Glashaboy Flood Relief Scheme otter breeding and resting area activity report 2025

Prepared by Triturus Environmental Ltd. for Sorensen

Civil Engineering Ltd.

January 2025

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1. Introduction

Sorensen Civil Engineering Ltd. commissioned Triturus Environmental Ltd. to carry out a survey for otter breeding and resting places (holts and couches respectively) in the vicinity of the Glashaboy Flood Relief Scheme. The survey was required in light of a derogation licence submission for the temporary disturbance of otter during construction activities carried out as part of the 2025 construction program. A full survey of the river corridors of the Glashaboy and Glenmore River tributary overlapping the 2025 construction works program was undertaken (**Figure 1.1**). As stated the survey concentrated on the breeding and resting areas of otters given these areas are protected under provisions of the Irish Wildlife Acts 1976-2021. 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 2011-2021. Otter are also included in a system of strict protection pursuant to the requirements of Articles 12, 13 and 16 of the Habitats Directive (92/43/EEC) (NPWS, 2021).

The survey was undertaken using the Total Corridor Otter Survey (TCOS) approach (Macklin et al. 2019). This full channel walkover approach would document both the locations of identified holts and couches (i.e. typical breeding and resting places) while also establishing activity (i.e. likely active or inactive). Our in-depth knowledge of the Glashaboy River catchment following years of historical monitoring coupled with the current survey helped us in our understanding of the patterns of otter activity at their identified breeding and resting areas (Triturus 2024; Triturus, 2023a; Triturus 2023b; Triturus 2022; Triturus 2021; Triturus 2017). The findings of the survey would help inform the threshold working distances based on the status of the holt activity while also helping to inform mitigation during construction works to minimise disturbance to otter. This would include future monitoring of by trail camera of those areas in the vicinity of the 2025 construction work program on the Glashaboy and Glenmore Rivers that were within the study area (**Figure 1.1**).

Figure 1.1 Otter survey area on the Glashaboy and Glenmore Rivers

2. Methodology

2.1 Holt activity survey

Walkover otter surveys of the Glashaboy River were undertaken on the 3rd and 4th January 2024 during base flow and low rainfall conditions to determine the presence and activity status of both couch and holt sites (**Figures 3.1-3.3 results**).

An assessment of the activity status in the absence of trail cameras was based on visual signs of activity at holts. This included the age and presence of spraint in the vicinity of holts, the presence of well-worn trails, recent digging activity and strong otter scent. Spraints were subjectively assessed as either fresh (recent), mixed-age (recent and older spraints, typically indicative of a regular sprainting site) or old (spraint not recently deposited and degrading). Combined this approach helped indicate the intensity of otter marking, which supported the relative levels of activity at holt sites. The site survey was undertaken during dry weather to ensure the detection of important markers of otter activity (i.e. depositional signs such as trails, spraint, jellies and scent) were well preserved for optimal detection. All breeding and resting areas were photographed with GIS locations recorded in ITM co-ordinates with important attribute information.

3. Results

A single active couch site, *n*=8 excavated holts, *n*=2 artificial holts (constructed as part of FRS mitigation), *n*=1 set of prints, *n*=1 latrine and *n*=2 spraints were recorded or examined during the survey (**Table 3.1**). The single couch site (couch C1) was regularly used and therefore active at the time of the survey. Of the 8 holts identified, seven showed signs of activity (H3, H4, H5, AH1, H7A, H7B & H8) with holts (H1, H2, AH2, H6A & H6B) not considered active. However only two of the active holts (numbers N7A & N7B) were screened in for detailed mitigation outside of standard avoidance that should be applied to all of the identified holts. The more detailed mitigation (section 5) applies given they are <20m from the construction works areas (**Figure 3.1**). A summary of the breeding and resting areas is provided below.

Holt N1

Holt N1 was situated on the upstream side of a river meander on the south bank of the Glashaboy River (ITM 572433, 577028; **Plate 3.1 & Figure 3.1**). The holt was situated in an earthen bank scrubbed over with bramble (*Rubus fruticosus* agg.) and ferns (*Dryopteris* sp.) under the root systems of mature alder (*Alnus glutinosa*). The holt is considered a transitional resting area rather than a natal holt and has not had activity since 2021. The lack of activity is considered consequential of the propensity for the holt to flood.

