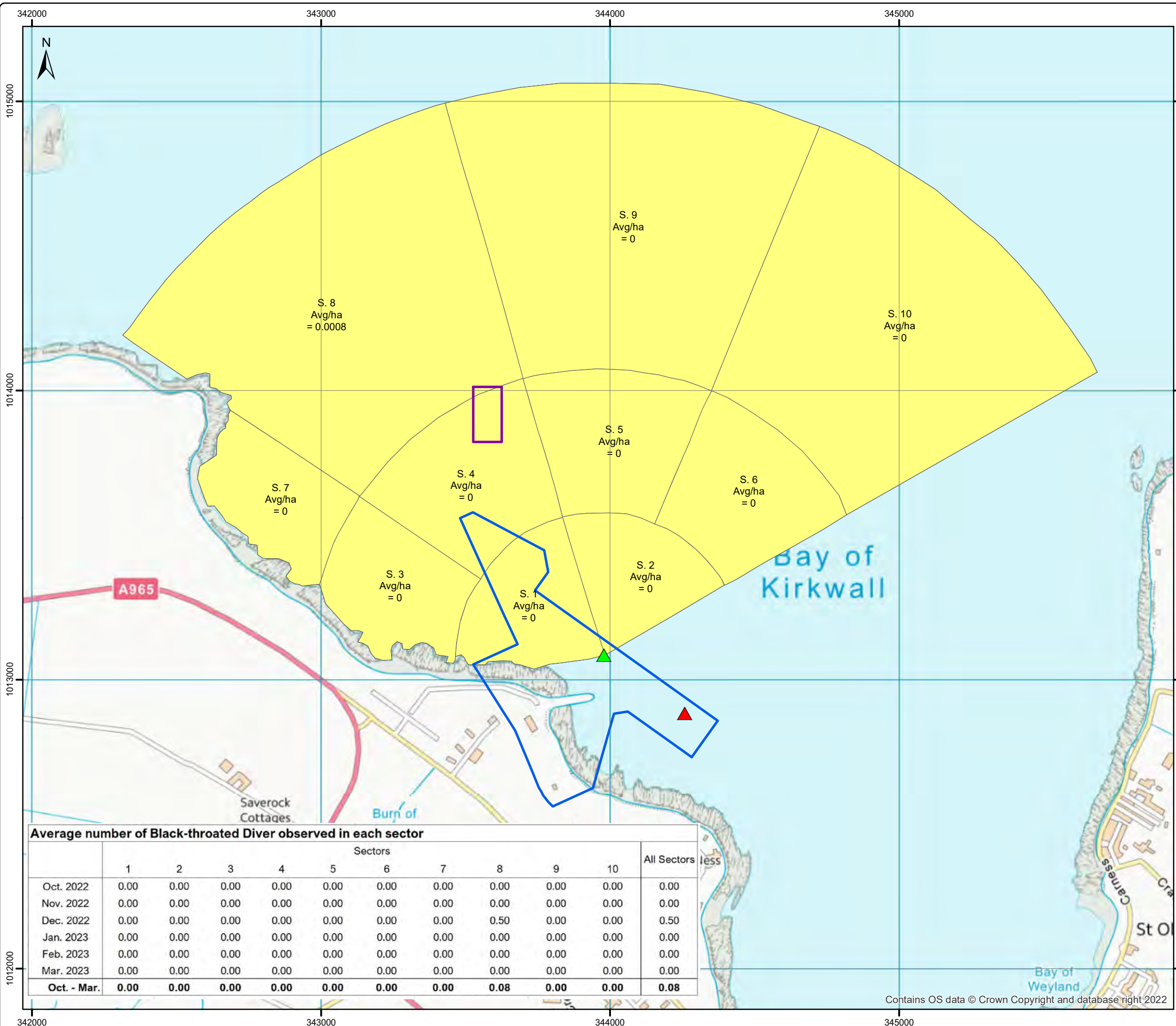
**Average number of Red-throated Diver observed in each sector**

	Sectors								All Sectors
	1	2	3	4	5	6	7	8	
Oct. 2022	0.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00	1.00
Nov. 2022	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Dec. 2022	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.00	1.00
Jan. 2023	0.00	0.00	0.00	0.50	0.00	0.50	0.00	0.00	1.00
Feb. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.50
Mar. 2023	0.00	0.50	0.00	0.00	0.00	0.00	0.50	0.00	1.00
<b>Oct. - Mar.</b>	<b>0.00</b>	<b>0.25</b>	<b>0.08</b>	<b>0.08</b>	<b>0.17</b>	<b>0.08</b>	<b>0.25</b>	<b>0.00</b>	<b>0.92</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors
- Fish Cage

Average Bird Count Density per ha

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map  
**Client**  
 Orkney Islands Council Harbour Authority

**Project**  
 Orkney Haston Pier

**Title**  
 Black-throated Diver Observations  
 Northern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS090	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:12,500 @A3

Rev	Date	Amendment	Initials
-	-	-	-

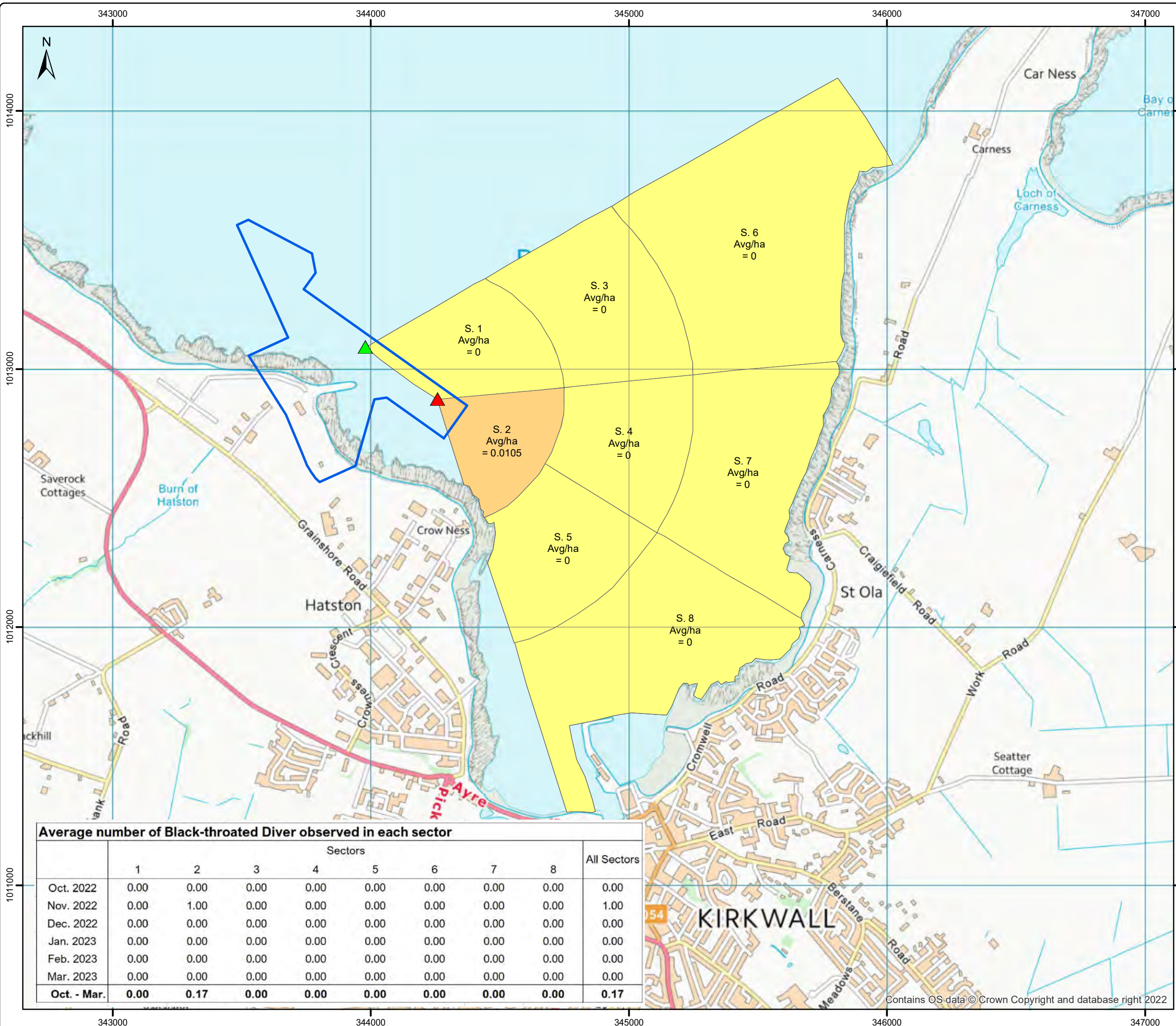
**Average number of Black-throated Diver observed in each sector**

