Appendix 5.3
Ecological Report

Ecological Report

Report on Breeding Birds & Protected Mammals at Marino Point, Cork

WILDEYE

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1 INTRODUCTION & SCOPE OF SERVICES

Wildeye was commissioned by Malachy Walsh & Partners, to undertake breeding bird and protected mammal (primarily Otter and Badger) survey of lands in relation to the proposed development of the Marino Point site. Survey work was undertaken from winter 2018 to summer 2019.

The scope of surveys requested was the Marino Point site itself and to include some of the surrounding areas. Badger and Otter surveys were conducted by means of a full walkover of the site, as well as all aquatic areas and a sample of internal areas. 'Camera Traps' (automated trail cameras with night recording capability) were deployed under licence in strategic areas. Breeding bird surveys were also undertaken monthly between April and June, within the site and a 500m buffer. Specific surveys were also conducted for Peregrine, Barn Owl and Kingfisher.

2 RELEVANT QUALIFICATIONS OF PERSONNEL

All work was undertaken by Ciarán Cronin of Wildeye.

Ciarán has been a very active naturalist and birdwatcher for over 30 years and has worked professionally as a wildlife surveyor since 1995. He specialises in terrestrial bird survey and marine wildlife survey, but is competent to carry out mammal, botanical and habitat surveys, and has survey skills across a wide range of species groups. Ciarán is a full member of the Chartered Institute of Ecologists and Environmental Managers (CIEEM), and a former voting member, by invitation, of the Irish Rare Birds Committee. He holds a Postgraduate Diploma in Ecological Assessment from University College Cork, Éire (1st class honours, 2011, NVQ Level 9), and a Diploma in Field Ecology from University College Cork, Éire (Distinction, 2009, NVQ level 7).
Since 2008 he has operated as a self-employed ecologist and bird surveyor, trading as Wildeye, and has completed numerous projects for private developers, state agencies, NGO's and universities in Ireland and Britain. These projects have mostly related to bird surveys around developments such as port developments, windfarms and roads and have often been located in designated conservation areas.

3 SITE LOCATION & DESCRIPTION

The project area comprises the areas as shown in Figures 1 and 2. The site is primarily a long disused industrial site, formerly a fertiliser production facility with associated jetty, offices and ancillary buildings and infrastructure. The buildings are almost all derelict, although there is currently a chemical production facility in the north-west of the site, and the jetty area still receives ships and cargo.
The central portion of the site has become overgrown, while there is a derelict estate house and mature woodland in the south-west of the site. There are three primary wetland areas, a small settlement pond in the west of the site, a tidal lagoon in the north and a swamp area (the Eastern Wetland) in the north-east.

Figure 1: Site Location

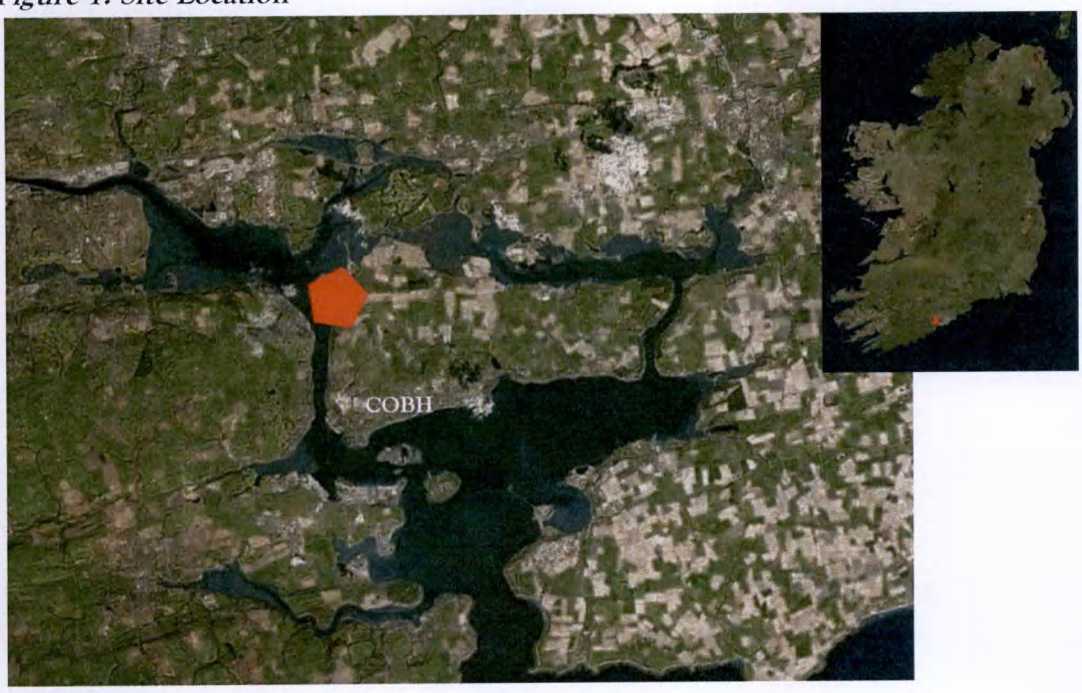

Figure 2: Site Boundary, Buffers and Main Labels

4 METHODS

The specific data collection methods employed during these surveys are detailed in this section.

4.1 Desktop Study

A comprehensive desktop study was initially performed in order to identify protected species which may be encountered in the area. This focused primarily on online data available from the National Biodiversity Data Centre (NBDC) and the National Parks and Wildlife Service (NPWS), data relating to adjacent Natura 2000 sites, as well as a variety of publications on Irish wildlife.
The National Biodiversity Data Centre (NBDC) is a national organisation that collates, manages, analyses and disseminates data on Ireland's biodiversity. It is funded by the Heritage Council and the Department of Arts, Heritage and the Gaeltacht. The NBDC provides access to all validated Irish biodiversity data through Biodiversity Maps, the on-line biodiversity data portal. Biodiversity records and full species accounts can be viewed and scrutinised through an interactive Biodiversity Maps portal (http://maps.biodiversityireland.ie/#/Home). This tool can be used to help make a preliminary assessment of biodiversity issues when considering site-specific proposed development.
The chosen search area using the NBDC search tool was customised in order to capture all records within a minimum 2km distance of the proposed development site. The principal purpose of this task was to capture any records of protected species or species of natural heritage importance in proximity to the site boundary.

4.2 Breeding Birds

Three general breeding bird surveys were conducted, once monthly from April to June (inclusive both) in order to fully record across the breeding season, including early breeding resident birds and birds breeding later in the year such as late arriving migrants.

In addition, specific surveys were conducted for a small number of species which could potentially breed on site and may not have been adequately assessed by the general breeding bird survey methods. These species were Peregrine, Barn Owl and Kingfisher.

4.2.1 General Breeding Bird Surveys

The study area included the entirety of the site itself as well as a 500m 'buffer' area on the terrestrial side. The purpose of the buffer was to record species which may make use of the site, or which may be breeding on site, but off-site at the time of survey. A larger buffer area was not required due to the small size of the site itself and the uniformity of habitat beyond that distance. On the seaward side any birds present out to 200m were recorded (approximately mid river). Distances were measured or estimated using GPS or laser rangefinder as appropriate.

As the site is relatively small and self-contained, surveys utilised a 'Roving Records' survey methodology, similar to that used in the Bird Atlas 20017-11 (Balmer et al 2013) whereby the entire

site (including buffer area) was covered on each visit. All areas of suitable habitat were approached, the aim being to approach all areas to within 100m, for consistency across the site. 100m is consistent with the requirements of other standard bird survey methods (eg Breeding Bird Survey) and was considered to be sufficient on this relatively open site. Regular stops to listen for calling or singing birds were incorporated. We were not aiming for a full 'territory mapping' type survey or accurate population size study, but rather to identify all breeding species on or near the site, to achieve indicative numbers of breeding pairs and to determine which species of conservation significance may be using the site. This method allowed for coverage of the most important areas and allowed for easier determination of approximate numbers of birds overall.

Table 1: Categorisation of Breeding Status

Breeding Status	Code	Description for Code
Non-breeding (NO)	F	**F**lying over
	M	Species observed but suspected to be still on **M**igration
	U	Species observed but suspected to be s**U**mmering non-breeder
POSSIBLE (PO)	H	Species observed in breeding season in suitable nesting **H**abitat
	S	**S**inging male present (or breeding calls heard) in breeding season in suitable breeding habitat
PROBABLE (PR)	P	**P**air observed in suitable nesting habitat in breeding season
	T	Permanent **T**erritory presumed through registration of territorial behaviour (song etc) on at least two different days a week or more apart at the same place or many individuals on one day
	D	Courtship and **D**isplay (judged to be in or near potential breeding habitat; be cautious with wildfowl)
	N	Visiting probable **N**est site
	A	**A**gitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby
	I	Brood patch on adult examined in the hand, suggesting **I**ncubation
	B	Nest **B**uilding or excavating nest-hole
CONFIRMED (CO)	DD	**D**istraction-**D**isplay or injury feigning
	UN	**U**sed **N**est or eggshells found (occupied or laid within period of survey)
	FL	Recently **FL**edged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitat.
	ON	Adults entering or leaving nest-site in circumstances indicating **O**ccupied **N**est (including high nests or nest holes, the contents of which can not be seen) or adults seen incubating
	FF	Adult carrying **F**aecal sac or **F**ood for young
	NE	**N**est containing **E**ggs
	NY	**N**est with **Y**oung seen or heard

(*Reproduced from Balmer et al, 2013*)

Birds showing evidence of breeding were recorded on maps with an associated annotation if evidence of breeding was recorded. Breeding evidence followed that used in the latest 'Bird Atlas 2007-11' indicating non-breeding, possible, probable or confirmed breeding, as shown in Table 1.

Surveys were conducted throughout the day with a focus on the early morning period. Although efforts were made to ensure that different areas received approximately equal coverage at various times of day, there were some access constraints requiring early morning visits.
Following each survey, records were tallied to a spreadsheet, and an assessment made of the indicative likely numbers of breeding birds, using professional judgement based on the location, activity, behaviour and ecology of each species.

4.2.2 Peregrine

Peregrines were noted at a potentially suitable breeding location on site during winter wader surveys. It is an Annex I species in the Birds Directive and although not listed as designated species within the adjacent Cork Harbour SPA, it is nonetheless important in a conservation context in Ireland.
Peregrine was effectively monitored during the monthly breeding bird surveys although some additional time was spent on each survey watching the potential nest site. This follows survey guidance (Hardy et al, 2013) which recommends 4 visits during the breeding season, the first in March and the last in mid-June/early July to inspect for fledged young.

4.2.3 Barn Owl

Although not considered likely to breed on site due to the low quality of the surrounding habitat, there were potential breeding sites available for Barn Owl in the old buildings on site as well as potential foraging habitat, albeit of low quality. Security guards had reported seeing 'owls' on occasion near the security hut (species unknown and more likely to be Long-eared Owls based on habitat and description).
Nonetheless it was considered prudent to conduct specific watches for Barn Owl on site. Surveys were conducted with reference to *Barn Owl Surveying Standards for National Road Projects* (TII 2017).
Two evening watches were conducted on-site (from 1 hour before dusk to at least 1 hour after), targeting the two buildings most suitable for Barn Owl. A further hour was spent watching the main site for Barn owl activity.
The evening watches were conducted as early as possible, in April, as birds were likely to still be involved in courtship displays at this time. As the species is particularly susceptible to breeding disturbance impacts early in the breeding cycle, and for Health and Safety reasons, it was decided not to undertake internal inspections of buildings unless evidence of Barn Owl presence on site was found.
A further survey of all potential Barn Owl breeding sites within 1km is also recommended (SNH, 2017), so all areas on the terrestrial side of the site, within 1km were checked and assessed visually from outside for potential as suitable nest sites. As owls are less likely to traverse open water, it was not considered necessary to check areas on the far side of the River Lee. In many cases sites were on private property and could not be fully inspected. They were thus assessed on what could be seen as well as the

suitability of the surrounding habitats. All potential Barn Owl roost locations were identified and graded as to suitability using the following codes:

0 Not suitable for breeding Barn Owl
1 Potentially suitable but considered unlikely.
2 Potentially suitable
3 Confirmed occupancy.

4.2.4 Kingfisher

Kingfisher was recorded in the lagoon area during winter surveys. Although it was not considered likely that the species would breed on site due to the habitats available, in view of the proposed infilling of the lagoon area, it was considered prudent and important to establish the breeding status of Kingfisher with certainty.

In addition to the general breeding bird surveys, specific time was therefore dedicated to watching over the two primary areas of potential breeding and foraging on site, during the breeding season.

4.3 Terrestrial Mammals (excluding Bats)

The entire site of the proposed development was specifically surveyed for signs of terrestrial mammals using a walkover technique and thorough inspection of likely habitats. Surveys were conducted with regard to best practice guidelines, in particular *"Ecological surveying techniques for protected flora and fauna during the planning of National Road Schemes"* (National Roads Authority, 2008). Surveys focused on finding evidence of use of the site by Badger and Otter. All visible evidence of protected mammals was recorded, and the site visually assessed, in particular for potential breeding or resting areas for protected mammal species.

Between mid-February and mid-March trail cameras (camera traps) were deployed at five locations around the site where they were considered likely to detect the range of terrestrial mammal species using the site, in particular protected species.

Following the initial site walkover survey in late February four locations were identified which required further survey to clarify the type and extent of use by protected species. These locations had camera traps placed nearby under licence No.43/2019 from the National Parks and Wildlife Service (NPWS), monitoring the locations for a period of 30+ days in order to provide data on usage, frequency of usage and potentially use as breeding sites.

These cameras are activated by motion or infra-red heat signatures and all were set to maximum sensitivity. One camera was at a potential Badger sett and was set to record a burst of 3 still images on activation. Three cameras were at potential Otter sites and these were set to record 10s video on activation. Otters can have a very low heat signature due to their highly insulating fur, especially when they have just left the water, so these cameras were set to highest sensitivity.

A further survey of the hinterland outside the site (to 300m range) was conducted in late April to inspect for evidence of breeding Badgers and Otters. Badger main setts are the focal point of social and breeding activity, so it was important to know if any main setts were present close to the site. Although guidance for road projects suggests that setts should be surveyed to 50m from a proposed road scheme, this is increased to 150m if piling or blasting works are anticipated (NRA, 2005). A distance of 300m therefore provides a substantial additional buffer for this site. This survey also served to check for other potential Otter holts which have similar range constraints to Badger setts (NRA, 2008).

Otters can breed at any time of year, and cubs can stay with mother for up to 12 months, but more often for about 7-8 months. Badger young tend to emerge from the setts around April or May. As such, camera work during the period from mid-April to mid-May was well timed to detect breeding activity.

Signs of protected species were monitored casually during all other surveys on site and surrounding lands. The suitability of habitats for protected terrestrial mammal species was also incorporated, using expert judgement in combination with the survey results and desktop assessment.

4.4 Other Wildlife

Other non-target wildlife of interest was recorded as incidental observations during all surveys.

5 CONSTRAINTS

A number of constraints to the proposed methods were encountered as follows:

- The golf course area, within the buffer for breeding birds, could only be accessed early in the morning, before golfers came on site, by prior arrangement. This is not considered to have had any negative impact on results as the area could also be viewed from outside over much of the rest of the day.
- Some minor areas of farmland in the buffer area for breeding birds could not be accessed as it was not possible to get permission. These were areas of generally poor quality habitat and all could be viewed to some extent from outside. This is not considered to have had any negative impact on results.
- Some residential areas in the buffer area for breeding birds could not be viewed thoroughly so as not to cause a nuisance. These were areas of generally poor quality habitat and all could be viewed to some extent from outside. This is not considered to have had any negative impact on results.
- Some areas of habitat on the main site were too dense to inspect properly for mammal evidence. This is discussed in the relevant sections but is not thought to have had an undue impact on results.

- One trail camera was stolen from within the site before the end of its 30-day deployment. The camera had been inspected after 21 nights deployment and the data downloaded at that stage. This is discussed in the appropriate section on Otters but is not thought to have had an undue impact on results, given the overall results on Otters.

6 RESULTS

The following are the results obtained from desktop data evaluation and site-based surveys.

6.1 Breeding Birds

Surveys performed for breeding birds are listed in Table 2.

