

Addendum to the  
Environmental Impact  
Assessment Report

**NISA**  
*North Irish Sea Array*

Volume 10 - Onshore Appendices

# Appendix A23.3

## Desk Study Results





## Appendix A23.3 Desk Study Results

**Table 1 - National Biodiversity Data Centre (NBDC) records for notable or protected bird species within the last 10 years with potential to occur within the onshore development area<sup>1</sup>**

Species name	Scientific name	BoCCI 2020-2026 <sup>2</sup>	Birds Directive Annex I	Wildlife Acts	Date of last record
Arctic Tern	<i>Sterna paradisaea</i>	A	Y	Y	30/08/2024
Balearic Shearwater	<i>Puffinus mauretanicus</i>	R	Y	Y	18/09/2008
Barn Owl	<i>Tyto alba</i>	R	-	Y	04/07/2025
Barnacle Goose	<i>Branta leucopsis</i>	A	Y	Y	23/11/2024
Bar-tailed Godwit	<i>Limosa lapponica</i>	R	Y	Y	29/12/2024
Black Guillemot	<i>Cepphus grylle</i>	A	-	Y	30/12/2024
Black Tern	<i>Chlidonias niger</i>	A	Y	Y	18/08/2019
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	A	-	Y	22/09/2025
Black-tailed Godwit	<i>Limosa limosa</i>	R	-	Y	01/01/2025
Black-throated Diver	<i>Gavia arctica</i>	A	Y	Y	12/04/2021
Brambling	<i>Fringilla montifringilla</i>	A	-	Y	10/02/2024
Chough	<i>Pyrrhocorax pyrrhocorax</i>	A	Y	Y	24/10/2023
Common Guillemot	<i>Uria aalge</i>	A	-	Y	24/09/2025
Common Gull	<i>Larus canus</i>	A	-	Y	28/12/2024
Common Sandpiper	<i>Actitis hypoleucos</i>	A	-	Y	30/06/2025
Common Scoter	<i>Melanitta nigra</i>	R	-	Y	30/12/2024
Common Tern	<i>Sterna hirundo</i>	A	Y	Y	11/08/2025
Coot	<i>Fulica atra</i>	A	-	Y	02/01/2025
Cormorant	<i>Phalacrocorax carbo</i>	A	-	Y	22/01/2025
Corncrake	<i>Crex crex</i>	R	Y	Y	31/12/2011
Curlew	<i>Numenius arquata</i>	R	-	Y	12/08/2025
Curlew Sandpiper	<i>Calidris ferruginea</i>	R	-	Y	13/10/2024
Dunlin	<i>Calidris alpina</i>	R	Y	Y	01/01/2025
Eider	<i>Somateria mollissima</i>	R	-	Y	15/08/2024
Fulmar	<i>Fulmarus glacialis</i>	A	-	Y	28/12/2024
Gadwall	<i>Mareca strepera</i>	A	-	Y	20/09/2025
Gannet	<i>Morus bassanus</i>	A	-	Y	03/12/2024
Garganey	<i>Spatula querquedula</i>	A	-	Y	21/05/2023

<sup>1</sup> Source: NBDC Website 10km Grid Squares O14, O15, O16, O24, O25 and O26. Available at: <https://maps.biodiversityireland.ie/Map> [Last accessed January 2026]