Plate 3.1 Otter holt N1 (inactive since 2021)

Holt N2

Holt N2 was situated on the west bank of the Glashaboy River on a very steep river valley escarpment (ITM572477, 576830; **Figure 3.1**). The holt has two entrances excavated under the roots of sycamore (*Acer pseudoplatanus*) on loose brown earth soils. The understories of sycamore trees support cherry

laurel (*Prunus laurocerasus*), a species invasive of native woodlands. However, the laurel overhangs the holt providing cover for otter. The holt entrance closest to the river is <0.5m above summer base flows but has a burrow system extending upwards into higher bank levels. The holt complex also had a secondary entrance 3m above the base flow river levels with a very well-worn trail supporting frequent activity. This was excavated out during 2022 and was not present in previous years. The holt was not active since the floods in October 2023. An examination of the entrance supported no recent spraint at the historically regular sprainting site at the entrance. The holt was previously considered a natal holt given the presence of both adult and juvenile otter at the entrance during historical trail camera surveys. Historically holt N2 was considered was one of the most important holts in the Sallybrook area and indeed on the wider Glashaboy River given it supported breeding otter.

Plate 3.2 Otter holt N2 showing the lower entrance closest to the Glashaboy River opposite the Sallybrook Industrial Estate

Couch C1

Couch C1 was situated on the west bank of the Glashaboy River under a steel container adjoining the GAA field (**Plate 3.3; Figure 3.3**). The couch (resting area) had very worn trails under container with latrines and spraint of mixed age (including very recent spraint). This couch area has been active for many years and forms part of the territory of otter using the nearby holts no. N3 and N4 (see below), that were active during the current January 2024 survey.

Plate 3.3 Otter Couch C1 under steel container at GAA field with slides to river showing well-worn trails

Holt N3

Holt N3 was situated on the east bank of the Glashaboy River on the millrace island. The holt was considered active holt with recent spoil and prints with a slide to the Glashaboy River (**Plate 3.4; Figure 3.3**). The holt had been excavated into sandy loamy bank under an alder tree opposite the GAA field. The holt had two entrances, with the second being on the bramble bank top. Otter have constructed numerous holts in this general area in recent years with new entrances constructed interannually given the suitability of the ground for digging (inclusive of nearby holts N4 & N5). The holt cluster of N3, N4 and N5 is now considered the most important breeding are for otter in the Glashaboy River given low disturbance and evident interannual use (pers. obs.).

Plate 3.4 Otter Holt N3 showing the recent sandy loam excavated with prints

Holt cluster N4 & N5

Holt cluster N4 & N5 were two excavated holts (in sandy loam) on the east bank of the Glashaboy River opposite the GAA pitch on the millrace island. These holts had worn entrance and recent diggings. Nearby mixed age spraint was also present at the couch site (C1 above) adjoining the GAA pitch under the steel container. was situated on the east bank of the Glashaboy River on the millrace island to the south of holt N3. Otters have constructed numerous holts in this general area in recent years with new entrances constructed interannually given the suitability of the ground for digging with holts. These holts have been active for many years and continue to be active given their situation in a low disturbance area not overlapping the flood relief scheme (**Figure 3.3**; **Plate 3.5**).

Plate 3.5 Otter Holt N5 showing the recent sandy loam excavated with slide to Glashaboy River

Artificial Holts AH1 & AH2

Artificial Holts AH1 and AH2 were constructed as part of compensation for the disturbance of otter habitat during the construction phase of the Glashaboy FRS. The two holts are situated on the millrace island on the east bank of the river opposite the GAA field (**Figure 3.3**). Holt AH1 had evidence of use with otter prints at the entrance during the previous January 2024 survey and also during the current January 2025 survey (**Plate 3.7**).

