
Winter bird and mammal surveys 2022

River Poddle Flood Alleviation Scheme

29 April 2022



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Executive Summary

NM Ecology Ltd prepared ecological assessments for the River Poddle Flood Alleviation Scheme, including a Biodiversity chapter for the Environmental Impact Assessment Report and a Natura Impact Statement. These assessments were based on surveys of over-wintering birds, badgers and otters that were first carried out in 2018. In order to assess potential changes in the baseline data, otter surveys were carried out in 2021, and over-wintering birds and badger surveys were carried out in 2022. In this document we present the results of the latest surveys, and consider whether any aspects of the Biodiversity Chapter or Natura Impact Statement need to be updated.

The majority of over-wintering birds were recorded around the lakes and ponds in Tymon Park and Tymon North. A total of 16 species were recorded, characterised mainly by gulls, mallard, moorhen and mute swan; this is the expected species assemblage for urban lakes / ponds. No brent geese were recorded during any of the surveys, or at any other time in 2021 / 2022 by SDCC Park Management staff. As small number of gulls were recorded in other working areas for the Poddle FAS, but no other over-wintering species. The 2022 survey results are similar to the 2018 results, so no changes are required to the impact assessments or mitigation strategies.

There has been no change in the number or status of badger setts between 2018 and 2022, so no changes are required to the impact assessment or mitigation strategy.

No signs of otters were recorded during baseline surveys in 2018 or 2019, but an otter holt was discovered in 2020. Detailed surveys of the study area were carried out in 2021, and a second (inactive) holt was found, along with signs of otter activity in Tymon Park and Tymon North. An impact assessment and mitigation measures for otters were submitted in October 2020 as Further Information, and no other changes are required.

In conclusion, the baseline survey information for over-wintering birds, badgers and otters has been updated, but none of the findings will require any changes to the impact assessments or mitigation strategies in the EIAR Biodiversity Chapter (as amended) or Natura Impact Statement (as amended) that were previously submitted as part of the planning application.

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1 Introduction

1.1 Background to this report

NM Ecology Ltd prepared ecological assessments for the River Poddle Flood Alleviation Scheme, including a Biodiversity chapter for the Environmental Impact Assessment Report (submitted in February 2020, and amended based on further information in October 2020) and a Revised Natura Impact Statement (submitted in October 2020). The assessments were based on a series of ecological surveys carried out by NM Ecology Ltd in 2018 and 2019, complemented by previous surveys of over-wintering birds, badgers and otters carried out by Roughan & O'Donovan Consulting Engineers in 2018, as outlined in a document titled *Winter Habitat Study of Tymon and Bancroft Parks*.

CIEEM guidance¹ notes that survey data collected three or more years previous is “*unlikely to still be valid and most, if not all, of the surveys are likely to need to be updated*”. At the time of writing in April 2022, the 2018 surveys by Roughan & O'Donovan Consulting Engineers are four years old, so they needed to be updated. In response, NM Ecology Ltd carried out additional surveys of winter birds and badgers in 2022, and Triturus Environmental Ltd carried out otter surveys in 2021. The results of all surveys are presented in this report. Triturus Environmental's stand-alone otter report is provided in Appendix B.

It is important to note that the additional surveys increase the spatial extent of baseline data, because the 2018 surveys only covered Tymon Park and Tymon North, whereas the 2022 surveys also include other areas in the vicinity of the proposed Flood Alleviation Works, including Whitehall, Wainsfort Manor, Ravensdale Park and St Martins Drive. At the conclusion of the report we consider the implications of the results for the EIAR Biodiversity chapter (as amended) and Revised Natura Impact Statement that were previously submitted.

1.2 Statement of authority

The review was carried out by Nick Marchant, the principal ecologist of NM Ecology Ltd. He has fourteen years of professional experience, including eleven years as an ecological consultant, one year as a local authority biodiversity officer, and two years managing an NGO in Indonesia. He provides ecological assessments for developments throughout Ireland and Northern Ireland, including renewable energy developments, infrastructural projects (roads, water pipelines, greenways, etc.), and a range of residential and commercial developments.

He has an MSc in Ecosystem Conservation and Landscape Management from NUI Galway and a BSc in Environmental Science from Queens University Belfast. He is a member of the Chartered

¹ Chartered Institute of Ecology and Environmental Management 2019. Advice note on the lifespan of ecological reports & surveys. Available online at <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf>

Institute of Ecology and Environmental Management, and operates in accordance with their code of professional conduct.

2 Methods

2.1 Overview

In general, survey methods were closely aligned with those used by Roughan & O'Donovan Consulting Engineers in 2018, to ensure that the results would be comparable. Extracts from the 2018 survey report are provided below, along with any minor variations using in 2022.

2.2 Survey area

The survey area in 2018 covered Tymon Park (including Tymon North) and Bancroft Park. The 2022 surveys covered a broader range of locations along the proposed scheme, including Tymon Park, Tymon North, Whitehall Park, Wainsfort Manor (land to the rear of Whitehall Road and Glendale Park), Fortfield Road, Ravensdale Park, St Martin's Drive and Mount Argus Close.

No surveys were carried out in Bancroft Park, as it is no longer part of the proposed scheme. No surveys were carried out at the locations proposed for manhole sealing or storm water upgrades, as these areas were either not suitable for badgers, otters or overwintering birds, and/or the proposed works will be of very short duration.

2.3 Winter bird surveys

The following was included in the 2018 report:

*"Bancroft Park and Tymon Park lies 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.*

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.

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 $\times 10$ 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."

The 2022 surveys followed the above approach. However, surveys were carried out every 2 – 3 weeks between the start of December and middle of April, comprising eight surveys in total. The survey dates were 16 December 2021, 31 December 2021, 12 January 2022, 28 January 2022, 11 February 2022, 28 February 2022, 20 March 2022 and 13 April 2022. The surveys started in Tymon Park or Tymon North (alternating direction for each survey), and proceeded to the other working areas along the route of the proposed scheme. Maps showing the location of subsites within Tymon Park and Tymon North are provided in Appendix A, and descriptions are provided in Table 1

Table 1: Codes and descriptions for survey sites in Tymon Park

Subsite	Description
A1	Tymon Park - Two playing fields in north-west
A2	Tymon Park - Grassland in north-west
A3	Tymon Park - Playing field in north-west
B1	Tymon Park - Playing field in north-west
B2	Tymon Park - Playing field in north-west
B3	Tymon Park - Playing field in north-west
B4	Tymon Park - Tymon Lake, western pond
C1	Tymon Park - Playing field north-east
C2	Tymon Park - Playing field north-east
C3	Tymon Park - Playing field north-east
C4	Tymon Park - Playing field north-east
C5	Tymon Park - Playing field north-east
D1	Tymon Park - Tymon Lake, largest pond
D2	Tymon Park - Tymon Lake, northern pond and adjacent meadow
D3	Tymon Park - Playing field north-east
D4	Tymon Park - Meadow along Limekiln Road
E1	Tymon Park - Playing field in east
E2	Tymon Park - Playing field in east
E3	Tymon Park - Playing field in east
E4	Tymon Park - Playing field in east
E5	Tymon Park - Playing field in east
E6	Tymon Park - Playing field in east

E7	Tymon Park - Pond by St Jude's GAA
F1	Tymon North - Amenity grassland by National Basketball Arena
F2	Tymon North - Mixed grassland and woodland in South
F3	Tymon North - Amenity grassland by National Basketball Arena
F4	Tymon North - Meadow in south
F5	Tymon North - Meadow in south
F6	Tymon North - Playing field in south
F7	Tymon North - Playing field and woodland in south
F8	Tymon North - Playing field in south
G1	Tymon North - Meadow in north-west
G2	Tymon North - Meadow and playing field in north-west
G3	Tymon North - Amenity grassland north of ponds
G4	Tymon North - Three ponds and surrounding grass
G5	Tymon North - Amenity grassland and path by SDCC centre
G6	Tymon North - Long strip of amenity grassland south of river
G7	Tymon North - Car park and nearby grassland
G8	Tymon North - Amenity grassland south of ponds
G9	Tymon North - Large pond

Brent Geese

One of the key species of interest for this assessment is brent geese, as they are special conservation interests of the SPAs in Dublin Bay. They have previously been recorded in Tymon Park in significant numbers, notably in the playing field alongside Lugnaquilla Avenue, but in recent years their use of the park has become less frequent. In order to increase the temporal coverage of the surveys, NM Ecology Ltd asked SDCC Park Management staff to record all sightings of brent geese over the survey period. The park management team cover all parts of Tymon Park, as well as the nearby grasslands in Greenhills Park.

2.4 Badger surveys

The following was included in the 2018 report:

"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 ..."

The 2022 surveys followed the above approach, but were carried out in February 2022.

2.5 Otter surveys

Surveys were carried out by Triturus Environmental Ltd, and their methods were summarised as follows:

“Walkover otter surveys of the River Poddle were undertaken in February 2021. The survey area comprised approx. 4.8km of open riverine channel (excluding 3.6km of culverted channel) and 0.55km of the Grand Canal (between Sally’s Bridge and Emmet Bridge, Parnell Road) which overlapped proposed works areas. Riverine habitat was divided into a total of 19 no. discrete 500m sections. Furthermore, a total of 9 no. artificial ponds located in Tymon Park (north and south) and Mount Argus Park were also surveyed.”

Further details are provided in the Otter Survey Report in Appendix B.