	Sectors										All Sectors
	1	2	3	4	5	6	7	8	9	10	
Oct. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.50
Jan. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Feb. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Oct. - Mar.</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.08</b>	<b>0.00</b>	<b>0.00</b>	<b>0.08</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors

**Average Bird Count Density per ha**

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map  
**Client**  
 Orkney Islands Council Harbour Authority

**Project**  
 Orkney Hatston Pier

**Title**  
 Black-throated Diver Observations  
 Southern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS091	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:14,000 @A3

Rev	Date	Amendment	Initials
-	-	-	-

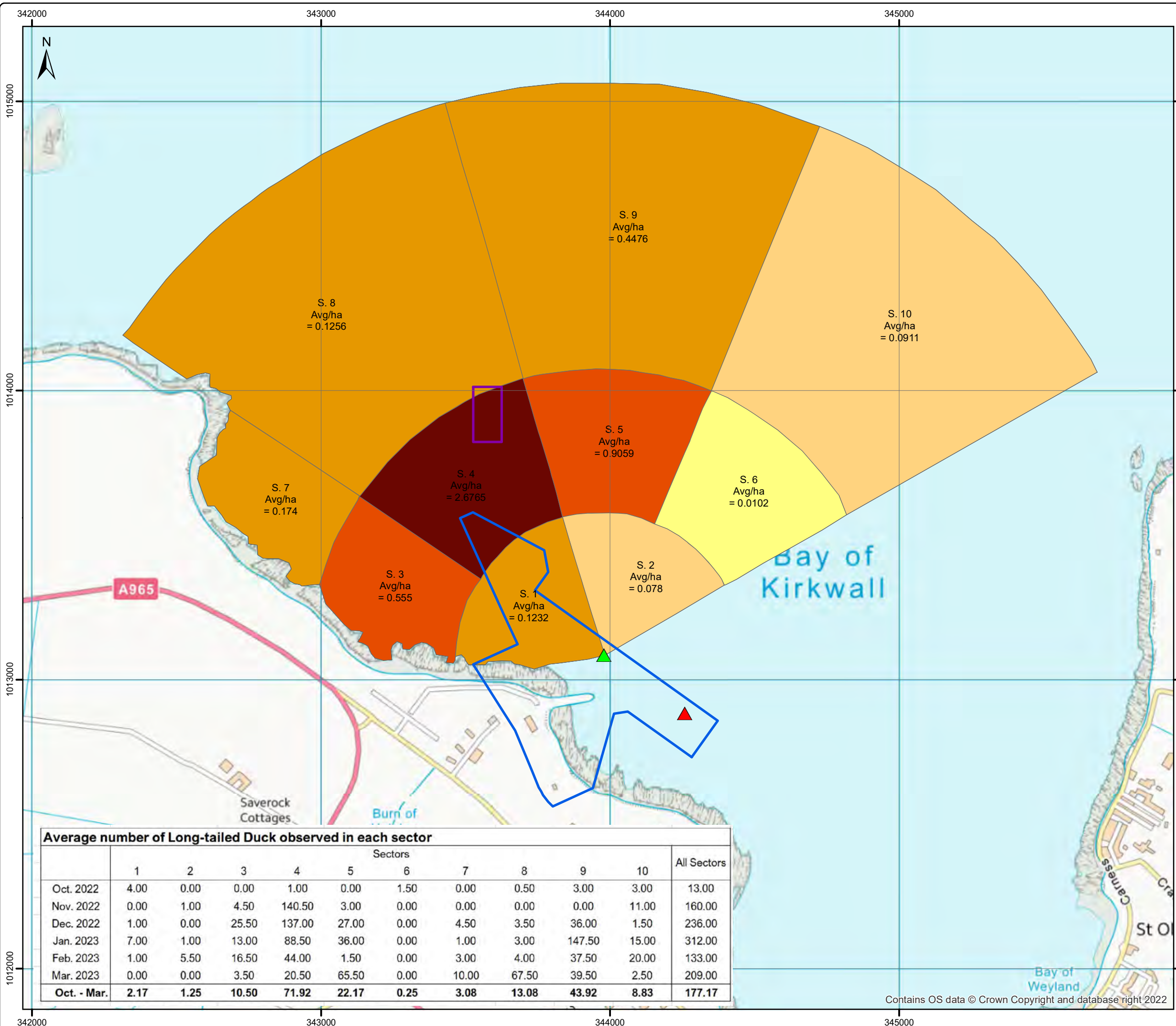
**Average number of Black-throated Diver observed in each sector**

	Sectors								All Sectors
	1	2	3	4	5	6	7	8	
Oct. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov. 2022	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Dec. 2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Feb. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar. 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Oct. - Mar.</b>	<b>0.00</b>	<b>0.17</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.17</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors
- Fish Cage

Average Bird Count Density per ha

- <0.05
- 0.05 - 0.1
- 0.1 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- >1.5

Do not scale this map

**Client**  
Orkney Islands Council Harbour Authority

**Project**  
Orkney Haston Pier

**Title**  
Long-Tailed Duck Observations  
Northern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS096	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
1:12,500 @A3

Rev	Date	Amendment	Initials
-	-	-	-

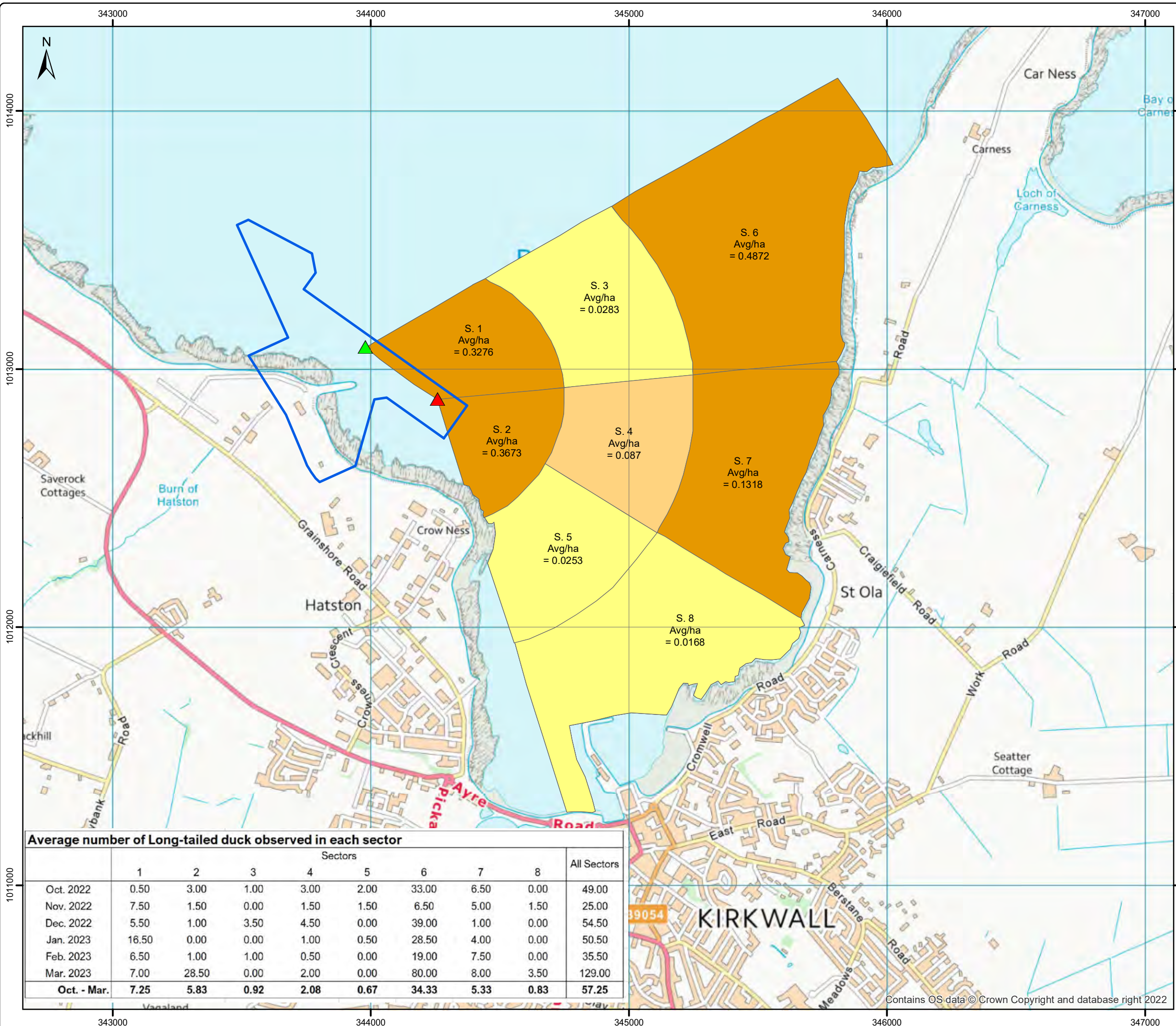
**Average number of Long-tailed Duck observed in each sector**