Plate 3.6 Artificial Holt AH1 entrance

Plate 3.7 Artificial Holt AH1 entrance with otter prints in sand

Holt N6A

Newly discovered and recently excavated holt on the east bank of the Glashaboy in the Meadowbrook area in January 2024 a very recently dug out holt was present. The holt was excavated in the sandy loam bank. While the entrance was still open during the current January 2025 survey it was grown over (**Plate 3.8; Figure 3.3**). Furthermore, there were no visible signs of otter usage at the time of the current survey (i.e. no otter scent, spraint, prints etc.).

Plate 3.8 N6A showing grown over entrance with no recent signs of activity

Holt N6B

Newly discovered and recently excavated holt on the east bank of the Glashaboy in the Meadowbrook area (**Plate 3.9; Figure 3.3**). The holt was excavated between boulders and sandy loam. A trail (slide) and otter prints were visible near the entrance during January 2024 indicating historical activity. However, as with nearby holt 6C no signs of activity were noted during the current survey (no otter scent, spraint, prints etc.).

Plate 3.9 Holt N6B had no recent signs of use as with nearby holt 6A

Holt N7A

Holt N7 was situated on the west bank of the Glashaboy River. It comprised of a system of three closely grouped entrances in a sandy muddy bank 1m above the waterline under a hawthorn treeline. Two of the three entrances had been completely filled in with sand. However, the most southerly entrance remained open and had signs of recent use (open entrance with worn path) (**Plate 3.10; Figure 3.3**). Furthermore, the historically active holt N7B directly opposite was also recently active supporting further likelihood of activity (see below).

Plate 3.10 Otter holt N7 showing worn entrance supporting recent use

Holt N7B

Holt N7B was identified in 2019 on the Glashaboy River but had not been active for a number of years. The holt is well above winter flood levels and thus may be attractive to otter in light of extreme flood events on the system. It comprised of a very well worn slide and an entrance 4.5m up a very steep embankment to a recently excavated holt. The boulders below the holt had wet paw prints of otter during January 2025 (**Plate 3.11; Figure 3.3**).

Plate 3.11 Otter holt N7B showing steep embankment, well-worn slide and wet paw prints on boulder

Holt N8

Holt N8 was identified in winter 2022 on the Glashaboy River and remained active despite significant flooding in October 2023. It comprised of an excavated entrance low down on the river bank opposite John O' Callaghan Park (north bank) with a tunnel to higher chamber (**Plate 3.12; Figure 3.3**). The holt has been known to be active in 2022, 2023 and 2024. During January 2025 (current survey), the entrance was beneath the water but prints and spraint were present on the bank top adjoining the holt.

Plate 3.12 Otter holt N8 showing water at entrance, tunnel extends into higher bank (still active)

Table 3.1 Summary of otter signs inclusive of holt and couch (potential breeding & resting areas) January 2025

No.	River	Type	Activity	Notes	Spraint density	ITM x	ITM y
S1	Bleach Hill Stream	Spraint	N/A	Mixed age spraint site under footbridge north of Sallybrook Industrial Estate.	3(6) Mixed age	572541	577156
H1	Glashaboy	Holt	Not Active	Large excavation in south bank with spraint present during historical surveys. Considered a transitional resting area (not a natal holt). Not active for over 3 years.	None in vicinity of holt	572433	577028
H2	Glashaboy	Holt	Not Active	Large holt system in west bank with historically frequent otter activity with evidence of use as a natal holt. However, no recent otter spraint detected at holt and no recent signs of activity based on 4 visits since early 2024.	None in vicinity of holt	572477	576830
S2	Glashaboy	Spraint	N/A	Recent spraint on tree limb adjoining opposite the Brook Inn Bar.	1(1)	572596	576345
C1	Glashaboy	Couch	**Active**	Regular couch under steel container GAA field (west bank) with mixed age spraint. Recent mixed age spraint and abundant activity at nearby holts on east bank.	3(8)	572681	575858
H3	Glashaboy	Holt	**Active**	Active holt with recent spoil and prints. Excavated into sandy loamy bank under alder tree opposite GAA field. Otter prints at entrance.	None (otter prints only)	572687	575843
H4	Glashaboy	Holt	**Active**	Excavated holt (east bank) with large tunnel in lower bank with worn entrance.	None in vicinity of holt	572678	575800
H5	Glashaboy	Holt	**Active**	Excavated holt with two entrances c. 2m apart on river side with slides (east bank).	None in vicinity of holt	572678	575806