<sup>2</sup> A= Amber-listed; R=Red-listed

Species name	Scientific name	BoCCI 2020-2026 <sup>2</sup>	Birds Directive Annex I	Wildlife Acts	Date of last record
Goldcrest	<i>Regulus regulus</i>	A	-	Y	29/12/2024
Golden Plover	<i>Pluvialis apricaria</i>	R	Y	Y	29/12/2024
Goldeneye	<i>Bucephala clangula</i>	R	-	Y	27/12/2024
Goosander	<i>Mergus merganser</i>	A	-	Y	02/10/2006
Goshawk	<i>Accipiter gentilis</i>	A	Y	Y	23/09/2021
Great Crested Grebe	<i>Podiceps cristatus</i>	A	-	Y	30/12/2024
Great Northern Diver	<i>Gavia immer</i>	A	Y	Y	26/12/2024
Great Skua	<i>Stercorarius skua</i>	A	-	Y	04/09/2016
Greenfinch	<i>Chloris chloris</i>	A	-	Y	02/01/2025
Grey Plover	<i>Pluvialis squatarola</i>	R	-	Y	26/12/2024
Grey Wagtail	<i>Motacilla cinerea</i>	R	-	Y	25/05/2025
Greylag Goose	<i>Anser anser</i>	A	-	Y	30/09/2024
Hen Harrier	<i>Circus cyaneus</i>	A	Y	Y	27/10/2024
Herring Gull	<i>Larus argentatus</i>	A	-	Y	29/09/2025
House Martin	<i>Delichon urbicum</i>	A	-	Y	21/09/2025
House Sparrow	<i>Passer domesticus</i>	A	-	Y	08/08/2025
Kestrel	<i>Falco tinnunculus</i>	R	-	Y	21/09/2025
Kingfisher	<i>Alcedo atthis</i>	A	Y	Y	22/08/2025
Kittiwake	<i>Rissa tridactyla</i>	R	-	Y	13/11/2024
Knot	<i>Calidris canutus</i>	R	-	Y	29/12/2024
Lapwing	<i>Vanellus vanellus</i>	R	-	Y	20/09/2025
Lesser Black-backed Gull	<i>Larus fuscus</i>	A	-	Y	09/01/2025
Linnet	<i>Linaria cannabina</i>	A	-	Y	11/01/2025
Little Egret	<i>Egretta garzetta</i>	-	Y	Y	09/01/2025
Little Gull	<i>Hydrocoloeus minutus</i>	A	Y	Y	17/04/2024
Little Ringed Plover	<i>Charadrius dubius</i>	A	-	Y	07/08/2022
Little Tern	<i>Sternula albifrons</i>	A	Y	Y	11/08/2025
Long-tailed Duck	<i>Clangula hyemalis</i>	R	-	Y	26/12/2024
Mallard	<i>Anas platyrhynchos</i>	A	-	Y	09/01/2025
Manx Shearwater	<i>Puffinus puffinus</i>	A	Y	Y	10/09/2024
Marsh Harrier	<i>Circus aeruginosus</i>	A	Y	Y	05/02/2017
Meadow Pipit	<i>Anthus pratensis</i>	R	-	Y	01/09/2025
Mediterranean Gull	<i>Ichthyætus melanocephalus</i>	A	Y	Y	08/11/2024

Species name	Scientific name	BoCCI 2020-2026 <sup>2</sup>	Birds Directive Annex I	Wildlife Acts	Date of last record
Merlin	<i>Falco columbarius</i>	A	Y	Y	29/12/2024
Mute Swan	<i>Cygnus olor</i>	A	-	Y	20/09/2025
Oystercatcher	<i>Haematopus ostralegus</i>	R	-	Y	09/01/2025
Peregrine	<i>Falco peregrinus</i>	-	Y	Y	26/12/2024
Pink-footed Goose	<i>Anser brachyrhynchus</i>	-	-	Y	28/10/2024
Pintail	<i>Anas acuta</i>	A	-	Y	21/12/2024
Pochard	<i>Aythya ferina</i>	R	-	Y	14/05/2024
Puffin	<i>Fratercula arctica</i>	R	-	Y	21/07/2024
Purple Sandpiper	<i>Calidris maritima</i>	R	-	Y	01/01/2025
Razorbill	<i>Alca torda</i>	R	-	Y	07/05/2025
Red Kite	<i>Milvus milvus</i>	R	Y	Y	12/08/2025
Red-breasted Merganser	<i>Mergus serrator</i>	A	-	Y	09/01/2025
Redshank	<i>Tringa totanus</i>	R	-	Y	22/01/2025
Red-necked Phalarope	<i>Phalaropus lobatus</i>	R	Y	Y	23/06/2019
Red-throated Diver	<i>Gavia stellata</i>	A	Y	Y	24/12/2024
Redwing	<i>Turdus iliacus</i>	A	-	Y	01/12/2024
Ringed Plover	<i>Charadrius hiaticula</i>	A	-	Y	26/12/2024
Roseate Tern	<i>Sterna dougallii</i>	A	Y	Y	30/08/2024
Ruff	<i>Calidris pugnax</i>	A	Y	Y	22/09/2025
Sand Martin	<i>Riparia riparia</i>	A	-	Y	21/05/2025
Sandwich Tern	<i>Thalasseus sandvicensis</i>	A	Y	Y	01/11/2024
Scaup	<i>Aythya marila</i>	R	-	Y	21/09/2024
Shag	<i>Gulosus aristotelis</i>	A	-	Y	29/12/2024
Shelduck	<i>Tadorna tadorna</i>	A	-	Y	22/01/2025
Short-eared Owl	<i>Asio flammeus</i>	A	Y	Y	17/10/2025
Shoveler	<i>Spatula clypeata</i>	R	-	Y	29/12/2024
Skylark	<i>Alauda arvensis</i>	A	-	Y	11/10/2025
Slavonian Grebe	<i>Podiceps auritus</i>	R	Y	Y	14/01/2024
Snipe	<i>Gallinago gallinago</i>	R	-	Y	20/09/2025
Spotted Flycatcher	<i>Muscicapa striata</i>	A	-	Y	07/09/2024
Spotted Redshank	<i>Tringa erythropus</i>	A	-	Y	17/05/2023
Starling	<i>Sturnus vulgaris</i>	A	-	Y	26/08/2025
Storm Petrel	<i>Hydrobates pelagicus</i>	A	Y	Y	02/08/2023
Swallow	<i>Hirundo rustica</i>	A	-	Y	06/08/2025

