Winter Habitat Study Tymon and Bancroft Parks CONFIDENTIAL

FINAL | JUNE 2018

ROD
ROUGHAN & O'DONOVAN

Comhairle Contae
Átha Cliath Theas
South Dublin County Council

Winter Habitat Study of Bancroft and Tymon Parks

TABLE OF CONTENTS

1. INTRODUCTION 3
1.1 Background 3
1.2 Approach and Objectives 3
1.3 Objectives of the Study 3
1.4 Existing Land Use 4
1.5 Description of the preferred Flood Risk Management Option (Option 2) 4
2. METHODOLOGY 5
2.1 Scope of the Assessment 5
2.2 Desk Study 5
2.3 Specific Ecological Methodologies 5
2.3.1 Habitat Survey 5
2.3.2 Badger Survey 5
2.3.3 Otter Survey 6
2.3.4 Wintering Bird Survey 7
3. RESULTS 9
3.1 Desk Study 9
3.2 Field Surveys 10
3.2.1 Habitats 10
3.2.2 Otter Survey 12
3.2.3 Badger Survey 12
3.2.4 Wintering Bird Survey 14
3.2.5 Invasive Species 17
3.2.6 Other Species 18
4. DISCUSSION 19
4.1 Badger 19
4.2 Otter 19
4.3 Wintering Birds 19
4.4 Invasive Species 19
5. RECOMMENDATIONS 20
5.1 Badgers 20
5.2 Otter 20
5.3 Invasive Species 20

5.4 Wintering Birds 20
5.5 Water Quality 20
6. ECOLOGICAL ENHANCEMENTS 22
6.1 Woodland thinning 22
6.2 Rejuvenation of the River Poddle 22
6.3 Bat Boxes and Bird Boxes 22
6.4 Removal of Non-native Plants 22
7. CONCLUSION 23
8. REFERENCES 24

Appendix A Mapping
Appendix B Bird Sectors
Appendix C Bird Counts

1. INTRODUCTION

1.1 Background

Roughan & O'Donovan was appointed by South Dublin County Council to undertake a Winter Habitat Study of Bancroft and Tymon Parks in County Dublin. The parks are connected by the River Poddle, which enters Bancroft Park from the west and flows into the western section of Tymon Park where it follows an artificial course through a series of ponds before passing under the M50 and emerging in the eastern section of Tymon Park. It flows through a number of ponds before exiting the park at Wellington Road. The parks serve as a local amenity and contains amenity grassland, woodland and ponds. The former land use of the site was agricultural, and a series of hedgerows show the former field boundaries.

The Poddle catchment is within the Eastern CFRAM study area. Due to the risk of flooding, the Poddle catchment was prioritised for flood alleviation works. To this end, the Poddle Options Report was produced in 2014. The report identified a preferred option for reducing the risk of flooding in the Poddle catchment, which consists of a number of embankments and flood walls. The flood alleviation measures are likely to involve the creation of 2 m high embankments and an overflow weir at the ponds in Tymon Park as well as 1.5 km of flood walls along the river downstream of Tymon Park. The purpose of the embankments and overflow weir is to increase the capacity of the ponds in order to use them for flood attenuation.

The purpose of this study is to identify and quantify the populations of otter, badger and wintering birds in Tymon and Bancroft Parks and to determine the impact, if any, that the flood alleviation works may have on them. This report is based on the results of the survey work undertaken between January and mid-April 2018.

The surveys were undertaken between January and April 2018 and were carried out by Patrick O'Shea MSc ACIEEM and Mike Bailey MSc MCIEEM.

1.2 Approach and Objectives

For the purposes of this Ecological Study, habitats, otter, badger and wintering birds were examined as features of ecological significance and were classified as Key Ecological Receptors (KERs). These KERs are all known to occur within Bancroft and Tymon Parks.

This study quantifies the potential impacts on the KERs and identifies the mitigation measures required to avoid and reduce any likely significant impacts. The results of the ecological surveys informed the recommendations, thereby addressing potential impacts on habitats and species.

The Study began with a Desk Study and consultation process aimed at gathering relevant information on the ecological conditions in Bancroft and Tymon Parks.

Following the desk study, a multidisciplinary ecological walkover survey was conducted in Bancroft and Tymon Parks adhering to *Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (TII, 2008a) and *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al*., 2011). The habitat survey classified habitats according to *A Guide to Habitats in Ireland* (Fossitt, 2000). The findings of these habitat surveys are presented in Appendix A. As part of the walkover survey, evidence of badger, otter and invasive species was also recorded.

Using the comprehensive assessment of the existing environment (baseline conditions), it has been possible to accurately predict the likely impacts of the proposed flood alleviation measures on the KERs and correctly assign an ecological significance to them.

1.3 Objectives of the Study

The overall objective of this study was to identify key habitats and species in order to assess and prioritise these animals on the site. The scope of the study was the collection of material

to enable the proper design and detail for any proposed flood alleviation measures. The main objectives were to:

1. Identify and assess the presence, numbers and status of badger and identify their foraging routes and sites and locations of setts.
2. Identify and assess the presence, numbers and status of otter, and identify their foraging routes and sites and locations of holts.
3. Identify and assess the presence of over-wintering birds (particularly Brent Geese) inhabiting and using the biodiversity resources on the site.
4. Identify potential impacts of construction processes, the effects of flooding the areas and recommend appropriate mitigation measures to minimise impact.
5. Identify, categorise and map the type of habitat of particular importance to the species being surveyed. Map the extent of the habitat type in each case.
6. Propose detailed mitigation measures, including avoidance of some elements if deemed necessary.
7. Recommend future habitat management and ecological monitoring of the site.

1.4 Existing Land Use

Tymon Park is a 130 ha park, catering for a range of recreational activities such as walking and field sports. The park contains playing fields, managed grassland for biodiversity, woodland, ponds and paths. The woodlands are generally young (5-7 m tall) mixed broadleaved woodland containing beech, ash, oak, sycamore, alder, birch and hazel. The River Poddle flows through Tymon Park from the west, passing through into the western section of Tymon Park where it follows an artificial course through a series of ponds before passing under the M50 and emerging on the eastern section of Tymon Park. It flows in an east-west direction passing through a series of ponds before exiting the park at Wellington Road.

Bancroft Park is an 11 ha park. It follows the course of the River Poddle between Castletymon Road and Greenhills Road. The park is predominantly amenity grassland including a playing pitch and also contains woodland along the edges and some pockets of woodland in the centre.

1.5 Description of the preferred Flood Risk Management Option (Option 2)

The preferred option (Option 2) involves creating a number of raised embankments and an overflow weir at the existing ponds in Tymon Park to create additional storage during floods (RPS, 2014). Flood walls will also be constructed between the storage area and for 2 km downstream along with measures to account for rainfall being diverted away from the River Poddle.

Additional measures will also be required downstream which would consist of flood walls and earth embankments located where the river banks are low relative to water level.

The following works are proposed:

- Storage: 280 m of sheet-piled core earthen embankment averaging 2 m in height and an overflow weir around Tymon Park ponds.
- Hard defences: 3,420 m of retaining wall and 180 m of earthen embankment.
- Sealing manholes: manholes to be sealed along main Poddle culvert line at Dolphin's Barn area and Poddle Park area.
- Culvert inlet screens.
- Flap valves.

2. METHODOLOGY

2.1 Scope of the Assessment

This section describes the methodology followed in the compilation of this study. Widely accepted and recognised guidelines were followed in relation to every aspect of the scoping, surveys, assessment and recommendations. The scope of the Study, as outlines in the RFQ document, was to include habitats, wintering birds otter and badger.

The habitat survey followed *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011) and *A Guide to Habitats in Ireland* (Fossitt, 2000). The wintering bird surveys followed *I-WeBS Counter Manual Guidelines for Irish Wetland Bird Surveys counters* (BirdWatch Ireland, 2016).

The Badger and Otter survey methodology was based on the Transport Infrastructure Ireland (formerly the National Roads Authority) guidelines:

- TII/NRA (2008b) Guidelines on the Treatment of Otters Prior to the Construction of National Road Schemes. National Roads Authority, Dublin.
- TII/NRA (2006a) Guidelines on the Treatment of Badgers Prior to the Construction of National Road Schemes. National Roads Authority, Dublin.