No.	River	Type	Activity	Notes	Spraint density	ITM x	ITM y
AH1	Glashaboy	Artificial Holt 1	**Active**	Large artificial Holt on millrace island. Otter prints in sand at entrance.	None in vicinity of holt	572679	575785
AH2	Glashaboy	Artificial Holt 2	Not Active	Small secondary artificial holt on millrace island. No spraint, scent or signs of recent activity.	None in vicinity of holt	572682	575786
H6A	Glashaboy	Holt	Not Active	The holt was 1st detected in January 2024 when recently excavated sand and loam diggings were present at entrance on the east bank of the Glashaboy (east bank). The recent January 2025 survey did not detect any signs of activity (i.e. no otter scent, prints, trails, recent diggings).	None in vicinity of holt	572868	575341
H6B	Glashaboy	Holt	Not Active	Holt between boulders in sandy loam bank (east bank). The recent January 2025 survey did not detect any signs of activity at holt 6B as with nearby 6A (i.e. no otter scent, prints, trails, recent diggings).	None in vicinity of holt	572870	575341
H7A	Glashaboy	Holt	**Active**	Excavated holt that had previously been inactive at Meadowbrook on meander. Well-worn entrance indicating recent use (west bank).	None in vicinity of holt	572952	575331
H7B	Glashaboy	Holt	**Active**	Holt with slide to river c. 4.5m above river level on very steep earthen embankment. Holt entrance c. 0.3 x0.3m in dimensions with very well worn trail inclusive of slide through bramble scrub. Wet paw prints on riverside boulder (east bank).	None in vicinity of holt	572594	575330
H8	Glashaboy	Holt	**Active**	Excavated holt with low entrance near river waterline near John O' Callaghan Park (north bank). The holt entrance was partially obscured by water but had prints and spraint on bank top supporting recent activity.	1(2)	573096	575102

No.	River	Type	Activity	Notes	Spraint density	ITM x	ITM y
L1	Glenmore River	Latrine	N/A	Recent latrine on mosses	1(1)	574176	575409
P1	Glenmore River	Prints	N/A	Recent prints under culvert	N/A	573989	575362