3 Winter birds

3.1 Summary of 2018 results

The following was included in the 2018 report:

“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.

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.”

3.2 2022 survey results – species composition

Waterbird species

A total of 16 waterbird species were recorded over the course of the eight surveys. The five most abundant species were black-headed gull, mallard, common gull, moorhen and herring gull. A full list of species is provided in Table 2.

Table 2: List of species recorded during the eight surveys, and their peak counts

Common name	1	2	3	4	5	6	7	8	Total	Peak Count
Black-headed Gull	208	296	135	289	45	197			1,170	296
Mallard	71	76	112	88	105	74	56	55	637	112
Common Gull	78	104	15	71	15	50	1	1	335	104
Moorhen	22	27	37	29	36	33	19	12	215	37
Herring Gull	12	8	8	14	6	2	10	2	62	14
Mute Swan	6	5	7	8	8	9	8	6	57	9
Tufted Duck	5	6	3	6	7	10	6	6	49	10
Grey Heron	6	4	2	5	1	5	1	2	26	6
Feral Goose	2	2	2	2	2	2	2	2	16	2
Teal	4		3	4		4			15	4
Coot		1	1	2	2			2	8	2
Little Grebe	1		1		3	1	1	1	8	3
Feral Duck	1			1	2	2			6	2
Lesser Black-backed Gull								6	6	6
Grey wagtail			1						1	1
Little Egret			3			1	2		6	3
Total	416	529	329	519	232	390	106	95	2,616	

Brent Geese

Brent geese were not recorded during any of the eight surveys, nor any goose droppings. SDCC Park Management staff were asked to record any sightings of brent geese during the course of their work, but none were recorded.

Two feral geese (with white plumage) are permanently resident in the area, alternating between lakes in Tymon North and Tymon Park. However, these are domesticated birds that are entirely distinct from brent geese, and are not qualifying interests of the SPAs in Dublin Bay.

Other anecdotal records

During the first survey, the surveyor was approached by a member of the public who reported seeing a Water Rail (*Rallus aquaticus*) in reedbeds around the Tymon Lakes. A photograph was provided to confirm the identification. There are no prior records on the National Biodiversity

Data Centre website of this species in Tymon Park, so it appears to be a new record. It is a highly secretive species that it rarely observed, but it is known to be widespread in suitable habitat in Ireland, including at least six locations in Dublin city. On this basis, its presence in Tymon Park is considered to be of County ecological importance. However, the mitigation strategy in the EIAR Biodiversity Chapter will be sufficient to prevent impacts on this species during the construction and operation of the proposed development, so no additional measures are required.

During the survey on 13 April 2022, a mute swan was observed sitting on a nest in the reedbed in the south-east of Tymon Lake. This is expected, because this species is known to nest on the lakes and ponds in Tymon Park; this was described and assessed in the EIAR Biodiversity Chapter.

3.3 2022 survey results – locations

A full list of the waterbird records from all subsites in Tymon Park and Tymon North is provided in Table 3. This shows that no birds (of any species) were recorded at a number of the subsites.

Table 3: Counts from each subsite in Tymon Park and Tymon North during the eight surveys

Subsites	1	2	3	4	5	6	7	8	Total
Tymon Park A1	33			4					37
Tymon Park A2				2					2
Tymon Park A3									0
Tymon Park B1									0
Tymon Park B2		150							150
Tymon Park B3	60	5		80					145
Tymon Park B4	32	7	4		11	8	7	1	70
Tymon Park C1		17							17
Tymon Park C2						4			4
Tymon Park C3									0
Tymon Park C4									0
Tymon Park C5									0
Tymon Park D1	156	230	139	253	123	216	51	30	1,198
Tymon Park D2	10	4	4	5	1	3	2	1	30
Tymon Park D3	6	1	1					2	10
Tymon Park D4	1		2			2	2	3	10
Tymon Park E1									0
Tymon Park E2									0
Tymon Park E3									0
Tymon Park E4									0
Tymon Park E5									0
Tymon Park E6									0

Tymon Park E7	54	42	76	38	40	26	29	305	
Tymon North F1	1							1	
Tymon North F2								0	
Tymon North F3		11						11	
Tymon North F5								0	
Tymon North F6								0	
Tymon North F7								0	
Tymon North F8								0	
Tymon North G1								0	
Tymon North G2								0	
Tymon North G3								0	
Tymon North G4	89	8	22	36		31	8	16	210
Tymon North G5									0
Tymon North G6									0
Tymon North G7				1	46	40			87
Tymon North G8									0
Tymon North G9	28	51	104	59	11	44	10	13	320

Lakes and ponds in Tymon Park and Tymon North

The majority of waterbird activity was around the lakes and ponds in Tymon Park and Tymon North. A list of species recorded at these locations is provided in Tables 4 and 5.

Table 4: Counts from lakes and ponds in Tymon Park

Subsite	Common name	1	2	3	4	5	6	7	8	Total
D1 - Tymon Lake, largest pond	Black-headed Gull	80	120	65	150	45	110			570
	Common Gull	25	60	15	65	15	46	1	1	228
	Mallard	21	23	40	9	38	28	22	16	197
	Moorhen	14	14	11	11	15	16	11	5	97
	Herring Gull	10	6		12	4		10		42
	Tufted Duck	5	6	3	2	3	9	2		30
	Mute Swan			4	4	2	5	3	2	20
	Grey Heron	1	1	1			2			5
	Lesser Black-backed Gull								4	4
	Coot								2	2
	Little Grebe					1		1		2
Little Egret							1		1	
D2 - Tymon Lake, northern pond	Moorhen	1	3	2	1		1			8
	Mallard	2		2		1	1	2		8
	Mute Swan	6								6
	Teal				4					4

	Grey Heron		1					1	2
	Black-headed Gull		1						1
	Feral Duck					1			1
B4 - Tymon Lake, western pond	Mallard	12	3		4	2	3		24
	Black-headed Gull	15	2			1			18
	Teal	4		3		4			11
	Mute Swan		2		2		2	1	7
	Moorhen			1	2	1	1		5
	Feral Duck				2				2
	Grey Heron				1				1
	Little Egret						1		1
	Little Grebe	1							1
E7 - Pond by St Jude's GAA	Mallard	25	28	29	23	12	14	19	150
	Black-headed Gull	18	2	35		15			70
	Moorhen	7	8	4	7	7	5	2	40
	Mute Swan	3	3	3	3	3	3	3	21
	Tufted Duck			2	2	1	4	4	13
	Coot	1	1	2	2				6
	Grey Heron			1		1		1	3
	Little Egret					1			1
	Little Grebe				1				1

Table 5: Counts from lakes and ponds in Tymon North

Subsites	Common name	1	2	3	4	5	6	7	8	Total
G9 - Western pond	Black-headed Gull	18	27	65	17		29			156
	Mallard	1	17	26	28		6	8	8	94
	Moorhen	7	3	10	8	8	6	1	2	45
	Grey Heron	2	2		3		2	1		10
	Tufted Duck				2	2			2	6
	Feral Goose		2	2						4
	Little Grebe			1		1	1		1	4
	Mute Swan				1					1
G4 - Three eastern ponds	Mallard	35	8	16	22		23	5	10	119
	Black-headed Gull	50			6		2			58
	Moorhen			5	5		2	1	2	15
	Feral Goose	2			2		2	2	2	10
	Feral Duck	1			1		1			3
	Lesser Black-backed Gull								2	2
	Grey Heron	1		1						2
	Mute Swan						1			1

The species assemblage is typical for urban lakes and ponds, notably gulls, mallard, moorhen, mute swan and grey heron. Teal and little grebe are less common species, but are also relatively widespread in suitable habitat in Dublin.

Other working areas outside Tymon Park / Tymon North

There was very little waterbird activity in the other areas outside Tymon Park and Tymon North. Two herring gulls were recorded on a regular basis on the green area at Wainsfort Manor Crescent or the nearby green area at Priory Hall. A single black-headed gull was recorded in St Martin's Drive on one occasion. Based on these results, we can conclude that none of the other working areas are of importance for waterbirds during winter months.

Table 6 Counts from other working areas outside Tymon Park / Tymon North

Subsite	Common name	1	2	3	4	5	6	7	8	Total
Whitehall Park	N.A.									
Wainsfort Manor Crescent	Herring Gull		2		2	2				6
Priory Hall	Herring Gull						2			2
Fortfield Road	N.A.									
Ravensdale Park	N.A.									
St. Martin's Drive	Black-headed Gull				1					1
Mount Argus Close	N.A.									

3.4 2022 survey conclusions

The 2022 surveys provide an update on the 2018 surveys, while also increasing their spatial and temporal coverage. The species assemblage is expected for urban lakes and ponds, characterised mainly by gulls, mallard, moorhen and mute swan. The main species of note is a first record of water rail (an anecdotal record by a member of the public), which we consider to be of County ecological importance. Other species are of Local importance, notably little grebe and teal.

Brent geese were not recorded during any surveys or by the SDCC Park Management staff. On this basis, we consider the survey area to have been of Negligible importance for this species in 2022.

Waterbirds were not recorded in any of the other survey areas outside Tymon Park and Tymon North, other than a small number of gulls.

4 Badgers

4.1 Summary of 2018 results

The following was included in the 2018 report:

“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 West [Tymon North]. 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. The sett is against the earth bank on the east side of Tymon Lane and may pre-date the foundation of the park.

A second sett (Sett 2) was recorded along the boundary of the park and the M50, close to the Visitor Centre. 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.