Species name	Scientific name	BoCCI 2020-2026 <sup>2</sup>	Birds Directive Annex I	Wildlife Acts	Date of last record
Swift	<i>Apus apus</i>	R	-	Y	30/06/2025
Teal	<i>Anas crecca</i>	A	-	Y	22/09/2025
Tree Pipit	<i>Anthus trivialis</i>	A	-	Y	19/12/2021
Tree Sparrow	<i>Passer montanus</i>	A	-	Y	27/12/2024
Tufted Duck	<i>Aythya fuligula</i>	A	-	Y	01/12/2024
Turnstone	<i>Arenaria interpres</i>	A	-	Y	22/01/2025
Turtle Dove	<i>Streptopelia turtur</i>	R	-	Y	25/06/2021
Twite	<i>Linaria flavirostris</i>	R	-	Y	03/11/2019
Velvet Scoter	<i>Melanitta fusca</i>	R	-	Y	27/02/2024
Wheatear	<i>Oenanthe oenanthe</i>	A	-	Y	12/10/2024
Whinchat	<i>Saxicola rubetra</i>	R	-	Y	04/09/2021
White-tailed Eagle	<i>Haliaeetus albicilla</i>	R	Y	Y	04/05/2021
Whooper Swan	<i>Cygnus cygnus</i>	A	Y	Y	09/01/2025
Wigeon	<i>Mareca penelope</i>	A	-	Y	29/12/2024
Willow Warbler	<i>Phylloscopus trochilus</i>	A	-	Y	06/10/2024
Wood Sandpiper	<i>Tringa glareola</i>	A	Y	Y	30/08/2023
Woodcock	<i>Scolopax rusticola</i>	R	-	Y	14/12/2024
Yellowhammer	<i>Emberiza citrinella</i>	R	-	Y	27/07/2025

**Table 2 - NBDC records for notable or protected species recorded within the last 10 years and with potential to occur within the onshore development area<sup>3</sup>**

Species group	Species	Scientific name	Habitats Directive (Annex II/IV)	Wildlife Acts	Date of last record
<b>Amphibian</b>					
	Common Frog	<i>Rana temporaria</i>	-	Y	2023
	Smooth Newt	<i>Lissotriton vulgaris</i>	-	Y	2019
<b>Marine Mammal</b>					
	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	II, IV	Y	2022
	Common Dolphin	<i>Delphinus delphis</i>	IV	Y	2023
	Common Porpoise	<i>Phocoena phocoena</i>	II, IV	Y	2023
	Grey Seal	<i>Halichoerus grypus</i>	II	Y	2025