In addition, *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2016) was used to provide direction in the preparation of the scope, structure and content of the study.

2.2 Desk Study

A desktop study was carried out to collate records of wintering birds, badger and otter in Bancroft Park and Tymon Park. The following sources of information were used:

- Records from the NPWS web-mapper.
- Review of the National Biodiversity Data Centre (NBDC) web-mapper.

Statutory and non-statutory consultees were contacted in January 2018. The purpose of the consultations was to collect any useful records and observations on wintering birds, otter and badger using the parks. In addition to consultees, the Park Ranger, local bird watchers and members of the public also provided useful information, particularly in relation to Brent Geese.

2.3 Specific Ecological Methodologies

2.3.1 Habitat Survey

The habitat survey involved visiting the entire site on foot. Aerial photographs were marked up showing the areas of habitat as polygons. Lines were drawn to represent linear features such as hedgerows and ditches. Target notes were made of list species present, signs of disturbance and height of trees as required.

As part of the habitat surveys, the presence of invasive species was recorded. This included species listed on the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). Notes on the species, location and area were recorded.

2.3.2 Badger Survey

Eurasian Badger (*Meles meles*) and their setts are protected under the Wildlife Acts, 1976-2012 and are evaluated as being Least Concern in the Irish Red Data list for mammals (Marnell et al., 2009). It is an offence to intentionally kill or injure a Badger or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. Badgers are found throughout Ireland in areas of suitable habitat (Hayden & Harrington, 2000). The badger population is in the Republic of Ireland is stable and is 84,000 (Sleeman et al., 2009).

The badger is an adaptable species inhabiting lowland grassland and woodland habitats and also occasionally in upland and suburban areas. Its group size is typically 4-5 animals (Feore, 1994; Smal, 1995). They are opportunistic foragers that exploit a broad range of prey. Earthworms are common in the diet but account for little of the bulk. Seasonally abundant food sources are important including insect larvae and frogs (Cleary et al., 2009).

The Badger survey was conducted in order to determine the presence or absence of Badger within the study area. The Badger survey involved a systematic search of all fence lines, woodland and scrub habitats for physical evidence of Badger, e.g. setts, latrines, badger paths. The optimal period for Badger surveys is during seasonal peaks in territorial activity and when vegetation cover is at a minimum (February to April and less pronounced peak in October). The study area was surveyed in January and February 2018.

Badger setts were classified as being main, annex, subsidiary or outlier setts, based on recommendations in Harris et al. (1994) and consistent with the convention set out in TII/NRA (2009b). Where badger setts were found, the number of entrances, activity level and sett status was recorded. Sett status categorisation is as follows:

- Main sett: Used throughout the year and constitutes the main breeding sett. Where a sett exhibits much activity and appears to be the largest (normally at least five holes) and most well used sett within a badger territory it is categorised as the main sett. Main setts always have active Badger runs leading away from them and are normally marked by latrines.
- Annex sett: Categorised where assumed to form a part of the main sett area but where the sett is unlikely to be directly linked by an underground passage to the main sett either due to a barrier (e.g. separated by a watercourse or ditch) or by distance. Normally linked to the main sett by a well used path and lie within 150 m of a main sett entrance.
- Subsidiary sett: Categorised where believed to offer an alternative large sett complex to the main sett. Subsidiary setts are normally at least 50 m away and are not always obviously linked by a well used path. Subsidiary setts often exhibit moderate levels of activity, are larger than outlier setts but smaller than main setts. Often marked by latrines.
- Outlier sett: Often comprise just one or two holes. Used infrequently and can be found at the edges of a Badger group's territory.
- Disused sett: Appears abandoned by the group for at least a year. Differs from "inactive" setts which are judged to be temporarily disused. Often completely blocked with vegetation or collapsed.

Exact locations of badger field signs and setts were marked with 10-figure grid references using a hand-held high-sensitivity Garmin GPSMAP 64st Geographical Positioning System (GPS) and imported into a geospatially referenced Geodatabase in ArcGIS.

Sett status can quickly change. It is not uncommon for badgers to switch the location of their main sett to the location of a previously identified subsidiary sett, or an outlier sett to be developed into a main sett. Motion-activated infra-red cameras were deployed on setts and in woodlands to determine the distribution and estimate the badgerpopulation.

2.3.3 Otter Survey

European Otter (*Lutra lutra*) is listed on Annexes II and IV to the EU Habitats Directive. It is also protected under the Wildlife Acts, 1976-2012 and is evaluated as being Near Threatened in the most recent Red Data list for mammals (Marnell et al., 2009). This species is distributed throughout Ireland and can have a home range of up to 10 or 20 km (NPWS, 2013). As per the NPWS Article 17 Reporting, the range, population, habitat and future prospects for this species in Ireland have been assessed as favourable.

The purpose of the otter survey was to identify any sensitive features within the study area potentially of use to breeding, resting, foraging or commuting otters and to establish presence or absence of otter activity.

The otter survey involved a search of the banks of the River Poddle and ponds for physical evidence of otters, e.g. spraints, prints, slides, trails, couches and holts. Particular attention was given to important riverine features within the survey corridor, such as under bridges. The survey methodology was also cognisant of the recommendations in the Otter Threat Response Plan 2009-2011 (NPWS, 2009) which recognises the importance of the riparian buffer (10 m on both banks) for otters and these areas were included in the survey corridor.

2.3.4 Wintering Bird Survey

The wintering bird survey was intended to determine which wintering bird species use the two parks and their numbers and distribution within the parks. The parks were divided into eight sectors. Each sector was further divided in sub-sectors depending on the characteristics of the habitats present. Each sub-sector represented a discrete area of similar habitat suitable for wintering birds, such as a pond or field. A map showing bird sectors is provided in Appendix B.

Bancroft Park and Tymon Park lie approximately 8.5 km from a number of Special Protection Areas (SPAs) in Dublin Bay. These SPAs are designated for wintering birds. As supplies of food found on the coast run out, many of these species, but in particular Light-bellied Brent Goose (*Branta bernicla hrota*), travel inland to feed. Playing fields and amenity grassland, such as those found in Bancroft Park and Tymon Park, provide valuable foraging habitat for these species.

Surveys were undertaken weekly and each survey lasted approximately 3.5 hours. Surveys involved walking a transect and scanning all areas of suitable habitat with ×10 binoculars. The direction as well as the start and end point was changed to vary the time that each area was visited. The species and number present in each subsector was recorded. Areas of open grassland were also searched for goose droppings.

The survey recorded all waterbirds, i.e. birds closely associated with aquatic habitat. This included all waterbird species as defined by Wetlands International (Wetlands International, 2006) and included all swans, geese, ducks, divers, grebes, Cormorant, Shag, herons, rails, crakes, waders and Kingfisher, as well as gulls. Incidental sightings of raptors and birds listed on Annex I to the Birds Directive were also recorded.

A description of each sector is provided below.

Tymon Park East

Sector A

This included the fields at the north end of Tymon Park east. It included the largest open field in the park and areas of grassland managed for biodiversity. The dog park is also within this sector. Construction of a pipeline through this area was continuous during the surveys.

Sector B

This sector included the three fields and the pond west of Tymon Lake. The fields were divided by hedgerows. The River Poddle followed one of the hedgerows to the pond.

Sector C

This sector included Tymon Lake and the grassland areas to the north and east along Limekiln Road. It also included the River Poddle to the point where it exits the park at Wellington Road.

Sector D

This sector consisted of five fields south of Tymon Lake between the M50 and Kennington Road.

Sector E

This sector included the fields between Templeogue United FC and the remainder of Tymon Park to the south. It also included the ponds at Faughs GAA Club.

Tymon Park West

Sector F

This sector included the fields around the National Basketball Arena and north as far and the visitor centre grounds.

Sector G

This sector included the remainder of Tymon Park West including the car park, the ponds and grassland areas around them, Coláiste de hÍde and the halting site. Significant construction works was ongoing next to Coláiste de hÍde during the surveys.

Bancroft Park

Bancroft Park was surveyed as one unit which included the amenity grassland and the River Poddle between Castletymon Road and Greenhills Road.

3. RESULTS

3.1 Desk Study

A review was undertaken of online sources of information in relation to Eurasian Badger, European Otter and wintering birds. The desk study identified one record of an otter in Tymon Park West (2016) and four records of badgers, two from Tymon Park West, one from Tymon Park East and one from Bancroft Park. Table 3.1 below lists the wintering birds recorded in the study area since 2007 (NBDC). Table 3.2 lists the consultees along with their responses.