No badger setts or footage was recorded in Tymon Park East [Tymon Park].”

4.2 2022 survey results

The two setts were still present in 2022, and of similar condition to 2018. Twelve entrances were recorded at the main sett, of which six were active and six were inactive (partially blocked by woody debris). The second sett has two entrances, neither of which had signs of recent activity. No badger setts were recorded in Tymon Park or any other survey areas. On this basis, we conclude that there has been no change since the 2018 surveys.

5 Otters

5.1 Original baseline data 2018 - 2019

No signs of otters were recorded by Roughan & O'Donovan Consulting Engineers in 2018, or by NM Ecology Ltd in 2019.

5.2 Subsequent findings in 2020 - 2021

Following the submission of the EIAR, and immediately prior to the submission of further information, NM Ecology Ltd was informed by SDCC staff that a possible otter holt had been seen in Tymon North. This was reported in Section 8.5.1 of the *Response to Request for Further Information* submitted in October 2020, as follows:

“Although the [baseline description of otters] was correct at the time of writing, the author was informed by SDCC staff in September 2020 that a possible otter holt had been discovered in Tymon North, approx. 50 – 100 m from proposed embankment adjacent to the ESB substation. Fresh spraints (droppings) were recorded outside the entrance to the holt, indicating recent activity. The exact location of the holt will not be revealed here, as it is best practice not to reveal the resting / breeding places of protected species in public documents.”

It was not an appropriate time to year to carry out an otter survey, but Triturus Environmental Ltd was subsequently engaged to carry out an otter survey for the study area in February 2021. The results are presented in full in Appendix B, but the key findings are summarised as follows.

*“A total of n=11 otter signs were recorded within the study area, comprising 4.8km of open River Poddle channel, 0.5km of Grand Canal and 9 no. ponds during February 2021. Spraints accounted for the majority of signs recorded (n=8). Two holts (one active and one inactive during the survey period) were identified. Potential otter prey remains (identified from scales as roach, *Rutilus rutilus*) were also identified on the margins of the River Poddle near Kimmage Cross Roads (KCR). With the exception of these potential otter prey remains, no otter signs were recorded downstream of Tymon Park (north).*”

The number of otter signs recorded on the River Poddle was significantly higher than previous surveys (i.e. Macklin et al., 2019 recorded n=2 signs along the River Poddle downstream of the M50 but the same study did not include areas south of the M50). There were no otter signs recorded along the Grand Canal at Parnell road in the vicinity of the proposed manhole works area.”

The exact locations of the otter holts have not been disclosed, because this species is vulnerable to persecution. For this reason, parts of the Otter Survey Report in Appendix B have been redacted. However, in the interests of clarity, we note that the active holt is located approx. 63 m from the proposed working area, and the inactive holt is approx. 136 m from the working area.

6 Conclusion

The EIAR Biodiversity Chapter (submitted in February 2020, and amended in October 2020) and Revised Natura Impact Statement (submitted in October 2020) for the River Poddle Flood Alleviation Scheme are currently under consideration by An Bórd Pleanála. The sections of these reports that addressed over-wintering birds, badgers and otters were based, in part, on survey data from 2018 (as presented in the report by Roughan & O’Donovan Consulting Engineers). In this section we consider whether the updated survey data from 2022 varies substantially from the 2018 survey data, and thus whether the impact assessments and mitigation strategies remain valid.

6.1 Winter birds

Brent Geese

Regarding brent geese, the following is presented in the Biodiversity Chapter and Revised Natura Impact Statement:

“In summary, Tymon Park was an important feeding area for brent geese approximately ten years ago, but it now appears to be used very infrequently. This is almost certainly due to disturbance from dogs (e.g. in the dog enclosure in the north-west of the park), which typically causes geese to take flight, even at distances of several hundred metres. Therefore, Tymon Park is no longer considered to be an important feeding area for brent geese.

All other areas of grassland along the River Poddle (e.g. Ravensdale Park) are considered to be of negligible value for brent geese, because they are small in size, surrounded by dense vegetation, have trees overhead (thus obstructing flight paths for geese), and are frequented by dog walkers”

A submission was received from An Taisce in June 2020 noting a discrepancy between the 2018 survey data and subsequent anecdotal records of goose activity in the park. In response, the following appraisal of brent geese activity in Tymon Park was presented in Section 3.5 of the Revised Natura Impact Statement for the scheme:

“The discussion of brent geese makes reference both to systematic survey data and anecdotal records. The survey data was from the 14 winter bird surveys that were carried out in Tymon Park in 2018 (as appended to Appendix 7-1 of the EIAR and also appended to this NIS - Appendix B), in which no geese were reported landing in the park. This is the key baseline information for the assessment. The survey data is supplemented by some anecdotal records that provide further context on the site, e.g. the highest number of geese recorded, and additional records of geese from outside the survey period.

For the avoidance of doubt, our conclusion is that the park is used infrequently by brent geese, not that the park is no longer used by geese. Nonetheless, as brent geese are a qualifying interest of SPAs in Dublin Bay, we have assumed under the precautionary principle that geese may use Tymon Park on an occasional basis during the construction of the proposed development.”

As noted in Section 3.2 of this report, no brent geese were reported during any of the winter bird surveys in 2022, nor any field signs of this species (e.g. droppings). SDCC Park Management staff did not observe any brent geese during this period. Therefore, we consider the above quotations from the EIAR Biodiversity Chapter and Natura Impact Statement to still be valid, and it is not necessary to alter any aspects of the impact assessments or mitigation strategies.

Other over-wintering birds

The following is presented in the Biodiversity Chapter and Revised Natura Impact Statement:

“A total of 19 bird species were recorded during the winter bird surveys by ecologists of Roughan & O’Donovan Consulting Engineers between January and April 2018. Mallard, wigeon, teal, northern shoveller, tufted duck, little grebe, coot, moorhen, mute swan, grey

heron and little egret were all recorded at the ponds. Large numbers of gulls (notably black-headed gulls and common gulls) were recorded in other parks, including the playing fields, Castletymon car park, and the ponds. Peak counts for all species are provided in Table 7-4, which is reproduced from the report by Roughan & O'Donovan Engineers in 2018.

In summary, the ponds in Tymon Park are used by a number of waterbirds, including several winter migrants. There are relatively few ponds of comparable size in the south-west of Dublin city, so the site is considered to be of local importance for breeding waterfowl.

Other sections of the River Poddle are considered to be of little importance for over-wintering birds, because the river corridor is relatively narrow and subject to frequent disturbance. Therefore, all other areas are considered to be of negligible importance for wintering birds."

The results of the 2022 surveys are broadly similar to those of the 2018 surveys, although slightly fewer species were recorded. We consider the above quotations from the EIAR Biodiversity Chapter and Natura Impact Statement to still be valid, and it is not necessary to alter any aspects of the impact assessments or mitigation strategies.

6.2 Badgers

The following is presented in the Biodiversity Chapter:

"Two badger setts were recorded in Tymon North by ecologists of Roughan & O'Donovan Consulting Engineers in early 2018: an active, nine-entrance main sett, and an inactive, two-entrance outlier sett. The locations of the setts are not shown in this chapter in order to avoid the risk of persecution, but they are located approximately 500m and 150m (respectively) from any aspect of the proposed development. Therefore, they are considered to be outside the zone of influence of the proposed development. On this basis, the study area is considered to be of Negligible importance for badgers."

There has been no change in the extent or location of these setts, and no new setts were recorded. Therefore, we consider the above quotation from the EIAR Biodiversity Chapter to still be valid, and it is not necessary to alter any aspects of the impact assessments or mitigation strategies.

6.3 Otters

The baseline information presented in the Biodiversity Chapter of the original EIAR was correct at the time of writing (February 2020), but an otter holt was discovered for the first time in September 2020. This change in conditions is not due to any deficiency in the original survey methods or efforts, as the same conclusion was reached in separate surveys by both Roughan & O'Donovan Consulting Engineers and NM Ecology Ltd. Instead, it appears to be a natural colonisation of the river by otters, as can naturally occur over time. It is noted that four years

have passed since the initial surveys by Roughan & O'Donovan Consulting Engineers, and that two years have passed since the submission of the planning application to An Bórd Pleanála.

Following the discovery of the otter holt, additional information was presented in the *Response to Request for Further Information* submitted in October 2020, including an updated impact assessment. A series of mitigation measures were proposed for the construction phase of the project in order to avoid indirect impacts on the holt, and a commitment was made to construct three artificial otter holts along the scheme.

The otter survey carried out by Triturus Environmental Ltd in February 2021 provides further information on the otter holt discovered in 2020, and provides records of another new holt. However, it is important to note that the report is intended only to provide information on otter activity, and it does not include an impact assessment or mitigation measures. Therefore, we consider the impact assessment and mitigation strategy from the EIAR Biodiversity Chapter (as amended by the Further Information submission in October 2020) to still be valid, and it is not necessary to alter any aspects of the impact assessments or mitigation strategies.

Appendix A: Locations of subsites in Tymon Park and Tymon North

Appendix B: Otter Survey by Triturus Environmental Ltd

River Poddle Flood Alleviation Scheme (FAS) otter survey 2021



Prepared by Triturus Environmental Ltd. for Nicholas O' Dwyer Ltd.

April 2021

Please cite as:

Triturus (2021). River Poddle Flood Alleviation Scheme (FAS) otter survey 2021. Report prepared by Triturus Environmental Ltd. for Nicholas O' Dwyer Ltd. April 2021.