<sup>3</sup> Source: NBDC Website 10km Grid Squares O14, O15, O16, O24, O25 and O26. Available at: <https://maps.biodiversityireland.ie/Map> [Last accessed January 2026]

Species group	Species	Scientific name	Habitats Directive (Annex II/IV)	Wildlife Acts	Date of last record
	Harbour Seal	<i>Phoca vitulina</i>	II	Y	2024
	Minke Whale	<i>Balaenoptera acutorostrata</i>	IV	Y	2021
<b>Reptile</b>					
	Common Lizard	<i>Zootoca vivipara</i>	-	Y	2020
<b>Terrestrial Mammal</b>					
	Brown Long-eared Bat	<i>Plecotus auritus</i>	IV	Y	2022
	Daubenton's Bat	<i>Myotis daubentonii</i>	IV	Y	2022
	Leisler's Bat	<i>Nyctalus leisleri</i>	IV	Y	2023
	Natterer's Bat	<i>Myotis nattereri</i>	IV	Y	2016
	Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	IV	Y	2022
	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	IV	Y	2023
	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	IV	Y	2023
	Badger	<i>Meles meles</i>	-	Y	2023
	Pygmy Shrew	<i>Sorex minutus</i>	-	Y	2018
	Otter	<i>Lutra lutra</i>	II, IV	Y	2022
	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	-	Y	2022
	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	-	Y	2025
	Pine Marten	<i>Martes martes</i>	-	Y	2021
	Hedgehog	<i>Erinaceus europaeus</i>	-	Y	2023

**Table 3 - NBDC records for notable invasive species recorded within the last 10 years and with potential to occur within the onshore development area<sup>4</sup>**

Species group	Species	Scientific name	Date of last record	Wildlife Acts
<b>Algae</b>				
	Wireweed	<i>Sargassum muticum</i>	High	2020
<b>Birds</b>				
	Canada Goose	<i>Branta canadensis</i>	High	2020
	Greylag Goose	<i>Anser anser</i>	High	2023
	Ring-necked Parakeet	<i>Psittacula krameri</i>	High	2021
	Ruddy Duck	<i>Oxyura jamaicensis</i>	High	2015

<sup>4</sup> Source: NBDC Website 10km Grid Squares O14, O15, O16, O24, O25 and O26. Available at: <https://maps.biodiversityireland.ie/Map> [Last accessed January 2026]

Species group	Species	Scientific name	Date of last record	Wildlife Acts
<b>Flatworm</b>				
	New Zealand Flatworm	<i>Arthurdendyus triangulatus</i>	High	2019
	Flatworm	<i>Australoplana sanguinea</i>	Medium	2020
<b>Insect - beetle (Coleoptera)</b>				
	Harlequin Ladybird	<i>Harmonia axyridis</i>	High	2025
<b>Fern</b>				
	Water Fern	<i>Azolla filiculoides</i>	Medium	2021
<b>Flowering Plants</b>				
	Butterfly-bush	<i>Buddleja davidii</i>	Medium	2023
	Canadian Fleabane	<i>Conyza canadensis</i>	Medium	2017
	Cherry Laurel	<i>Prunus laurocerasus</i>	High	2022
	Common Broomrape	<i>Orobanche minor</i>	Medium	2022
	Common Cord-grass	<i>Spartina anglica</i>	High	2014
	Evergreen Oak	<i>Quercus ilex</i>	Medium	2020
	Giant Hogweed	<i>Heracleum mantegazzianum</i>	High	2022
	Himalayan Honeysuckle	<i>Leycesteria formosa</i>	Medium	2025
	Japanese Knotweed	<i>Fallopia japonica</i>	High	2021
	Pampas-grass	<i>Cortaderia selloana</i>	Medium	2022
	Sea-buckthorn	<i>Hippophae rhamnoides</i>	Medium	2023
	Sycamore	<i>Acer pseudoplatanus</i>	Medium	2020
	Three-cornered Garlic	<i>Allium triquetrum</i>	Medium	2024
	Wild Parsnip	<i>Pastinaca sativa</i>	Medium	2020
	Traveller's-joy	<i>Clematis vitalba</i>	Medium	2020
	Turkey Oak	<i>Quercus cerris</i>	Medium	2020
	Wall Cotoneaster	<i>Cotoneaster horizontalis</i>	Medium	2017
<b>Mollusc</b>				
	Jenkins' Spire Snail	<i>Potamopyrgus antipodarum</i>	Medium	2017