Table 3.1. Winterng birds recorded in Tymon and Bancroft Parks (2007-2018).

Common Name	Scientific Name
Pochard	*Aythya ferina*
Teal	*Anas crecca*
Northern Shoveler	*Anas clypeata*
Little Egret	*Egretta garzetta*
Kingfisher	*Alcedo atthis*
Tufted Duck	*Aythya marila*
Brent Goose	*Branta bernicula*
Goldeneye	*Bucephala clangula*
Oystercatcher	*Haematopus ostralegus*
Golden Plover	*Pluvialis apricaria*
Great-crested Grebe	*Podiceps cristatus*
Water Rail	*Rallus aquaticus*
Little Grebe	*Tachybaptus ruficollis*
Greenshank	*Tringa nebularia*
Redshank	*Tringa totanus*
Northern Lapwing	*Vanellus vanellus*

Table 3.2. Consultation responses.

Consultee	Date of Response	Summary Response
National Parks & Wildlife Service	None received	n/a
South Dublin Branch of BirdWatch Ireland	None received	n/a
Irish Brent Goose Research Group	None received	n/a
Local Birdwatcher	7th February	Geese have not used the park since c. 2012. A combination of disturbance by dogs and the construction of the dog park may have made the areas previously used unsuitable.
Park Ranger	23rd January and 21st February	Park rangers were consulted twice during the surveys. They said geese have not used the park in 2017/18. He said this might be due to ongoing construction work in the areas historically used.
Public	13th February	Member of the public told surveyor that geese had not been to the park in a few years. He said he had seen Kingfisher recently on the west side of Tymon Park and on one occasion flying out of the culvert on the east side.

3.2 Field Surveys

3.2.1 Habitats

A list of the habitats identified in the study area during the field surveys is presented in Table 3.3 below, followed by a more detailed description below. Habitat mapping is provided in Appendix A.

Table 3.3. Habitats recorded in the study area. Habitat names and codes correspond to Fossitt (2000).

Habitat Name	Habitat Code	Total Area (m^2)	% of Total Area
Amenity Grassland	GA2	648,873	50.8
Dry Meadows and Grassy Verges	GS2	94,661	7.4
Buildings and Artificial Surfaces	BL3	102,636	8.0
Scrub	WS1	7,311	0.2
Mixed Broadleaf Woodland	WD1	246,152	19.3
Spoil and Bare Ground/ Mixed Broadleaf Woodland	ED2/WD1	8,199	0.6
Mixed Conifer/ Broadleaf Woodland	WD2	134,080	10.5
Immature Woodland	WS2	224	0.2
Artificial Lakes and Ponds	FL8	32,021	2.5
Reed and Large Sedge Swamps	FS1	1,616	0.1
Linear Habitats	**Habitat Code**	**Length (m)**	
Lowland/ depositing Rivers	FW2	3,263	
Drainage Ditches	FW4	1416	
Hedgerows	WL1	2,860	
Paths	BL3	12,966	

Amenity Grassland (GA2)

Amenity grasslands are heavily managed grassland that are usually species poor and mowed to maintain a short sward. Amenity grassland includes the pitches in Bancroft Park and Tymon Park and the areas of both parks that are regularly mown. This habitat is species-poor, being dominated by Perennial Rye-grass (*Lolium perene*) and clovers (*Trifiloum* sp.). However, it can provide feeding habitat for wintering birds, especially Brent Geese.

Dry Meadows and Grassy Verges (GS2)

This habitat includes the areas of Tymon Park and Bancroft Park that are managed for biodiversity. These areas are mown once or twice a year and left standing over winter. These areas provide a food resource for birds and invertebrates. This habitat is also found along the River Poddle where it forms a buffer between amenity grassland and the river.

Buildings and Artificial Surfaces (BL3)

This habitat type includes car parks, roads, paths and buildings. Generally, built habitats are not considered of high ecological significance and do not offer high-quality floral or faunal habitat. In the study area these areas often had high densities of birds due to feeding by the public.

Scrub (WS1)

This habitat consists of areas of shrubs less than 5 m high. This habitat is found in Bancroft Park and in some areas of Tymon Park, often next to woodland. Common species include Gorse, Dogwood and Bramble. Scrub provides nesting habitat for birds and cover for mammals.

Mixed Broadleaf Woodland (WD1)

This habitat is the second most common habitat found in Bancroft and Tymon Parks, after amenity grassland. Most of this habitat was planted and is of a similar age. The most common tree species are beech, ash, oak, sycamore, alder, birch and hazel. The understory species visible during the survey were ivy and bramble. Development of the field layer is limited where the trees are densely plants and of similar age. Japanese Knotweed (*Fallopia japonica*) and Snowberry (*Symphoricarpos albus*) were recorded in this habitat.

Spoil and Bare Ground/Mixed Broadleaf Woodland (ED2/WD1)

This habitat mosaic is found behind the Tymon Park Visitor Centre. It includes areas where rubble, cuttings and chippings from park maintence works are stored. The tree species composition is similar to that found in the broadleaf woodland elsewhere in the park.

Mixed Broadleaf/Conifer Woodland (WD2)

Some areas of Tymon Park have been planted with a mix of broadleaved and coniferous species. The species composition is similar to WD1 but includes Larch (*Larix deciduas)* and Scot's Pine (*Pinus sylvestris*). This habitat is found in parts of Tymon Park East.

Immature Woodland (WS2)

This habitat consists of recently planted mixed woodlands that have not reached 5 m in height. A small area of immature woodland was recorded in Tymon Park east.

Artificial Lakes and Ponds (FL8)

This habitat included the artificial or ornamental bodies of standing water that are found in Tymon Park. Although artificial in origin, the ponds are of particular biodiversity value as they support large number of waterbirds. The large number of waterbirds is attributed to feeding by people using the park. The natural habitats along the banks contain riparian species such as Common Reed (*Phragmitis australis*), Bull Rush (*Typha latifolia*) and rushes (*Juncus* spp.). Small fish are present in the ponds and these were observed being preyed on by Little Grebe. Frog spawn was recorded in the shallow, still areas of the ponds. The invasive species Giant Rhubarb (*Gunnera tinctoria*) was recorded in two areas on the edges of the ponds in Tymon Park. This is an invasive species capable of displacing native flora.

Lowland/Depositing Rivers (FW2)

The River Poddle flows through Bancroft Park and Tymon Park. It is culverted under Castletymon Road and the M50. The channel has been straightened in several places and the banks have been reinforced. The flow is slow and the river is broken up by several ponds in Tymon Park. Lesser Water-parsnip was commonly found growing along the river edges. The River Poddle is frequently bordered by rough grassland, which protects the river from sedimentation and nutrient run-off and has added to the biodiversity value of the river. Litter is a significant problem, especially in Bancroft Park.

Drainage Ditches (FW4)

Drainage ditches commonly found associated with hedgerows and make up former field boundaries. Generally the ditches are ephemeral, only containing water after rainfall. They support wetland plants including rushes and provide breeding habitat for frogs.

Hedgerows (WL1)

These are managed strips of trees and shrubs which typically form field boundaries. Within the study area, hedgerows are found forming the old field boundaries in Tymon Park. Common species include Hawthorn, Ash, Ivy and Bramble.

Plate 1. The River Poddle in Tymon Park East.

3.2.2 Otter Survey

While no evidence of otters was recorded during the surveys, this species is likely to use the site. Otters have been recorded in Tymon Park as recently as 2016 (NBDC, 2018).

3.2.3 Badger Survey

Badgers are vulnerable to persecution. Therefore, the data pertaining to badgers in this report should be considered confidential and should not be made available to the public.

Two badger setts were recorded in Tymon Park [redacted]. The main sett (Sett 1) had 9 entrances in total, with 7 showing signs of recent use. Several of the holes had very large spoil heaps typical of this species. [redacted]

A second sett (Sett 2) was recorded [redacted] This sett had two entrances. Bedding was present in the spoil heaps. Both of the entrances were blocked with leaves suggesting the sett is not currently active. Snuffle holes were recorded 50 m north of the sett at the base of a tree.