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1. Introduction

1.1 Project background

Triturus Environmental Ltd. were commissioned by Nicholas O' Dwyer Ltd., on behalf of South Dublin County Council (SDCC) and Dublin City Council (DCC), to undertake a baseline otter (*Lutra lutra*) survey of the River Poddle as part of the Poddle Flood Alleviation Scheme (FAS). The survey area encompassed a total of 8.4km of the River Poddle, 9 no. small artificial ponds and 0.5km of the Grand Canal which overlapped the proposed works areas. The survey was undertaken during February 2021.

The Poddle FAS proposes flood protection, flood storage and flood prevention measures at locations along a 6km stretch of the Poddle River from Tymon North, Tallaght to St. Teresa's Gardens and Donore Avenue, and at the National Stadium, South Circular Road, Merchant's Quay, Dublin. It combines main flood storage at Tymon Park and additional flood storage at Ravensdale Park, linear defences along the River where they are required to provide flood protection, new flap valves and culvert screens, and sealing manholes to prevent surcharging during a flood event. The proposed Scheme is designed to provide protection against fluvial or river flooding in a 1 in 100-year flood event (1% Annual Exceedance Probability). The Scheme will provide protection for approximately 921 properties in SDCC and DCC areas (Nicholas O' Dwyer, 2020).

The baseline otter surveys helped to identify the presence of otters relative to the proposed works areas and map their distribution within the works footprint by identifying the occurrence of otter field signs (i.e. holts, spraints, couches, prints and other signs). The distribution of these signs acted as an indicator regarding areas of channel and aquatic habitat used by otters, inclusive of potential breeding areas (e.g. holts). The data collated would facilitate the recommendation of otter-specific mitigation measures for the proposed flood relief works in addition to general management and conservation of otters associated with the River Poddle.

1.2 Legislative protection

The Eurasian otter (*Lutra lutra*) is a species of conservation concern and high priority having suffered major declines in its range and population throughout Europe since the 1950s. It is classified as 'near threatened' by the IUCN Red List with a decreasing population trend and, as such, is listed in Appendix I of CITES, Appendix II of the Bern Convention (Council of Europe, 1979) and Annexes II and IV of the EC Habitats Directive (92/43/EEC).

Otters, along with their breeding and resting places, are also protected under provisions of the Irish Wildlife Acts 1976 to 2018. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Directive 92/43/EEC, which is transposed into Irish law by the European Union (Birds and Natural Habitats) Regulations 2011 to 2015.

The protection of otters is outlined in Article 51(1) and (2):

Protection of fauna referred to in the First Schedule;

51.(1) *The Minister shall take the requisite measures to establish a system of strict protection for the fauna consisting of the species referred to in Part 1 of the First Schedule.*

51.(2) *Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a license granted by the Minister under Regulation 54, a person who in respect of the species referred to in Part 1 of the First Schedule (listed below). Items (b) and (d) may be considered most relevant to developments.*

- (a) deliberately captures or kills any specimen of these species in the wild,*
- (b) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,*
- (c) deliberately takes or destroys eggs of those species from the wild,*
- (d) damages or destroys a breeding site or resting place of such an animal, or*
- (e) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive, shall be guilty of an offence.*

In an Irish context, according to the most recent Article 17 reporting (NPWS, 2019), otter conservation status has improved, with the species now evaluated as being of 'Favourable' conservation status. Otters were considered to be previously 'Near Threatened' (Marnell, 2009) based on a 20-25% decline between 1980 and 2005 (Bailey & Rochford, 2006). However, the current conservation status is now of 'Least Concern' (Marnell et al., 2019).

1.3 Study area description

The River Poddle (EPA code: 09P03) is some 11.6km in length with a catchment area of approximately 16.44km². The Poddle rises in the Cookstown area, north of Tallaght village flowing east through Tymon North (Tymon Park west of the M50) and into Tymon Park (east of the M50) where it passes under the M50 motorway. It flows northeast towards Greenhills/Templeogue and continues through Kimmage and the edge of Crumlin and runs through Mount Jerome into Harold's Cross. The River then crosses under the Grand Canal and flows under the city centre in a culverted section, discharging to the River Liffey. The confluence of the Poddle and the Liffey is visible at low tide at a grated opening in the Liffey walls at Wellington Quay. The Poddle is a heavily modified, urban watercourse and is extensively culverted underground for much of its c.10km length (particularly in its lower reaches). Several parklands are located along the river, most notably Tymon Park in vicinity of the M50 road crossing and Mount Argus Park, Kimmage.

The water quality of the River Poddle is currently appreciably poor (Q3 throughout), with the only fish species recorded during a 2020 electro-fishing survey being three-spined stickleback (*Gasterosteus aculeatus*) (Aquafact, 2020). Biological water quality, based on Q-sampling, was calculated as Q2-3 (poor status in the upper Poddle at Bancroft Park in 2020 (Triturus, 2020). There was no contemporary EPA biological water quality monitoring data available for the River Poddle (Q3, (poor status) recorded at station RS09P030400 in 2007 only).

2. Methodology

2.1 Desktop review

A desktop review of published and unpublished data for the River Poddle and associated habitats was undertaken in respect of otter. Data pertaining to otters held by the National Biodiversity Data Centre (NBDC) was also reviewed.

2.2 Otter sign surveys

Walkover otter surveys of the River Poddle were undertaken in February 2021. The survey area comprised approx. 4.8km of open riverine channel (excluding 3.6km of culverted channel) and 0.55km of the Grand Canal (between Sally's Bridge and Emmet Bridge, Parnell Road) which overlapped proposed works areas. Riverine habitat was divided into a total of 19 no. discrete 500m sections (see section 2.3 below). Furthermore, a total of 9 no. artificial ponds located in Tymon Park (north and south) and Mount Argus Park were also surveyed (**Figure 2.1**).

The site surveys were completed during dry, mild, bright and settled conditions, which ensured that a good representation of habitat marked by otter could be recorded in the field, including territorial marking or marking of feeding areas. The surveys also deliberately coincided with prolonged dry periods (≥ 72 hours of dry weather) to ensure safe water access and also to minimise the risk of washout to visible otter signs (spraint, smears etc.).

Each otter sign was logged by type, location (handheld GPS), condition and approximate age for later interpretation to distinguish differences in habitat use and activity. Spraints were subjectively assessed as either fresh (very recent), mixed-age (recent & older spraints typically indicative of a regular sprainting site) or old (spraint breaking down & not recently deposited). Furthermore, indicative counts of spraint (i.e. number of individual spraints) and the number of sprainting sites (often separate clusters in one area) were noted. This helped indicate the frequency of otter marking, which can clarify levels of activity in particular areas of river channel or other aquatic habitats.

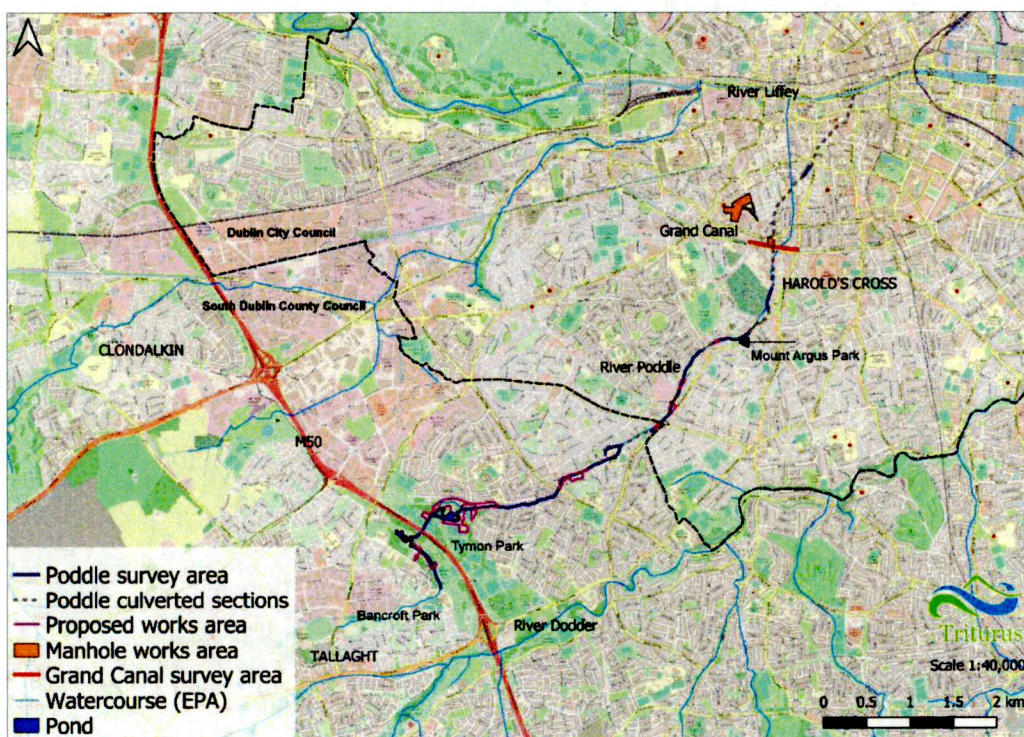


Figure 2.1 Overview of the otter study area surveyed as part of the Poddle FAS, February 2021

2.3 Total corridor otter survey (TCOS) methodology

The site visits broadly followed the best practice survey methodology for otter as recommended by Lenton et al. (1980), Chanin (2003) and Bailey & Rochford (2006). However, methodology differed in that the entire waterline was surveyed rather than the standard 500-600m sections from accessible points (e.g. bridges). The novel survey technique, known as a total corridor otter survey (TCOS) (Macklin et al., 2019), encompassed the entire riparian zone and in-channel surveys along both banks of the River Poddle and the entire perimeter of associated pond habitats. The riverine survey area was divided into 19 no. discrete 500m sections to facilitate greater resolution of data.