Table 2: Details for Breeding Bird Surveys

Date	*Type*	*Start*	*End*	*Wind*	*Cloud (x/8)*	*Precipitation*	*Visibility*	*Temp (°C)*
02/04/2019	Barn Owl watch	1925	2150	S1	3	Occasional light showers	Excellent	10
21/04/2019	Breeding Bird	0820	1010	SE3	4	Nil	Excellent	14
21/04/2019	Kingfisher	1015	1420	SE3	4	Nil	Excellent	15
22/04/2019	Breeding Bird	0610	1740	SE2	4	Nil	Excellent	17
29/04/2019	Barn Owl 1km Hinterland	1500	1900	S2	7	Nil	Excellent	13
29/04/2019	Barn Owl watch	1920	2150	S2	6	Nil	Excellent	10
29/04/2019	Barn Owl watch	2150	2250	S2	6	Nil	Excellent	10
09/05/2019	Breeding Bird	0610	1030	NW2	5	Nil	Excellent	13
09/05/2019	Kingfisher	1030	1300	NW2	5	Nil	Excellent	13
09/05/2019	Breeding Bird	1335	1930	NW2	5	Nil	Excellent	13
10/05/2019	Breeding Bird	0600	1045	0	3	Nil	Excellent	7
10/06/2019	Breeding Bird	0620	1445	NW2	6	Nil	Excellent	14
11/06/2019	Breeding Bird	1022	1650	N3	4	Nil	Excellent	17

All surveys were performed in suitable weather conditions.

The results of breeding bird surveys are summarised in Table 3. The results from each of the monthly surveys was inspected, and with the application of professional judgement, based on the location, activity, recorded breeding evidence and ecology of each species an estimate was made as to the number of likely breeding pairs within the site boundary and within the 500m buffer area. The final table shows the maximum number of likely breeding pairs considered to have been present on site over the breeding season.

Table 3: Summary Results of Breeding Bird Surveys

BirD[1]	BoCCI[2]					Best Estimate (Maximum)		
Anx1	Brd	Win	SCI[3]	Species	Maximum Non-Breeding	On-site (Pairs)	500m Buffer (Pairs)	Highest Breeding Evidence
	R		Y	Black Headed Gull	52			Non-breeding
		A	Y	Black Tailed Godwit	18			Non-breeding
				Blackbird		13	17	Confirmed
				Blackcap		3	3	Probable
				Blue Tit		4	3	Confirmed
				Bullfinch		1	3	Confirmed
				Buzzard		0	2	Probable
				Chaffinch		5	4	Probable
				Chiffchaff		4	2	Probable
				Coal Tit		0	1	Probable
Y	A		Y	Common Tern	18	0	26	Confirmed
	R	R	Y	Curlew	25			Non-breeding
				Dunnock		5	7	Probable
	A			Goldcrest		2	2	Probable
				Goldfinch		3	2	Confirmed
	A			Great Black Backed Gull	10			Non-breeding
				Great Tit		4	4	Confirmed
	A			Greenfinch		4	0	Probable
			Y	Grey Heron	6			Non-breeding
	R			Grey Wagtail		1	0	Possible
				Hooded Crow		5	5	Confirmed
	A			House Martin	4	1	2	Confirmed
	A			House Sparrow		0	1	Confirmed
				Jackdaw	3	8	4	Confirmed
				Jay		1	1	Probable
	A			Kestrel		0	1	Possible
	A			Linnet		0	2	Probable
Y				Little Egret	2			Non-breeding
	A	A	Y	Little Grebe		0	3	Confirmed
				Long Tailed Tit		2	1	Confirmed
				Magpie		5	3	Confirmed
			Y	Mallard		1	4	Confirmed
Y	A			Mediterranean Gull	1			Non-breeding
	A			Mistle Thrush		0	1	Possible
				Moorhen		1	1	Confirmed
	A	A	Y	Oystercatcher	26			Non-breeding
Y				Peregrine Falcon		1	0	Confirmed
				Pheasant		0	2	Probable

BirD[1]	BoCCI[2]					Best Estimate (Maximum)		
Anx1	Brd	Win	SCI[3]	Species	Maximum Non-Breeding	On-site (Pairs)	500m Buffer (Pairs)	Highest Breeding Evidence
				Pied Wagtail		1	2	Confirmed
				Raven		1	0	Confirmed
				Reed Bunting		1	0	Probable
	A			Robin		9	17	Confirmed
				Rock Dove - Feral Pigeon		10	0	Probable
				Rook	22			Non-breeding
	A			Sand Martin	3			Non-breeding
				Sedge Warbler		1	0	Probable
	A	A	Y	Shelduck	4	18	2	Confirmed
	A	A		Snipe		0	0	Non-breeding
				Song Thrush		1	5	Probable
	A			Sparrowhawk		0	1	Probable
	A			Spotted Flycatcher		0	1	Probable
	A			Starling		1	2	Confirmed
	A			Stock Dove		1	1	Probable
	A			Stonechat		0	1	Confirmed
	A			Swallow	17	4	5	Confirmed
	A	A	Y	Teal		1	0	Probable
				Treecreeper		1	0	Probable
		R		Tufted Duck	1	0	2	Probable
				Whimbrel	14			Non-breeding
				Willow Warbler		5	4	Probable
				Woodpigeon	65	22	20	Confirmed
				Wren		7	9	Probable
	R			Yellowhammer		0	1	Probable

1 Y = Species is listed on Annex 1 of the Birds Directive.

2 BOCCI = Birds of Conservation Concern in Ireland 2014 -19 (Colhoun & Cummins 2014)
Brd = Breeding (R = Red List, A = Amber List)
Win = Wintering (R = Red List, A = Amber List)

3 SCI = Special Conservation Interest in the Cork Harbour SPA

Sixty-three bird species were recorded overall in the study area (including the 500m buffer), with 51 of these recorded as breeding species and 12 as solely non-breeding species.
A total of 37 species were recorded breeding on the proposed development site, consisting of an estimated total of 158 pairs of breeding birds.

Figure 3: Locations of Breeding Birds of conservation significance

6.1.1 Annex 1 Species

The following four species appear on Annex 1 of the Birds Directive and were recorded on the study site:

- Common Tern
- Little Egret
- Mediterranean Gull
- Peregrine Falcon

Common Tern (Annex1, Amber List-Breeding, SCI)

Birds were recorded in the vicinity of the site from April onwards, with almost all activity centred around the Martello Tower, approximately 350m to the north of the site boundary (Figure 3). This is an established Common Tern colony since the early 1980's (NPWS 2014).

In June approximately 26 birds were visible on the roof of the tower, sitting as if on nests. A number of other birds were flying around the area. Informal consultation with a local bird ringer suggests that up to 80 birds were seen in the air in recent weeks, following a disturbance. This suggests that there could be up to 40 active nests on the tower.

This species is an SCI for the Cork Harbour SPA and is assessed to be a feature of ecological value of County Importance on this site.

Little Egret (Annex 1)

2 adult birds were seen foraging on the site in May and one in June. There is no suggestion that breeding is occurring on site and suitable breeding habitat is sparse and was inspected thoroughly. This species is not considered to breed on site but may use the site in low numbers to forage. Suitable breeding habitat exists nearby on Fota Island and it is likely that these birds may be breeding there although it was not surveyed. It is assessed to be of Local Importance (Lower Value) at this site.

Mediterranean Gull (Annex 1, Amber List-Breeding)

A single, immature bird was recorded in May, associating with immature, non-breeding Black-headed Gulls. This species does not breed on or near the site and is present in small numbers throughout Cork Harbour in the summer months. It is assessed to be of Local Importance (Lower Value) at this site.

Peregrine (Annex1)

A pair of Peregrine were seen regularly on the tallest building at the centre of the site (Figure 3) throughout the winter, spring and summer, on almost all surveys. Birds were seen displaying and mating in April, with adults bringing in prey in May and June, so a confirmed nesting attempt has been proven. At the current time, there has, as yet, been no evidence of young birds having been produced. It is difficult to view the likely nesting area on top of this tower. Breeding success is therefore uncertain, although adult birds were seen bringing in prey and sitting on railings (therefore not incubating eggs or chicks) in mid-June so it is likely that chicks have been produced and are well grown, not requiring incubation.

With a commanding view of the estuary and a close by supply of known prey (pigeon, waders, duck, corvids), this can be considered a high-quality nesting territory. It is assessed to be a feature of ecological value of County Importance on this site.

6.1.2 Red-Listed Species

Five red-listed species were recorded during the study as follows:

- Black-headed Gull
- Curlew
- Grey Wagtail
- Tufted Duck
- Yellowhammer

Black-headed Gull (Red List – Breeding, SCI)
52 were recorded in April, 10 in May and 14 in June. These are low numbers, consistent with the presence of non-breeding birds in Cork Harbour over the summer. There is no suitable breeding habitat for the species in the locality and it is not known to breed in County Cork.
This species is an SCI for the Cork Harbour SPA.

Curlew (Red List-Breeding, Red List-Wintering, SCI)
25 were recorded in the buffer area in April, with 2 in May. This is consistent with birds passing through the area in spring and being present in low numbers (of non-breeding birds) in Cork Harbour in the breeding season. There is no suitable breeding habitat for the species on or near the site and it is not known to breed in the harbour area.
This species is an SCI for the Cork Harbour SPA.

Grey Wagtail (Red List- Breeding)
A single bird was recorded on two occasions, during a survey in April, and caught on a trail camera in June. The April record came from the settlement pond in the north of the site, while the camera record came from the lagoon area (Figure 3). Although there may possibly be a single breeding pair on site, the lack of sightings over the summer would suggest that the species is breeding off site and foraging occasionally on site. It is assessed to be of Local Importance (Higher Value) at this site.

Tufted Duck (Red List-Wintering)
Two pairs were present on highly disturbed ornamental lakes on the adjacent golf course in April, but none were present in May and only a single male was seen in June (showing no signs of breeding). It is therefore unlikely that the species breeds on site, although it may breed nearby. This species is not red-listed as a breeding species, and was not recorded during winter surveys of the estuary and river areas.

Yellowhammer (Red Listed-Breeding)

A single pair of Yellowhammer were recorded towards the outer edge of the 500m buffer in May and June (Figure 3) and are probably breeding in farmland hedgerows. None were noted on the proposed development site. It is assessed to be of Local Importance (Higher Value) at this site.

6.1.3 Amber Listed Species

Twenty-two species of amber (moderate) conservation concern were recorded within the study area.

Five of these species were only recorded in small numbers as non-breeding species:

- Black-tailed Godwit
- Great Black-backed Gull
- Oystercatcher
- Sand Martin
- Snipe

Black-tailed Godwit and Oystercatcher are SCI's in the Cork Harbour SPA. All are assessed to be of negligible ecological value on site as breeding species.

Of the remaining 17 species, the following 8 species were only recorded breeding in the buffer zone, and none are likely to be unduly affected by development on site:

- House Sparrow
- Kestrel
- Linnet
- Little Grebe
- Mistle Thrush
- Sparrowhawk
- Spotted Flycatcher
- Stonechat

Little Grebe is an SCI in the Cork Harbour SPA. Three pairs were confirmed breeding on the ornamental lakes on the golf course (Figure 3) and the species is known to winter on the adjacent estuary in the Belvelly area. The lakes are exposed to a high level of daily disturbance in the form of golfers, indeed some of the putting greens are immediately adjacent to the lakes. As such, these birds are exposed to a high level of daily disturbance and are unlikely to be negatively affected by construction or operation of the proposed development. It is assessed to be of Local Importance (Higher Value) at this site, the others being assessed to be of Local Importance (Lower Value).

The remaining 9 species are as follows, with estimated numbers breeding on the proposed development site and buffer in parentheses:

- Goldcrest (2,2)
- Greenfinch (4,0)
- House Martin (1,2)
- Robin (9,17)

- Shelduck (18,2)
- Starling (1,2)
- Stock Dove (1,1)
- Swallow (4,5)
- Teal (1,0)

Most of these species are relatively widespread in the Irish countryside, and as they are only occurring in small numbers on site it is not likely that the proposed development will have significant negative impacts on these species, despite the fact that breeding and foraging habitat will be lost on site. They are assessed to be of Local Importance (Lower Value) as breeding species on this site.
However, two species - Shelduck and Teal (Figure 3), are also SCI's in the Cork Harbour SPA, albeit primarily for their wintering numbers on site.

The single pair of Teal were present in the north-eastern wetland area in April and May, but not in June and may not have bred. They are assessed to be of Local Importance (Higher Value) as breeding species on this site.

The Shelduck are notable on site in that they appear to be breeding in numbers primarily in the roof space of the old estate house in the south-west of the site. 18 pairs were noted on the main development site in April, 14 in May (plus 1 pair in buffer) and 5 pairs on site in June (plus 2 in buffer).

In April and May birds were seen displaying and calling on the roof of the house, and became very agitated when approached, flying off the roof and circling overhead calling, returning soon after the surveyor departed. Such behaviour in a normally wary species is strongly indicative of breeding. Two birds were seen exiting the roof through a missing tile space in May, and 'peeping' calls were heard from within the roof. Although these calls could not be firmly ascribed to species, they are consistent with the calls of nestling Shelduck, so are again strongly indicative of breeding, while a single pair exited the same spot in June.
A pair with 8 small chicks was noted in the Eastern Wetland in June and likely bred close by on site. A pair was also seen here in April. Two agitated pairs were noted elsewhere at various locations around the main site on each visit between April and June. It is uncertain if, or precisely where they bred, but the species often uses rabbit holes to breed and the site is littered with a large number of rabbit holes. It is likely that the birds are breeding, with likely locations around the settlement pond and the lagoon as birds were seen in these areas in June acting appropriately for breeding birds.
Shelduck is assessed to be of Local Importance (Higher Value) at this site.

6.1.4 Barn Owl

Dedicated surveys for Barn Owl occupancy were conducted on two dates and three locations in April (see Table 2). Barn Owls are known to nest in old tree cavities and in man-made structures, particularly derelict or other buildings.

On the 29th April a daytime survey was conducted within a 1km buffer from the site. 15 sites were identified as having potential suitability for breeding Barn Owl (see Figure 4), although 14 of these were considered to be unlikely breeding sites based primarily on the lack of signs, busy road network and the poor quality of the surrounding habitats. One site, Belvelly Castle might previously have been considered very suitable, but has undergone extensive renovation recently and is now a sealed occupied dwelling and no longer suitable.

Only one location was considered to be potentially suitable, that being the old estate house on site, which was surveyed that evening, with no signs or sightings of Barn Owl.

Figure 4: Locations of sites within 1km with potential for nesting Barn Owl

On the 02nd April the survey covered the ruined house in the extreme south of the site (site 2), from the pathway nearby. This is a suitable nest site but is close to a busy main road and in area of limited

foraging potential. For safety reasons it was not possible to inspect around the property for signs, but there were no obvious signs of Barn Owl occupancy visible (eg 'whitewash'/faeces). No owls were recorded.
On the 29th April the survey concentrated on the large old estate house within the proposed development site (site 10), viewed from low on the west side with a clear view of the most likely exit holes as well as a good view of the treeline against the sky (any owl exiting the property would have to break the skyline or pass the observer position). The building and adjacent area was inspected thoroughly from outside before the watch began for signs of owl occupancy (whitewash, moulted feathers, pellets etc). No signs or sightings of owls were recorded.
Subsequent to this watch an hour of watching over the central portion of the main site was conducted in order to check for Barn owl activity in this area (sites 11-15). No sightings were recorded.
Many of the other buildings on the main site were inspected at ground level over the course of the season. No indications of Barn Owl presence were recorded anywhere on site.

6.1.5 Kingfisher

A number of holes were noted on an embankment near the south-east side of the lagoon during the mammal walkover in late February. Although of low suitability, these had some potential to be used by breeding Kingfisher, a species encountered occasionally in the lagoon area during the previous winter surveys.

On 21st April 2 x 2-hour surveys were conducted for Kingfisher at the two most likely sites, the Eastern Wetland and the Lagoon (ensuring a view of potential nest holes). No sightings of Kingfisher were recorded.

On 9th May a further one hour of survey was conducted at each site, again with no records.

Kingfishers were not encountered on site during any other site surveys during the breeding season. Given the relatively low suitability of the site for breeding Kingfisher it is concluded that Kingfisher do not breed on site.

6.2 Terrestrial Mammals

The site in general is of moderate quality for terrestrial mammals, being primarily concrete surfaced. Nonetheless, the derelict and generally low levels of disturbance have allowed for substantial growth of cover in places, and there are some areas of mature woodland and wetland around the edges.
The entire site was walked in the winter period (27th & 28th February) to check for signs of use by protected mammals, in particular by Otter and Badger. This was supplemented by the deployment of trail cameras at 5 locations around the site for periods of approximately two weeks between 12th February and 18th March.