Motion sensor cameras were placed at Sett 1 to record badger. In order to ascertain the movements of badger within the park, motion sensor cameras were also placed in the woodlands [redacted] to establish if badger were present in this area. [redacted]

There were a number of limitations in carrying out the badger survey. Firstly, the level of disturbance in Tymon Park and Bancroft Park made detecting prints very difficult. The presence of dogs may have deterred badgers from marking territories with latrines, or dogs may have dug up the latrines. The placing of remote cameras had to be considerate of the potential for theft, and therefore the cameras were not always placed in optimum positions.

The presence of two badger setts – an active main sett and an inactive outlier sett – suggests that there is a single social group occupying the west side of Tymon Park. It is unlikely that badger would use the M50 overpasses or could access other relatively natural areas such as

the River Dodder corridor. The location of the setts and feeding signs show that badgers belonging to this social group use the entire area of Tymon Park West, and potentially Bancroft Park, which badgers may access though the culvert during low flow. The varied habitats including woodland, amenity grassland and hedgerows provide suitable foraging habitat. Leftover food from people feeding birds at the car park probably provides additional food. Leftover citrus fruit was noted regularly, a food that birds are unlikely to eat. The high level of disturbance of the site reduced the setting opportunities in the parks.

No badger setts or footage was recorded in Tymon Park East, although there is a mammal path leading from the Carr Golf Centre under the palisade fence and into the park which may be used by badger. [redacted]

Without capturing and marking badgers, there is no practical method for calculating badger populations (Tuyttens et al., 2001). However, the badger population can be measured based on studies that involved capturing badgers in similar situations. In this situation, based on the habitats present and the levels of disturbance, the social group in Tymon Park is likely to consist of 3-5 individuals. Inbreeding in this isolated badger population poses a considerable risk to their long term survival.

Habitats for badgers could be enhanced by the thinning of woodlands which contain trees of uniform age and height, thereby allowing a more diverse field layer to develop as well as scrub which would provide cover for badgers to dig setts.

Plate 2. Entrance to Sett 1 showing recent signs of digging.

Plate 3. Badger Sett 2 entrance with bedding in spoil.

Plate 4. Still image showing a badger close to Sett 1.

3.2.4 Wintering Bird Survey

A summary of the results of the wintering bird survey is given in Table 3.4 below. A total of 19 species were recorded during the surveys. Five species, namely Brent Goose, Wigeon, Shoveler, Teal and Snipe are species that migrate to Ireland each winter.

The distribution of wintering birds in Tymon Park and Bancroft Park was consistent between January and mid-April 2018. The ponds contained the highest concentration of all species recorded other than gulls. This is because the ponds provide suitable habitat and they are

popular places for the public to feed birds. Gulls, ducks, Coot, Moorhen, Mute Swan, Grey Heron and Little Egret were all recorded at the ponds.

The car park off Castletymon Road supported high numbers of gulls as well as Mute Swans and Grey Heron. This is a popular place for the public to feed birds.

The areas of amenity grassland were often used by gulls. The field at the north end of Tymon Park East often had numbers exceeding 150 gulls.

Table 3.4. Wintering bird species recorded. (w) denotes a winter migrant. "Peak Count" is the highest number of a species recorded on a single date.

Common Name	Scientific Name	Peak Count
Mute Swan	*Cygnus olor*	17
Brent Goose **(w)**	*Branta bernicula*	10
Wigeon **(w)**	*Anas Penelope*	23
Teal **(w)**	*Anas crecca*	5
Mallard	*Anas platyrhynchos*	126
Tufted Duck	*Aythya marila*	15
Northern Shoveler **(w)**	*Anas clypeata*	9
Little Grebe	*Tachybaptus ruficollis*	9
Grey Heron	*Ardea cinerea*	8
Little Egret	*Egretta garzetta*	1
Coot	*Fulica atra*	60
Moorhen	*Gallinula chloropus*	39
Black-headed Gull	*Chroicocephalus ridibundus*	356
Common Gull	*Larus canus*	234
Feral goose	*Anser sp.*	3
Feral duck	*Anas sp.*	6
Herring Gull	*Larus argentatus*	79
Lesser Black-backed Gull	*Larus fuscus*	3
Snipe **(w)**	*Gallinago gallinago*	1

Wintering Species

Brent Goose

Light-bellied Brent Goose has a circumpolar distribution, breeding throughout the extreme high Arctic. The range extends from Greenland to Svalbard and northern Russia, continuing through Alaska to the Canadian Arctic Archipelago. The Canadian breeding population winters almost entirely in Ireland. The winter distribution in Ireland is wholly coastal, with large estuaries and areas of intertidal mudflats with fine sediments the preferred habitat.

Brent Goose, a particular focus of the surveys, was recorded flying over Tymon Park East on the 23rd January. The flock appeared to land in Greenhills Park to the east. Based on anecdotal evidence, Brent Geese have not used Tymon Park in recent years as a result of constant disturbance by dogs. In addition, a dog park was built next to the area that was used by Brent Geese in the fields at the north end of Tymon Park East. Construction activity was noted during the survey period. The areas traditionally used by Brent Geese are presented on the drawings in Appendix A.

Plate 5. Construction work in a field used historically by brent geese.

Wigeon

Wigeon is a medium-sized duck with a round head and small bill. The head and neck of the male are chestnut, with a yellow forehead, pink breast and grey body. In flight birds show white bellies and males have a large white wing patch. Wigeon were recorded regularly on Tymon Lake. The numbers recorded varied from 10 to 23 with numbers usually around 19 birds during the winter months.

Plate 6. Wigeon on Tymon Lake

Teal

Teal have a wide distribution across Eurasia and North America. In winter, the species occurs across much of Europe, wherever there are suitable wetland habitats, including both inland and coastal wetlands. Non-breeding teal are widespread throughout Ireland, favouring areas of shallow water on estuarine coastal lagoons, coastal and inland marshes, and flooded pastures and ponds. Teal were recorded consistently in small numbers (2-5) in Tymon Park East. They were recorded on the small pond above Tymon Lake, in Tymon Lake and along the River Poddle. They were easily flushed along the river channel.

Northern Shoveler

Shoveler is a medium- to large-sized duck with a long and broad bill. Males have a green head, white breast, chestnut belly and flanks and blue upper forewing. Females are similar to Mallard but distinguished by the bill and darker brown belly. The species is Red-listed in Ireland. Most occur between October and March. Shoveler was recorded on three occasions in February and March. One individual was recorded on the 5th February, nine were recorded on the 21st February and three were recorded on the 5th March.

Snipe

Snipe is a small wader with a long bill. It is well camouflaged and is usually only seen when flushed from long grass. When flushed, snipe typically fly in a frantic zig-zag fashion. Snipe occur in Ireland both as a winter migrant from the north and a summer visitor from North Africa and the Mediterranean. It is Amber-listed in Ireland due to a moderate decline. Snipe were recorded in March and April in the long grass managed for biodiversity in the northern end of Tymon Park East.

3.2.5 Invasive Species

Three invasive species listed on the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended) were identified during the walkover surveys. Two other species, namely Snowberry and Winter Heliotrope were recorded during the surveys. They form dense stands and pose a risk to biodiversity if allowed to spread.

Japanese Knotweed

Japanese Knotweed is a non-native, invasive, perennial plant with hollow, bamboo-like stems. Its leaves are approximately the size of a human hand and plants form yellow-cream flowers in late June to August. The plant consists of hollow bamboo-like stems which are green with red spots during summer and turn brown during winter. During growth red sideshoots form off the main stem and its leaves are arranged in a zig-zag pattern. Japanese Knotweed is on Invasive Species Ireland's list of the "most unwanted" species (Invasive Species Ireland is a joint project between the Northern Ireland Environment Agency and the National Parks & Wildlife Service). Japanese Knotweed is a threat in open and streamside areas. It can spread rapidly through underground stems (rhizomes) and fragmentation to form dense stands, excluding native vegetation and reducing species diversity. Japanese Knotweed does not produce viable seeds in Ireland. Rhizomes may spread up to 7 m horizontally and 3 m deep from the above-ground plant. Once stands become established, they are extremely persistent and difficult to remove. This plant has the ability to grow through tarmac and concrete (in some cases within dwellings). Failure to manage Japanese Knotweed on a development site may result in eventual structural damage.