	Sectors										All Sectors
	1	2	3	4	5	6	7	8	9	10	
Oct. 2022	4.00	0.00	0.00	1.00	0.00	1.50	0.00	0.50	3.00	3.00	13.00
Nov. 2022	0.00	1.00	4.50	140.50	3.00	0.00	0.00	0.00	0.00	11.00	160.00
Dec. 2022	1.00	0.00	25.50	137.00	27.00	0.00	4.50	3.50	36.00	1.50	236.00
Jan. 2023	7.00	1.00	13.00	88.50	36.00	0.00	1.00	3.00	147.50	15.00	312.00
Feb. 2023	1.00	5.50	16.50	44.00	1.50	0.00	3.00	4.00	37.50	20.00	133.00
Mar. 2023	0.00	0.00	3.50	20.50	65.50	0.00	10.00	67.50	39.50	2.50	209.00
<b>Oct. - Mar.</b>	<b>2.17</b>	<b>1.25</b>	<b>10.50</b>	<b>71.92</b>	<b>22.17</b>	<b>0.25</b>	<b>3.08</b>	<b>13.08</b>	<b>43.92</b>	<b>8.83</b>	<b>177.17</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors

**Average Bird Count Density per ha**

- <0.05
- 0.05 - 0.1
- 0.1 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- >1.5

Do not scale this map  
**Client**  
 Orkney Islands Council Harbour Authority

**Project**  
 Orkney Hatston Pier

**Title**  
 Long-tailed Duck Observations  
 Southern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS097	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:14,000 @A3

Rev	Date	Amendment	Initials
-	-	-	-

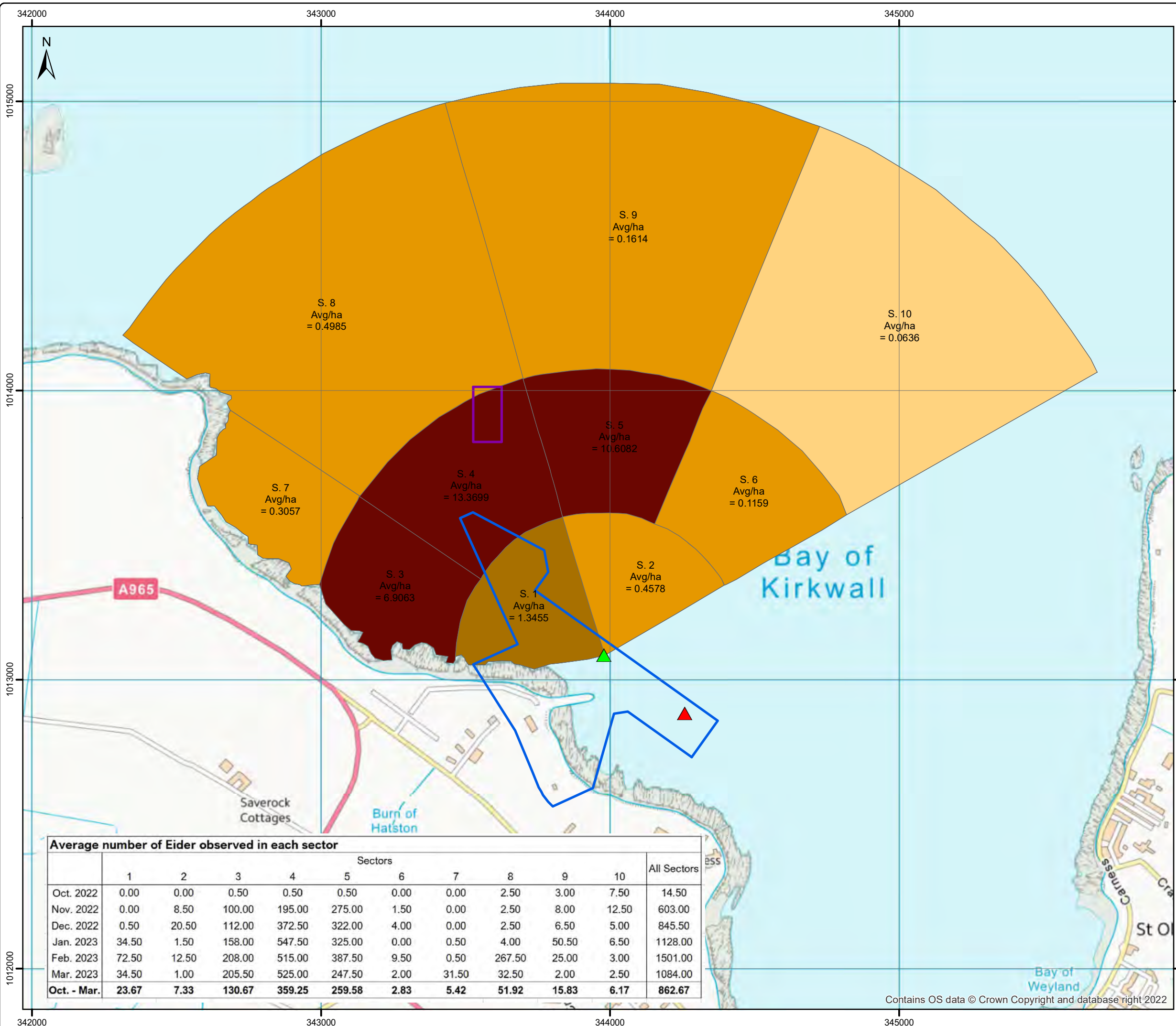
**Average number of Long-tailed duck observed in each sector**

	Sectors								All Sectors
	1	2	3	4	5	6	7	8	
Oct. 2022	0.50	3.00	1.00	3.00	2.00	33.00	6.50	0.00	49.00
Nov. 2022	7.50	1.50	0.00	1.50	1.50	6.50	5.00	1.50	25.00
Dec. 2022	5.50	1.00	3.50	4.50	0.00	39.00	1.00	0.00	54.50
Jan. 2023	16.50	0.00	0.00	1.00	0.50	28.50	4.00	0.00	50.50
Feb. 2023	6.50	1.00	1.00	0.50	0.00	19.00	7.50	0.00	35.50
Mar. 2023	7.00	28.50	0.00	2.00	0.00	80.00	8.00	3.50	129.00
<b>Oct. - Mar.</b>	<b>7.25</b>	<b>5.83</b>	<b>0.92</b>	<b>2.08</b>	<b>0.67</b>	<b>34.33</b>	<b>5.33</b>	<b>0.83</b>	<b>57.25</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors
- Fish Cage

Average Bird Count Density per ha

- <0.05
- 0.05 - 0.1
- 0.1 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- >1.5

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**Project**  
 Orkney Haston Pier