Species group	Species	Scientific name	Date of last record	Wildlife Acts
<b>Reptile</b>				
	Red-eared Terrapin	<i>Trachemys scripta</i>	Medium	2021
<b>Terrestrial Mammal</b>				
	American Mink	<i>Neovison vison</i>	High	2016
	Brown Rat	<i>Rattus norvegicus</i>	High	2017
	Grey Squirrel	<i>Sciurus carolinensis</i>	High	2017
	Rabbit	<i>Oryctolagus cuniculus</i>	Medium	2023
	House Mouse	<i>Mus musculus</i>	High	2015
	Red-necked Wallaby	<i>Macropus rufogriseus</i>	Medium	2024

**Table 4 - Irish Wetland Bird Survey (IWeBS) data for Malahide Estuary (Source IWeBS Data Request)<sup>5</sup>**

Species	1% national	1% international	2013/14 <sup>6</sup>	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Mean <sup>7</sup>	Site Peak Months <sup>8</sup>
Knot	160	5300	110			202	760	950*	200	156	161	125*	318.4	Dec
Common Scoter	110	7500									86*	45*	26.2	Feb, Mar
Sandwich Tern			12*			38*	1*	52*		25*	54*	17*	29.6	Oct
Cormorant	110	1200	101*	21*		118*	99*	39*	97*	121*	97	172	105.2	Sep, Oct
Ruff			2*	5*			1*	2*		3*	1	3*	1.8	Sep
Green Sandpiper			27*							2*		1*	0.6	Sep
Red-throated Diver	20	3000					3*		8*	2*	14	7	6.2	Oct
Little Gull												1*	0.2	Oct
Mute Swan	90	100	50*	89*		66*	61*	68*	62	54	69*	78*	66.2	Sep
Tufted Duck	270	8900								3			0.6	Nov
Slavonian Grebe						1*							0	Feb
Dunlin	460	13300	94*	1*		838	445*	299	57*	123*	200*	777	291.2	Oct
Common Sandpiper				1*								1	0.2	Sep, Nov
Red-breasted Merganser	25	860	80			237*	23*	37	33	74	62	47	50.6	Nov
Ringed Plover	120	540				75	240*	160*	170*	72	215*	71	137.6	Oct
Mallard (domestic)									3	2*	1*	7*	2.6	Oct
Great Crested Grebe	30	6300	60	10*		83*	54	29	26	15*	115*	65*	50	Feb

<sup>5</sup> Source: IWeBS Data Request. Available at <https://c0cre470.caspio.com/dp/4BAE30005dbe20614b404564be88> [Last accessed January 2026].

<sup>6</sup> An asterisk (\*) indicates where peak counts were recorded outside the midwinter period (Nov, Dec, Jan). This may indicate that higher numbers occurred during passage periods, or may be due to a lack of counts in the midwinter months.

<sup>7</sup> The mean is based only on available survey data from the most recent 10-season period, i.e. for the period 2013/14 - 2022/23, using I-WeBS core counts.

<sup>8</sup> 'Peak Months' column indicates the months when the highest number of peak counts were recorded.