Japanese Knotweed was identified on a woodland edge on the eastern side of Tymon Park close to the dog park (ITM 710407 729518). The stand was thinly spread throughout an area of approximately 8 m × 18 m.

Giant Rhubarb

Giant Rhubarb is a large herbaceous perennial, which can grow up to 2 m tall, with leaves of up to 2 m in diameter. It is a rhizatomous plant and the rhizomes of mature plants can be up to 1.5-2 m long growing above ground. It is deciduous with the leaves dying off in autumn (October), leaving the large brown rhizomes exposed. Growth starts in early spring (March), prior to the emergence of native species. It can reproduce by both sexual (seed) and asexual

(vegetative) means. Inflorescence development occurs early in the spring, with the fruits maturing in late summer/early autumn. Large numbers (up to 250,000 seeds per mature plant) of drupe like, red or orange seeds are produced. Small fragments of the rhizome have the potential to establish new plants. The impacts of concern are colonisation of peat bog and waterside vegetation where large dense colonies can rapidly dominate and displace important native species. Colonisation of agricultural and amenity areas can lead to these areas being unusable due to the dense stands of Giant Rhubarb.

Giant Rhubarb was identified on the western shore of Tymon Lake and also along the stream flowing into Tymon Lake from the west (ITM 710708 729367).

Grey Squirrel

Grey Squirrel, a non-native species which was introduced to Ireland in 1911 is an invasive forest mammal. It has had a negative impact on the native Red Squirrel through competition and possibly disease, and has caused considerable damage to Irish woodland through its habitat of bark stripping trees. Grey Squirrel has spread from its original point of introduction to cover much of the eastern half of the island of Ireland. Grey Squirrel has not, however, established itself in the west of Ireland, with the River Shannon marking the western boundary of its range. In its range, Grey Squirrels readily associate with human environments such as public parks and suburban gardens. During the surveys, Grey Squirrels were regularly recorded in Tymon Park West.

3.2.6 Other Species

Other species of interest recorded during the survey include a number of raptors, namely Common Buzzard, Peregrine and Sparrowhawk. Buzzards and sparrowhawks were recorded within the parks themselves, while a peregrine was seen above Bancroft Park. It is likely that buzzard are attracted by the high numbers of rabbits that occur in Tymon Park. Similarly, sparrowhawks are likely to feed on the high numbers of birds such as finches, blackbirds and thrushes, all of which are numerous in the parks.

Grey Wagtail and Redwing were both recorded occasionally in Bancroft Park and Tymon Park. Grey Wagtail is a wetland insectivore that was recorded along the Poddle in Bancroft Park. Redwings were occasional recorded in Tymon Park. This thrush species is a winter visitor from Eastern Europe.

4. DISCUSSION

The potential impacts resulting from the construction of the flood embankments include:

- Disturbance during construction;
- Reduced habitat quality as a result of the embankments and flood walls; and,
- Impacts from the increase in areas flooded.

The following sections describe the potential impacts of the construction of the flood alleviation measures and associated flood events on badgers, otters, wintering birds and invasive species.

4.1 Badger

Two badger setts were identified in Tymon Park West. The locations of the two setts are away from the flood alleviation works and the area that will be flooded. Therefore, badger setts will not be impacted by the works. The construction of the works may result in temporary noise and light disturbance. However, it is anticipated that these impacts can be reduced through appropriate work practices.

4.2 Otter

No otters or otter signs were recorded during the field surveys. However, there are records of otters in Tymon Park from 2016. The construction of the works may result in temporary noise and light disturbance, but these impacts can be reduced through appropriate work practices.

4.3 Wintering Birds

Tymon Park and Bancroft Park support five species of wintering birds and at least 13 other species of wetland birds, including gulls. Wintering and wetland birds were concentrated in the ponds in Tymon Park.

Wintering birds may be impacted through increased noise, vibration and people present in the park. If works were to be carried out during winter, it is likely that species such as Wigeon, Teal and Shoveler would be displaced.

The construction of embankments around the ponds will reduce the sightlines from the water to safe areas currently utilised by birds. This could reduce the suitability of the ponds for wintering birds, causing them to flush more easily and reducing the efficiency with which they can feed. However, it should be noted that Tymon Lake and the other ponds are already subject to disturbance and are enclosed by reed beds, trees and hedgerows. Therefore, the embankments are unlikely to deter the species currently present from using the ponds.

Brent geese were not recorded in Bancroft Park or Tymon Park during the surveys. This may be due to the increased pressures from people, dogs and construction activities. Brent geese are known to have historically used the fields at the northern end of Tymon Park East (see Appendix A). This area provides a suitable sward height and adequate sightlines for this species. These fields are not in the vicinity of the proposed works and, therefore, brent geese behaviour is unlikely to be impacted by the proposed flood alleviation works.

4.4 Invasive Species

The surveys recorded two listed invasive species in Tymon Park, namely Japanese Knotweed and Giant Rhubarb. Of these, only Giant Rhubarb was recorded in the vicinity of the works. This species was recorded on the western shore of Tymon Lake and also along the stream flowing into Tymon Lake from the west. This species spreads by producing huge amounts of seed and the seed is likely to be present in the soil on the banks of Tymon Lake. Measures should be taken to prevent the accidental spread of this species within and outside Tymon Park. This should take the form of an Invasive Species Management Plan which should be included in the Construction Management Plan.

5. RECOMMENDATIONS

5.1 Badgers

This report contains information on the locations of badger setts and should be considered confidential. Although there are no badger setts in the vicinity of the proposed works, badger activity may still be impacted by construction activities. To reduce the impacts on badger, the following measures should be included the Construction Management Plan:

- Works should be programmed to occur during the hours of daylight only.
- Any excavations greater than 1 m deep should be securely covered at night or a ramp provided to enable animals to escape should they fall in.
- Flood-lighting of the works areas should be avoided.

5.2 Otter

No otters were recorded during the surveys. However, they have been recorded in Tymon Park as recently as 2016. To reduce the impacts on otter, the following measures should be included the Construction Management Plan:

- Works should be programmed to occur during the hours of daylight only.
- Any temporarily exposed open pipe system should be capped in such a way as to prevent otters gaining access, as may happen when contractors are off-site.
- Flood-lighting of the works areas should be avoided.

5.3 Invasive Species

The Parks Department of South Dublin County Council should be notified about the presence of Japanese Knotweed and Giant Rhubarb within Tymon Park East and arrangements should be made to treat these species with herbicide suitable for use near watercourses and in the appropriate season.

5.4 Wintering Birds

In order to reduce the impacts on wintering birds, the following measures should be included in the Construction Management Plan:

- There should be no planting on the flood embankments.
- Works should begin in late April to avoid impacts on wintering birds.

5.5 Water Quality

Best practice procedures from Inland Fisheries Ireland (IFI, 2016) should be incorporated into the design of the Project. The following is an overview of general design measures that should be employed during the construction of the Project to minimise and avoid negative impacts within the footprint and on the wider environment.

Earthworks

- The Construction Method Statement should be read and approved by the Site Foreman and the Works Team inducted by the Site Foreman on the ecological considerations detailed in the Construction Method Statement.
- Felling and hedge cutting within the bird breeding season (1st March to 31st August) should be avoided. If vegetation removal is required within the bird breeding season, trees should be examined for birds by a suitable qualified ecologist prior to felling.
- Prior to any excavation works, the works area should be assessed and clearly delineated with temporary fencing. There should be no access by works vehicles outside the fenced-off areas.

- All storage of plant, excavated material and topsoil and other materials required for construction and landscaping should be held within the fenced area.
- No washing of plant, vehicles or equipment should be completed within 50 m of a watercourse. The Site Foreman should ensure that all deliveries are required to complete wash-out at their own company base, not on-site.

Hydrocarbon usage

The use of hydrocarbons during the construction process leads to the potential for pollution to enter the wider environment, including drainage ditches and watercourses. Leaks in poorly maintained plant and machinery could lead to hydrocarbon dispersal over works areas. Leaks in fuel storage tanks and spillages during refueling operations could lead to larger releases of hydrocarbons into the environment.