**Title**  
 Eider Observations  
 Northern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS098	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:12,500 @A3

Rev	Date	Amendment	Initials
-	-	-	-

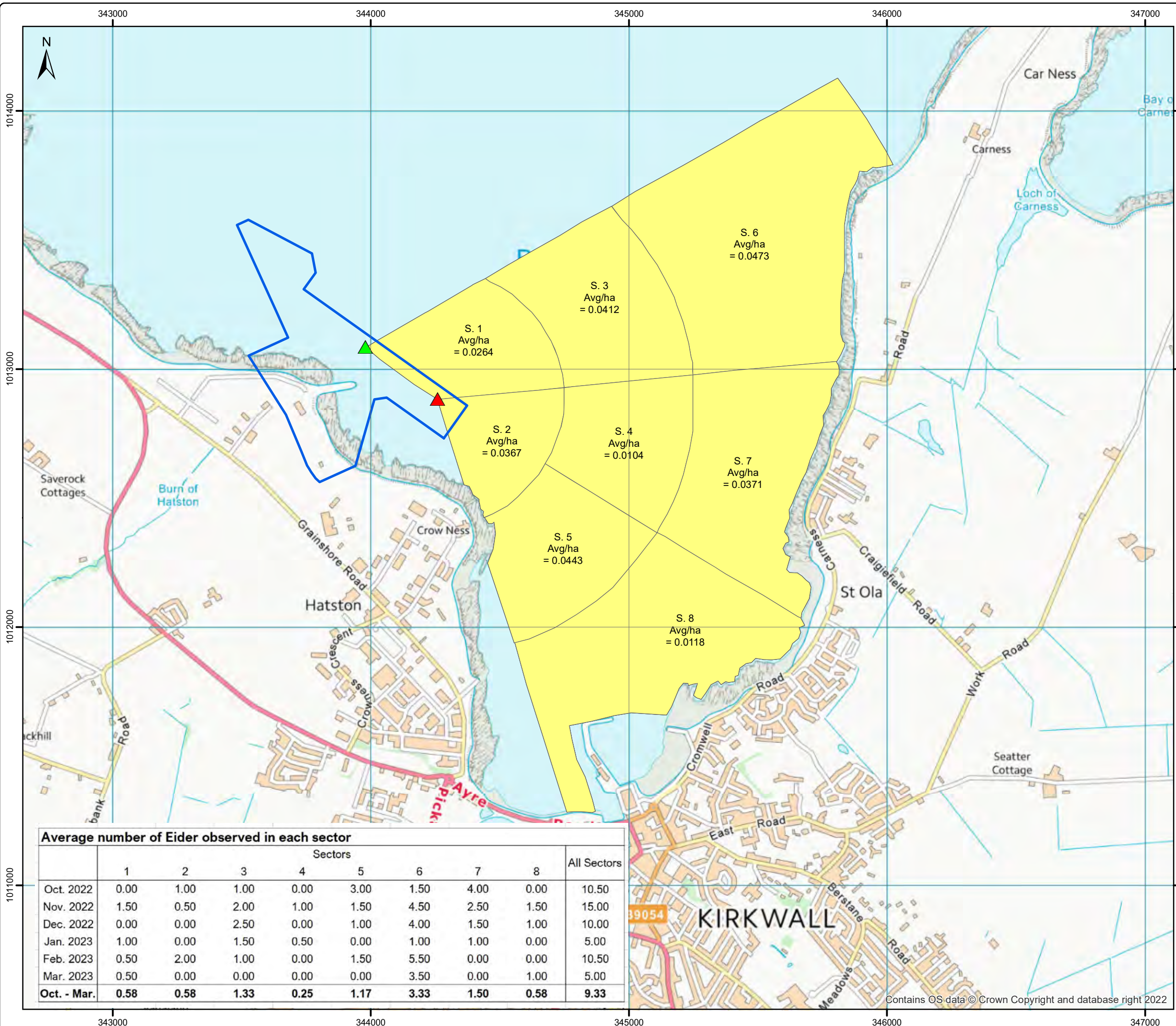
**Average number of Eider observed in each sector**

	Sectors										All Sectors
	1	2	3	4	5	6	7	8	9	10	
Oct. 2022	0.00	0.00	0.50	0.50	0.50	0.00	0.00	2.50	3.00	7.50	14.50
Nov. 2022	0.00	8.50	100.00	195.00	275.00	1.50	0.00	2.50	8.00	12.50	603.00
Dec. 2022	0.50	20.50	112.00	372.50	322.00	4.00	0.00	2.50	6.50	5.00	845.50
Jan. 2023	34.50	1.50	158.00	547.50	325.00	0.00	0.50	4.00	50.50	6.50	1128.00
Feb. 2023	72.50	12.50	208.00	515.00	387.50	9.50	0.50	267.50	25.00	3.00	1501.00
Mar. 2023	34.50	1.00	205.50	525.00	247.50	2.00	31.50	32.50	2.00	2.50	1084.00
<b>Oct. - Mar.</b>	<b>23.67</b>	<b>7.33</b>	<b>130.67</b>	<b>359.25</b>	<b>259.58</b>	<b>2.83</b>	<b>5.42</b>	<b>51.92</b>	<b>15.83</b>	<b>6.17</b>	<b>862.67</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors

**Average Bird Count Density per ha**

- < 0.05
- 0.05 - 0.1
- 0.1 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- >1.5

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**Client**  
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**Project**  
 Orkney Hatston Pier

**Title**  
 Eider Observations  
 Southern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS099	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:14,000 @A3

Rev	Date	Amendment	Initials
-	-	-	-

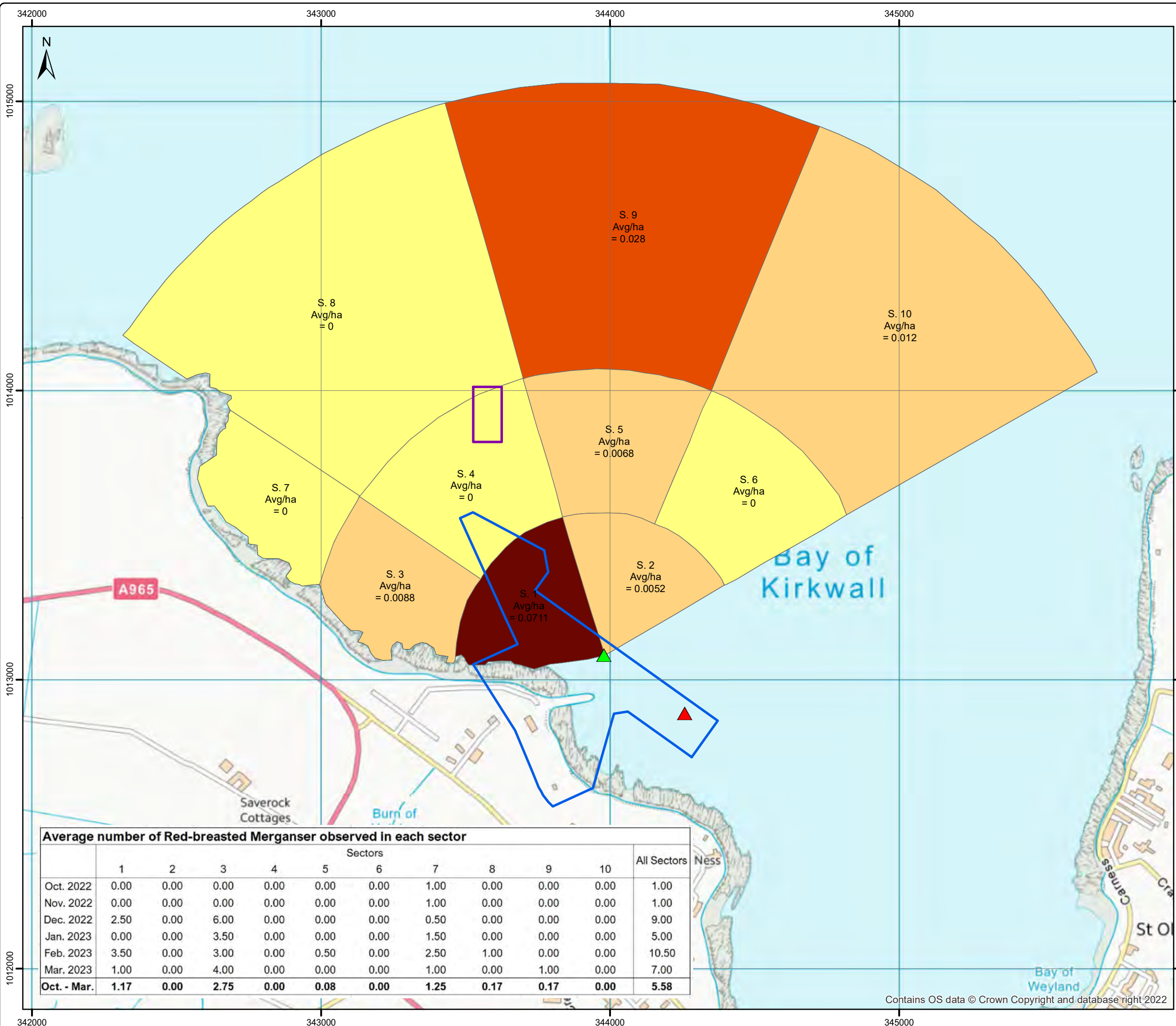
**Average number of Eider observed in each sector**