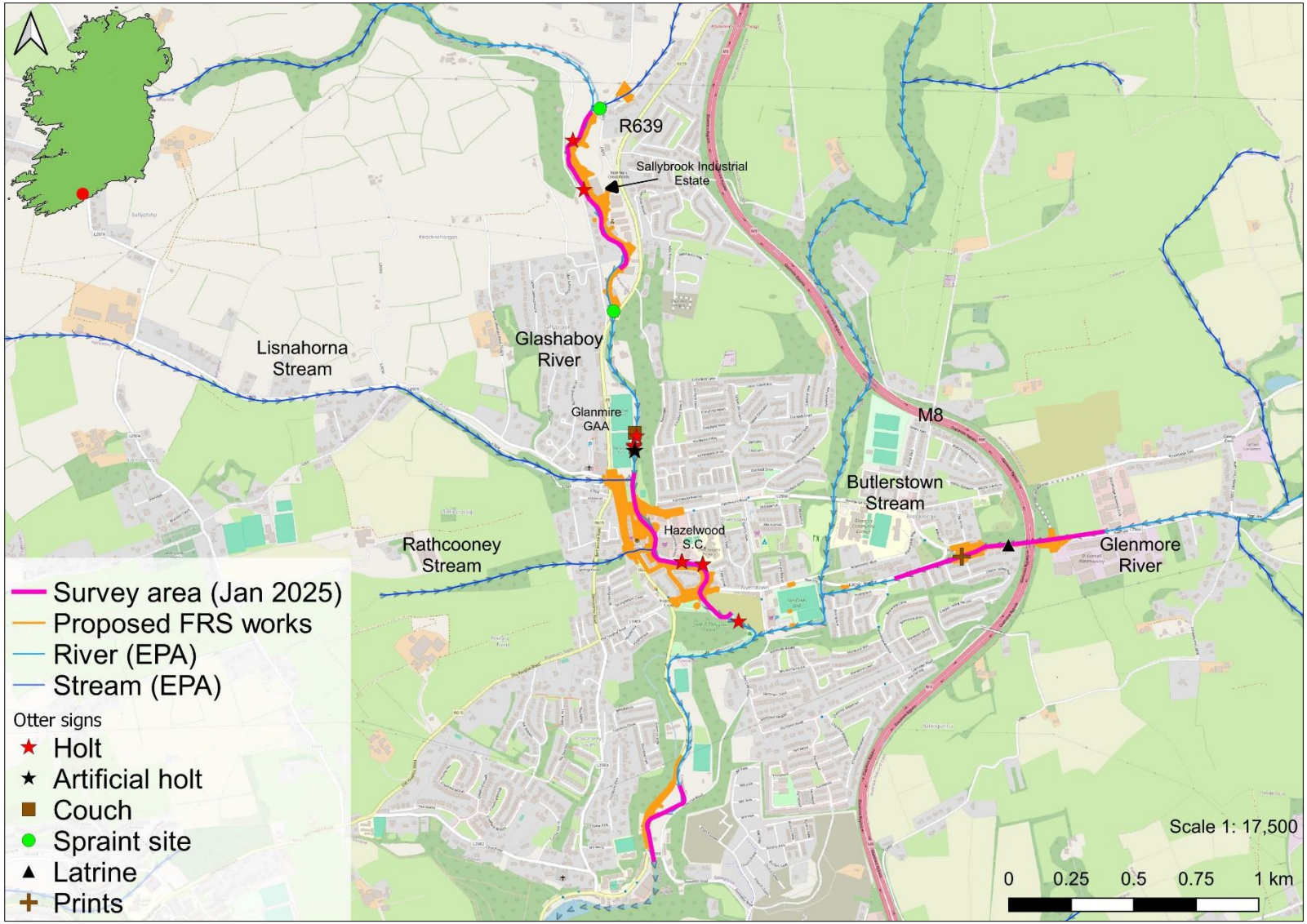

Figure 3.1 Summary of all signs including holts and couches recorded during the January 2025 survey

Figure 3.2 Summary of activity status of holts and couches recorded during the survey at Sallybrook (no active holts and no couches present)