The use of machinery carries the potential for accidental hydrocarbon contamination of works areas, by fuel spillages or oil leaks for example. The works should be carried out in accordance with the following measures to avoid such impacts:

- All machinery should be refuelled from mobile tankers on the local or access roads. No refuelling should take place within 50 m of any watercourse.
- Mobile storage such as fuel bowsers should be bunded to 110% capacity to prevent spills. Tanks for bowsers and generators should be double-skinned.
- When not in use, all valves and fuel trigger guns from fuel storage containers should be locked.
- All plant refuelling should take place using mobile fuel bowsers. Only dedicated trained and competent personnel should carry out refuelling operations. Plant refuelling should take place as far as practicable from watercourses. A spill kit and drip tray should be on site at all times and available for all refuelling operations. Equipment should not be left unattended during refuelling. All pipework from containers to pump nozzles should have anti-siphon valves fitted.
- Strict procedures for plant inspection, maintenance and repairs should be detailed in the Contractor's method statements and machinery should be checked for leaks before arrival on site.
- All site plant should be inspected at the beginning of each day prior to use. Defective plant should not be used until the defect is satisfactorily fixed.
- All major repair and maintenance operations should take place off-site.
- Care should be taken at all times to avoid contamination of the environment with contaminants other than hydrocarbons, such as uncured concrete or other chemicals.
- Specific measures to off-set potential impacts relating to surface water run-off, during the operation of the road, have been incorporated into the design of the Project. These include the use of hydrocarbon interceptors and attenuation systems.

Protection of watercourses

- No direct discharges should be made to waters where there is cement or residues in discharges.
- There should be no visible oil film on any discharges from construction works to waters.
- Silt fences should be used, as required, to prevent sediment from contaminating the watercourses.

6. ECOLOGICAL ENHANCEMENTS

Ireland's national biodiversity action plan Actions for Biodiversity 2017-2021 (DAHG, 2011), in accordance with the Convention on Biological Diversity, is a framework for the conservation and protection of Ireland's biodiversity, with an overall objective to secure the conservation, including, where possible, the enhancement and sustainable use of biological diversity in Ireland and to contribute to collective efforts for conservation of biodiversity globally. Action 1.1.3 of the National Biodiversity Strategy aspires that "all Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure". This is particularly relevant to developments.

6.1 Woodland thinning

In many areas of the parks, planted woodland has a uniform canopy height resulting in a homogenous understory. The trees, competing for light, have grown tall and thin and, in time, will be subject to wind throw. In addition, the competition for light weakens the trees making them more susceptible to insects and disease.

By thinning out the weakest trees and reducing the competition for light, the remaining trees will be able to develop more resistance to environmental stresses. In addition, by opening the canopy, more light will reach the woodland floor and promote the development of a more diverse understory and field layer. This will provide more habitat for invertebrates, mammals and birds. Having trees of varying ages in the woodland will also improve the visual appearance of the wood and create an "old growth" forest character. Thinning of trees should include felling weaker trees and leaving them in-situ as invertebrate habitat. Other trees can be cut all the way around the trunk and left as standing dead trees.

The protection of bird breeding habitats during the breeding season (1st March to 31st August, inclusive), is set out in the Wildlife Acts, 1976-2012. Any removal of vegetation within this period should be avoided.

6.2 Rejuvenation of the River Poddle

The River Poddle has the potential to be enhanced through the rehabilitation of existing habitats and creation of new ones. It is important for ecologically healthy watercourses to have habitat heterogeneity, which is achieved by a variety of pools, waterfalls and riffles being present, in addition to varying amounts of flow and shading by vegetation. Litter should be removed from the river and dead wood should be left in-situ.

6.3 Bat Boxes and Bird Boxes

The lack of dense scrub and old trees with holes and cracks suitable for nesting and roosting means that the provision of artificial boxes for birds and bats could enhance the capacity of the parks for birds and bats. Boxes should be placed in suitable locations and at least 3 m high, to prevent vandalism. Bat boxes should be positioned following guidance in Stebbings (1991). Boxes should be placed out of view of paths to avoid disturbance. Bird boxes of different types should be used in order to cater for a variety of species. Bat boxes should be of the self-cleaning type.

6.4 Removal of Non-native Plants

Three non-native shrubs were identified during the surveys and without treatment these will displace native flora. In particular, Japanese Knotweed and Giant Rhubarb should be treated as a matter of urgency. Herbicide should be suitable for use near watercourses and be used sparingly and damage to the native flora avoided where possible.

7. CONCLUSION

- Wintering birds use Tymon Park and may be impacted by the proposed flood alleviation works.
- Badgers are present in Tymon Park. However, there are no setts near the proposed works.
- Brent geese were recorded flying low over Tymon Park on one occasion during the surveys. No Brent geese or evidence of this species was recorded within the parks during the surveys between January and April 2018.
- Four species of wintering birds: Teal, Northern Shoveler, Wigeon and Snipe were recorded during the survey.
- The recommendations outlined in Section 5 should be adhered to.

In conclusion, given the full implementation of the recommendations in Section 5 of this report, the proposed flood alleviation measures as described in the Eastern CFRAM Study Poddle Options Report (RPS, 2014) will not result in any impacts on wintering birds, badgers or otters.

8. REFERENCES

CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal. 2nd ed.* Chartered Institute of Ecology and Environmental Management, Winchester.

European Communities (Birds and Natural Habitats) Regulations, 2011. *SI No. 477/2011.*

European Communities (Birds and Natural Habitats) (Amendment) Regulations, 2013. *SI No. 499/2013.*

European Communities (Birds and Natural Habitats) (Amendment) Regulations, 2015. *SI No. 355/2015.*

Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny.

IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin.

Kingston, N. (2012) *Checklist of protected and rare species in Ireland. Unpublished Report.* National Parks & Wildlife Service, Dublin.

Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland

NBDC (2018) *Biodiversity Maps* <http://maps.biodiversityireland.ie/#/Map> [Accessed 17/01/2018]. National Biodiversity Data Centre, Waterford.

NPWS (2009) *Threat Response Plan: Otter (2009-2011).* National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

NPWS (2013) *The Status of EU Protected Habitats and Species in Ireland. Volume 2 (Habitat Assessments) and Volume 3 (Species Assessments).* National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.

NPWS (2018) *Online Map Viewer* <http://webgis.npws.ie/npwsviewer/> [Accessed 17/01/2018]. Department of Arts, Heritage and Gaeltacht, Dublin.

NRA (2006a) *Guidelines on the Treatment of Badger Prior to the Construction of National Road Schemes*. National Roads Authority, Dublin.

NRA (2008b) *Guidelines on the Treatment of Otter Prior to the Construction of National Road Schemes*. National Roads Authority, Dublin.

NRA (2008c) *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes*. National Roads Authority, Dublin.

NRA (2009a) *Environmental Impact Assessment of National Road Schemes – A Practical Guide.* National Roads Authority, Dublin.

NRA (2009b) *Guidelines for Assessment of Ecological Impacts of National Road Schemes*. National Roads Authority, Dublin.

RPS (2014) Eastern CFRAM Study Poddle Options Report. Office of Public Works. http://eastcfram.irish-surge-forecast.ie/wp-content/uploads/2011/10/IBE0600Rp0030_Poddle-Options-Report_F02.pdf

Smith, G.F., O'Donoghue, P., O'Hora, K. and Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council, Kilkenny.

Stebbings, R.E. (1991) *Natterer's Bat.* In: Corbet, G.B. and Harris, S. (eds.) *The Handbook of British Mammals*, pp.102-105. Blackwell, Oxford.

Tuyttens, F.A.M., Long, B., Fawcett, T., Skinner, A., Brown, J.A., Cheeseman, C.L., Roddam, A.W. and Macdonald, D.W. (2001) *Estimating group size and population density of Eurasian badgers Meles meles by quantifying latrine use*. Journal of Applied Ecology, 38: 1114-1121.

Wildlife Act, 1976. *No. 39 of 1976.*

Wildlife Act, 1976 (Protection of Wild Animals) Regulations, 1990. *SI No. 112/1990.*

Wildlife (Amendment) Act, 2000. *No. 38 of 2000.*

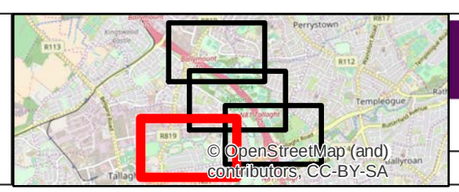
Wildlife (Amendment) Act, 2012. No 29 of 2012.