Resulting from these surveys, four areas of particular interest were identified for further survey:

- Station 1 (camera ref. 8/12) : A likely single entrance Otter holt in a bank at the top of the shingle beach, east of the jetty base. This hole was of a suitable size for Otter, with numerous Otter spraint outside, being located under overhanging tree branches and well hidden.
- Station 2 (camera ref. 9/13) : A likely regular resting and sprainting area ('seat') for Otters in the Eastern Wetland near to the boundary wall. There was a lot of flattened grass in this area and abundant Otter spraint, both old and new. A well-used run was evident between this area and the nearby estuary.
- Station 3 (camera ref. 6/10) : An area of flat concrete slabs at the east end of the Lagoon, adjacent to thick vegetation and which had apparent holes below them. There were abundant Otter signs around the lagoon (spraint, slides, prey remains, mammal runs).
- Station 4 (camera ref. 7/11) : A larger burrow entrance near a rabbit warren in the woodland to the north of the old Estate House in the west of the site. This was occupied by fox (smell and scavenged prey remains nearby), but it was the only potential Badger sized burrow recorded on the site and it was therefore required to rule out alternative or simultaneous occupancy by Badger.

Table 4: Camera Trap Deployments and Mammal Capture Summary

Ref	*Easting (ITM)*	*Northing (ITM)*	*Location Description*	*Deployment Date*	*Recovery Date*	*No. Nights Operational*	*Mammals Detected (No. Triggers)*
1	578127.851	569935.611	Eastern wetland by hut	12/02/1919	27/02/2019	15	Badger (1), Fox (9), Rabbit (16), Brown Rat (8)
2	577262.316	569668.353	Settlement Pond	12/02/2019	27/02/2019	15	Otter (3), Rabbit (60)
3	577336.194	569394.129	Woodland N of estate house	28/02/2019	18/03/2019	18	Fox (24)
4	577513.242	569244.706	By fence N of security hut	28/02/2019	18/03/2019	18	Rabbit (8)
5	577423.098	569608.254	Centrally on main site	06/03/2019	18/03/2019	12	Fox (9), Rabbit (202)
6	577842.563	569826.173	Lagoon by concrete slabs	09/05/2019	30/05/2019	21	Otter (1), Fox (8), Rabbit (17), Brown Rat (27)
7	577352.068	569390.052	Woodland N of estate house	09/05/2019	30/05/2019	21	Fox (47), Rabbit (43)
8	577172.894	569475.523	At potential holt entrance north of jetty base	09/05/2019	30/05/2019	21	Otter (3), Fox (2), Wood Mouse (106)
9	578286.247	570017.29	Potential couch site in eastern wetland	09/05/2019	30/05/2019	21	Otter (10), Fox (13)
10	577842.563	569826.173	Lagoon by concrete slabs	30/05/2019	11/06/2019	12	Otter (1), Rabbit (11), Brown Rat (12)
11	577352.068	569390.052	Woodland N of estate house	31/05/2019	11/06/2019	11	Rabbit (24)
12	577172.894	569475.523	At potential holt entrance north of jetty base	31/05/2019	20/06/2019	0 (Stolen)	N/A
13	578286.247	570017.29	Potential couch site in eastern wetland	30/05/2019	11/06/2019	12	Fox (1)

Four trail cameras were deployed at these sites for a month, from the 09th May 2019. Table 4 shows the deployments of all trail cameras on site with summary results for each. All cameras were checked at approximately 10-day intervals for continued operation, battery and memory capacity. On 30th May all 4 cameras had data downloaded and were redeployed in same position immediately or the following day. Unfortunately, one camera was subsequently stolen and provided no further information.

Figure 5: Camera Trap Locations

6.2.1 Badger

Badgers are strictly nocturnal. Widespread in Ireland, they thrive in mosaic habitats of woodland, hedgerow and farmland. They excavate complex underground tunnel systems, called setts, and avoid building setts in areas prone to flooding. Hedgerows are favoured sett sites (Lysaght & Marnell, 2016).

Badgers are omnivorous, taking a wide variety of foods, both animal and plant, with earthworms being a favourite. Territories vary from 60 – 200 hectares. Cubs are born in the early spring.
There were 11 records of Badger in and around the site. In addition, a large network of mammal paths were present through fields, hedgerows and woodland both on and off site, although it is not certain which species had made these and many were seen to be used by Rabbits and Foxes on a regular basis.

Table 5: Badger Records on Site

RECORD	*SPECIES*	*CERTAINTY*	*RECORD TYPE*	*DATE*	*TIME*	*NUMBER*	*COMMENTS*
1	BADGER	CONFIRMED	Camera	23/02/2019	2042	1	walking past
2	BADGER	POSSIBLE	Trail	27/02/2019			clear mammal path in woodland between roads, likely Badger access point from road
3	BADGER	CONFIRMED	Corpse	27/02/2019		1	roadkill at side of road
4	BADGER	POSSIBLE	Trail	27/02/2019			Run, probable large mammal path along inside of old fenceline. Torn wood, likely badger?
5	BADGER	POSSIBLE	Breeding-Resting Site	28/02/2019			Burrow by fallen tree, clear entrance, no bedding outside. Lots of digging in vicinity, possible Badger.
6	BADGER	CONFIRMED	Print	28/02/2019			on main path
7	BADGER	PROBABLE	Trail	21/04/2019		1	
8	BADGER	PROBABLE	Trail	21/04/2019		1	
9	BADGER	PROBABLE	Trail	21/04/2019		1	
10	BADGER	PROBABLE	Trail	21/04/2019		1	
11	BADGER	CONFIRMED	Droppings	21/04/2019		1	in foraging pit

A single Badger was captured passing a trail camera at the eastern wetland in late February, while it or another was found dead on the adjacent main road a few days later.

Although there were large mammal trails throughout the woodland in the vicinity of the Eastern Wetland, the on-site areas are not suitable for Badger setts as the ground is mostly very damp and likely prone to flooding. No setts or other evidence of Badger was found in this section.
The woodland between the golf course and the site contained a number of large mammal crossing points over ditches into fields, which may have been made by Badger. A single crossing point onto the main road was also noted. This woodland also contains and old quarry and is quite impenetrable in parts. It was inspected thoroughly for Badger setts but no evidence was found despite the habitat being quite suitable. Should a main sett have been present we would certainly have located active pathways. This woodland and surrounding area is likely frequented by foraging Badgers.

A single badger print was found in mud at the south of the site, although the woodland here is partly flooded and there are few areas suitable for Badger setts. These were inspected and found not to contain setts. A number of large mammal trails were noted between the field and the woodland at the southern extreme of the site, possibly made by Badger, so again it is likely that this area is used by

foraging Badgers, perhaps from woodland areas further up the hill which were not inspected (out of range and no permissions).

A single badger dropping was found at the edge of the golf course. This was adjacent to a moderately large burrow within an extensive Rabbit warren, although there was no further evidence of Badger use (spoil heap/bedding etc).

A large burrow within a Rabbit warren was also present in the woodland just north of the estate house. Although Badger sized it was clearly occupied by fox (smell and scavenged prey outside). However, given the suitability of the habitat it was decided to place a trail camera in the vicinity, focused on the burrow entrance. Over a period of 32 nights in May/June there were no records of Badger obtained, only Fox visiting the burrow regularly.

Given the high level of survey effort and very low number of detections it is concluded that use of the site by Badgers is irregular to occasional. Badgers are likely to use the site for occasional foraging and there are no breeding Badgers, or occupied Badger setts on the site or within 300m.

Figure 6: Records of Badger

Badger is widespread in Ireland but is a protected species under the Wildlife Acts. There is a general lack of suitable habitat for setts on site and the species is an irregular visitor in small numbers. It is assessed to be of Local Importance (Higher Value) at this site.

6.2.2 Otter

Otters are widespread in Ireland and found in a variety of aquatic habitats, both freshwater and marine, but always requiring access to fresh water. The national population is estimated at 16,000 – 20,000 individuals (Lysaght & Marnell, 2016). They are a protected species under the Wildlife Acts, and under Annexes II and IV of the European Habitats Directive. Their territorial nature results in frequent marking of territories with droppings ('spraints'), which can usually be readily identified and are often placed in conspicuous locations. Otters breed in burrows, called 'holts', and also use safe places to rest above ground during the day ('couches') or have favoured sprainting sites ('seats'). Holts are often found under tree root systems near water but breeding holts in particular can be located some distance from water. Otters are primarily nocturnal, although coastal otters in particular are often active diurnally, and they feed on a variety of prey, primarily fish and crustaceans, but occasionally also taking birds and small mammals.

During the initial site walkover survey Otter spraint was found regularly, along most coastal areas but particularly adjacent to the sites' wetlands. The entire perimeter of the site adjacent to the river/estuary was walked, apart from the outside of the railway line (no permission), the jetty by the security hut (sealed off)and a portion of the north-west side of the Eastern Wetland which is inaccessible due to dense vegetation and soft mud.

Particular concentrations of spraint were noted at two locations, while a single entrance Otter holt was also found. No signs of Otter were located during the 300m hinterland search (for Badger and Otter) in late April.

<u>Site 1 – Eastern Wetland</u>

The first concentration of spraint was the eastern wetland in a couch/seat area of flattened grass and numerous fresh and old spraint. A clear Otter trail was visible connecting this area across the site boundary (rock armour) and into the mudflat/estuarine area. There is some dense woodland in this area, although almost all was inspected and no visible evidence of an Otter Holt was found. Although some areas could not be inspected due to the dangerously soft substrate and impenetrable vegetation, there was no visible, these areas were small and not considered likely to contain a holt. There were few spraint found on the retaining embankment by the estuary, away from the above mentioned crossing point and no further mammal crossing trails were encountered here. The outer rock embankment, adjacent to the railway could not be inspected for safety reasons, however, the fenceline along the site border was checked and was found to have no evidence of Otter presence.

A trail camera was deployed in the area of the spraint concentration for a period of 32 nights in May/June, recording 10s video clips. Otter was recorded 10 times but only on 2 dates (18th and 26th May), often sniffing around the area and sprainting once.

This low level of activity would suggest that the area is not a breeding site, a conclusion supported by the lack of breeding evidence found on searches. However, the area is clearly used by Otters on a regular basis. Otters are likely to forage regularly both within the wetland area and outside on the estuary and may rest up at this couch site which is undisturbed.

Site 2 - Lagoon

During the initial site walkover in late February there was abundant evidence of Otter activity around the lagoon, with numerous spraint, prey remains (crustaceans), mammal runs probably maintained by otter and a slide into the north side of the lagoon. Evidence was strongly biased to the north and east sides of the lagoon, and there were large concrete slabs in this area which appeared to have substantial tunnel entrances below them. It was uncertain if these were burrows or just eroded cavities, but there was at least a possibility that this area contained an Otter holt. These were not visible in May and June, so it would appear that they are not permanent burrows. The adjacent woodland areas were inspected as far as possible, but no signs of distinct mammal trails or any holt was found. A trail camera was deployed at the slabs for a period of 33 nights in May/June, recording video footage. Two records of Otter were obtained, single animals on the night of 23rd May and the evening of 07th June, the latter entering the water. During May and June it was noted that there was very little evidence of Otter at this area during camera inspection visits and bird surveys.

As with the previous site evidence suggests that Otters move between this site and the adjacent estuary using regular pathways, and forage within the lagoon on a regular basis.

There is no evidence of breeding in the lagoon and adjacent woodland. The lack of spraint away from crossing points on the embankment would suggest that there is no breeding or resting site within the embankment, although there remains a possibility that animals may rest within the rock cavities on occasion.

Site 3 – Holt Entrance near Jetty

A suitably sized, distinct burrow was located approximately 70m north of the jetty entrance. The burrow had a spoil heap at the entrance with numerous otter spraint present in late February (much less in May and June). The burrow is located at the base of a steep bank, at the top of the beach, above the high-water mark, and under a canopy of low hanging tree branches. It has a smoothed entrance and is clearly used by Otters at least occasionally.

The adjacent woodland was thoroughly inspected but no other entrances were found and no likely mammal trails were present in the area.

A trail camera was positioned near this entrance and recorded data over 21 nights in May (it was stolen at some point subsequent to this). Otters were recorded on two consecutive nights in May (22nd & 23rd), passing by and sniffing near the entrance, but not entering. A wood mouse was recorded entering the burrow with nesting material on a regular basis. This indicates that this burrow is not in regular use by Otters and is certainly not a current breeding site. On this basis it is not considered a significant constraint that the recording camera was removed early from this location.

Other Sites

Approximately 200m to the north of Site 3, a small amount of spraint was found at the edge of the old pier. This has the potential to hold resting or breeding Otters within the structure, but no likely entrances could be found. Although there may be entrances present underwater the fact that the construction is made with sheet steel piling would suggest that this is unlikely. Otter spraint was also recorded in late February around the settlement pond, also about 200m distant from the holt, and live Otters were recorded via trail cameras here on two nights. Spraint was not noted here during breeding bird surveys from April – June. This is likely a foraging area as no suitable breeding or resting areas appear to be present.

A single Otter spraint was recorded in late February at a very small stream in the extreme south of the site. This woodland was also inspected but no evidence of Otter breeding was found.

Overall, there is certainly regular Otter activity at the site. Activity is concentrated where the wetland areas are adjacent to the edge of the site, and there appears to be significantly more sprainting activity in the winter/early spring than during the summer. The site is clearly used regularly by foraging Otters, probably more than one (on 23rd May single Otters were recorded within 30 minutes of each other at the holt by the jetty and the lagoon).

No evidence of the existence of currently occupied or active Otter holts was found on-site or within 300m of the site. However, the following precautions should be followed prior to works commencing in order to ensure that any prescribed mitigation measures in the EIAr remain adequate to address possible impacts on otters. It is also important to ensure that no new holts have been created in the intervening period.:

- These surveys can be classed as Pre-construction surveys so long as construction begins within 12 months (ie before 28th February 2020). Otherwise a further full suite of pre-construction surveys will be required in advance of works, to ascertain that no changes have taken place. Up to 8 weeks should be allowed for such pre-construction surveys, as a further period of trail camera monitoring may be required, and should an active holt be found it may take 3-4 weeks for exclusion of animals (no exclusion allowed if it is a breeding holt).
- Further survey will be required in any case, immediately prior to site clearance, to ensure no new holts have been constructed or occupied. Up to 6 weeks should be allowed for this, as a further period of trail cameras monitoring may be required.
- In particular, the holt near the jetty base should be checked for activity prior to works.

Site clearance should proceed in accordance with guidance *"Guidelines For The Treatment Of Otters Prior To The Construction Of National Road Schemes"* (NRA 2008). All areas of woodland, wetland and dense cover should be attended by a suitably qualified and experienced ecologist when being cleared.

It is concluded that Otters are not currently breeding at the site but visit on a regular basis to forage and rest. Such foraging will be focused on the coastal areas and adjacent wetland areas.

Otter territories in good quality foraging areas can be as small as 2km on coastal sites (www.vincentwildlife.ie/species/otter) but can be much larger. Otters will be less inclined to enter areas which have significant lighting, effectively resulting in a loss or significant degradation of foraging and breeding habitats, or an interruption of commuting routes.

Artificial night lighting during the construction and/or operational phases of the proposed development has the potential to negatively impact Otters by impeding their ability to forage successfully and to move efficiently through the landscape. Development of this site forms a potential barrier along the shoreline. Although otters can swim the coastal section of this site is approximately 2.5km in length, which would have negative energetic cost on Otters wishing to traverse the coastline here. The site is also potentially a valuable foraging area, so it will be important to mitigate any negative effects on Otter.

It is assessed to be of County Importance at this site.