Total corridor survey methodology typically involves the use of two (or more) surveyors working independently (in tandem) along each respective bank of an individual watercourse (where practical). This also facilitates one to work from a more elevated position (e.g. bank top) with one surveying (with appropriate PPE such as a wet suit or chest waders) from within the channel, thus greatly increasing the likelihood of otter sign detection. This is especially true of more cryptic signs such as holts, which can be located in undercut banks, under tree root systems etc. out of the view of traditional surveys. Surveyors can alternate between the river channel and each bank depending on surveyor knowledge and experience of preferential areas of habitat likely to be used by otter.

The ecological characteristics of each riverine survey section and pond are summarised in **Appendix A**, with representative site images provided in **Appendix B**.

2.4 Biosecurity

A strict biosecurity protocol including the Check-Clean-Dry approach was adhered to during surveys for all equipment and PPE used. Disinfection of all equipment and PPE before and after use with Virkon™ was conducted to prevent the transfer of pathogens or invasive propagules between survey sites. Surveys were undertaken at sites in a downstream order to minimise the risk of upstream propagule mobilisation. Any aquatic invasive species or pathogens recorded within or adjoining the survey areas were geo-referenced.

3. Results

3.1 Desktop review

A desktop review revealed a low number of available otter records for the study area. In 2016 a live otter sighting was recorded from the largest pond in Tymon Park (survey pond no. 4) according to NBDC records. Multiple otter records were available for the Grand Canal in the vicinity of the survey area (i.e. River Poddle crossing). Live otters were recorded within the canal in Ranelagh and Dolphin's Barn in the 2014-2016 period (i.e. within <1km of survey area), with a historical record also available at Emmet Bridge (within the survey section) in 1980 (NBDC data).

3.2 Otter records

A total of $n=11$ otter signs were recorded within the study area, comprising 4.8km of open River Poddle channel, 0.5km of Grand Canal and 9 no. ponds during February 2021 (**Table 3.1; Figures 3.1 & 3.2**). Spraints accounted for the majority of signs recorded ($n=8$). Two holts (one active and one inactive during the survey period) were identified [REDACTED] [REDACTED] Potential otter prey remains (identified from scales as roach, *Rutilus rutilus*) were also identified on the margins of the River Poddle near Kimmage Cross Roads (KCR) (**Table 3.1**). With the exception of these potential otter prey remains, no otter signs were recorded downstream of Tymon Park (north).

The number of otter signs recorded on the River Poddle was significantly higher than previous surveys (i.e. Macklin et al., 2019 recorded $n=2$ signs along the River Poddle downstream of the M50 but the same study did not include areas south of the M50).

There were no otter signs recorded along the Grand Canal at Parnell road in the vicinity of the proposed manhole works area. However, a single mink (*Neovison vison*) spraint site was recorded underneath Sally's Bridge (ITM 714303,732530), with a suspected mink den recorded in a heavily scrubbed section of north canal bank approximately 180m east of the spraint site (714483, 732497).



Table 3.1 Summary of otter signs recorded in the footprint of the Poddle FRS in February 2021 (holt records excluded)

Sign ID	Watercourse	Location	Survey section	Sign	No. spraint sites (no. spraints)	Sign age	Associated marking feature	ITM x	ITM y	Notes
PODD_21_001	River Poddle	Tymon Park zipline footbridge	001	Spraint	2 (10)	Mixed	Bridge	710540	728956	Regular sprainting area on small boulder under concrete (zipline) footbridge with muddy ledges underneath.
PODD_21_003	Tymon Park	Pond no. 2 outfall	002	Spraint	1 (2)	Old	Boulder	710391	729108	Historical spraint site on boulders at pond number 2 outfall.
PODD_21_004	Tymon Park	Pond 3 inflow (from pond 4)	002	Spraint	1 (5)	Mixed	Boulder	710378	729132	Regular sprainting site at secondary small stream inflow on marginal boulder littoral.
PODD_21_005	River Poddle	M50 culvert	002	Spraint	1 (1)	Old	Culvert	710484	729188	Historical sprainting area and prints on littoral sand/mud immediately upstream of the culvert crossing with abundant stickleback remains.
PODD_21_007	Tymon North Park	South bank of southernmost pond	003	Spraint	1 (5)	Mixed	Pond (grassy tussock)	710603	729389	Regular spraint site along margins of pond. Clearly a regular commuting route (well-worn path/slide). Area regularly used by people/dogs during park hours.
PODD_21_008	Tymon North Park	South bank of southernmost pond	003	Spraint	1 (2)	Mixed	Pond (grassy tussock)	710603	729385	Along same grassy route as above site.
PODD_21_009	Tymon North Park	Secondary (eastern) pond outflow	003	Spraint	1 (8)	Mixed	Willow roots	710675	729368	Regular spraint site on willow root zone. The spraint supported abundant roach remains (scales)
PODD_21_010	Tymon North Park	Second pond in system	003	Spraint	1 (1)	Old	Pond (grassy tussock)	710827	729332	Old spraint site on margins of largest lake adjacent to footpath
PODD_21_011	River Poddle	u/s Kimmage Cross Roads (KCR)	009	Prey remains	n/a	n/a	Bridge	713263	730437	Suspected otter prey remains. Roach (<i>Rutilus rutilus</i>) remains (scales) on marginal sand/silt accumulation immediately upstream of road bridge, in section bound on east bank by high retaining wall. No spraint or prints visible but present near water level so other signs may have been washed away recently.

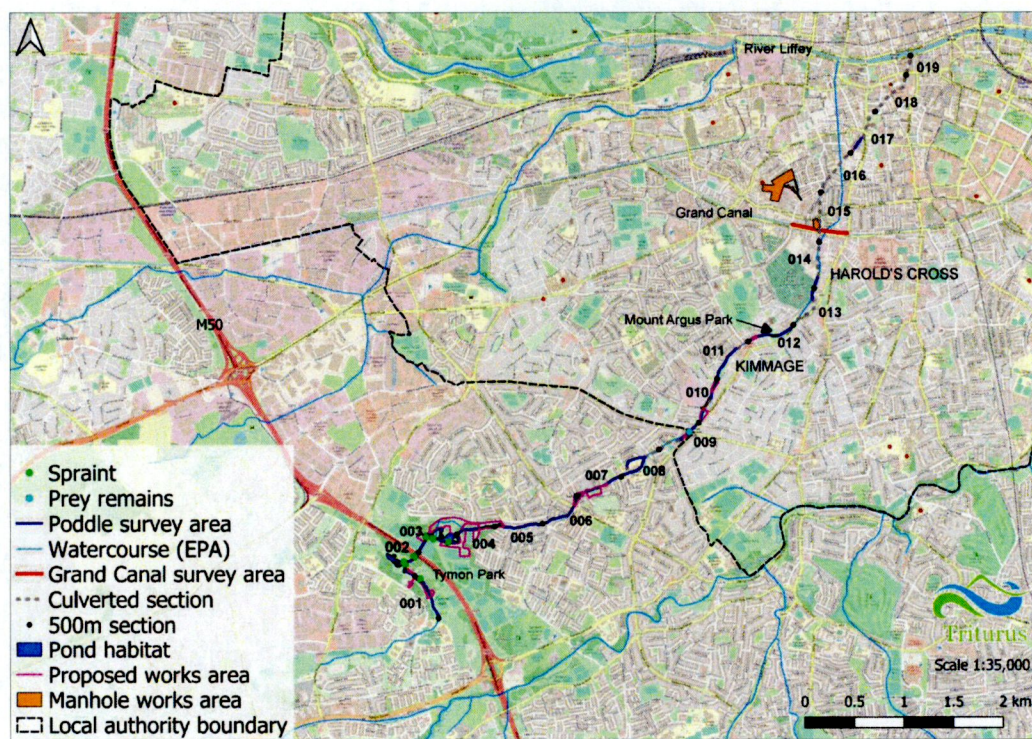


Figure 3.1 Overview of otter signs recorded as part of the Poddle FAS, February 2021 (n=11 total) (holt locations not shown)