APPENDIX A
Mapping

Legend

- FW2-Depositing/Lowland Rivers
- BL3 - Building and Artificial Surface
- GA2 - Amenity Grassland (Improved)
- GS1 - Dry Calcareous and Neutral Grassland
- WD1 - (Mixed) Broadleaved Woodland
- WD2 - Mixed Broadleaved / Conifer Woodland
- WS1 - Scrub

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council



ROD
ROUGHAN & O'DONOVAN
Consulting Engineers
Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford,
Dublin 18, Ireland
t +353 (0) 1 294 0800
f +353 (0) 1 294 0820
www.rod.ie

Drawn	Designed	Checked	Approved	Suitability Code - Description
LA	KM	POS	BC	S2 - Information / Planning

Project Stage

Project Title: TYMON PARK WINTER HABITAT STUDY

Drawing Title: HABITAT MAPPING SHEET 1 OF 4

Drawing Number	Project	Originator	Volume	Location	Type	Role	Number
	TPW	ROD	EBD	SW_AE	DR	EN	00001

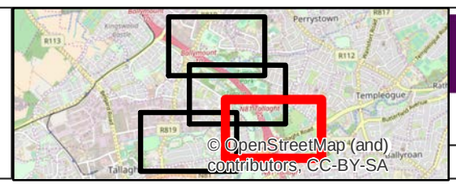
Scale (A1): 1:4,000 | Date: June 2018 | Job No: 18.104 | Rev:

13 June 2018 09:09:20 Drawing Location: J:\2018\18104\18104-02_WIP\08 MODELS\05 GIS\01 MXD\TPW-ROD-EBD-SW_AE-DR-00000.mxd

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

Information on this figure has been redacted



ROD
ROUGHAN & O'DONOVAN
Consulting Engineers
Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford,
Dublin 18, Ireland
t +353 (0) 1 294 0800
f +353 (0) 1 294 0820
www.rod.ie

Drawn	Designed	Checked	Approved	Suitability Code - Description
LA	KM	POS	BC	S2 - Information / Planning

Project Stage

Project Title: TYMON PARK WINTER HABITAT STUDY

Drawing Title: HABITAT MAPPING SHEET 2 OF 4

Drawing Number	Project	Originator	Volume	Location	Type	Role	Number
	TPW	ROD	EBD	SW_AE	DR	EN	00002

Scale (A1)	Date:	Job No:	Rev:
1:4,000	June 2018	18.104	

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

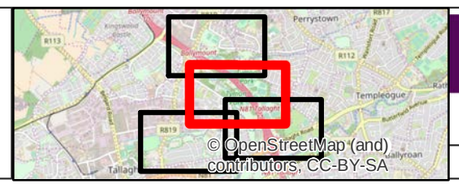
13 June 2018 09:09:27 Drawing Location: J:\2018\18104\18104-02_WIP\08 MODELS\05 GIS\01 MXD\TPW-ROD-EBD-SW_AE-DR-00000.mxd

Legend

- Historical Brent Goose Feeding Areas
- FW2-Depositing/Lowland Rivers
- FW4-Drainage Ditches
- WL1-Hedgerows
- WL2-Treeline
- BL3 - Building and Artificial Surface
- ED2 / WD1, Spoil and Bare Ground / (Mixed) Broadleaved Woodland
- FL8 - Other Artifical Lakes and Ponds
- FS1 - Reed and Large Sedge Swamp
- GA2 - Amenity Grassland (Improved)
- GS1 - Dry Calcareous and Neutral Grassland
- GS2 - Dry Meadows and Grassy Verges
- WD1 - (Mixed) Broadleaved Woodland
- WD2 - Mixed Broadleaved / Conifer Woodland
- WS1 - Scrub
- WS2 - Immature Woodland

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

Information on this figure has been redacted



ROD
ROUGHAN & O'DONOVAN
Consulting Engineers
Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford,
Dublin 18, Ireland
t +353 (0) 1 294 0800
f +353 (0) 1 294 0820
www.rod.ie

Drawn	Designed	Checked	Approved	Suitability Code - Description
LA	KM	POS	BC	S2 - Information / Planning

Project Stage

Project Title: TYMON PARK WINTER HABITAT STUDY

Drawing Title: HABITAT MAPPING SHEET 3 OF 4

Drawing Number	Project	Originator	Volume	Location	Type	Role	Number
	TPW	ROD	EBD	SW_AE	DR	EN	00003

Scale (A1): 1:4,000 | Date: June 2018 | Job No: 18.104 | Rev:

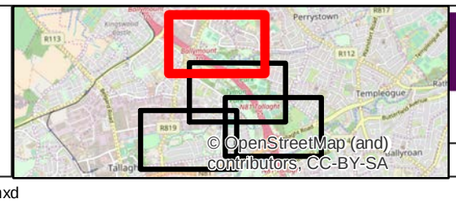
13 June 2018 09:09:34 Drawing Location: J:\2018\18104\18104-02_WIP\08 MODELS\05 GIS\01 MXD\TPW-ROD-EBD-SW_AE-DR-00000.mxd

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

Legend

- Historical Brent Goose Feeding Areas
- FW2-Depositing/Lowland Rivers
- FW4-Drainage Ditches
- WL1-Hedgerows
- BL3 - Building and Artificial Surface
- FL8 - Other Artifical Lakes and Ponds
- FS1 - Reed and Large Sedge Swamp
- GA2 - Amenity Grassland (Improved)
- GS2 - Dry Meadows and Grassy Verges
- WD1 - (Mixed) Broadleaved Woodland
- WD2 - Mixed Broadleaved / Conifer Woodland
- WS1 - Scrub
- WS2 - Immature Woodland

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council



ROD
ROUGHAN & O'DONOVAN
Consulting Engineers
Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford,
Dublin 18, Ireland
t +353 (0) 1 294 0800
f +353 (0) 1 294 0820
www.rod.ie

Drawn	Designed	Checked	Approved	Suitability Code - Description
LA	KM	POS	BC	S2 - Information / Planning

Project Stage

Project Title: TYMON PARK WINTER HABITAT STUDY

Drawing Title: HABITAT MAPPING SHEET 4 OF 4

Drawing Number	Project	Originator	Volume	Location	Type	Role	Number
	TPW	ROD	EBD	SW_AE	DR	EN	00004

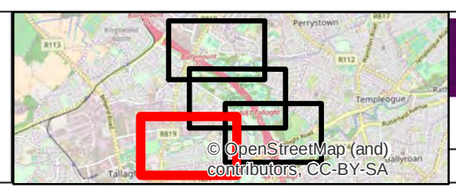
Scale (A1): 1:4,000 | Date: June 2018 | Job No: 18.104 | Rev:

13 June 2018 09:09:42 Drawing Location: J:\2018\18104\18104-02_WIP\08 MODELS\05 GIS\01 MXD\TPW-ROD-EBD-SW_AE-DR-00000.mxd

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

Appendix B
Bird Sectors

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council



ROD
ROUGHAN & O'DONOVAN
Consulting Engineers
Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford,
Dublin 18, Ireland
t +353 (0) 1 294 0800
f +353 (0) 1 294 0820
www.rod.ie

Drawn	Designed	Checked	Approved	Suitability Code - Description
LA	KM	POS	BC	S2 - Information / Planning

Project Stage

Project Title: TYMON PARK WINTER HABITAT STUDY

Drawing Title: BIRD SECTORS SHEET 1 OF 4

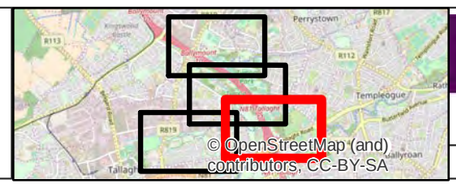
Drawing Number	Project	Originator	Volume	Location	Type	Role	Number
	TPW	ROD	EBD	SW_AE	DR	EN	00101

Scale (A1): 1:4,000 | Date: June 2018 | Job No: 18.104 | Rev:

13 June 2018 09:09:01 Drawing Location: J:\2018\18104\18104-02_WIP\08 MODELS\05 GIS\01 MXD\TPW-ROD-EBD-SW_AE-DR-00100.mxd

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council



ROD
ROUGHAN & O'DONOVAN
Consulting Engineers
Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford,
Dublin 18, Ireland
t +353 (0) 1 294 0800
f +353 (0) 1 294 0820
www.rod.ie