Figure 7: Records of Otter

Potential mitigation against negative impacts on Otters should be considered and could include:

- Avoidance of development of wetland areas
- Shielding of wetland areas from disturbance

- Creation of new high-quality wetland areas of high quality
- Directional lighting of the site, shielding the coastal areas from excessive lighting at night-time
- Installation of artificial Otter holts as an enhancement measure

Table 6: Camera Trap Deployments and Mammal Capture Summary

Date	*Time*	*Camera*	*Location*	*Species*	*Num.*	*Notes*
13/02/2019	1856	2	Settlement Pond	Otter	1	inward bound
13/02/2019	1906	2	Settlement Pond	Otter	1	inward bound
21/02/2019	0559	2	Settlement Pond	Otter	1	outward bound
23/02/2019	2042	1	Eastern wetland	Badger	1	walking past
18/05/2019	0145	9	Eastern wetland	Otter	1	sniffs and runs off
18/05/2019	0615	9	Eastern wetland	Otter	1	runs past camera
18/05/2019	0905	9	Eastern wetland	Otter	1	runs towards camera
18/05/2019	0905	9	Eastern wetland	Otter	1	passing by
18/05/2019	2259	9	Eastern wetland	Otter	1	feeding or sniffing intently
18/05/2019	2300	9	Eastern wetland	Otter	1	moving around, sniffs
18/05/2019	2300	9	Eastern wetland	Otter	1	feeding or sniffing intently
18/05/2019	2301	9	Eastern wetland	Otter	1	moving around
18/05/2019	2306	9	Eastern wetland	Otter	1	spraints, moves around
22/05/2019	1959	8	Potential holt by jetty base	Otter	1	sniffs near entrance and poss spraints, no entry
23/05/2019	2108	8	Potential holt by jetty base	Otter	1	inspects entrance, sniffs spraint and moves on
23/05/2019	2311	8	Potential holt by jetty base	Otter	1	sniffs spraint and moves on
23/05/2019	2338	6	Lagoon	Otter	1	sniffing, then into water
26/05/2019	0206	9	Eastern wetland	Otter	1	runs past and returns
07/06/2019	2129	10	Lagoon	Otter	1	runs down slabs into water

6.2.3 Other Terrestrial (non-volant) Mammals

A number of other mammal species of conservation significance occur or are likely to occur on site.

The following species are protected species under the Wildlife Acts and have been recorded on the NBDC database as being present within 2km of the site:

- Hedgehog
- Red Squirrel
- Irish Stoat

Hedgehog is a widespread species, was not noted on site, but is likely to occur at least occasionally.

Red Squirrel records are most likely to refer to a known population on Fota Island and was not recorded on site.
Irish Stoat is likely to occur on site as it's favoured prey (Rabbit) is abundant throughout the site.
In addition, Pygmy Shrew is likely to occur on site.
Hedgehog, Irish Stoat and Pygmy Shrew are assessed to be of Local Importance (Lower Value) at this site.

The following species are classified as Invasive Species and have been recorded on the NBDC database as being present within 2km of the site:

- American Mink
- Bank Vole

Both are likely to occur on site. A probable Mink footprint was recorded in February in mud at the Eastern Wetland.

6.2.1 Marine Mammals

Harbour Seal
Single Harbour Seals have been recorded in the vicinity of the main jetty in most months since February. This is a protected species under the Wildlife Acts, and under Annexes II and IV of the European Habitats Directive, with a National population of 4,500 – 6,500 individuals (Lysaght & Marnell, 2016). Although animals present this far up the River Lee are likely to be wandering and foraging animals, the regularity of sightings in this area means that this species is assessed to be of Local Importance (Higher Value) at this site.

7 SUMMARY OF CONSERVATION SIGNIFICANCE ASSESSMENT

Table 7: Summary of Ecological Valuation of the Site and Species

Ecological Receptor	Conservation Status			Assessed Significance Level
	Birds Directive	BOCCI	SCI	
Common Tern	Annex 1	Amber (Breeding)		County Importance
Peregrine	Annex 1			County Importance
Otter				County Importance
Grey Wagtail		Red (Breeding)		Local Importance (Higher Value)
Yellowhammer		Red (Breeding)		Local Importance (Higher Value)
Little Grebe		Amber (Breeding)	SCI	Local Importance (Higher Value)
Shelduck		Amber (Breeding & Winter)	SCI	Local Importance (Higher Value)
Badger				Local Importance (Higher Value)
Harbour Seal				Local Importance (Higher Value)
Teal		Amber (Breeding & Winter)	SCI	Local Importance (Higher Value)

Ecological Receptor	Conservation Status			Assessed Significance Level
	Birds Directive	BOCCI	SCI	
Goldcrest		Amber (Breeding)		Local Importance (Lower Value)
Mistle Thrush		Amber (Breeding)		Local Importance (Lower Value)
Robin		Amber (Breeding)		Local Importance (Lower Value)
Sparrowhawk		Amber (Breeding)		Local Importance (Lower Value)
Spotted Flycatcher		Amber (Breeding)		Local Importance (Lower Value)
Mute Swan		Amber (Winter)		Local Importance (Lower Value)
Cormorant		Amber (Winter)		Local Importance (Lower Value)
Little Egret	Annex 1			Local Importance (Lower Value)
Mediterranean Gull	Annex 1			Local Importance (Lower Value)
House Sparrow		Amber (Breeding)		Local Importance (Lower Value)
Kestrel		Amber (Breeding)		Local Importance (Lower Value)
Linnet		Amber (Breeding)		Local Importance (Lower Value)
Mistle Thrush		Amber (Breeding)		Local Importance (Lower Value)
Sparrowhawk		Amber (Breeding)		Local Importance (Lower Value)
Spotted Flycatcher		Amber (Breeding)		Local Importance (Lower Value)
Stonechat		Amber (Breeding)		Local Importance (Lower Value)
Goldcrest		Amber (Breeding)		Local Importance (Lower Value)
Greenfinch		Amber (Breeding)		Local Importance (Lower Value)
House Martin		Amber (Breeding)		Local Importance (Lower Value)
Robin		Amber (Breeding)		Local Importance (Lower Value)
Starling		Amber (Breeding)		Local Importance (Lower Value)
Stock Dove		Amber (Breeding)		Local Importance (Lower Value)
Swallow		Amber (Breeding)		Local Importance (Lower Value)
Hedgehog				Local Importance (Lower Value)
Irish Stoat				Local Importance (Lower Value)
Pygmy Shrew				Local Importance (Lower Value)

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TII Publication Number RE-ENV-07005

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The Stationary Office, Dublin.

9 APPENDIX 1 : SCIENTIFIC NAMES OF SPECIES IN TEXT

BIRDS	
Sterna paradisaea	Arctic Tern
Limosa lapponica	Bar Tailed Godwit
Tyto alba	Barn Owl
Cepphus grylle	Black Guillemot
Larus ridibundus	Black Headed Gull
Phoenicurus ochruros	Black Redstart
Limosa limosa	Black Tailed Godwit
Turdus merula	Blackbird
Sylvia atricapilla	Blackcap
Cyanistes caeruleus	Blue Tit
Pyrrhula pyrrhula	Bullfinch
Buteo buteo	Buzzard
Fringilla coelebs	Chaffinch
Phylloscopus collybita	Chiffchaff
Periparus ater	Coal Tit
Streptopelia decaocto	Collared Dove
Larus canus	Common Gull
Actitis hypoleucos	Common Sandpiper
Sterna hirundo	Common Tern
Phalacrocorax carbo	Cormorant
Loxia curvirostra	Crossbill
Numenius arquata	Curlew
Calidris alpina	Dunlin
Prunella modularis	Dunnock
Regulus regulus	Goldcrest
Carduelis carduelis	Goldfinch
Locustella naevia	Grasshopper Warbler
Larus marinus	Great Black Backed Gull
Podiceps cristatus	Great Crested Grebe
Parus major	Great Tit
Tringa ochropus	Green Sandpiper
Carduelis chloris	Greenfinch
Tringa nebularia	Greenshank
Ardea cinerea	Grey Heron
Motacilla cinerea	Grey Wagtail
Uria aalge	Guillemot
Larus argentatus	Herring Gull
Corvus cornix	Hooded Crow
Delichon urbica	House Martin
Passer domesticus	House Sparrow
Coloeus monedula	Jackdaw

Garrulus glandarius	Jay
Falco tinnunculus	Kestrel
Alcedo atthis	Kingfisher
Vanellus vanellus	Lapwing
Larus fuscus	Lesser Black Backed Gull
Acanthis cabaret	Lesser Redpoll
Carduelis cannabina	Linnet
Egretta garzetta	Little Egret
Tachybaptus ruficollis	Little Grebe
Larus minutus	Little Gull
Asio otus	Long Eared Owl
Aegithalos caudatus	Long Tailed Tit
Pica pica	Magpie
Anas platyrhynchos	Mallard
Anthus pratensis	Meadow Pipit
Larus melanocephalus	Mediterranean Gull
Turdus viscivorus	Mistle Thrush
Gallinula chloropus	Moorhen
Haematopus ostralegus	Oystercatcher
Falco peregrinus	Peregrine Falcon
Phasianus colchicus	Pheasant
Motacilla alba	Pied Wagtail
Corvus corax	Raven
Alca torda	Razorbill
Tringa totanus	Redshank
Emberiza schoeniclus	Reed Bunting
Acrocephalus scirpaceus	Reed Warbler
Larus delawarensis	Ring Billed Gull
Charadrius hiaticula	Ringed Plover
Erithacus rubecula	Robin
Columba livia	Rock Dove - Feral Pigeon
Anthus petrosus	Rock Pipit
Corvus frugilegus	Rook
Riparia riparia	Sand Martin
Sterna sandvicensis	Sandwich Tern
Acrocephalus schoenobaenus	Sedge Warbler
Phalacrocorax aristotelis	Shag
Tadorna tadorna	Shelduck
Spinus spinus	Siskin
Alauda arvensis	Skylark
Gallinago gallinago	Snipe
Turdus philomelos	Song Thrush
Accipiter nisus	Sparrowhawk
Muscicapa striata	Spotted Flycatcher

Sturnus vulgaris	Starling
Columba oenas	Stock Dove
Saxicola torquata	Stonechat
Hirundo rustica	Swallow
Apus apus	Swift
Anas crecca	Teal
Certhia familiaris	Treecreeper
Aythya fuligula	Tufted Duck
Arenaria interpres	Turnstone
Rallus aquaticus	Water Rail
Oenanthe oenanthe	Wheatear
Numenius phaeopus	Whimbrel
Sylvia communis	Whitethroat
Phylloscopus trochilus	Willow Warbler
Scolopax rusticola	Woodcock
Columba palumbus	Woodpigeon
Troglodytes troglodytes	Wren
Emberiza citrinella	Yellowhammer
Larus michahellis	Yellow-legged Gull

TERRESTRIAL MAMMALS	
Meles meles	Badger (Eurasian Badger)
Clethrionomys glareolus	Bank Vole
Rattus norvegicus	Brown Rat
Vulpes vulpes	Fox (Red Fox)
Erinaceus europaeus	Hedgehog
Mustela erminea hibernica	Irish Stoat
Neovison vison	Mink (American Mink)
Lutra lutra	Otter (European Otter)
Sorex minutus	Pygmy Shrew
Oryctolagus cuniculus	Rabbit (European Rabbit)
Sciurus vulgaris	Red Squirrel (Eurasian)
Apodemus sylvaticus	Wood Mouse

MARINE MAMMALS	
Phoca vitulina	Harbour Seal (Common Seal)

Appendix 5.4
Marino Point Winter Bird Survey 2018/19 Report

Malachy Walsh and Partners
Engineering and Environmental Consultants

Marino Point Winter Bird Survey 2018/19 Report

www.mwp.ie

ISSUE FORM	
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Contents

1. INTRODUCTION

Malachy Walsh and Partners (MWP) commissioned Wildeye wildlife surveyors to conduct wintering bird surveys on a monthly basis between November and March, inclusive, during the wintering bird period of 2018/2019. This report summarises the findings of the survey data gathered and provides an appraisal of the potential impacts of the proposed site demolition, site infrastructure improvements, and utility upgrade works at the Belvelly Port Facility in Marino Point on Great Island in County Cork, on birds utilising the development site and the coastal areas adjacent to it.

The information in this report was used to help determine the impacts on bird populations and also informed the conclusions of the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) report for the proposed development and any proposed future development works at Marino Point.

2. PROJECT BACKGROUND

Marino Point is a small peninsula located on Great Island, County Cork. The site is bound by Lough Mahon, which forms part of the greater Cork Harbour, to the north, west and south. Passage West which lies to the west of the site on the opposite side of the harbour is approximately 1km from the centre of the site. The immediate surrounding area is lightly populated, while Passage West currently has a population of approximately 6,000 people. The northern coastal boundary of the site is adjacent to intertidal mudflats and sandflats. The eastern boundary of the site is formed by the Cork to Cobh railway and R624 Cork-Cobh regional road. The nearest significant town on the same side of the harbour is Cobh which lies approximately 5km south-east of the site. The site is located at Irish Grid Reference W 177535 E, 069595 N on Great Island in Greater Cork Harbour.

The Belvelly Marino Development Company (BMDC) acquired the former Irish Fertiliser Industries (IFI) site at Marino Point on Great Island, Co. Cork in 2017 with a view to redeveloping the site in line with the existing port-related industrial zoning objective for Marino Point. BMDC is a Public Private Partnership between Lanber Holdings and the Port of Cork Company. The site (referred to herein as the Belvelly Port Facility) contains several derelict IFI buildings and structures. The existing infrastructure and utilities are in poor condition and not fit for purpose and require upgrading to stabilise existing activities on site and provide capacity for future development proposals.

The proposed development involves demolition, site infrastructure and utility upgrade works at the Belvelly Port Facility. The proposed works will clear the site of redundant and derelict buildings and structures, and provide infrastructure and utility services to comply with current engineering standards and environmental protection requirements.

3. DESKTOP REVIEW

A desktop review was carried out to identify designated Special Protection Areas (SPA's) in the surrounding landscape and any previous records of water birds (waders and wildfowl) from the study area and surrounding region. From the information identified in the desktop review and a site inspection, it was concluded that winter bird counts would be required to accurately assess any potential ecological impacts on birds from the proposed development.

3.1 DESIGNATED SITES

3.1.1 Special Protection Areas (SPAs)

Ireland is required under the terms of the EU Birds Directive (2009/147/EC) to designate Special Protection Areas (SPAs) for the protection of endangered species of wild birds. Sites that meet any of the following criteria may be selected as SPAs:

- A site regularly supporting 20,000 waterbirds or 10,000 pairs of seabirds;
- A site regularly supporting 1% or more of the all-Ireland population of an Annex I species;
- A site regularly supporting 1% or more of the biogeographical population of a migratory species;
- A site that is one of the 'n' most suitable sites in Ireland for an Annex I species or a migratory species (where 'n' is a variable which is related to the proportion of the total biogeographic population of a species held by Ireland).

The closest Special Protection Area for birds is the Cork Harbour SPA (Site code 004030) which lies adjacent to the Belvelly Port Facility site on its northern shore and the land parcel (northern annex) in the northeast on its north-eastern shore (**Figure 1**).

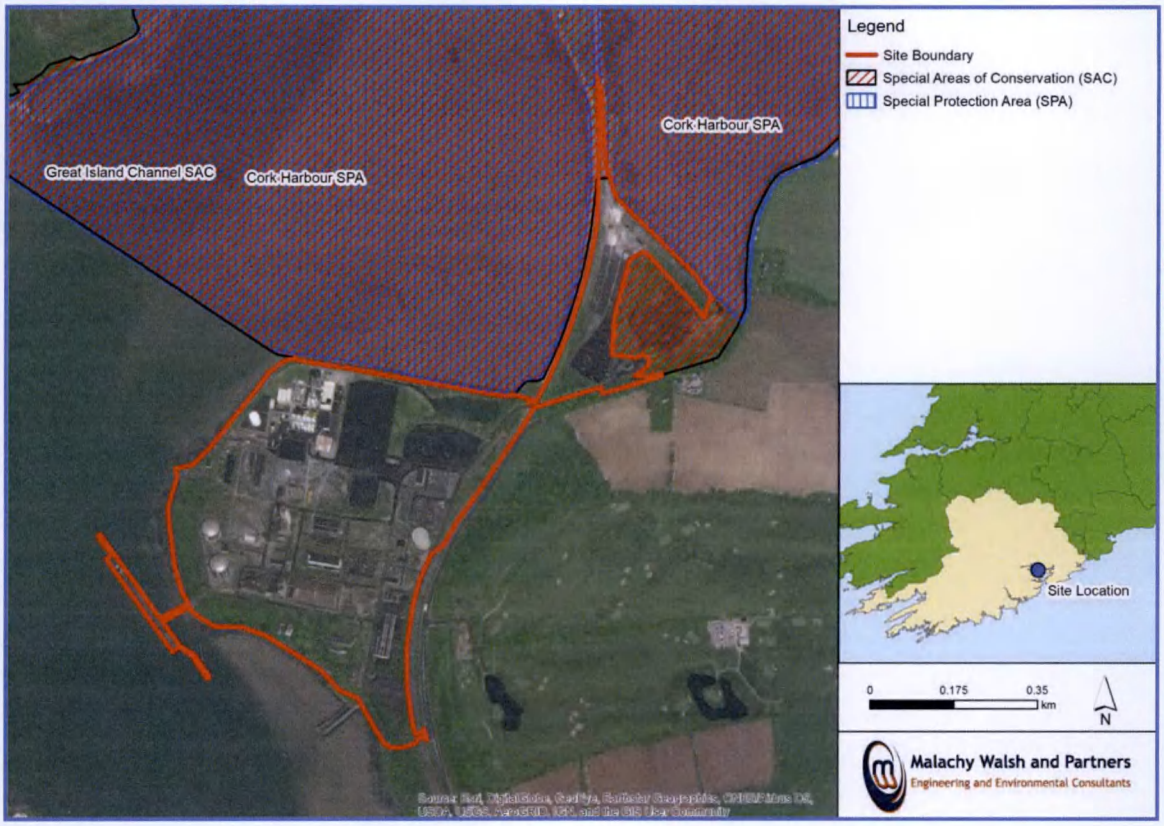

Figure 1 Proposed development site in relation to adjoining Natura 2000 sites i.e. Great Island Channel SAC & Cork Harbour SPA

Cork Harbour is a large, sheltered bay system, with several river estuaries, principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The Belvelly Port Facility site lies immediately to the south of the SPA. The SPA site comprises of a number of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay and the Rostellan and Poulnabibe inlets. Cork Harbour SPA is designated for twenty three predominantly wintering species of bird.