Species	1% national	1% international	2013/ 14 <sup>6</sup>	2014/ 15	2015/ 16	2016/ 17	2017/ 18	2018/ 19	2019/ 20	2020/ 21	2021/ 22	2022/ 23	Mean <sup>7</sup>	Site Peak Months <sup>8</sup>
Sanderling	85	2000	80			13	2*				50	1	10.2	Nov
Greenshank	20	3300	64*	1*		32*	43*	61*	25	35*	33*	65*	43.8	Oct
Herring Gull			110*	24*		179*	389	212*	124	316*	276*	250*	235.6	Sep
Great Northern Diver	20	50	3*								12	3	3	Nov
Grey Plover	30	2000	9			38	82*	50	2	85	77	42	51.2	Dec
Curlew	350	7600	244*			363*	349*	232*	328	387	197*	345	297.8	Jan, Sep, Oct
Little Grebe	20	4700	8*	5*		33	84	39	52	35*	58*	51	47	Jan
Shoveler	20	650				24*	30	20*		1	10*	3	6.8	Feb, Dec
Black-tailed Godwit	200	1100	206*	167*		146*	245*	699*	577	214	186*	489*	433	Feb
Shelduck	100	2500	120			569	321	416*	9	455	367*	216	292.6	Jan, Feb, Nov, Dec
Redshank	240	2400	145*	77*		473*	575*	410*	331*	355*	677*	478*	450.2	Sep
Greenland White-fronted Goose	100	190									250*		50	Mar
Little Egret	20	1100	13	1*		35*	22*	20*	17*	15*	52*	25*	25.8	Sep, Oct
Bar-tailed Godwit	170	1500	133			93*	107*	185	9	78	130	97*	99.8	Feb, Dec
Common Gull			71*	4*		75*	126*	29	108	49	41*	109	67.2	Oct, Nov
Scaup	25	3100					1*				2*		0.4	Feb, Mar
Gadwall	20	1200	4*				4*	2*			17		3.8	Mar
Turnstone	95	1400	94*			54*	98	32*	138*	48	32	35*	57	Oct
Great Black-backed Gull			93*	6*		70*	69*	44*	30*	39*	35	22*	34	Sep
Moorhen			6	6*		3*	4*	8	7	5*	5*	5*	6	Feb

Species	1% national	1% international	2013/14 <sup>6</sup>	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Mean <sup>7</sup>	Site Peak Months <sup>8</sup>
Whooper Swan	150	340	1*										0	Jan, Mar, Dec
Goldeneye	40	11400	36*			43*	14	24	20		17	5	13.2	Jan, Feb, Dec
Oystercatcher	610	8200	1833	2*		1523*	1242	1150	1863	1438	1247*	1538*	1447.2	Dec
Black-headed Gull			659*	314*		422*	294	440*	243	365*	553	317	383.6	Oct, Nov
Common Tern											2*		0.4	Sep
Wigeon	560	14000		1*		94	215	135	12*	104	93*	133	95.4	Dec
Teal	360	5000	119	8*		163	196*	190*	70	85*	412	187*	188.8	Feb
Long-tailed Duck						1						2*	0.4	Jan, Oct
Eider	55	9800									1		0.2	Nov
Snipe			56	4*		25*	3	17*	22	8*	19*	27	18.6	Nov
Mediterranean Gull										1	3	4*	1.6	Nov
Light-bellied Brent Goose	350	400	710			1565*	605	1121	242*	1177	1554	403*	899.4	Feb, Nov, Dec
Grey Heron	25	5000	19*	7*		30*	21*	17*	12	21*	19	11	16	Feb, Sep, Oct, Nov
Dipper												2*	0.4	Feb
Mallard	280	53000	112	23*		81*	110*	127*	82	136*	152*	191*	137.6	Oct
Golden Plover	920	9300	200	5*			10*	10*	4*		27		8.2	Oct
Whimbrel										1*			0.2	Sep
Shag			8			12	2*	4	4	23	26	78	27	Jan
Jack Snipe							1*						0	Jan, Mar

<b>Species</b>	<b>1% national</b>	<b>1% international</b>	<b>2013/14<sup>6</sup></b>	<b>2014/15</b>	<b>2015/16</b>	<b>2016/17</b>	<b>2017/18</b>	<b>2018/19</b>	<b>2019/20</b>	<b>2020/21</b>	<b>2021/22</b>	<b>2022/23</b>	<b>Mean<sup>7</sup></b>	<b>Site Peak Months<sup>8</sup></b>
Kingfisher								1*		1*	1	1*	0.8	Oct
Pintail	20	600	6			12*	39*	16*		12	41	28*	19.4	Feb
Lapwing	850	72300	590	29*		331	202	305	246	153*	62	140	181.2	Jan
Lesser Black-backed Gull			11*	2*		20*	6*	5*	6*	11*	5	17*	8.8	Mar, Sep