	Sectors								All Sectors
	1	2	3	4	5	6	7	8	
Oct. 2022	0.00	1.00	1.00	0.00	3.00	1.50	4.00	0.00	10.50
Nov. 2022	1.50	0.50	2.00	1.00	1.50	4.50	2.50	1.50	15.00
Dec. 2022	0.00	0.00	2.50	0.00	1.00	4.00	1.50	1.00	10.00
Jan. 2023	1.00	0.00	1.50	0.50	0.00	1.00	1.00	0.00	5.00
Feb. 2023	0.50	2.00	1.00	0.00	1.50	5.50	0.00	0.00	10.50
Mar. 2023	0.50	0.00	0.00	0.00	0.00	3.50	0.00	1.00	5.00
<b>Oct. - Mar.</b>	<b>0.58</b>	<b>0.58</b>	<b>1.33</b>	<b>0.25</b>	<b>1.17</b>	<b>3.33</b>	<b>1.50</b>	<b>0.58</b>	<b>9.33</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors
- Fish Cage

Average Bird Count Density per ha

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map

**Client**  
Orkney Islands Council Harbour Authority

**Project**  
Orkney Haston Pier

**Title**  
Red-breasted Merganser Observations  
Northern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS103	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
1:12,500 @A3

Rev	Date	Amendment	Initials
-	-	-	-

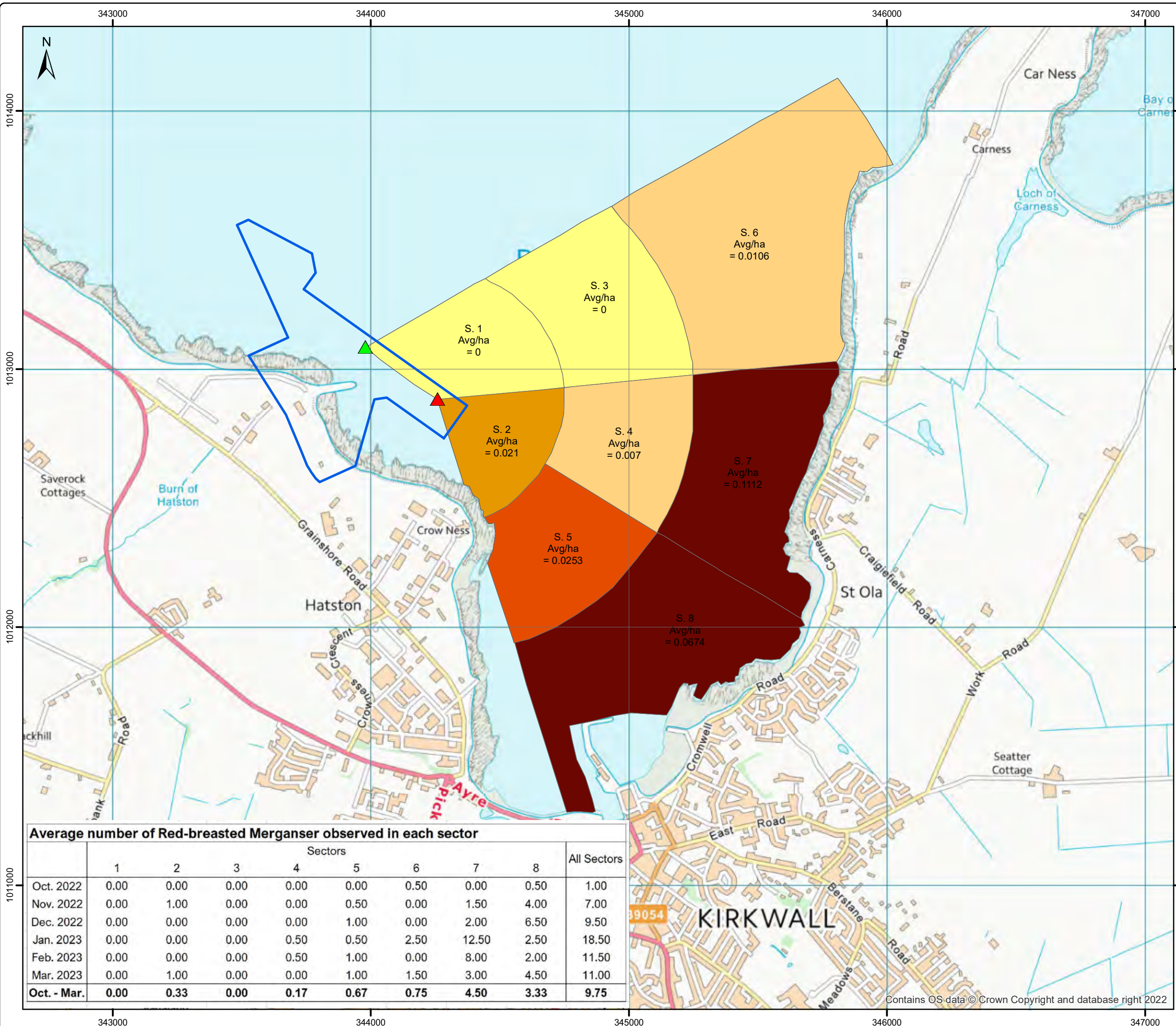
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**Average number of Red-breasted Merganser observed in each sector**

	Sectors										All Sectors
	1	2	3	4	5	6	7	8	9	10	
Oct. 2022	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Nov. 2022	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Dec. 2022	2.50	0.00	6.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	9.00
Jan. 2023	0.00	0.00	3.50	0.00	0.00	0.00	1.50	0.00	0.00	0.00	5.00
Feb. 2023	3.50	0.00	3.00	0.00	0.50	0.00	2.50	1.00	0.00	0.00	10.50
Mar. 2023	1.00	0.00	4.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	7.00
<b>Oct. - Mar.</b>	<b>1.17</b>	<b>0.00</b>	<b>2.75</b>	<b>0.00</b>	<b>0.08</b>	<b>0.00</b>	<b>1.25</b>	<b>0.17</b>	<b>0.17</b>	<b>0.00</b>	<b>5.58</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors

**Average Bird Count Density per ha**

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

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**Client**  
 Orkney Islands Council Harbour Authority

**Project**  
 Orkney Hatston Pier

**Title**  
 Red-breasted Merganser Observations  
 Southern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS104	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:14,000 @A3