The site is of important conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds. Cork Harbour has a nationally important breeding colony of Common Tern (3-year mean of 69 pairs for the period 1998-2000, with a maximum of 102 pairs in 1995). The birds have nested in Cork Harbour since about 1970 and, since 1983, on various artificial structures, notably derelict steel barges and the roof of the Martello Tower to the north of the site. The birds are monitored annually and the chicks are ringed[1]. Common tern breeds on the coastal areas, and inland on islets in freshwater lakes.

[1]https://www.npws.ie/sites/default/files/publications/pdf/Cork%20Harbour%20SPA%20(004030)%20Conservation%20objectives%20supporting%20document%20-%20[Version%201].pdf

Table 1 below lists the Species of Conservation Interest (SCI) of the Cork Harbour SPA along with the conservation objective for each species.

Table 1 Species of Conservation Interest (SCI) for the Cork Harbour SPA

Species code	Species	Scientific name	Conservation objective
A004	Little Grebe	*Tachybaptus ruficollis*	Maintain
A005	Great Crested Grebe	*Podiceps cristatus*	Maintain
A017	Cormorant	*Phalacrocorax carbo*	Maintain
A028	Grey Heron	*Ardea cinerea*	Maintain
A048	Shelduck	*Tadorna tadorna*	Maintain
A050	Wigeon	*Anas penelope*	Maintain
A052	Teal	*Anas crecca*	Maintain
A054	Pintail	*Anas acuta*	Maintain
A056	Shoveler	*Anas clypeata*	Maintain
A069	Red-breasted Merganser	*Mergus serrator*	Maintain
A130	Oystercatcher	*Haematopus ostralegus*	Maintain
A140	Golden Plover	*Pluvialis apricaria*	Maintain
A141	Grey Plover	*Pluvialis squatarola*	Maintain
A142	Lapwing	*Vanellus vanellus*	Maintain
A149	Dunlin	*Calidris alpina*	Maintain
A156	Black-tailed Godwit	*Limosa limosa*	Maintain
A157	Bar-tailed Godwit	*Limosa lapponica*	Maintain
A160	Curlew	*Numenius arquata*	Maintain
A162	Redshank	*Tringa totanus*	Maintain
A179	Black-headed Gull	*Chroicocephalus ridibundus*	Maintain
A182	Common Gull	*Larus canus*	Maintain
A183	Lesser Black-backed Gull	*Larus fuscus*	Maintain
A193	Common Tern	*Sterna hirundo*	Maintain
A999	Wetland and Waterbirds		Maintain

To acknowledge the importance of Ireland's wetlands to wintering waterbirds, "Wetland and Waterbirds" may be included as a Special Conservation Interest for some SPAs that have been designated for wintering waterbirds and that contain a wetland site of significant importance to one or more of the species of Special Conservation Interest. Thus, a further objective is to maintain or restore the favourable conservation condition of the wetland habitat within the Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

The favourable conservation conditions of these SCIs in the Cork Harbour SPA are defined by various attributes and targets, which are shown in **Table 2**.

Table 2 Attributes and targets for the conservation objectives for the wintering waterbirds and breeding Common Tern

Species/Habitats	Attribute	Measure	Target
Little Grebe Great Crested Grebe Cormorant	Population trend	Percentage change	Long term population trend stable or increasing
	Distribution	Range, timing	No significant decrease in the

Species/Habitats	Attribute	Measure	Target
Grey Heron Shelduck Wigeon Teal Pintail Shoveler Red-breasted Merganser Oystercatcher Golden Plover Grey Plover Lapwing Dunlin Black-tailed Godwit Bar-tailed Godwit Curlew Redshank Black-headed Gull Common Gull Lesser Black-backed Gull		and intensity of use of areas	range, timing or intensity of use of areas by each species, other than that occurring from natural patterns of variation
Common Tern	Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline
	Productivity rate: fledged young per breeding pair	Mean number	No significant decline
	Distribution: breeding colonies	Number; location; area (hectares)	No significant decline
	Prey biomass available	Kilogrammes	No significant decline
	Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase
	Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population
	Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation

3.1.2 Ramsar Sites

The Ramsar Convention on Wetlands of International Importance, especially as Waterfowl Habitat, is an international treaty that was established for the conservation and sustainable use of wetlands. The Ramsar Convention was ratified by Ireland in 1984 and came into force for Ireland on 15 March 1985. Ireland presently has 45 sites designated as Wetlands of International Importance, with a surface area of 66,994 hectares.

Within its 1,436 ha, Cork Harbour Ramsar site (site no. 837) supports various breeding water birds, internationally important numbers of wintering and spring staging water birds, and provides important feeding areas for waders[2]. The site comprises two sections one of which is located in the north east corner of the harbour encompassing the area from Little Island to Midleton, with its southern boundary being formed by Great Island; the other is in the west of the harbour encompassing the intertidal flats of Lough Mahon. The site is a wetland of international importance for its wintering populations of black-tailed godwit, curlew and redshank and its spring migration numbers of whimbrel; while twelve species occur at nationally important levels[3]. The Ramsar site overlaps with Cork Harbour SPA and IBA sites and, with the exception of whimbrel, the species identified in site documentation6 as occurring in the Ramsar site in important numbers are included as SCI species for which the SPA site is selected.

3.1.3 Important Bird Areas

The Important Bird Areas (IBA) Programme is a BirdLife International initiative aimed at identifying and protecting a network of critical sites for the conservation of the world's birds. There are 156 IBA's in Ireland including 140 in the Republic of Ireland and 16 in Northern Ireland, 122 of which support wintering water birds. These sites are important for breeding seabirds and for wintering wildfowl.

5,950 ha of the Cork Harbour waters are designated as an IBA (Site Code: IE088) for the conservation of important wetland, breeding and migratory bird populations. Cork Harbour regularly supports over 20,000 waterfowl which includes: various breeding water birds, internationally important numbers of wintering and spring staging water birds, and provides important feeding areas for waders. It is one of the most important sites in Ireland for breeding tern and for wintering great crested grebe, red-breasted merganser, oystercatcher, and lapwing, as well as for staging whimbrel. Several other species also occur in numbers of national importance, including cormorant, shelduck, wigeon, teal and golden plover4. The IBA overlaps with Cork Harbour SPA and Ramsar sites5 and, with the exception of whimbrel, the species occurring in the IBA site in important numbers are included as SCI species for which the SPA site is selected.

3.1.4 Wading Birds, Wildfowl & Gulls

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000, for which it is amongst the top five sites in the country) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. It is an important site for gulls in winter and autumn, especially Common Gull and Lesser Black-backed Gull.

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[2] https://www.ramsar.org/wetland/ireland

[3] https://rsis.ramsar.org/RISapp/files/RISrep/IE837RIS.pdf

[4] Except for whimbrel all of the birds listed in this paragraph are Special Conservation Interest species for the SPA

[5] http://datazone.birdlife.org/site/factsheet/cork-harbour-iba-ireland/text

Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.

3.2 PREVIOUS (RELEVANT) STUDIES IDENTIFIED

3.2.1 Review of the Irish Wetland Bird Survey (I-WeBS) & Waterbird Survey Programme

Most species which occur in Ireland migrate from the north and northwest (principally Canada, Greenland and Iceland) or from the northeast (northern continental Europe, including Scandinavia, Russia and Siberia), moving south to winter predominantly in west and northwest Europe and west Africa (Wetlands International, 2006, Wernham et al., 2002). Estuaries and other wetlands of north-west Europe support vast numbers of these migratory wading birds and wildfowl each winter. These wetland habitats along with the mild climate, provide ample feeding throughout the winter period, particularly when many other parts of northwest Europe are frozen over. It is the high densities of benthic macroinvertebrates and easy access which are the main attraction of these wetland sites. Disturbance free roosting and resting areas are additional important ecological requirements. It is a combination of these factors which make Ireland particularly attractive for wintering waterbirds.

The Irish Wetland Bird Survey (I-WeBS) is the scheme that monitors wintering waterbirds in Ireland. The survey runs from September to March each winter. Wetlands of all types and sizes are monitored, including estuaries, coastlines, bays, rivers, turloughs, lakes, streams and flooded fields. I-WeBS is traditionally a high-tide survey and at large, complex estuarine sites with extensive intertidal areas that require some time to cover, counts are typically made within three hours either side of the high tide.

Non-breeding waterbirds are counted at Cork Harbour each winter as part of the Irish Wetland Bird Survey (I-WeBS). The dataset spans the period 1994/95 to 2015/16 and a total of 21 count subsites, covering some 2,961 ha have been monitored regularly.

A review of the Irish Wetland Bird Survey (I-WeBS) data shows that the area directly north of the Belvelly Port Facility site (Subsite: 0L426 Carrigrenan - Great Island & Railway) and northeast of the northern annex (Subsite: 0L425 Belvelly Bridge – Railway) is monitored as part of the I-WeBS scheme. Refer to **Table 4** and **Figure 2** below for reference. The transitional water and adjoining mudflat habitats to the south and southwest of the Belvelly Port Facility site are currently not monitored.

A review of the Irish Wetland Bird Survey (I-WeBS) data for the periods 2012/2013 to 2015/2016 for the subsites 0L425 and 0L426 shows that a small number of species were noted to be of national importance based on both mean and peak values. Refer to **Table 3** below.

Table 3 Irish Wetland Bird Survey (I-WeBS) data for the periods 2012-2016 for the subsites 0L425 and 0L426, which recorded species above the threshold for the national 1% of the all-Ireland population, based on the most recent estimates for Ireland, namely Crowe and Holt (2013).

Subsite: : 0L426 Carrigrenan - Great Island & Railway				
Species	**1% National**	**1% International**	**Mean (12/13 – 15/16)**	**Peak (12/13 – 15/16)**
Great Crested Grebe	30	6,300	26	59*
Grey Plover	30	2,000	16	38*
Dunlin	460	13,300	813*	2,850*
Subsite: 0L425 Belvelly Bridge – Railway				
Species	**1% National**	**1% International**	**Mean (12/13 – 15/16)**	**Peak (12/13 – 15/16)**
Shelduck	100	2,500	365*	527*
Gadwall	20	1,200	9	36*
Grey Heron	25	5,000	20	46*
Black-tailed Godwit	200	1,100	149	275*
Greenshank	20	3,300	23*	29*
Redshank	240	2,400	378*	538*

* Above 1% of the all-Ireland population, based on the most recent estimates for Ireland, namely Crowe and Holt (2013)

Of the species recorded all but Gadwall are listed as special conservation interest of the Cork Harbour SPA. Based on the subsite location, as detailed above, the majority of species recorded are located northeast of the northern annex. Of the species noted as occurring at nationally important levels north of the Belvelly Site i.e. Great Crested Grebe, Grey Plover and Dunlin, only two rely on mudflat habitats in relation to foraging. Great Crested Grebe is a piscivorous species.

3.2.2 *NPWS Winter Bird Survey 2010/2011*[6]

During 2010/2011 a waterbird survey programme was conducted by the NPWS within Cork Harbour. This waterbird survey programme was designed to investigate how waterbirds are distributed across coastal wetland sites during the low tide period. The surveys ran alongside and were complementary to the Irish Wetland Bird Survey (I-WeBS). This survey consisted of four low tide counts (October, November and December 2010 and February 2011) and one high tide count (January 2011), where waterbirds were counted within a series of 73 count subsites within the SPA. Subsite locations can be seen in **Figure 2** below and Appendix 6 of Cork Harbour Special Protection Area (Site Code 4030) Conservation Objectives Supporting Document Version 1.

The behaviour of waterbirds during counts was attributed to one of two categories (foraging or roosting/other) while the position of birds was recorded in relation to one of four broad habitat types; Intertidal (area between mean high water and mean low water), Subtidal (area that lies below mean low water), Supratidal and Terrestrial. In addition to the main survey programme described above, a high tide roost survey was undertaken on the 29th and 30th of November 2010. During this

[6] https://www.npws.ie/sites/default/files/publications/pdf/Cork%20Harbour%20SPA%20(004030)%20Conservation%20objectives%20supporting%20document%20-%20%5BVersion%201%5D.pdf

survey, waterbird roost sites were located, species and numbers of waterbirds counted and the position of roosts marked onto field maps.

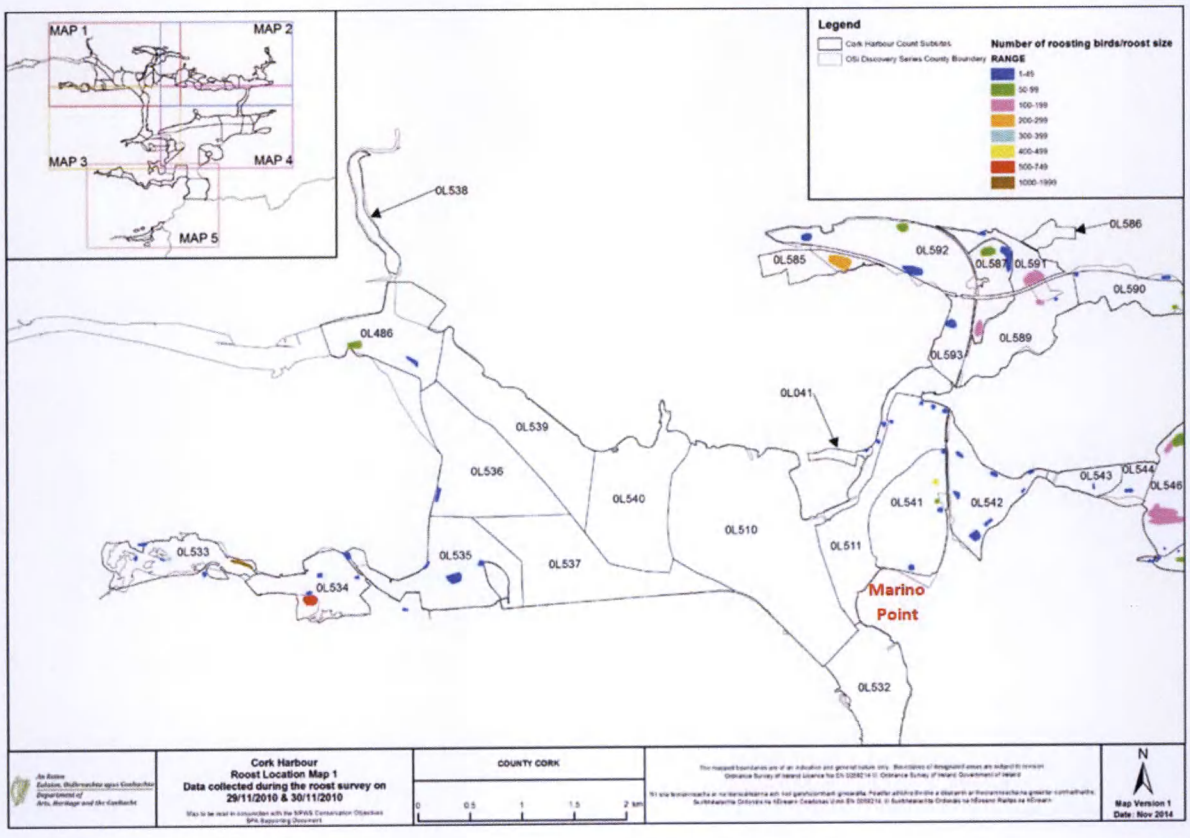

Figure 2 Roost location map in relation to Marino Point (NPWS, 2014)

A total of 58 waterbird species were recorded during the 2010/11 survey programme at Cork Harbour, which includes all species listed as conservation interests for the Cork Harbour SPA. The following lists any records of note in relation to the subsites located adjacent to the Belvelly Port Facility site at Marino Point i.e. Martello west to Carrigrenan (0L541), Belvelly Br. West (0L542), and Marino Pt to Carrigrenan Pt (0L511).