Drawn	Designed	Checked	Approved	Suitability Code - Description
LA	KM	POS	BC	S2 - Information / Planning

Project Stage

Project Title: TYMON PARK WINTER HABITAT STUDY

Drawing Title: BIRD SECTORS SHEET 2 OF 4

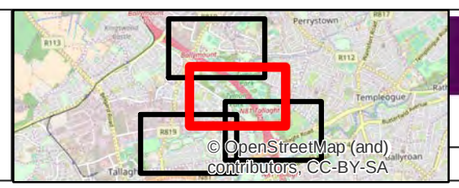
Drawing Number	Project	Originator	Volume	Location	Type	Role	Number
	TPW	ROD	EBD	SW_AE	DR	EN	00102

Scale (A1)	Date:	Job No:	Rev:
1:4,000	June 2018	18.104	

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

13 June 2018 09:09:10 Drawing Location: J:\2018\18104\18104-02_WIP\08 MODELS\05 GIS\01 MXD\TPW-ROD-EBD-SW_AE-DR-00100.mxd

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council



ROD
ROUGHAN & O'DONOVAN
Consulting Engineers
Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford,
Dublin 18, Ireland
t +353 (0) 1 294 0800
f +353 (0) 1 294 0820
www.rod.ie

Drawn	Designed	Checked	Approved	Suitability Code - Description
LA	KM	POS	BC	S2 - Information / Planning

Project Stage

Project Title: TYMON PARK WINTER HABITAT STUDY

Drawing Title: BIRD SECTORS SHEET 3 OF 4

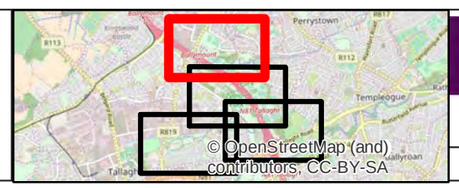
Drawing Number	Project	Originator	Volume	Location	Type	Role	Number
	TPW	ROD	EBD	SW_AE	DR	EN	00103

Scale (A1)	Date:	Job No:	Rev:
1:4,000	June 2018	18.104	

13 June 2018 09:09:17 Drawing Location: J:\2018\18104\18104-02_WIP\08 MODELS\05 GIS\01 MXD\TPW-ROD-EBD-SW_AE-DR-00100.mxd

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council



ROD
ROUGHAN & O'DONOVAN
Consulting Engineers
Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford,
Dublin 18, Ireland
t +353 (0) 1 294 0800
f +353 (0) 1 294 0820
www.rod.ie

Drawn	Designed	Checked	Approved	Suitability Code - Description
LA	KM	POS	BC	S2 - Information / Planning

Project Stage

Project Title: TYMON PARK WINTER HABITAT STUDY

Drawing Title: BIRD SECTORS SHEET 4 OF 4

Drawing Number	Project	Originator	Volume	Location	Type	Role	Number
	TPW	ROD	EBD	SW_AE	DR	EN	00104

Scale (A1)	Date:	Job No:	Rev:
1:4,000	June 2018	18.104	

13 June 2018 09:09:24 Drawing Location: J:\2018\18104\18104-02_WIP\08 MODELS\05 GIS\01 MXD\TPW-ROD-EBD-SW_AE-DR-00100.mxd

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

Appendix C
Bird Counts

British Trust for Ornithology (BTO) Species Codes

BG	Brent Goose
BH	Black-headed Gull
CM	Common Gull
CO	Coot
ET	Little Egret
H.	Grey Heron
HG	Herring Gull
LB	Lesser Black-backed Gull
LG	Little Grebe
MA	Mallard
MH	Moorhen
MS	Mute Swan
SN	Snipe
SV	Northern Shoveler
T.	Teal
TU	Tufted Duck
WN	Wigeon
ZF	Feral Duck
ZG	Feral Goose

SECTOR A

Table1. All counts for Sector A

Date	BG	BH	CM	HG	SN
5th January			102	2	
15th January		42	115		
23rd January	10	50	90		
5th February		19	100		
14th February		16	77	6	
21st February		7	70		
8th March		18	22		1
13th March		10	41		
20th March		30	23		
5th April			1		1
12th April			5		

SECTOR B

Table 2. All counts for Sector B

Date	BH	CM	CO	HG	LG	MA	MH	MS	TU	ZF
5tj January	16			2		8	2			
15th January	35					7	1	2		
23rd January	26	1				14	2			1
29th January	11	3				13	1	3		1
5th February	3		1			9	2			1
14th February						8		2		1
21st February			1		1	2				
8th March	1		3			3	1			
13th March	6		2			5	2		2	1
20th March			4			5	2	4	9	2
27th March			1		1	5	1	4		
5th April			1			2	1		4	
12th April			2	2		4	2	2	1	

SECTOR C

Table 3. All counts for Sector C

Dates	BH	CM	CO	HG	LB	LG	MA	MH	MS	SV	T.	TU	WN	ZL
5th January	93	2	58	5		1		26	6		2	2	10	1
15th January			36			6	5	5	8		5		23	1
23rd January	85	3	28	10		3	23	13	6		3		23	1
29th January	21		37			2	15	19	6		2	4	20	1
5th February	27		21			3	26	16	6	1	5	1	18	1
14th February	68	5	19	7		3	21	16	6		3	3	21	1
21st February	47		13	1		6	21	19	6	9			18	1
8th March	90	20	16	2		1	15	15	6	3	4	3	10	1
13th March	45		19			7	18	16	6		3	7		1
20th March	102	23	14	15	2	4	18	9	2			5		1
27th March	14		11	9		2	20	5	4		2			1
5th April	1		6	18	3		13	11	6		2	2		1
12th April			8	13	2	1	17	4	4			2		

SECTOR D

Table 4. All counts for Sector D

Date	BH	CM	HG
15th January	73	11	
23rd January	2		
5th February	1	1	
14th February	89	142	25
8th March	25	20	1

SECTOR E

Table 5. All counts for Sector E

Date	BH	CM	CO	ET	H.	HG	LG	MA	MH	MS	TU	ZF
5th January	67	2	2		4	5		43	11	4	6	
15th January			2		1	4	1	33	10	5	8	
23rd January	109		4		1		1	31	9	5	10	
29th January	17		3	1			1	22	10	5	11	
5th February	53	2	5		1	4	1	21	4	5	13	
14th February	66	6	3		2	39		19	7	5	10	
21st February	42		4					24	6	5	18	1
8th March	51	5	4			1	1	19	11	5	6	
13th March	52		4					32	4	5	9	1
20th March	29	2	2				2	19	6	5	2	
27th March			4				2	19	7	5	28	
5th April			1				2	20	6	3	20	
12th April			3		1		2	17	6	3	16	2

SECTOR F

Table 6. All counts for Sector F

Date	BH	CM	HG
5th January	7	2	
15th January	4	2	
23rd January	2		
29th January	3		
5th February	15	4	
14th February	9	4	
8th March	15	6	2
13th March	1	1	
12th April	7	3	

SECTOR G

Table 7. All counts for the Sector G

Date	BH	CM	CO	H.	HG	LB	LG	MA	MH	MS	T.	TU	ZF	ZL
5th January	124	1		5	2			42		2	3		3	2
15th January	2			5			2	68	4	2				2
23rd January	65		1	5			3	60	12	2			5	2
29th January			2	1			1	58	5	1			3	2
5th February	1		1	2				34	4	2			2	2
14th February	98		3	6	2			65	7	2			2	2
21st February			3	8			2	28	4	2			4	2
8th March	66		2	6		1		22	2	2			2	2
13th March	112	1	3	3				40	5	2			2	2
20th March	52		4	8			2	17	2	2			2	2
27th March			4	5			2	29	4	2			4	2
5th April			2	7		1		23	2	2			2	2
12th April			1					31	2	2		1	2	2

BANCROFT PARK

Table 8. All counts for Bancroft Park

Date	BH	ET	H.	LB	MA
5th January	21		1		
23rd January	2				
29th January	3				
5th February	15				
14th February		1			
5th April					2
12th April				1	

ROUGHAN & O'DONOVAN CONSULTING ENGINEERS

Arena House
Arena Road
Sandyford
Dublin 18
D18 V8P6
Ireland

Phone +353 1 294 0800
Email info@rod.ie