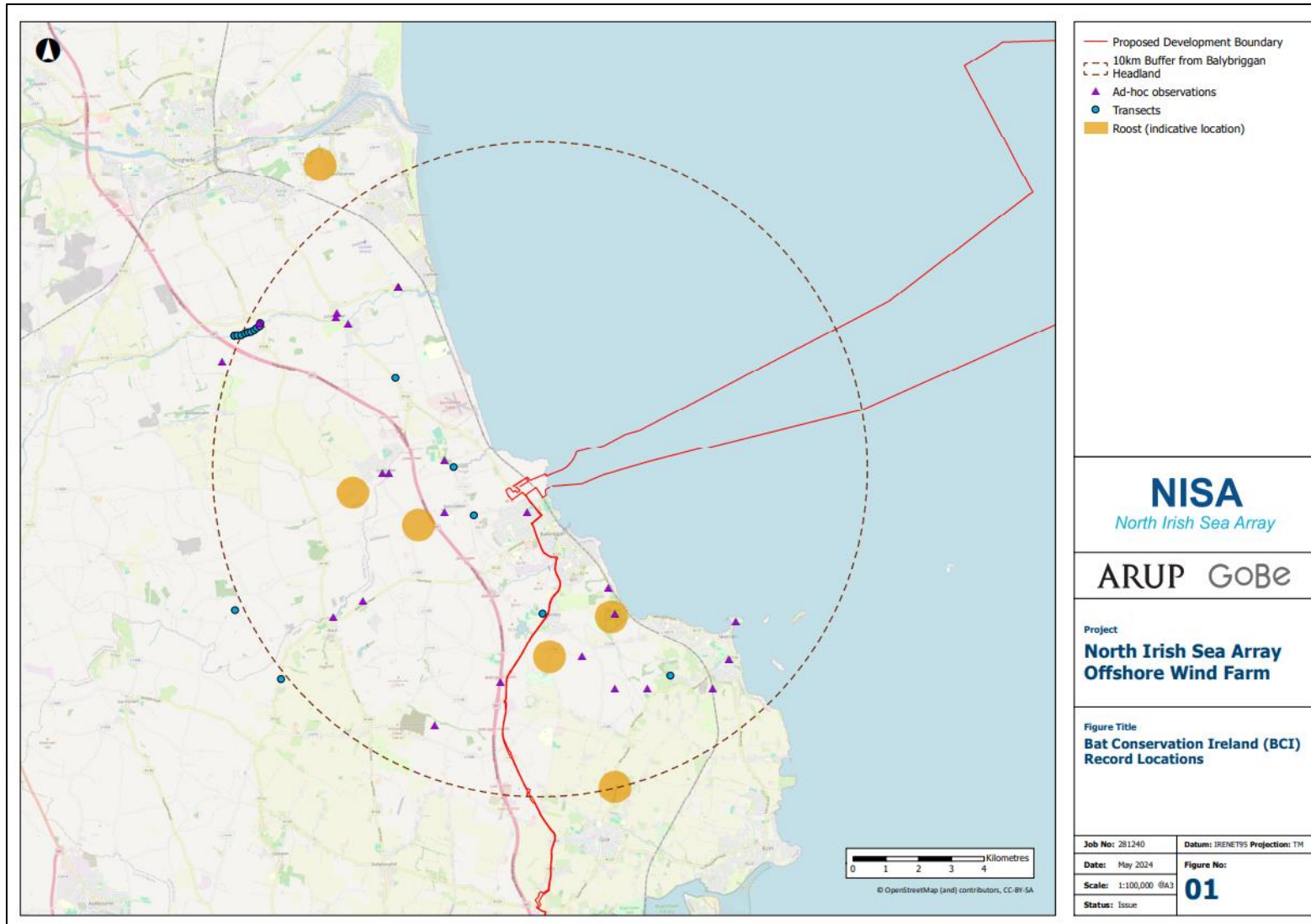


Figure 1 - Bat Conservation Ireland (BCI) roost records returned for a 10km search area of the landfall site. These roost sites are not exclusive and a buffer has been indicated to protect the exact location of the roost sites.