- Shelduck
  259 Shelduck roosted subtidally during the high tide survey in January 2011. Peak numbers were recorded within the subsite Belvelly Br. West (0L542) with a max 73 Shelduck noted.

- Wigeon
  During the low tide surveys, subtidal roosting/other occurred with most regularity (two or more low tide surveys) within a number of subsites, one of which was the Martello west to Carrigrenan (0L541) subsite.

- Little Grebe
  Irregular and often once-off records were made of subtidally roosting/other individuals during low tide surveys. The peak number recorded was 17 at subsite Marino Pt to Carrigrenan Pt (0L511) during the December 2010 survey.

- Great Crested Grebe
  16 Great Crested Grebes were recorded in roosting/other behaviour during the high tide survey. The largest numbers (five individuals) were positioned in subsite Martello west to Carrigrenan (0L541)

- Cormorant
  Subsite Martello west to Carrigrenan (0L541) was noted for recording numbers ranked as 'high' in all four low tide surveys, with roosting/other behaviour commonly seen.

- Oystercatcher
  Oystercatchers roosted supratidally during the high tide survey; the largest number (91) was recorded on shingle/gravel in subsite Martello west to Carrigrenan (0L541). The November 2010 roost survey recorded roosting Oystercatchers in 27 subsites overall. The largest single roost was in Martello west to Carrigrenan (0L541) where the birds roosted in the north of the subsite in the same position as the flock recorded during the high tide survey.

- Grey Plover
  The peak intertidal foraging density was 1.5 Grey Plover ha^{-1} recorded for 0L511 Marino Pt to Carrigrenan Pt (0L511) in December 2010. This was the only subsite to record a density of over 1 Grey Plover ha^{-1}. The whole site average intertidal foraging density was 0.02 Grey Plover ha^{-1}.

- Dunlin
  Subsite Martello west to Carrigrenan (0L541) was notable for supporting numbers ranked as 'high' on at least two survey occasions for foraging Dunlin.

  An additional high roost survey record (counted outside of the allotted time for the roost survey) noted 1,850 Dunlin roosting in the north of subsite Marino Pt to Carrigrenan Pt (0L511) on shingle/gravel.

- Redshank
  Subsite Belvelly Br. West (0L542) recorded 64 roosting individuals during the high tide survey.

3.2.3 Port of Cork Bird Surveys: Report on the Winter 2012 / 2013 Bird Survey at Marino Point (RPS, 2013)

As part of a report into the future development of Marino Point, ornithological staff from RPS and Cork Ecology (subcontracted to RPS) conducted a winter bird survey during the winter of 2012 / 2013. The objectives of the study were as follows:

- To examine the pattern of usage by birds of marine, intertidal and adjacent terrestrial areas in the vicinity of Marino Point, Cork Harbour, during the period November 2012 to February 2013;

- To identify locations of key importance to birds at this time of year; and

- To generate data which can be used for possible forthcoming impact assessments (Environmental Impact Assessment and Appropriate Assessment) for any proposed future development works at Marino Point.

The study area comprised all the intertidal areas of shoreline and areas of open water that lie adjacent to Marino Point. A total of ten counts were conducted, five at high tide and five at low tide, each covering the entire study area.

This survey found that in general, the intertidal areas within 200m of the shoreline of Marino Point did not appear to be of great importance to feeding birds at low tide. The area to the north of Marino that is located within the SPA boundary is of importance within the broader context of Cork Harbour to feeding Shelduck, Grey Plover Dunlin and Black-headed Gull, and to a lesser extent for other waders including Curlew, Redshank and Oystercatcher.

Only two high tide roosting areas where noted to be areas of importance to wintering birds at high tide in the vicinity of Marino Point i.e. Martello Tower roost and the Jetty, Dolphin and Pier roost.

By far the most important roosting area for birds was located north of the Belvelly Port Facility site in the area around the Martello Tower, particularly the land spit to the north which was noted to be one of the most important high tide roosts in Cork Harbour. This result corresponded to that found by the NPWS during the high tide roost counts in 2010, see **Figure 2** above. The spit to the north of the Martello Tower produced high counts of roosting birds which included up to 2,000 Dunlin, 135 Oystercatcher, 102 Shelduck, 25 Bar-tailed Godwit and 24 Curlew. Small numbers of Cormorant, Grey Plover, Ringed Plover, Knot, Greenshank, Redshank, Black-tailed Godwit, Turnstone and gulls, including up to 208 Black-headed Gulls, were also recorded using the roost.

Both the barges to the west of the Martello Tower and the saltmarsh to the east of the railway track and the east-facing embankment of the railway track to the east of the Martello Tower were also considered important for roosting Redshank, Curlew, Black-tailed Godwit and Teal.

To the southwest of Belvelly Port Facility site a second roosting area was noted. This comprised of three separate structures. The large jetty was noted to support moderate numbers of Cormorant, but was primarily utilized by gull species i.e. Black-headed Gull, Common Gull and Great Black-backed Gull. A few Shags were also recorded. The birds were recorded perching on the handrails, walkways and other structures at both the northern and southern ends of the jetty. The mooring dolphin to the southeast of the jetty was noted to support moderate numbers of primarily Cormorant with a few Shags and Grey Herons recorded. The stone pier adjacent to the dolphin also supports moderate numbers of Cormorant, Oystercatcher and Curlew with a few Greenshank, Redshank and Black-tailed Godwit noted on occasions. During site visits conducted by Wildeye in 2018 and 2019, it was noted that both the mooring dolphin and stone pier where primarily utilized by cormorant with gulls utilising the jetty.

Overall, it was concluded that low numbers of SCI species utilize the intertidal mudflats that are within the SPA and that are also in relatively close proximity (within 200m), of the shoreline at the Belvelly Port Facility site. It is within this 200m zone that birds are potentially the most susceptible to

disturbance. Results show that areas further north, located 200m from the shoreline of Marino at its closest point are of much greater importance.

Therefore, whilst any noisy or visually intrusive activity at the Belvelly Port Facility site is likely to result in a degree of disturbance to birds, it is not considered likely, based upon the findings of the survey, that significant numbers of birds are likely to be disturbed or displaced from feeding areas or roosting areas to the north of Marino during the winter period.

4. WINTER BIRD SURVEY 2018/2019

4.1 METHODOLOGY

Counts of wintering birds at the Marino Point site and wider area were commissioned in November 2018 by Malachy Walsh & Partners, and all field surveys were conducted by Mr. Ciarán Cronin of Wildeye.

6 counts were completed in the winter of 2018/19 between late November 2018 and March 2019 inc. Counts were monthly over those 5 months, with an extra count inserted in the Nov/Dec period to help establish the situation on site quickly.

A further 4 counts were conducted in 2019 between July and October 2019 with aim, over all surveys, of covering the main period of wader occurrence from July to March. This extends beyond the standard I-WeBS (national waterbird census) count period of September to March, with a view to detecting the first arrival of waders returning in July.

Counts were separated into Low Water and High Water counts, the aim being to monitor the numbers, distribution and major activity of waders and waterbirds around the site at these times. Count dates and times are shown in **Appendix 1**.

The survey locations were based on information gathered during the desktop review, original site walkover and the location of the proposed development works. Boundaries of the count areas were selected primarily to delineate patches of relatively homogenous habitat within the study area in order to compare bird usage of these habitats and spatial areas; but were also selected to be easily perceived by the observer. This was done by use of sight-lines to prominent landmarks such as permanent marker buoys, coastal features and features on the horizon.

As per best practice and having regard to the precautionary principle, all water birds were regarded as target species for the purposes of this assessment. Waterbirds are defined as "birds that are ecologically dependent on wetlands" (Ramsar Convention, 1971) which are a diverse group that includes divers, grebes, swans, geese and ducks, gulls, terns and wading birds.

Low Water Counts

Low water counts broadly followed the count methodology used in the national IWeBS surveys. Counts were conducted within 3 hours either side of Low Water. IWeBS recommend completing all counts within 3 hours but this was not possible on site. However, it was generally possible to count

the primary areas from Belvelly to Little Island within 3 hours, and this area overlaps closely with the IWeBS count areas. Other areas, including Monkstown Creek, were counted in the remaining time. Counts were only conducted when conditions were suitable so count accuracy was maintained.

The count areas extended to cover areas of open water and mud, to approximately 1km from the site (or obvious land border). This included the area from Belvelly Bridge in the north, across to Little Island/Carrigrenan Point, the outer reaches of Lough Mahon and through the channel at Passage West. The count area was extended southwards to include the important feeding areas at Monkstown Creek. The overall area was subdivided into 7 sectors to aid counting and recording. These sectors are detailed in **Table 4** and shown in **Figure 3** below. Count Locations are shown in **Appendix 2** below.

Within each sector, birds were recorded in discreet subsectors, defined on the day as containing 'pockets' of birds, with distinct flocks marked separately.

Birds within approximately 100m of the site in each sector were enumerated separately to give an indication of numbers of birds which may be at increased risk of disturbance.

Birds were recorded as either resting (r) or feeding (f). Flying birds were only recorded if they passed the site without landing, otherwise they were recorded either where they took off or landed.

Notes were made of significant flocks flying out of or into the area in order to assist with avoiding double counting.

The internal parts of the main site were not counted specifically during low water counts as the site was not expected to contain any significant numbers of waterbirds at low water (this was evidenced during other work on site).

Counts were conducted by driving or walking between the main vantage points, in order to gain maximum viewing potential, and counting sectors with as few vantage points as possible to reduce the potential for double counting.

<u>High Water Counts</u>

High water counts focused on the main development site and immediate surrounds, with a view to recording roosting birds displaced by the high tide.

The High Water count areas are shown on **Figure 4**. The main site was termed 'H-main' and was a composite of 12 areas identified in initial site drawings but amalgamated for count purposes. Areas H13 – H16 were numbered consecutively from there. Areas H-main and H13 were specifically surveyed on each occasion, but areas H14 – H16 were only counted from within the main site.

Waders and waterbirds were recorded as either resting (r) or feeding (f). Flying birds were only recorded if they passed the site without landing, otherwise they were recorded either where they took off or landed.

The main site was walked, and all significant habitats on site approached within 100m. We were not aiming for an accurate census of the entire site, but rather to identify all bird species on site and achieve indicative numbers.

Table 4 Locations of low water bird counts

Location code	Location Description
L1	Mudflats northeast of northern annex
L2	Mudflats and open water north of main site including channel between Foaty Island and Carrigrenan Point
L3	West of main site including main channel at Lough Mahon
L4	South of main site including main channel with intertidal mudflats in the northeast corner
L5	Main channel along West Passage
L6	Main channel at Monkstown
L7	Intertidal mudflats at Monkstown Creek

Figure 3 Low water bird count areas

High tide roost counts were also undertaken monthly within the main site and the northern annex, at the intertidal mudflats to the south and north of the main site, and to the northeast of the northern annex. However, not all sites were specifically surveyed on each visit. Refer to **Table 5** and **Figure 4**.

Table 5 Locations of high water bird counts

Location code	Location Description
H (H1-H7 & H9-H12)	Main site
H8	Northern annexe
H13	South of main site
H14	Northeast of northern annexe
H15	North of main site
H16	East of main site and south east of northern annex

Figure 4 High water bird count locations

5. RESULTS

It is important to note that waterbird counts represent a 'snapshot' of bird numbers during a count session, so in general and taking into account all potential sources of error, resulting data are regarded to be underestimates of population size.

A total of 71 species were recorded during the winter survey period (2018/2019). The most numerous group was the passerines with 26 species followed by the waders with 15 species. The groups with the least species were the Auks with three species followed by Grebes, Pigeons and Rails and Crakes which all has two species recorded. The only species recorded breeding was Great-crested Grebe in the month of December 2018 at the H15 site.

Species of wintering waterbirds recorded during the surveys, along with mean and peak abundance are shown in **Appendix 3** of this report.

Forty-five waterbird species in total were recorded within the survey areas during the winterbird survey period. Only one Special Protection Area (Cork Harbour SPA, Site Code 004030) is deemed relevant to the proposed works. The qualifying interests for Cork Harbour SPA are shown in **Table 1** together with the conservation objectives for each species. A total of twenty species listed as qualifying interests for the Cork Harbour SPA were recorded, namely, Cormorant, Oystercatcher, Curlew, Redshank, Red-breasted Merganser, Bar-tailed Godwit, Black-tailed Godwit, Dunlin, Grey Plover, Grey Heron, Lapwing, Shelduck, Wigeon, Teal, Shoveler, Great Crested Grebe, Little Grebe, Black-headed Gull, Common Gull and Lesser Black-backed Gull.

Six Annex I bird species were recorded during the survey period i.e. Mediterranean Gull, Bar-tailed Godwit, Kingfisher, Dunlin, Little Egret and Red-throated Diver.

Table 6 & 7 below shows the max peak count of each species recorded during both low and high tide surveys as a percentage, in relation to the mean values obtained for Cork harbour over a 5-year period between 2012 – 2016.

Figure 5 shows the High tide roost locations including total bird counts over the 6 monthly survey period for winter 2018-19.

Table 6 Peak Counts (Low Tide) of Species of Conservation Interest for each of the Study Areas in relation to the I-WeBS Five-Year-Means for Cork Harbour as a Whole.

Species		I-Webs 5 yr. Mean Cork Harbour	L1	L1	L2	L2	L3	L3	L4	L4	L5	L5	L6	L6	L7	L7
			Peak	%	Peak	%	Peak	%	Peak	%	Peak	%	Peak	%	Peak	%
Bar-tailed Godwit	BA	300	1	0%	6	2%	0	0%	0	0%	0	0%	29	10%	0	0%
Black-headed Gull	BH	3460	252	7%	713	21%	169	5%	210	6%	59	2%	56	2%	176	5%
Black-tailed Godwit	BW	2951	126	4%	121	4%	0	0%	25	1%	0	0%	10	0%	88	3%
Cormorant	CA	335	17	5%	60	18%	7	2%	39	12%	2	1%	3	1%	51	15%
Common Gull	CM	306	13	4%	57	19%	17	6%	97	32%	12	4%	25	8%	36	12%
Curlew	CU	1520	30	2%	72	5%	0	0%	9	1%	0	0%	0	0%	32	2%
Dunlin	DN	4316	1129*	26%	985*	23%	0	0%	0	0%	0	0%	0	0%	31	1%
Great-crested Grebe	GG	107	0	0%	18	17%	17	16%	0	0%	0	0%	0	0%	0	0%
Grey Plover	GV	29	4	14%	19	66%	0	0%	0	0%	0	0%	0	0%	0	0%
Grey Heron	H.	81	4	5%	17	21%	2	2%	3	4%	0	0%	0	0%	33*	41%
Lapwing	L.	1917	58	3%	26	1%	0	0%	0	0%	0	0%	0	0%	2	0%
Lesser Black-backed Gull	LB	133	10	8%	75	56%	0	0%	4	3%	0	0%	0	0%	7	5%
Little Grebe	LG	74	8	11%	3	4%	0	0%	0	0%	0	0%	0	0%	0	0%
Oystercatcher	OC	1659	68	4%	109	7%	0	0%	16	1%	0	0%	0	0%	60	4%
Redshank	RK	1595	100	6%	84	5%	0	0%	8	1%	0	0%	0	0%	161	10%
Red-breasted Merganser	RM	66	6	9%	15	23%	0	0%	0	0%	0	0%	0	0%	3	5%
Shelduck	SU	1114	36	3%	99	9%	0	0%	8	1%	0	0%	4	0%	36	3%
Shoveler	SV	22	2	9%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Teal	T.	1225	117	10%	79	6%	0	0%	38	3%	0	0%	0	0%	242	20%
Wigeon	WN	1378	34	2%	61	4%	38	3%	8	1%	0	0%	0	0%	0	0%

* Nationally Important Numbers

% - max peak count of each species as a percentage, in relation to the mean values obtained for Cork harbour over a 5-year period of 2012 to 2016.