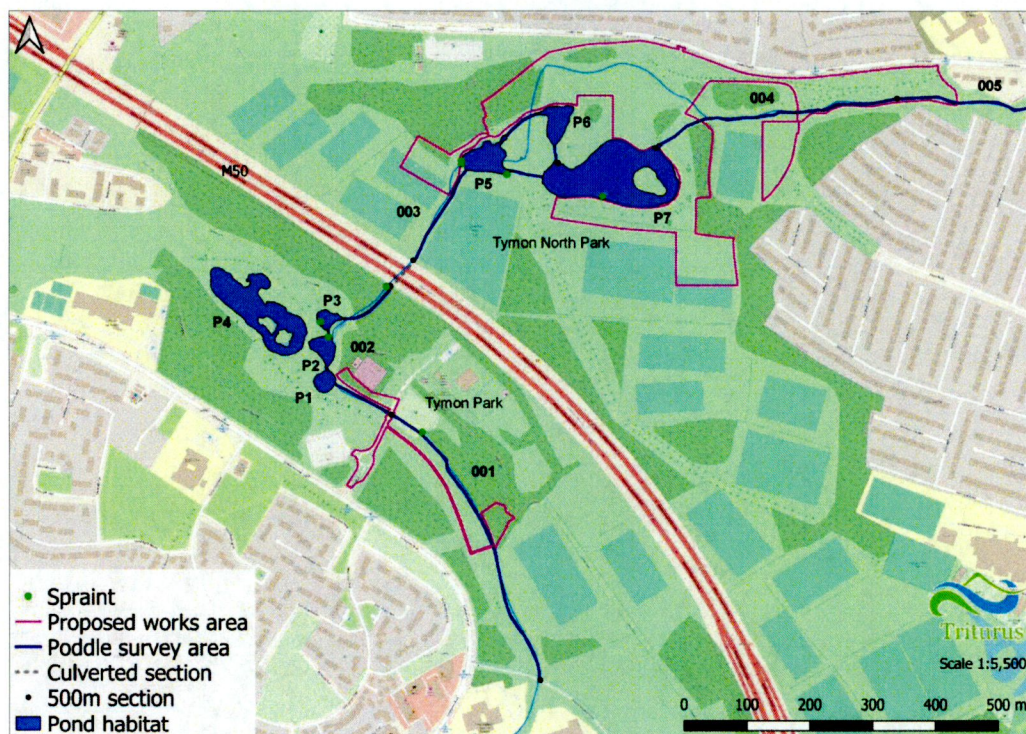


Figure 3.2 Otter signs recorded in the vicinity of Tymon Park, February 2021 ($n=10$ of $n=11$ total) (holt locations not shown)

4. Discussion

A total of $n=11$ otter signs were recorded within the study area during February 2021, with all but one sign located in the vicinity of Tymon Park and Tymon North Park (**Table 3.1; Figures 3.1 & 3.2**). The majority of these signs were associated with pond habitats rather than the River Poddle itself. No otter signs were recorded along the Lower River Poddle or the Grand Canal in the vicinity of the proposed manhole works areas.

With the exception of a single fish (roach) prey remains site (immediately upstream of Kimmage Cross Roads¹), otter signs were heavily concentrated in the vicinity of Tymon Park and Tymon North Park (**Figure 3.2**). These parklands featured better-quality otter habitat overall, including localised lower disturbance areas and superior prey resources (fish such as roach, waterfowl etc.) compared to the River Poddle channel (see **Appendix A** for more details). Downstream of Tymon North Park, the River Poddle became increasingly urbanised, with higher human disturbance, frequent culverting and channel modifications impacting the quality of otter habitat. Several structures (e.g. Kimmage Manor culverts/trash screens) evidently presented a significant barrier to otter passage along the Poddle channel. The lower reaches of the river (survey sections 012-019) in particular, were extensively culverted underground and this would appear to block otter movement between the tidal reaches of the River Liffey and the Poddle sub-catchment. River hydromorphology and human disturbance levels are known to be key drivers of otter distribution and habitat utilisation, particularly in urban watercourses such as the Poddle (Scorpio et al., 2016; Macklin et al., 2019; Brazier & Macklin, 2020).

In addition to a limited fisheries prey resource (i.e. three-spined stickleback only¹), the River Poddle also suffers from considerable water quality pressures (Q3, poor status throughout; Aquafact, 2020). Otters are food-limited and prey availability is a crucial factor in determining mortality and breeding success (Ruiz-Olmo et al., 2002; Ruiz-Olmo & Jiménez, 2009). In this context, higher value areas for otter are currently restricted to the vicinity of Tymon Park and Tymon North Park. Here, despite appreciable levels of human disturbance associated with urban parklands, it would appear that the pond habitats (evidently supporting fish species such as roach) and less-accessible woodland/scrub/reedbed areas (such as pond islands and margins) are responsible for supporting a local otter population within the upper River Poddle catchment.

In summary, whilst many areas of the River Poddle channel featured restricted human access (therefore higher otter seclusion), the historically modified, urbanised and degraded nature of the watercourse significantly reduced otter foraging and breeding potential. However, even areas of river channel with little inherent value for otter are important to enable lateral and longitudinal colonisation, by allowing otters to commute between better habitats (Van Looy et al., 2014). Furthermore, well-developed and preserved riparian zones can buffer anthropogenic impacts, and healthy ecological corridors with good connectivity are likely to play an increasingly important role in otter dispersion and commuting in light of climate change impacts (Cianfrani et al., 2018).

¹ In light of the absence of roach (*Rutilus rutilus*) in the River Poddle electro-fishing surveys (Aquafact, 2020), it remains unclear whether these roach remains originated in the River Poddle channel, Tymon Park (approx. 2.7km upstream) or a small private pond along Fortfield Road (ITM 713084,730286) located approx. 0.2km upstream of the site

The number of otter signs recorded in the River Poddle survey area was significantly higher than previous surveys (i.e. Macklin et al., 2019 recorded $n=2$ signs along the River Poddle downstream of the M50). However, it should be noted that this previous survey did not include riverine or pond habitats upstream of the M50 (i.e. Tymon Park). Nevertheless, the frequency of signs recorded in Tymon North Park was greater than previous surveys (four in 2021 versus one in 2018-2019). This may be explained by an increased prey resource in recent years (e.g. improved fish stocks within ponds), thus supporting/attracting more otters or simply due to natural demographic stochasticity in the local otter population (i.e. an increase in otter numbers or ranges).

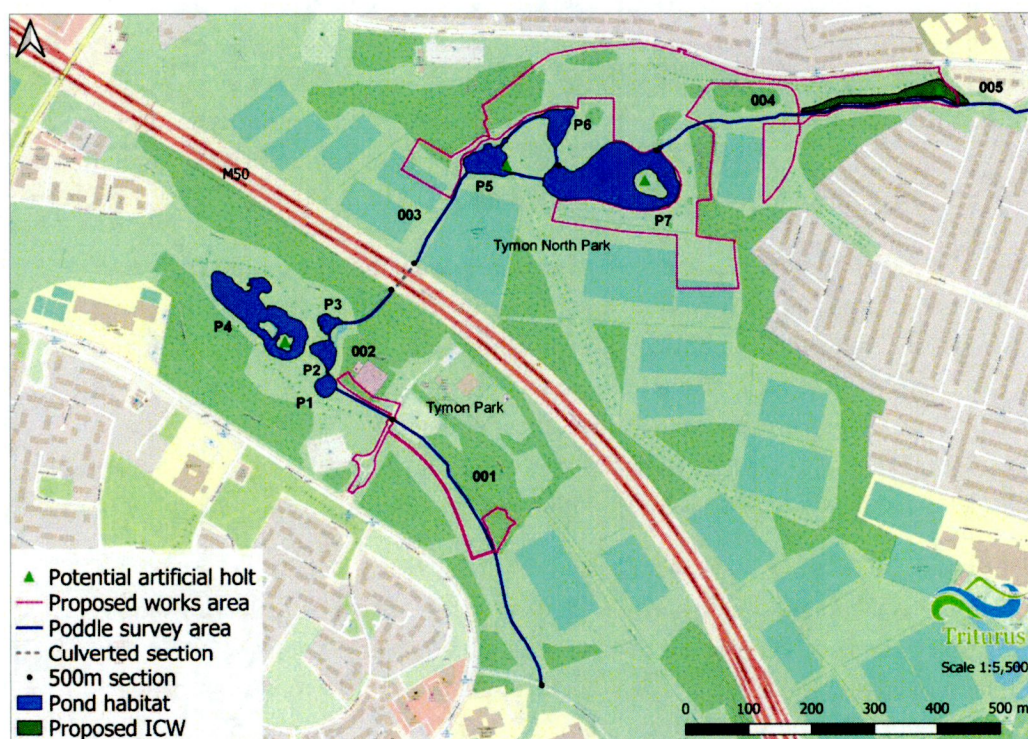


Figure 5.1 Possible location options for artificial holt installation in the vicinity of Tymon Park and Tymon North Park

5. Management recommendations

Otters, along with their breeding and resting places, are protected under provisions of the Irish Wildlife Acts 1976 to 2018. The identified holt and potential holt area identified [REDACTED] located within 150m of proposed flood relief works (**Figure 4.2**). Therefore, as works may disturb otter breeding/resting areas, a derogation licence will be required from the National Parks and Wildlife Service (NPWS) in advance of any works in this area.

Otter breeding sites are especially sensitive to direct human disturbance (Mason & Macdonald, 2009). As both [REDACTED] holt areas identified were located in localised areas of low human disturbance adjoining the wider [REDACTED] landscape (moderate to high disturbance), additional planting should be considered to further reduce disturbance and buffer any encroachment resulting from future park management or maintenance activities. Encouragement of existing scrub through avoidance of cutting/pruning would further reduce human and dog access to the holt area [REDACTED]. Although present in a heavily scrubbed area of woodland habitat, the supplemental planting of a line of blackthorn or hawthorn hedging near the potential holt area [REDACTED] would further reduce human access to this area, thus benefiting otters through increased seclusion.