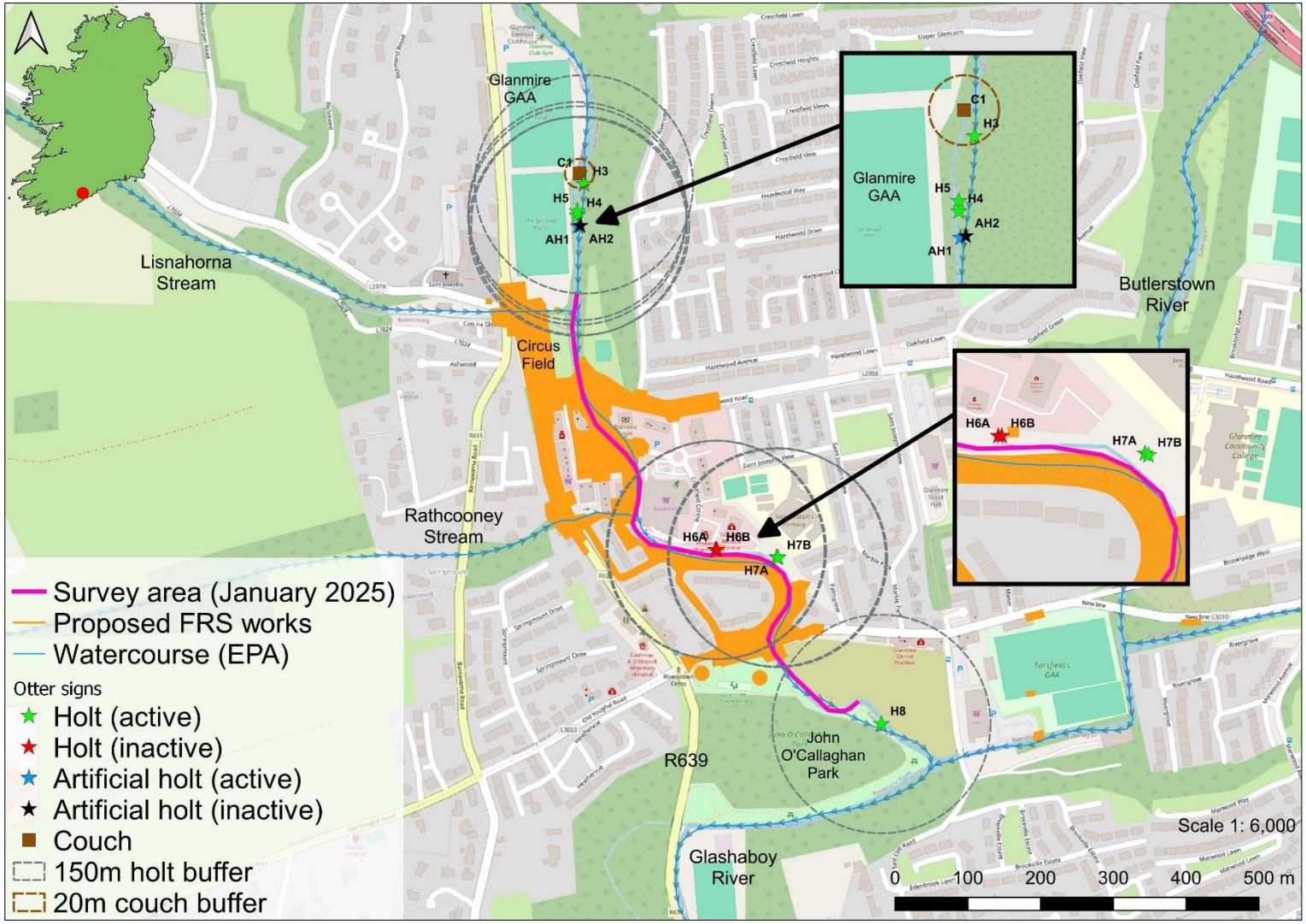

Figure 3.3 Summary of activity status of holts and couches recorded between Glanmire GAA pitch, Hazelwood & John O' Callaghan Park

4. Discussion

Otter breeding (holts) and resting areas (couches) are especially sensitive to direct human disturbance (Mason & Macdonald, 2009) and there is a known clear association between the location of holts and low disturbance areas of river channel on the Glashaboy River (pers. obs). This same local disturbance-related trend has been repeatedly observed in other urban and peri-urban watercourses across Ireland (e.g. Macklin et al., 2019; Brazier & Macklin, 2020; Triturus pers. obs.). Otter reproductive success is known to be higher in less disturbed habitats and demonstrates a preferential fidelity for low disturbance areas of channel (Loy et at., 2009; Ruiz-Olmo et al., 2011). Furthermore, well-developed and preserved riparian zones such as those found on the Glashaboy can buffer anthropogenic impacts, and healthy ecological corridors with good connectivity are likely to play an increasingly important role in otter dispersion and commuting considering climate change impacts (Cianfrani et al., 2018).

No breeding or resting areas (i.e. holts or couches) were recorded on the Glenmore River, rather only a print and latrine site (**Figure 3.1**). However, a single active couch and n=10 holts (2 of which are artificial) were examined or newly recorded during the survey (**Table 3.1**). The single couch site was regularly used and therefore active at the time of the survey as per previous surveys (Triturus, 2024). Of the 10 holts identified (including two artificial holts), seven were considered active based on field signs activity. This included holt numbers H3, H4, H5, AH1, H7A, H7B & H8 (**Table 3.1**) with holts (H1, H2, AH2, H6A & H6B) not considered active. While these holts are inside the 150m buffer for the majority (excluding H7A & H7B) is a significant riparian buffer supporting that they can be screened out for detailed mitigation apart from optional monitoring. However, this needs to be balanced against unnecessary disturbance as the holt cluster adjoining Glanmire GAA pitch (i.e. H3, H4 & H5) is considered the most important breeding and resting area of the middle Glashaboy catchment.