Table 7 Peak Counts (Hide Tide) of Species of Conservation Interest for each of the Study Areas in relation to the I-WeBS Five-Year-Means for Cork Harbour as a Whole.

Species		I-Webs 5 yr. Mean Cork Harbour	H8	H8	H13	H13	H Main	H Main	H14	H14	H15	H15	H16	H16
			Peak	%	Peak	%	Peak	%	Peak	%	Peak	%	Peak	%
Bar-tailed Godwit	BA	300	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Black-headed Gull	BH	3460	112	3%	12	0%	114	3%	41	1%	77	2%	0	0%
Black-tailed Godwit	BW	2951	22	1%	0	0%	0	0%	0	0%	0	0%	0	0%
Cormorant	CA	335	0	0%	0	0%	41	12%	0	0%	7	2%	0	0%
Common Gull	CM	306	0	0%	0	0%	21	7%	0	0%	0	0%	0	0%
Curlew	CU	1520	1	0%	0	0%	21	1%	0	0%	23	2%	0	0%
Dunlin	DN	4316	0	0%	0	0%	1	0%	0	0%	0	0%	0	0%
Great-crested Grebe	GG	107	0	0%	0	0%	0	0%	0	0%	2	2%	0	0%
Grey Plover	GV	29	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Grey Heron	H.	81	5	6%	0	0%	8	10%	8	10%	9	11%	0	0%
Lapwing	L.	1917	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Lesser Black-backed Gull	LB	133	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Little Grebe	LG	74	1	1%	0	0%	1	1%	0	0%	0	0%	0	0%
Oystercatcher	OC	1659	2	0%	13	1%	22	1%	0	0%	75	5%	0	0%
Redshank	RK	1595	62	4%	0	0%	5	0%	21	1%	0	0%	0	0%
Red-breasted Merganser	RM	66	0	0%	0	0%	0	0%	3	5%	0	0%	0	0%
Shelduck	SU	1114	72	6%	0	0%	24	2%	78	7%	0	0%	0	0%
Shoveler	SV	22	0	0%	0	0%	0	0%	2	9%	0	0%	0	0%
Teal	T.	1225	96	8%	35	3%	4	0%	83	7%	2	0%	0	0%
Wigeon	WN	1378	60	4%	0	0%	2	0%	30	2%	31	2%	0	0%

% - max peak count of each species as a percentage, in relation to the mean values obtained for Cork harbour over a 5-year period of 2012 to 2016.

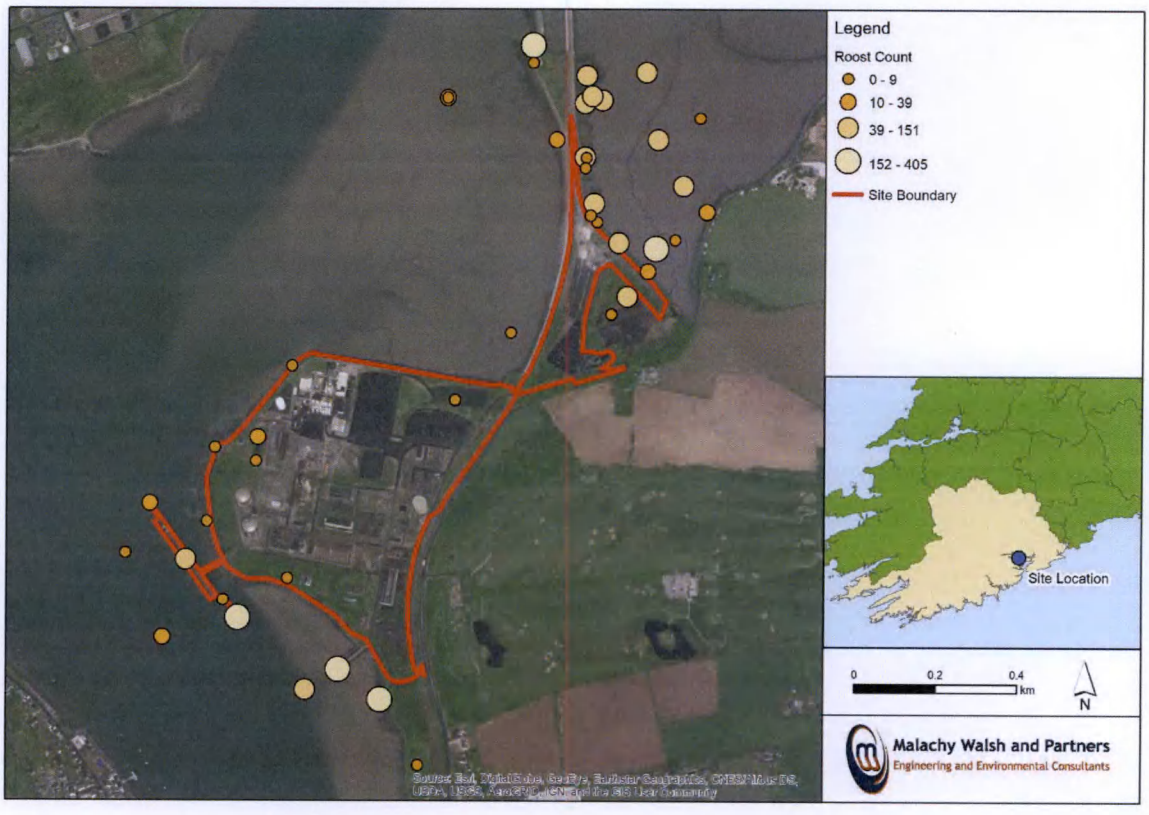

Figure 5 High tide roost locations including total bird counts over the 6 monthly survey period for winter 2018-19

Figures presented in **Tables 6 & 7** indicate that both the low tide survey areas L1 and L2 which are located north of the Belvelly Port Facility site (See **Figure 3**) support an array of species, some of which represent a high percentage of the total Cork Harbour population. Of the species listed of conservation interest for the Cork Harbour SPA the only species not recorded within L1 during the low tide surveys was Great Crested Grebe, likewise for L2 the only species not recorded was Shoveler.

No survey area including the Belvelly Port Facility site itself supports a substantial proportion of the Cork Harbours total populations of a particular species during the high tide counts. Black-headed Gull and Cormorant were noted to be the most abundant species recorded roosting/loafing during the high tide survey period but the peak counts only represent a small percentage of the overall Cork Harbour population with approximately one tenth of the Cork Harbour Cormorant population recorded. It is noted that the majority of these birds were recorded roosting along the southern pier and adjacent mooring dolphin. These areas will be unaffected by the proposed development and the erection of hoarding will provide a visual screen from the proposed works. Gulls were the most abundant birds noted roosting on the existing jetty. Gulls in general are relatively tolerant to human disturbance which is evident by presence of gulls in many coastal cities and towns.

With the exception of Dunlin and Grey Heron (see **Table 6**), none of the wintering birds, were recorded in numbers which would be considered nationally significant (i.e. 1% or more of the all-Ireland population of an Annex I species or 1% or more of the bio-geographical population of a migratory species).

6. CONCLUSION

Based on results of the winter bird surveys along with I-WeBS, NPWS and RPS data it can be concluded that the areas north of the proposed development site and within the Cork Harbour SPA have the potential to support a range of important bird species due to the presence of high value mudflat habitat. In addition, the open water areas adjacent to Marino Point have the potential to support piscivorous species associated with the Cork Harbour SPA as they forage.

A new study by BirdWatch Ireland has found that the number of waterbirds wintering in Ireland has declined by 15% over the past five years and 40% since the mid-1990's. Wading bird species, including Knot, Dunlin, Golden Plover and Redshank, have been the worst hit, suffering a combined loss of over 100,000 individuals (19%) over the past five years (Burke, et al. 2019). Oystercatcher, Dunlin, Redshank and Grey Plover, four species recorded during the winter bird survey, for example have seen a drop in numbers by more than 20%. Black-tailed Godwit, Grey Heron and Greenshank, three species recorded during the winter bird survey have alternatively shown an increase over the last five year period (Burke, et al. 2019).

The habitats in close proximity to the Belvelly Port Facility site have the potential to support some of the species listed as conservation interest of the Cork Harbour SPA. Different habitats will vary in their sensitivity periods based around function e.g. mudflats are most important during the winter for wintering waterbirds.

Although some waterbird species will be faithful to specific habitats within the SPA, many will at times also use habitats situated in proximate areas or in areas ecologically connected e.g. via coastal waters, to the SPA. These areas may be used as alternative high tide roosts, as a foraging resource or, be simply flown over, either on migration or as commuting corridors between feeding and roosting areas. It must also be taken into account that numerous factors are at play when it comes to numbers and distribution of species within the survey sites e.g. prey abundance, habitat quality and disturbance factors. As wading bird distribution is highly correlated with the densities of their prey (Yates et.al. 1993) it is likely that their distribution is linked to the densities of prey items.

Data collected during the I-WeBS counts between 2012 to 2016 recorded three species at nationally important numbers in the subsite directly north of the Belvelly Port Facility, namely Great Crested Grebe, Grey Plover and Dunlin. Of these three species it was noted the Great Crested Grebe was the only species of conservation interest not recorded during the low tide surveys conducted by Wildeye within the study site L1 during the 2018/2019 survey period.

It is noted that Grey Plover are a relatively disturbance tolerant species who are tolerant of moderate to high level visual disturbance and are presumed moderately sensitive to noise stimuli. Dunlin are a relatively tolerant species that habituates to various works. (Cutts, 2013).

Data collected during the NPWS surveys noted that the subsites north of the Belvelly Port Facility site were also of particular importance to species showing roosting/other behaviour. However, based on the dot density maps (see **Figure 2** above) produced for these surveys it can be seen that the concentrations of birds are primarily located west of the Martello Tower or along the land spit north of the tower. This data showed some correlation with that found by RPS who noted that the area around the Martello Tower, particularly the land spit to the north, was noted to be one of the most important high tide roosts in Cork Harbour. These areas are outside the proposed development site and will be screened from the proposed development by the erection of hoarding and as such birds roosting within these areas will be unaffected by the proposed development.

The Cormorants recorded during the 2018/2019 winter bird survey were noted roosting/loafing during the daytime along the southern pier and the stand alone mooring dolphin in close proximity, with lower numbers on the Jetty. Cormorants roost in shoreline and terrestrial habitats and generally use separate locations for daytime and nocturnal roosts. During the day, they roost on piers, jetties, gravel banks, etc.

There are a large number of known day roosts of Cormorants (approximately 37) within Cork Harbour (Atkins, 2019). See **Figure 6** below. The largest day roost is on the ADM jetty (circa 3.5km south) at the mouth of Monkstown Creek, , which is located adjacent to the active deep water berth and ferry port at Ringaskiddy, while other sizeable day roosts occur on the sea wall enclosing the Dunkettle tidal impoundment (circa 4.5km northwest), on a gravel bank on the northern shore at Rathcoursey (circa 8km east) and on a platform 500m offshore from the northern side of ESB Aghada Generating Station (circa 7km outheast). Numerous other smaller daytime roosts occur in proximity (<3km) of the Belvelly Port Facility.

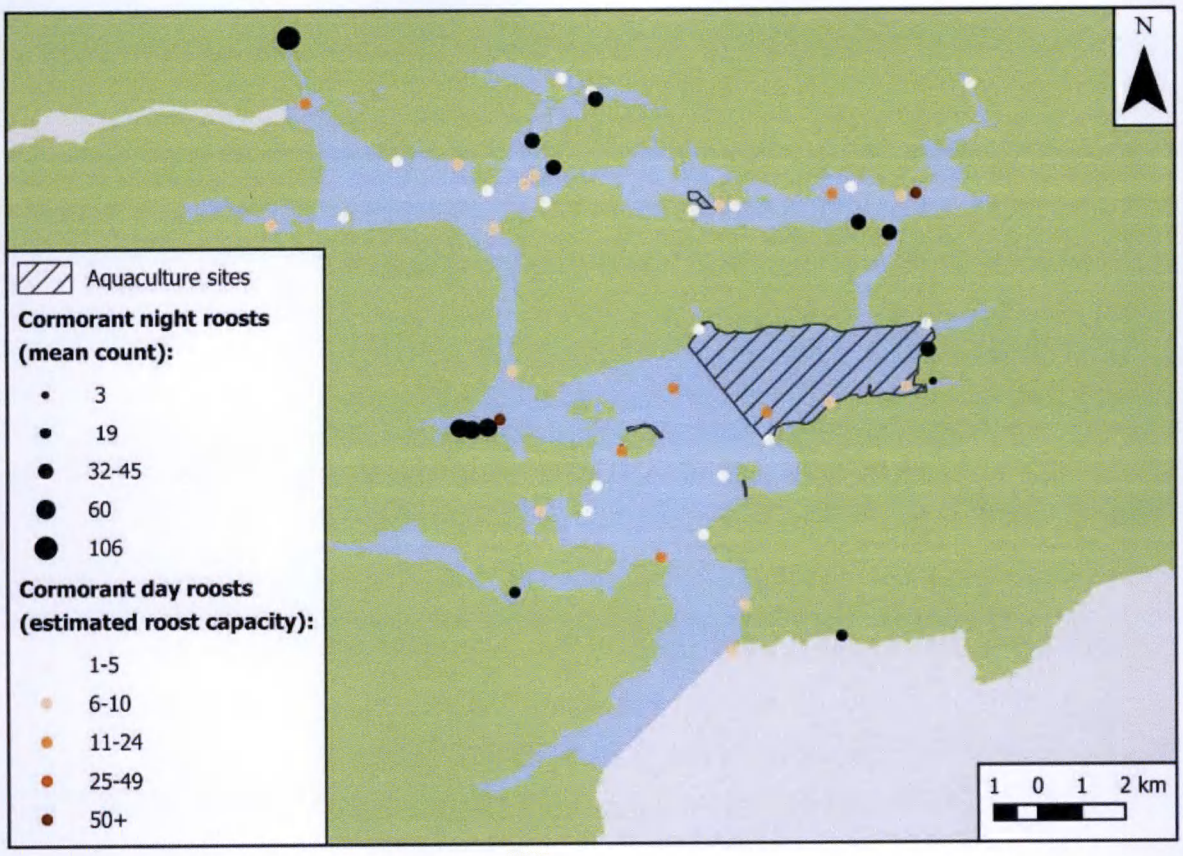

Figure 6 Cormorant Roost Sites in Cork (Atkins, 2019)

It is noted that recorded roosting/loafing sites within the Belvelly Port Facility site, with particular reference to the jetty, are located within a pre-existing and functional port facility. Therefore, given that an operational jetty currently exists at the site, it is safe to assume that these birds are already subject to and tolerant to a certain level of disturbance from jetty works and boat traffic. In Wexford Harbour, Cormorants roosting on the training walls along the navigation channel generally showed no disturbance response to marine traffic (Atkins, 2019).

In general, Cormorants disturbed from one day roost, by boats for example, are likely to be able to resettle on another day roost nearby without significant energy expenditure and the disturbance impact is unlikely to be significant. Cormorants are a mobile species and are frequently observed flying around the harbour (Atkins, 2019).

It is noted that both the southern pier and mooring dolphin will be unaffected by the proposed development. However, to mitigate against any potential disturbance of birds utilising these two structures, temporary hoarding will be erected to screen the development site from birds roosting/loafing on these structures.

As can be seen from **Tables 3** & **6**, four species were recorded as occurring as nationally important numbers directly north of the Belvelly Port Facility site. Grey Heron was noted occurring in nationally

important number within study area L7. Based on distance and visual screening of the site, proposed works within the Belvelly Port Facility site are unlikely to have an impact on Grey Heron utilising the habitats within study area L7. As stated above Great Crested Grebe was the only species of conservation interest not recorded during the low tide surveys conducted by Wildeye within the study site L1.

As part of the site investigations a predictive model for noise levels was run using a worst case scenario for the construction phase of the works. In the SPA areas to the north of the site, $L_{Aeq\ 1\ h}$ levels associated with the worst case scenario will marginally exceed 65 dB alongside the site boundary and at the onsite lagoon. Levels will be lower further north.