Rev	Date	Amendment	Initials
-	-	-	-

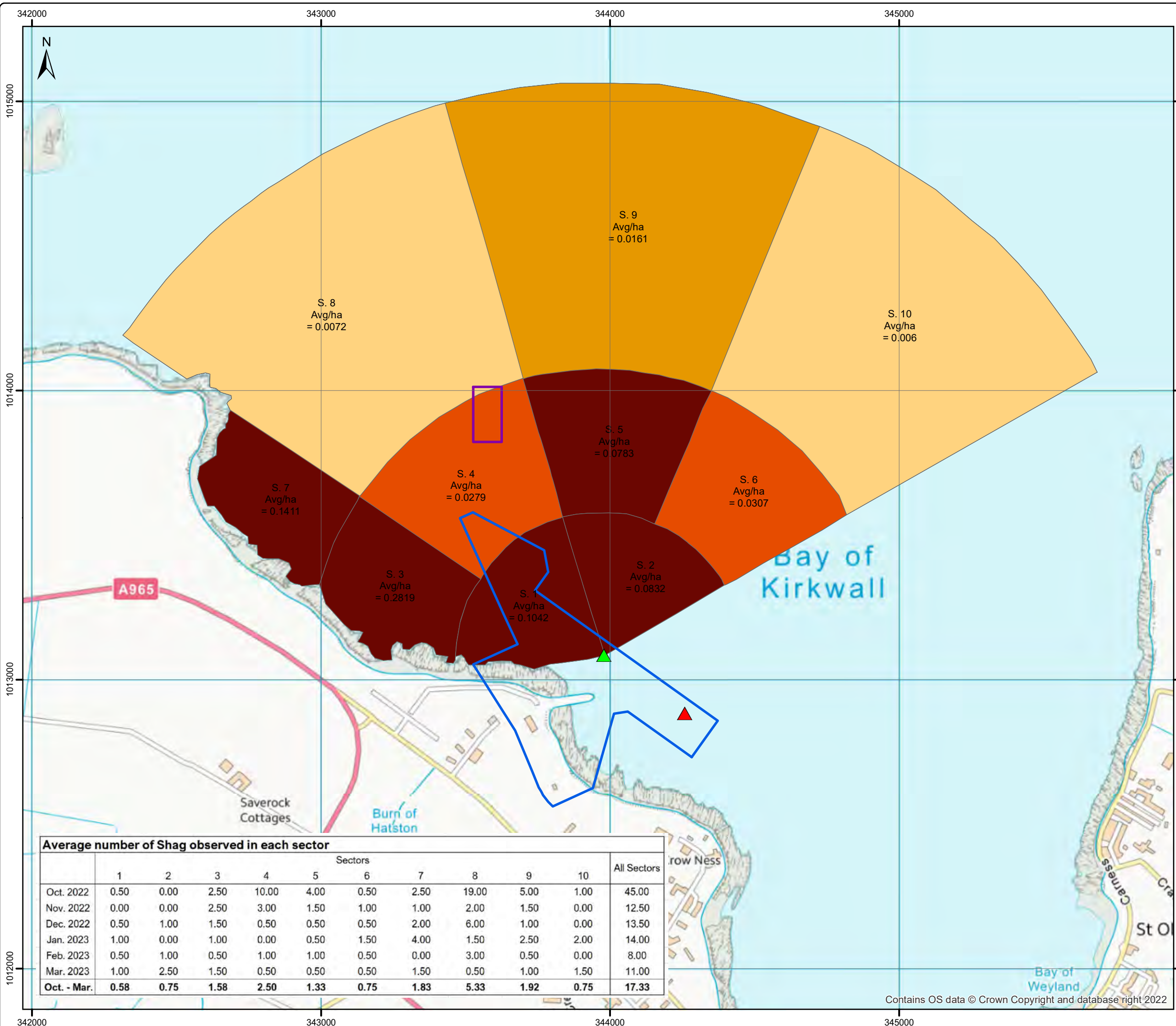
**Average number of Red-breasted Merganser observed in each sector**

	Sectors								All Sectors
	1	2	3	4	5	6	7	8	
Oct. 2022	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.50	1.00
Nov. 2022	0.00	1.00	0.00	0.00	0.50	0.00	1.50	4.00	7.00
Dec. 2022	0.00	0.00	0.00	0.00	1.00	0.00	2.00	6.50	9.50
Jan. 2023	0.00	0.00	0.00	0.50	0.50	2.50	12.50	2.50	18.50
Feb. 2023	0.00	0.00	0.00	0.50	1.00	0.00	8.00	2.00	11.50
Mar. 2023	0.00	1.00	0.00	0.00	1.00	1.50	3.00	4.50	11.00
<b>Oct. - Mar.</b>	<b>0.00</b>	<b>0.33</b>	<b>0.00</b>	<b>0.17</b>	<b>0.67</b>	<b>0.75</b>	<b>4.50</b>	<b>3.33</b>	<b>9.75</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors
- Fish Cage

Average Bird Count Density per ha

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map  
**Client**  
 Orkney Islands Council Harbour Authority

**Project**  
 Orkney Haston Pier

**Title**  
 Shag Observations  
 Northern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS101	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:12,500 @A3

Rev	Date	Amendment	Initials
-	-	-	-

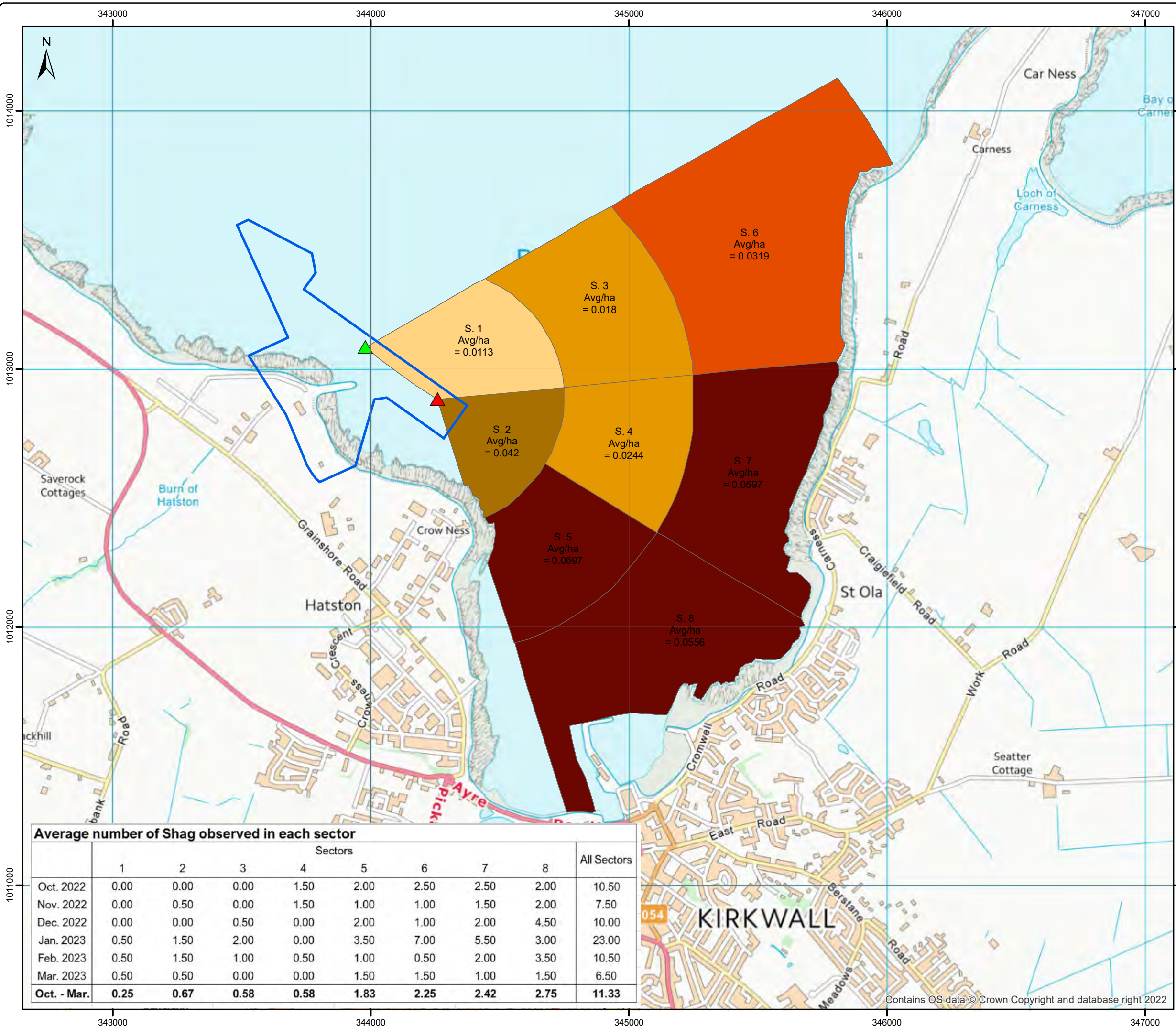
**Average number of Shag observed in each sector**