To conclude, two of the active holts (numbers N7A & N7B) were in very close proximity to the works (i.e. <20m) and therefore should be subject to additional mitigation other than mitigation by avoidance (i.e. holts H7A & H7B). The outline measures are discussed in section 5 of this report and should be agreed with the NPWS as part of the derogation mitigation requirements to protect otter.

5. Mitigation

Active Holts H3, H4, H5, AH1, H7A, H7B and H8 are within 150m of the flood relief works footprint. While these are within the 150m buffer they should be considered as part of the derogation licence application. However, given the high degree of separation from holts H3, H4, H5, AH1 and N8 from the works risks to otter are indirect and of lower risk. While the derogation should consider these areas also, the highest risk is posed to holts H7A & H7B given close proximity to works and signs of recent activity (**Figure 3.3**). Specific mitigation is summarised below for holts H7A and H7B given they at higher risk of disturbance. The protection measures will be undertaken in accordance with the specifications of the section 54 otter derogation licence once granted (not available at the time of writing) that should consider the mitigation outlines below. The construction works should also follow the recommendations of the local NPWS conservation ranger based on a pre-construction consultation and review of the information contained within this report.

Active Holts H7A & H7B (specific mitigation)

Recently active holts H7A and H7B are situated on the east and west banks of the Glashaboy River respectively in the Meadowbrook area (i.e. <20m from working areas). The holts may be used by breeding otter and may be natal holt areas. Timber hording should be constructed along the west bank of the Glashaboy River for 15m either side of the centre point of holt 7A and the west bank behind the treeline. Alternatively an acoustic barrier can be constructed. Holt 7B does not overlap working areas and is considered at less risk given its situation in a low disturbance area of river bank. The hording or acoustic barrier will screen noise disturbance from access and egress required along the west bank to minimise impacts for holt 7A.

Holts 7A and 7B will be monitored by trail camera during the 2024 construction works program. This will establish patterns of occupancy and help inform live decision making based on potential disturbance through the construction period. The ecological clerk of work (ECoW) and environmental manager for the job will also monitor the construction works area in the vicinity of the holts to ensure that there is no direct disturbance to the holts. They will ensure that all machine drivers and construction staff are aware of the sensitivity of the holt and signage will be erected denoting an 'ecologically sensitive area'.

Where piling and construction of flood relief infrastructure is required at Meadowbrook on the west bank, the works will be monitored by the ECoW to ensure that the holt is not disturbed. Piling works should employ soft start piling. An assessment of the threshold for the onset of temporary threshold shifts (TTS) and permanent threshold shifts (PTS) derived from the most recent scientific literature is summarised below (NMTS, 2018). According Matuschek and Betke (2009) vibration pile drivers peaked at around 170dB with peak frequencies between 100 and 500 hertz. These would be below the peak thresholds that would impact otter following the criteria outlined by the NMTS (2018) that would cause the onset of permanent threshold shifts (non- recoverable damage to hearing) and temporary threshold shifts (TTS) i.e. fully recoverable. The soft start piling approach would allow otter sufficient time to become evasive of the sound should it be uncomfortable despite being outside the likely PTS range.

Water quality should be monitored by the ECoW to ensure that the food resources (i.e. salmonid prey) are not impacted by water quality deterioration in accordance with the method statement.

It is preferred that the works are completed in this area after the January to April 2024 core breeding period given that otter breeding is generally concentrated at this time (pers. obs.). As holts 7A and 7B may be natal holts (i.e. used for breeding & unknown without trail camera monitoring) it is critically important not to disturb otter during the core breeding season. Works should be conducted under daylight hours only with no lighting inclusive of security lighting cast on the river.

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