Based on the observed responses of both Grey Plover and Dunlin to various noise stimuli, it has been concluded that the noise levels associated with the proposed development will be within acceptable levels i.e. below 70dB, which are unlikely to cause a response in birds using a fronting intertidal area (Cutts, 2013).

Some of the proposed works at these sites may take place within the winter period when impacts on wading birds listed as qualifying interests for the Cork Harbour SPA could theoretically occur. However, timing of works has the potential to reduce impact levels substantially, including the reduction in disturbance effects. It is noted though that the efficacy of timing in achieving this will depend on the species (and associated habitats) in proximity to the planned works.

Numerous species recorded have the ability to utilize alternative habitats within the wider landscape e.g. agricultural grassland. Curlew and Black-tailed Godwit for example, two species listed as species of conservation concern for the Cork Harbour SPA and recorded in proximity to the Belvelly Port Facility site, have the ability to forage terrestrially. When tidal flats are covered at high water, intertidally-foraging waterbirds are excluded and many will move to nearby fields to feed. Black-tailed Godwit and Curlew can be considered generalists, making use of a range of habitats, for example foraging across both intertidal mudflats and grassland habitats. For Black-tailed Godwit in southern Ireland, the feeding resources provided by grasslands have been shown to be important for the maintenance of the wintering population (Alves et al., 2013). Therefore, any disturbance events caused by the proposed project in proximity to adjoining mudflat habitats, will have a minimal impact on the foraging capabilities of these species due to their ability to utilise a wide array of habitats within the wider landscape that occur outside the zone of influence of the works.

Most disturbances to waterbirds result in an interruption to normal activity and the displacement of birds over variable distances, often into sub-optimal habitats. This can be critical during severe winters and can lead to a reduction in the carrying capacities of important wintering wetland sites. However, in general, studies show that most bird species have the ability to habituate to regular and continual sources of noise and visual disturbances providing there is no large 'startling' component. It is noted that the areas in which it is proposed to develop, are already subject to levels of disturbance by operational works within the Marinochem facility and traffic, including rail and boat. While there may be some temporary displacement of species during construction it is considered highly unlikely to have a negative

effect on their overall survival rate due to the close proximity of identical habitat and roosting and foraging resources i.e. high value mudflats with high densities of macro-invertebrates.

Cork Harbour is of high value for birds and mudflat habitat supports high numbers of wintering birds. Based on the desktop review of data and the results of the bird counts it is concluded that the habitats in proximity to the proposed development site, primarily those located to the north, are of moderate to high value for birds and works during the winter period should be avoided during the winter period. It is noted that the intertidal mudflats within the SPA that are in relatively close proximity i.e. within 200m, to the shoreline at the Belvelly Port Facility site are potentially the most susceptible to disturbance. However, results show that areas further north, located 200m from the shoreline of Marino at its closest point are of much greater importance (RPS, 2013). Birds within this 200m band will be exposed to noise emissions from the construction work at a predicted level of 65dB at the site boundary. It is considered that this is within acceptable noise levels for water birds.

Many species are seen to mitigate the effects of continued but harmless disturbance by habituation; as they become used to disturbance they react less strongly. Wintering birds in Cork harbour have habituated to moderate levels of disturbance associated with the daily activity of a busy harbour. With full implementation of the mitigation measures outlined e.g. erection of hoarding and timing of works where possible outside the wintering period, there will be no significant impacts of the proposed development on wintering birds within the Cork Harbour SPA. It is concluded that there will be no significant impacts of the proposed development on the Conservation Objectives of the Special Protection Areas in Cork Harbour or neighbouring coastlines.

7. REFERENCES

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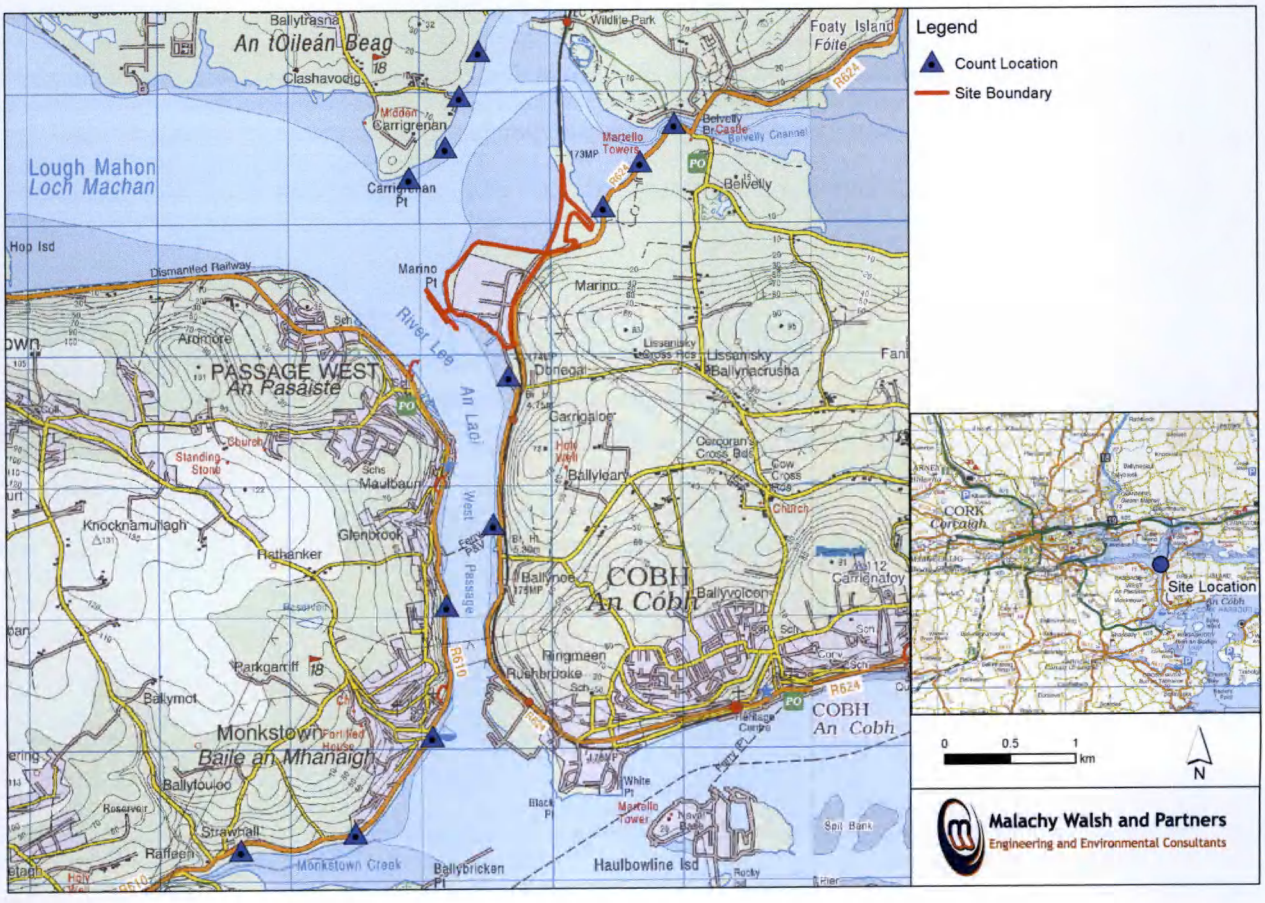
Appendix 1- Count dates, times and tidal conditions.

Survey Number	Sector	HW / LW	Year	Month	Day	HW Time	LW Time	Spring / Neap	Start	End	Duration	Disturbance
1	L1	LW	2018	11	25	06:26	12:55	S	11:40	12:55	75	0
1	L2	LW	2018	11	25	06:26	12:55	S	10:00	10:50	50	2
1	L3	LW	2018	11	25	06:26	12:55	S	10:50	11:10	20	0
1	L4	LW	2018	11	25	06:26	12:55	S	12:50	13:20	30	1
1	L5	LW	2018	11	29	09:48	16:19	N	14:00	14:30	30	2
1	L6	LW	2018	11	29	09:48	16:19	N	14:30	15:00	30	2
1	L7	LW	2018	11	29	09:48	16:19	N	15:00	16:40	100	2
2	L1	LW	2018	11	30	10:53	17:30	N	14:30	15:05	35	1
2	L4	LW	2018	11	30	10:53	17:30	N	15:10	15:25	15	1
2	L2	LW	2018	11	30	10:53	17:30	N	15:40	16:10	30	1
2	L3	LW	2018	11	30	10:53	17:30	N	16:10	16:30	30	1
2	L5	LW	2018	12	2	13:23	07:15	N	08:30	08:42	12	2
2	L6	LW	2018	12	2	13:23	07:15	N	08:42	09:00	18	2
2	L7	LW	2018	12	2	13:23	07:15	N	09:00	10:00	60	1
3	L5	LW	2018	12	21	16:17	10:27	S	08:18	08:38	20	2
3	L4	LW	2018	12	21	16:17	10:27	S	08:38	09:06	28	2
3	L1	LW	2018	12	21	16:17	10:27	S	09:10	10:00	50	1
3	L2	LW	2018	12	21	16:17	10:27	S	10:20	11:25	65	2
3	L3	LW	2018	12	21	16:17	10:27	S	11:25	11:40	15	1
3	L6	LW	2018	12	21	16:17	10:27	S	12:05	12:25	20	1
3	L7	LW	2018	12	21	16:17	10:27	S	12:25	13:20	55	2
4	L7	LW	2019	1	2	14:52	08:49	N	10:50	11:50	60	2
4	L6	LW	2019	1	2	14:52	08:49	N	11:50	12:10	20	1
4	L5	LW	2019	1	3	15:44	09:56	N	08:30	08:45	15	1
4	L4	LW	2019	1	3	15:44	09:56	N	08:50	09:10	20	1
4	L1	LW	2019	1	3	15:44	09:56	N	09:15	09:50	35	1
4	L2	LW	2019	1	3	15:44	09:56	N	10:00	10:40	40	2
4	L3	LW	2019	1	3	15:44	09:56	N	10:40	10:50	10	1

Survey Number	Sector	HW / LW	Year	Month	Day	HW Time	LW Time	Spring / Neap	Start	End	Duration	Disturbance
5	L1	LW	2019	2	12	09:56	16:20	S	15:02	15:55	53	1
5	L2	LW	2019	2	12	09:56	16:20	S	13:20	14:35	75	1
5	L3	LW	2019	2	12	09:56	16:20	S	14:35	14:50	15	1
5	L4	LW	2019	2	12	09:56	16:20	S	16:00	16:10	10	2
5	L5	LW	2019	2	12	09:56	16:20	S	16:10	16:18	8	1
5	L6	LW	2019	2	12	09:56	16:20	S	16:28	16:38	10	1
5	L7	LW	2019	2	12	09:56	16:20	S	16:40	17:25	45	1
6	L5	LW	2019	3	18	15:21	09:23	N	08:00	08:20	20	1
6	L4	LW	2019	3	18	15:21	09:23	N	08:20	08:40	20	1
6	L1	LW	2019	3	18	15:21	09:23	N	08:45	09:30	45	1
6	L2	LW	2019	3	18	15:21	09:23	N	09:45	10:35	50	1
6	L3	LW	2019	3	18	15:21	09:23	N	10:35	10:50	15	1
6	L7	LW	2019	3	18	15:21	09:23	N	11:08	11:45	37	1
6	L6	LW	2019	3	18	15:21	09:23	N	11:50	12:05	15	1

Appendix 2 – Count Locations



Appendix 3 - Mean & Peak Counts for waterbirds recorded during the winter bird survey period.

Species		Thresholds		I-Webs 5 yr. Mean Peak Counts Cork Harbour	L1		L2		L3		L4		L5		L6		L7		H8		H13		H main		H14		H15		H16	
		1% National	1% International		Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak
Bar-tailed Godwit	BA	150	1200	300	0	1	1	6	0	0	0	0	0	0	5	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brent Goose	BG	360	400	53	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed Gull	BH		20000	3460	136	252	429	713	92	169	125	210	15	59	20	56	95	176	24	112	3	12	40	114	12	41	19	77	0	0
Black-tailed Godwit	BW	190	610	2951	27	126	32	121	0	0	15	25	0	0	2	10	41	88	4	22	0	0	0	0	0	0	0	0	0	0
Cormorant	CA	120	1200	335	6	17	26	60	4	7	14	39	1	2	1	3	36	51	0	0	0	0	23	41	0	0	2	7	0	0
Common Gull	CM		16400	306	4	13	27	57	9	17	23	97	3	12	5	25	17	36	0	0	0	0	10	21	0	0	0	0	0	0
Common Sandpiper	CS			1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Curlew	CU	350	8400	1520	20	30	43	72	0	0	7	9	0	0	0	0	11	32	0	1	0	0	4	21	0	0	5	23	0	0
Dunlin	DN	570	13300	4316	239	1129	167	985	0	0	0	0	0	0	0	0	5	31	0	0	0	0	0	1	0	0	0	0	0	0
Little Egret	ET	20	1300	103	4	5	1	3	0	0	0	1	0	0	0	0	0	1	1	2	0	0	0	1	0	0	0	0	0	0
Gadwall	GA	20	600	22	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Great Black-backed Gull	GB		4200	162	2	3	31	94	3	7	4	9	2	8	6	22	6	15	0	0	0	0	7	27	0	0	0	2	0	0
Green Sandpiper	GC		15500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	2	0	0
Goldeneye	GE	60	11500	12	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great-crested Grebe	GG	40	3500	107	0	0	6	18	3	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Greenshank	GK	20	2300	98	7	12	2	4	0	0	1	0	0	0	0	0	2	5	3	12	0	1	1	4	0	0	0	0	0	0
Common Guillemot	GU				0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	3	0	0	0	0	0	0
Grey Plover	GV	30	2500	29	1	4	7	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	H.	25	2700	81	3	4	7	17	1	2	2	3	0	0	0	0	14	33	2	5	0	0	5	8	2	8	2	9	0	0
Herring Gull	HG		10200	105	4	8	29	59	3	10	6	15	3	10	33	127	7	28	0	0	0	0	6	15	0	0	1	5	0	0
Ring-billed Gull	IN		20000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0
Kingfisher	KF			2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
Lapwing	L.	1100	20000	1917	42	58	6	26	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Lesser Black-backed Gull	LB		5500	133	4	10	34	75	0	0	1	4	0	0	0	0	3	7	0	0	0	0	0	0	0	0	0	0	0	0
Little Grebe	LG	20	4000	74	4	8	2	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
Long-tailed Duck	LN		17250	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moorhen	MH		20000	25	0	0	1	2	0	0	0	0	0	0	0	0	0	0	2	5	0	0	0	1	0	0	0	0	0	0
Mute Swan	MS		90	45	0	0	1	2	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oystercatcher	OC	690	8200	1659	43	68	77	109	0	0	4	16	0	0	0	0	22	60	0	2	2	13	8	22	0	0	22	75	0	0
Mediterranean Gull	MU		770	68	0	0	0	1	0	1	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Razorbill	RA				0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3	0	0	0	0	0	0
Redshank	RK	300	3900	1595	64	100	53	84	0	0	4	8	0	0	0	0	65	161	16	62	0	0	1	5	6	21	0	0	0	0
Red-breasted Merganser	RM	20	1700	66	2	6	7	15	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	1	3	0	0	0	0
Red-throated Diver	RT	20	3000		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ringed Plover	RP	100	730	29	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0
Shag	SA		2000	7	0	0	0	1	0	1	0	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Snipe	SN		20000	44	0	0	1	3	0	0	0	0	0	0	0	0	1	4	1	2	0	1	10	38	1	3	0	0	0	0
Shelduck	SU	120	3000	1114	18	36	34	99	0	0	3	8	0	0	1	4	20	36	12	72	0	0	4	24	35	78	0	0	0	0
Shoveler	SV	30	400	22	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Teal	T.	340	5000	1225	48	117	46	79	0	0	24	38	0	0	0	0	103	242	16	96	12	35	1	4	33	83	0	2	0	0
Turnstone	TT	95	1400	137	0	0	12	21	0	0	0	0	0	0	0	0	2	13	0	0	0	0	0	0	0	0	0	0	0	0
Black Guillemot	TY				0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Water Rail	WA			2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whimbrel	WM		6700	17	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wigeon	WN	630	15000	1378	7	34	29	61	7	38	3	8	0	0	0	0	0	0	10	60	0	0	0	2	10	30	5	31	0	0