	Sectors										All Sectors
	1	2	3	4	5	6	7	8	9	10	
Oct. 2022	0.50	0.00	2.50	10.00	4.00	0.50	2.50	19.00	5.00	1.00	45.00
Nov. 2022	0.00	0.00	2.50	3.00	1.50	1.00	1.00	2.00	1.50	0.00	12.50
Dec. 2022	0.50	1.00	1.50	0.50	0.50	0.50	2.00	6.00	1.00	0.00	13.50
Jan. 2023	1.00	0.00	1.00	0.00	0.50	1.50	4.00	1.50	2.50	2.00	14.00
Feb. 2023	0.50	1.00	0.50	1.00	1.00	0.50	0.00	3.00	0.50	0.00	8.00
Mar. 2023	1.00	2.50	1.50	0.50	0.50	0.50	1.50	0.50	1.00	1.50	11.00
<b>Oct. - Mar.</b>	<b>0.58</b>	<b>0.75</b>	<b>1.58</b>	<b>2.50</b>	<b>1.33</b>	<b>0.75</b>	<b>1.83</b>	<b>5.33</b>	<b>1.92</b>	<b>0.75</b>	<b>17.33</b>

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**Legend**

- ▲ Northern Vantage Point (HY 44257 12883)
- ▲ Southern Vantage Point (HY 43978 13084)
- Proposed Site Extent
- Survey Sectors

**Average Bird Count Density per ha**

- < 0.005
- 0.005 - 0.015
- 0.015 - 0.025
- 0.025 - 0.035
- 0.035 - 0.045
- >0.045

Do not scale this map  
**Client**  
 Orkney Islands Council Harbour Authority

**Project**  
 Orkney Hatston Pier

**Title**  
 Shag Observations  
 Southern Sectors - Oct 2022 to March 2023

**Status**  
**DRAFT**

<b>Drawing No.</b> 674795-GIS102	<b>Revision</b> -	<b>Date</b> 21 March 2023
<b>Drawn</b> JAS	<b>Checked</b> MS	<b>Approved</b> xx

**Scale**  
 1:14,000 @A3

Rev	Date	Amendment	Initials
-	-	-	-

**Average number of Shag observed in each sector**

	Sectors								All Sectors
	1	2	3	4	5	6	7	8	
Oct. 2022	0.00	0.00	0.00	1.50	2.00	2.50	2.50	2.00	10.50
Nov. 2022	0.00	0.50	0.00	1.50	1.00	1.00	1.50	2.00	7.50
Dec. 2022	0.00	0.00	0.50	0.00	2.00	1.00	2.00	4.50	10.00
Jan. 2023	0.50	1.50	2.00	0.00	3.50	7.00	5.50	3.00	23.00
Feb. 2023	0.50	1.50	1.00	0.50	1.00	0.50	2.00	3.50	10.50
Mar. 2023	0.50	0.50	0.00	0.00	1.50	1.50	1.00	1.50	6.50
<b>Oct. - Mar.</b>	<b>0.25</b>	<b>0.67</b>	<b>0.58</b>	<b>0.58</b>	<b>1.83</b>	<b>2.25</b>	<b>2.42</b>	<b>2.75</b>	<b>11.33</b>

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# **D BIRD/BOAT INTERACTIONS**



Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
A	1	25-Oct-22	16:23	16:31	tug		slow	GU	1	<100m	none	
A	2	25-Oct-22	16:23	16:31	tug		slow	LN	12	100-200m	flying up	flew c.250m (with display calls); on alighting then swam slowly back towards their original position
A	3	25-Oct-22	16:23	16:31	tug		slow	E.	1	c.100m	slow swim away	
B	4	29-Oct-22	c.10:00	1-2 mins	creel boat		slow	RH	1	c.200m	diving, but not moving away	this bird was already actively foraging and diving, so no obvious change in behaviour
C	4	29-Oct-22	c.10:01	1-2 mins	Earl T		quite fast	RH	1	100-200m	diving, but not moving away	this bird was already actively foraging and diving, so no obvious change in behaviour
D	5	29-Oct-22	13:35	13:40	creel boat		slow	LN	16	100-150m	none	
D	6	29-Oct-22	13:35	13:40	creel boat		slow	E.	2	100-150m	none	

Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
D	7	29-Oct-22	13:35	13:40	creel boat		slow	TY	1	100-150m	none	
E	5	29-Oct-22	13:43	13:49	Shapinsay		quite fast	LN	16	c.300m	none	
E	6	29-Oct-22	13:43	13:49	Shapinsay		quite fast	E.	2	c.300m	none	
E	7	29-Oct-22	13:43	13:49	Shapinsay		quite fast	TY	1	c.300m	none	
		08-Nov-22	watch from 14:15 to 14:45 - MV Shapinsay out but only a very thin scattering of LN visible in bay - no interactions noted									
F	8	24-Nov-22	09:20	not timed	Shapinsay		quite fast	ND	1	400-500m	flying out of bay	picked up already in flight, but thought to be shortly after take-off
F	9	24-Nov-22	09:20	not timed	Shapinsay		quite fast	ND	1	c.500m	none	
G	10	24-Nov-22	10:20	not timed	Earl T		quite fast	ND	2	c.300m	slow swim away & dive	with 2 BV - already foraging
G	10	24-Nov-22	10:20	not timed	Earl T		quite fast	BV	2	c.300m	slow swim away & dive	with 2 ND - already foraging
H	11	24-Nov-22	10:52	not timed	Earl S		quite fast	RH	1	c.400m	none	bird preening
I	12	24-Nov-22	11:55	not timed	yacht (sailing)		quite fast	RH	1	c.400m	flying away approx 1.5km	seen alert, then flying away west and down beyond fish cages



Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
J	13	24-Nov-22	13:45	not timed	workboat		slow	E.	tens	<25m	padding/short flights	boat heading straight through a dense flock, which moved a few tens of metres to either side, but no further
K	14	05-Dec-22	13:17	13:27	charter boat		quite fast	ND	1	500m	probably no change	bird was already swimming steadily in this direction when the boat appeared, and continued to do so
K	15	05-Dec-22	13:17	13:27	charter boat		quite fast	ND	1	c.200m	none apparent	in a group with 7 LN and 1 SA; boat passed south at 13:26
K	15	05-Dec-22	13:17	13:27	charter boat		quite fast	LN	7	c.200m	none apparent	in a group with 1 ND and 1 SA; boat passed south at 13:26
K	15	05-Dec-22	13:17	13:27	charter boat		quite fast	SA	1	c.200m	none apparent	in a group with 1 ND and 7 LN; boat

Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
												passed south at 13:26
L	15	05-Dec-22	13:24	13:27	workboat		slow	ND	1	100-150m	dived	in a group with 7 LN and 1 SA; boat passed north at 13:27; diver not refound straight away, but an actively foraging ND several minutes later a few hundred metres to N was probably this bird
L	15	05-Dec-22	13:24	13:27	workboat		slow	LN	7	100-150m	1 flew off, the rest appeared unmoved	in a group with 1 ND and 7 LN; boat passed north at 13:27
L	15	05-Dec-22	13:24	13:27	workboat		slow	SA	1	100-150m	none apparent	in a group with 1 ND and 7 LN; boat passed north at 13:27

Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
M	16	05-Dec-22	13:40	13:51	Shapinsay		quite fast	RH	2	c.350m	none apparent; foraging throughout	these two divers had first been seen foraging at c.13:15 (16 i), before any of the vessel movements K, L and M. They were not refound until 13:48 (16 ii) and 13:51 (16 iii), still foraging; whilst they may have reacted unseen to the first two smaller boats, they were clearly able to avoid them without major stress



Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
N	17	16-Dec-22	14:25	14:37	creel boat		q fast on approach, but much slower past Hatston pier	RH	1	c.400m	diving in advance of boat, which was heading directly towards it; it probably stayed under longer than it would otherwise have done, but no real change of behaviour	diver resurfaced 3 minutes later behind the boat by several hundred metres; had already been foraging and spending little time on the surface, and continued to do so, with several more sightings as it came back into the same area again after moving west
O	17	16-Dec-22	15:21	-	Earl Sigurd		quite fast	RH	1	c.350m	swimming away & diving as ferry at closest point; up again soon after, similar to its apparently normal foraging pattern, so probably not a change in behaviour	presumed same bird still foraging actively with only brief appearances on the surface; resurfacing a couple of hundred metres later &

Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
												diving again in line with its apparently normal foraging pattern
O	18	16-Dec-22	15:21	-	Earl Sigurd		quite fast	ND	1	c.750m	none apparent	bird already foraging actively and steadily moving out of the bay as the ferry came in
P	18	16-Dec-22	15:08	15:11	large work boat		quite fast	ND	1	c.600m	swam slightly alert as boat past but otherwise no change of behaviour	bird foraging actively and steadily moving out of the bay before boat passed
Q	19	20-Jan-23	10:11	-	Earl Thorfinn	In	quite fast	E.	25	<50m	alert, then swimming, then flying away further than 1 km	initially likely to have been directly in the path of the ferry
Q	20	20-Jan-23	10:11	-	Earl Thorfinn	In	quite fast	LN	6	<50m	flying away	initially likely to have been directly in the path of the

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												ferry; not followed
Q	21	20-Jan-23	10:14	-	Earl Thorfinn	In	quite fast	ND	2	150-200m	none apparent	both birds stayed on the surface as the ferry passed
R	22	20-Jan-23	10:44	-	Shapinsay	In	quite fast	RH	1	c.600m	none apparent	bird foraging actively and, in doing so, diving before boat drew level, and not refound
R	23	20-Jan-23	10:46	-	Shapinsay	In	quite fast	ND	1	350-400m	none apparent	bird foraging actively
S	23	20-Jan-23	10:53	-	Earl Thorfinn	Out	quite fast	ND	1	125-150m	none apparent	bird foraging actively; at surface unmoved as boat passed
S	24	20-Jan-23	10:53	-	Earl Thorfinn	Out	quite fast	ND	1	c.100m	none apparent	bird foraging actively; in wing moult
S	25	20-Jan-23	10:56	-	Earl Thorfinn	Out	quite fast	ND	1	<100m	none apparent	bird foraging actively; underwater as boat passed



Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
T	24	20-Jan-23	11:38	-	Shapinsay	Out	quite fast	ND	1	125-150m	none apparent	bird loafing unmoved between bouts of foraging
U	24	20-Jan-23	11:59	-	Varagen	In	quite fast	ND	1	c.150m	none apparent	bird foraging; underwater as boat passed then up close by
U	26	20-Jan-23	11:59	-	Varagen	In	quite fast	ND	1	<100m	none apparent	bird foraging; underwater as boat passed then up close by
V, W	27	20-Jan-23	13:28	-	Workboat plus large workboat	In & away N	quite slow & quite fast	LN	c.100	? 100-200m	flying up	Dense flock in direct track of both boats; flying up in all directions, most alighting at less than a kilometre to the west or at c.1km to southeast
V, W, X	28	20-Jan-23	c.13:30	-	2 workboats plus large workboat	2 in & 1 away N	quite slow & quite fast	VS	3	300-400m	swimming slowly away and back again as boats passed on both sides	essentially unmoved after boats had gone, but ceased foraging for a

Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
												few minutes
W, X	29	20-Jan-23	c.13:30	-	2 workboats	2 in	quite slow	VS	5	>500m when bird flew; closest at c.350m or more	1 male flying up and away W (but had not appeared alert beforehand); 4 birds swimming slowly away then back again as boats passed by	4 out 5 essentially unmoved after boats had gone, but ceased foraging for a few minutes
W, X	30	20-Jan-23	c.13:35	-	2 workboats	2 in	quite slow	VS	6	c.600m	none apparent	birds on surface as boats passed, but not alert or swimming away
W, X	31	20-Jan-23	c.13:35	-	2 workboats	2 in	quite slow	ND	1	c.500m	none apparent	on surface as boats passed, but not alert or swimming away

Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
Y	32	20-Jan-23	c.15:00	-	small creel boat	In	slow	SZ	1	250-300m	swimming alertly, then diving & swimming out of the way	as the boat curved round, the grebe changed direction so as to still be heading away from it; total alarmed swim/dive movement probably little more than 200-300m; little or no reaction from many Eiders nearby
Z	33	25-Feb-23	10:45	-	Shapinsay	in	quite fast	ND	1	c.200m	none apparent	bird loafing & preening; fully winged
AA	33	25-Feb-23	10:55	-	rib	out	not very fast, but splashy into wind	ND	1	200-250m	Diving	dived once; previously loafing and continued to do so after rib past, drifting S on wind
AB	33	25-Feb-23	11:33	-	Shapinsay	Out	quite fast	ND	1	c.300 and c.100m	Alert as boat approached and swimming to side	Alert at c.300m and swimming sideways;



Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
												swimming slowly at c.100m as boat passed
AC	34	25-Feb-23	11:45	-	work boat	E from cages	quite fast	VS	1	v approx 150-200m	swimming	Later these three each seen foraging, so at most a brief pause as the boat passed
AC	35	25-Feb-23	11:45	-	work boat	E from cages	quite fast	ND	1	v approx c.200m	swimming	
AC	36	25-Feb-23	11:45	-	work boat	E from cages	quite fast	ND	1	v approx c.250m	swimming	
AD	37	25-Feb-23	11:50	-	Earl Thorfinn	in	quite fast	VS	2	v approx c.500m	swim away to c.200-250m from path of boat, then back again	mostly swimming/loafing throughout - moving to the side well in advance of the ferry, then back again; only a couple of dives, so no real interruption to foraging
AE	38	04-Mar-23	09:40	10:05	small creel boat	in from Gairsay Sound	quite slow	VS	1	150-200m	flying, for less than 1 km	more or less directly at bird; VS found swimming (?alertly) as boat approached

Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
												then flying off at 09:50, landing much closer to pier where it dived (?foraging) at least once
AF	39	04-Mar-23	10:00		work boat	out from W of pier	quite slow	VS	2	not seen	probably flying up (but actual interaction not seen); alighted c. 1km away	These two scoters picked up flying past no. 38, which took off after them and all three alighted further out
AF	38 & 39	04-Mar-23	10:05		work boat	out to Gairsay Sound	quite slow	VS	3	250-300m	swimming so as to be about equidistant between boats AF and AG as they passed in opposite directions	Mostly swimming to E as AF passed first, then slowly back to SW from 10:10-10:23, during which time some foraging. By 10:23 the three were quite spread apart and two seemed to be sleeping.
AG	38 & 39	04-Mar-23	10:05		fish cage 'pump' boat	in from Gairsay Sound	slow	VS	3	250-300m		

Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
AH	38 & 39	04-Mar-23	10:15	10:30	large creel boat	out	quite slow	VS	3	c.800m	inconclusive - birds already swimming and continued to do so	Scoters picked up again after boat gone at 10:43, now loafing in a tight group again, back to the E. Very soon splitting into 1 (continued loafing nearby) and 2 birds again swimming SW and commencing foraging at 10:58
AI	40	04-Mar-23	11:45	12:06	Earl Sigurd	in	quite fast	LN	tens	v approx 500m	swimming to the side, well in advance of boat, at c.11:50	
AI	41	04-Mar-23	11:45	12:06	Earl Sigurd	in	quite fast	LN	tens	v approx 200m or less	flying up much closer to boat, which was more directly at them	v estimated distance of disturbance; looping around widely in flight for a few minutes - not sure where they went



Boat ref no.	Species ref no.	Date	Time start	Time end	Boat type	Boat direction	Speed	Species	Number	Distance	Reaction/Evasion	Comment
AI	42	04-Mar-23	11:45	12:06	Earl Sigurd	in	quite fast	E.	5	v approx 200m or less	flying up with LN no. 41	heading away W
AI	43	04-Mar-23	11:45	12:06	Earl Sigurd	in	quite fast	ND	1	c.700m & c.450m	Sitting up and semi-alert as ferry approached at c.700m, otherwise unmoved as ferry passed at c.450m	