There is opportunity for the provision of artificial holts on vegetated pond islands and vegetated pond margins (i.e. reedbed areas) in both Tymon Park and Tymon North Park (**Figure 5.1**). These low-disturbance areas (i.e. little or no human access) offer inherently high seclusion for otter and would, therefore, be suitable sites for artificial holt installation. Similarly, there is scope for the inclusion of an artificial holt in the proposed integrated constructed wetland (ICW) in Tymon North Park (VESI, 2019) (**Figure 5.1**). Artificial holt design should follow best practice (e.g. Sussex Otters & Rivers [Project](#)) and be undertaken in consultation with an otter specialist.

Given the poor fisheries value of the River Poddle and the importance of same for otters (as outlined above), future management should aim to remediate and or enhance the river's fisheries habitat in conjunction with key stakeholders (i.e. South Dublin County Council, Dublin City Council, OPW, Inland Fisheries Ireland etc.). This could be achieved in a multitude of ways including the improvement of water quality from storm drain pollution point sources, instream fisheries habitat enhancement measures and improvement of the water quality in the ponds at Tymon Park.

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7. Appendix A – survey section characteristics

Table A.1 Summary characteristics of River Poddle survey sections and ponds, February 2021 (refer to Figure 4.1 for section locations)

Section	Watercourse	Site profile	Bordering land uses & riparian habitat	Known fish species	Otter signs recorded Y/N	Observations on otter habitat	Threats & pressures to otter
001	River Poddle, Tymon Park	1.5-2m wide channel, shallow riffle & glide with limited pool, historically straightened & modified, several small weirs present, often heavily scrubbed channel, moderate siltation of gravels/cobble bed with evident enrichment	WD5, GS2	Three-spined stickleback	No	Moderate value overall due to localised mature riparian buffer & some low human disturbance areas but value reduced moving downstream	Hydromorphology, human disturbance, eutrophication, water quality
002	River Poddle, Tymon Park	2-3m wide channel upstream & downstream of pond system, shallow glide with localised riffle & limited pool, historically straightened, mostly open channel, moderate siltation upstream of ponds but lower downstream (faster glide), evident enrichment	WD5, GS2, WD1	Three-spined stickleback	Yes; spraint site under zipline footbridge & at M50 culvert	Relatively poor value overall with high levels of human disturbance throughout & more open channel although evidently used by otter	Hydromorphology, human disturbance, eutrophication, water quality
003	River Poddle, Tymon North Park	1.5-2m wide channel flowing through series of ponds, shallow glide and riffle with occasional pool, heavy siltation throughout, heavily overgrown upstream of ponds, evident enrichment	WD5, WS1, GA2	Three-spined stickleback	No (but spraint recorded in adjoining ponds)	River channel offered poor fisheries & otter habitat being largely open & degraded. Commuting value only	Hydromorphology, human disturbance, eutrophication, water quality
004	River Poddle, Tymon North Park	1-1.5m wide channel, historically straightened, shallow riffle & glide with limited pool, open banks with little riparian cover, moderate-heavy siltation & evident enrichment	WD5, GS2, WS1	Three-spined stickleback	No (but spraint recorded in adjoining ponds)	River channel offered poor fisheries & otter habitat being largely open & degraded. Commuting value only	Hydromorphology, human disturbance, eutrophication, water quality
005	River Poddle, u/s Wellington Road	1.5-2m wide channel, historically straightened & deepened, heavily overgrown banks, faster shallow riffle & glide with limited	WS1, WL2, GS2, BL3	Three-spined stickleback	No	Improved otter seclusion compared with upstream but evidently poor fisheries resource despite considerable improvement.	Hydromorphology, eutrophication, water quality

Section	Watercourse	Site profile	Bordering land uses & riparian habitat	Known fish species	Otter signs recorded Y/N	Observations on otter habitat	Threats & pressures to otter
		pool, light to moderate siltation, improved fisheries habitat over upstream				Poor holting opportunities in steep, compacted banks. Area of commuting value	
006	River Poddle, d/s Wellington Road	1.5-2.5m wide channel, historically straightened & deepened but some areas with semi-natural features (meanders), heavily overgrown banks in most areas, shallow riffle & glide with limited pool, multiple small weirs, moderate siltation, evident enrichment	WS1, WL2, GS2, BL3	Three-spined stickleback	No	Some localised good otter seclusion due to steep banks but evidently poor fisheries resource despite physical suitability for salmonids etc. Poor holting opportunities in steep, compacted banks. Area of commuting value	Hydromorphology, human disturbance, eutrophication, water quality
007	River Poddle, Wainsfort Manor	1.5-2m wide channel, historically straightened, shallow riffle & glide with limited pool, multiple small weirs, moderate siltation, evident enrichment	GA2, GS2, BL3, WS1	Three-spined stickleback	No	Poor otter value overall given poor seclusion/higher human disturbance due to open, modified banks. Poor fisheries habitat throughout provided poor otter foraging opportunities. Area of commuting value although impacted by significant instream barrier (culvert/trash screen) at Kimmage Manor	Hydromorphology, abstraction (Lakelands off-shoot), human disturbance, eutrophication, water quality, instream barriers (Kimmage Manor culvert)
008	River Poddle, d/s Kimmage Manor	2-2.5m wide shallow channel, historically straightened but not deepened, over half of section culverted underground, shallow riffle & glide with limited pool, moderate siltation, evident enrichment	GA2, WL1, BL3	Three-spined stickleback	No	Poor otter value overall given poor seclusion/higher human disturbance due to open, modified banks. Poor fisheries habitat throughout provided poor otter foraging opportunities. Area of commuting value although impacted by significant instream barriers (extensive culverting)	Hydromorphology, human disturbance, eutrophication, water quality, instream barriers (underground culverting)
009	River Poddle, KCR/ Ravensdale Park	2-2.5m wide shallow channel, historically straightened & deepened, retaining walls at KCR & in parkland, largely open	WS1, WL2, BL3, WD5	Three-spined stickleback	Yes; prey remains (roach)	Poor otter habitat overall despite some good seclusion upstream of KCR (high human disturbance & poor seclusion downstream).	Hydromorphology, human disturbance, eutrophication, water quality, instream barriers (underground culverting)



Section	Watercourse	Site profile	Bordering land uses & riparian habitat	Known fish species	Otter signs recorded Y/N	Observations on otter habitat	Threats & pressures to otter
		banks, over half of section culverted underground, deeper glide & occasional deep pool in parkland, moderate to heavy siltation, evident enrichment			recorded u/s KCR culvert	Improved fisheries habitat through Ravensdale Park but evidently poor prey resource present. Area of commuting value although impacted by extensive upstream & downstream culverting (poor connectivity)	
010	River Poddle, Poddle Park	1.5-2m wide shallow channel, historically straightened & modified with frequent retaining walls, over a third of section culverted, shallow glide & riffle with limited pool, moderate siltation, evident enrichment	BL3, WDS, WS1	Three-spined stickleback	No	Some moderate foraging habitat although evidently poor prey (fish) resource. Poor levels of seclusion overall. Area of commuting value although impacted by extensive upstream & downstream culverting (poor connectivity)	Hydromorphology, human disturbance, eutrophication, water quality, instream barriers (underground culverting)
011	River Poddle, Sundrive	2-2.5m wide shallow channel, historically straightened & modified with frequent retaining walls, over a third of section culverted, often steep open banks (deepened channel), shallow glide & riffle with limited pool, moderate siltation, evident enrichment	BL3, WDS, GA2, WS1	Three-spined stickleback	No	Poor value as foraging habitat with poor levels of seclusion overall. Area of poor commuting value given extensive upstream & downstream culverting (poor connectivity)	Hydromorphology, human disturbance, eutrophication, water quality, instream barriers (underground culverting)
012	River Poddle, Mount Argus Park	2.5m wide heavily modified channel with concrete bed, contained within retaining walls, often mature riparian zone but poor instream habitat quality, shallow glide dominated, moderate siltation & evident enrichment	WDS, BL3	Three-spined stickleback	No	Poor value for otter given poor foraging habitat & low levels of seclusion. Adjoining Mount Argus ponds also of little to no value to otter. Area of poor commuting value given extensive upstream & downstream culverting (poor connectivity)	Hydromorphology, human disturbance, eutrophication, water quality, instream barriers (underground culverting)
013	River Poddle, d/s Mount Argus	Section mostly culverted with only 130m above ground. 2m wide heavily modified channel with retaining walls & poor-	BL3, WL2	Three-spined stickleback	No	Poor value for otter given poor foraging habitat & extensive culverting impacting commuting	Hydromorphology, eutrophication, water quality, instream barriers (extensive underground culverting)



Section	Watercourse	Site profile	Bordering land uses & riparian habitat	Known fish species	Otter signs recorded Y/N	Observations on otter habitat	Threats & pressures to otter
		quality aquatic habitats, heavily overgrown banks, shallow riffle & glide with limited pool, evident enrichment				value. Channel had poor fisheries value where present above ground.	
014	River Poddle, Mount Jerome	Section mostly culverted with only 120m above ground. 2m wide heavily modified channel with retaining walls & poor-quality aquatic habitats, heavily overgrown banks, shallow riffle & glide with limited pool, evident enrichment	BL3, WL2	Three-spined stickleback	No	Poor value for otter given poor foraging habitat & extensive culverting impacting commuting value. Channel had poor fisheries value where present above ground.	Hydromorphology, eutrophication, water quality, instream barriers (extensive underground culverting)
015	River Poddle, Parnell Road	n/a – section 100% culverted underground	n/a	n/a	n/a	Poor commuting value for otter given extensive underground culverting (poor connectivity)	Hydromorphology, eutrophication, water quality, instream barriers (extensive underground culverting)
016	River Poddle, Warrenmount	n/a – section 100% culverted underground	n/a	n/a	n/a	Poor commuting value for otter given extensive underground culverting (poor connectivity)	Hydromorphology, eutrophication, water quality, instream barriers (extensive underground culverting)
017	River Poddle, Lauderdale Terrace	Section mostly culverted with only 150m above ground. 2.5-3m wide heavily modified channel with retaining walls & poor-quality aquatic habitats, heavily overgrown banks with very poor human access & steep/vertical banks, shallow riffle & glide with limited pool, evident enrichment	BL3, WS1	Three-spined stickleback	No	Poor value for otter given poor foraging habitat & extensive culverting impacting commuting value. Channel had poor fisheries value where present above ground.	Hydromorphology, eutrophication, water quality, instream barriers (extensive underground culverting)
018		n/a – section 100% culverted underground	n/a	n/a	n/a	Poor commuting value for otter given extensive underground culverting (poor connectivity)	Hydromorphology, eutrophication, water quality, instream barriers (extensive underground culverting)



Section	Watercourse	Site profile	Bordering land uses & riparian habitat	Known fish species	Otter signs recorded Y/N	Observations on otter habitat	Threats & pressures to otter
019		n/a – section 100% culverted underground	n/a	n/a	n/a	Poor commuting value for otter given extensive underground culverting (poor connectivity)	Hydromorphology, eutrophication, water quality, instream barriers (extensive underground culverting)
GC1	Grand Canal, Parnell Road	8-10m wide canal (FW3), 1.2-1.6m deep with locally deeper areas to 1.8m, open banks with only one small treeline/scrub section (north bank), high instream vegetation cover & good fisheries habitat	BL3, GS2, GA2, WL2	Pike, roach, perch, European eel	No	Good quality foraging and commuting value despite lack of otter signs and proximity to high human disturbance. No holting potential.	Urbanisation/encroachment, human disturbance, surface water run-off
Site	Waterbody	Site profile	Bordering land uses & riparian habitat	Known fish species	Otter signs recorded Y/N	Observations on otter habitat	Threats & pressures to otter
P1	Pond in Tymon Park	0.09ha mature artificial on-line pond in parkland, shallow (<0.6m) & very heavy siltation, evidently poor water quality, poor fisheries habitat, mature riparian zone but half of pond perimeter open to human access	WD5, WS1, WL2, WD1	Three-spined stickleback	No	Poor quality otter foraging habitat but of value to commuting otter. Low suitability for otter holting given high levels of human access. Superior otter habitat in adjoining ponds.	Human disturbance, water quality
P2	Pond in Tymon Park	0.12ha mature artificial on-line pond in parkland, shallow (<0.1m) & very heavy siltation, evidently poor water quality, poor fisheries habitat, mature riparian zone but most of pond perimeter open to human access	WD5, WS1, WL2, WD1	Three-spined stickleback	Yes, active holt located between ponds no. 2 & 3; spraint site located at pond no. 2 outflow	Relatively poor otter foraging habitat but active holt located on causeway between pond no. 2 and 3 in system in small area of scrub with poor human access.	Human disturbance, water quality
P3	Pond in Tymon Park	0.07ha mature artificial on-line pond in parkland, last pond in series, deeper than upstream ponds, average depth of >1m, heavy siltation, evidently water quality issues but improved over	WD5, GS2, WS1, WL2, WD1	Three-spined stickleback; other species (unidentified)	Yes, active holt located between ponds no. 2 & 3; spraint site located along	Much improved otter foraging habitat compared with upstream ponds (deeper pond, better fisheries habitat). Active holt located on causeway between pond no. 2 and 3 in system in small	Human disturbance, water quality

Section	Watercourse	Site profile	Bordering land uses & riparian habitat	Known fish species	Otter signs recorded Y/N	Observations on otter habitat	Threats & pressures to otter
		upstream ponds, improved fisheries habitat, mature riparian zone with little human access			southern margins of pond	area of scrub with poor human access.	
P4	Pond in Tymon Park	0.85ha mature artificial off-line pond, largest on site, shallow depth overall (<1m average), deep silt bed, two heavily vegetated islands present (good otter potential), heavily vegetated margins (willow-dominated)	WD5, GS2, WS1, WD1	Three-spined stickleback; other species (unidentified)	No (but otters recorded historically in pond)	High otter potential given presence of two heavily vegetated islands & dense marginal scrub vegetation (i.e. good seclusion). Good foraging opportunities (fish and wildfowl).	Human disturbance, water quality
P5	Pond in Tymon North Park	0.25ha mature artificial on-line pond, uppermost in series of three ponds, moderate depth of >1m on average, silt-dominated, heavily vegetated margins (reedbeds/scrub) with poor human access, superior fisheries habitat compared to ponds south of M50	WD5, FS1, WS1, WD1	Roach, three-spined stickleback	Yes; three spraint sites around pond	Good quality otter habitat given good fisheries value/foraging opportunities & high seclusion from humans. Some suitability for holting given dense reedbed/scrub habitat but none recorded.	Human disturbance, water quality
P6	Pond in Tymon North Park	0.18ha mature artificial on-line pond, heavily vegetated wetland-like habitat, shallow (<0.5m on average), silt bed, relatively poor fisheries value compared with other ponds in park	WD5, FS1, WS1, WD1	Roach, three-spined stickleback	No	Moderate foraging value for otter (better in adjoining ponds). Some suitability for holting given dense reedbed/scrub habitat but none recorded.	Human disturbance, water quality
P7	Pond in Tymon North Park	1.4ha mature artificial on-line pond, shallow with average depth of <1m, silt bed, open banks in parkland, sparse marginal vegetation but some fisheries value despite shallow depth. Single heavily vegetated island present	WD5	Roach, three-spined stickleback	Yes; single spraint site recorded along southern margins	Good quality foraging habitat given good fisheries value but poor seclusion from human disturbance given open banks (except island, high seclusion).	Human disturbance, water quality



Section	Watercourse	Site profile	Bordering land uses & riparian habitat	Known fish species	Otter signs recorded Y/N	Observations on otter habitat	Threats & pressures to otter
P8	Pond, Mount Argus Park	0.04ha small artificial on-line pond, encircled by retaining walls, 100% concrete base, shallow (<0.4m average), very poor fisheries value, poor quality aquatic habitats, open banks in parkland with only scattered mature trees	WD5, WS1	Three-spined stickleback	No	Little or no inherent value for otter given poor fisheries value/foraging opportunities, absence of suitable holding areas and extensive downstream culverting impacting otter commuting	Human disturbance, bank modification, water quality
P9	Pond, Mount Argus Park	0.03ha small artificial on-line pond, encircled by retaining walls, 100% concrete base, shallow (<0.4m average), very poor fisheries value, poor quality aquatic habitats, open banks in parkland with only scattered mature trees	WD5, WS1	Three-spined stickleback	No	Little or no inherent value for otter given poor fisheries value/foraging opportunities, absence of suitable holding areas and extensive downstream culverting impacting otter commuting	Human disturbance, bank modification, water quality

8. Appendix B – representative site images



Plate B1 Section 001 on the River Poddle in Tymon Park adjacent to proposed works area



Plate B2 Pond no. 1 in Tymon Park showing excessive siltation, poor water quality and poor otter habitat



Plate B3 Pond no. 2 in Tymon Park facing towards otter holt location near pond outflow



Plate B4 Pond no. 3 in Tymon Park facing south towards active otter holt located near pond inflow



Plate B5 Pond no. 4 in Tymon Park, the largest pond surveyed (no otter signs recorded)



Plate B6 Section 002 on the River Poddle immediately upstream of the M50 culvert (facing upstream)



Plate B7 Section 003 on the River Poddle immediately downstream of the M50 culvert (heavily scrubbed)



Plate B8 Pond no. 5 in Tymon North Park (regular otter spraint site located in grassy foreground)



Plate B9 Regular otter spraint site located near the outflow from pond no. 5 in Tymon North Park



Plate B10 Pond no. 7 in Tymon North Park



Plate B11 The largest pond in Tymon North Park showing open banks with relatively high human disturbance



Plate B12 Section 004 on the River Poddle downstream of the largest pond in Tymon North Park



Plate B13 Section 005 on the River Poddle was historically straightened & deepened (no otter signs recorded)



Plate B14 Section 006 on the River Poddle from underneath the R112 road bridge (no otter signs recorded)



Plate B15 A significant instream barrier present on Section 007 on the River Poddle at Kimmage Manor



Plate B16 Section 008 on the River Poddle at Kimmage Manor before underground culverting



Plate B17 Section 009 on the Poddle at KCR, modified and bound by retaining walls (potential otter prey remains recorded)



Plate B18 Roach scales (potential otter prey remains) recorded on the Rive Poddle upstream of the KCR culvert



Plate B19 The heavily modified section 010 in Poddle Park showing poor otter habitat



Plate B20 Section 011 at St. Martin's Drive footbridge (heavily modified, poor otter habitat)



Plate B21 Section 012 on the River Poddle at Mount Argus Park with uppermost pond in background (no otter signs, very poor otter habitat)



Plate B22 Section 013 at Mount Argus, facing downstream (no otter signs, heavily modified section)



Plate B23 Grand Canal at Parnell Road facing east to Emmet Bridge



Plate B24 Stock image of the Poddle-Liffey confluence at Wellington Quay, Dublin City centre



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