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Water Supply Project

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(Appendix 8.18) Aquatic Ecological Survey at the Proposed Parteen Basin Abstraction Site (August 2019)

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Report on
Aquatic Ecological Survey at the Proposed Parteen Basin Abstraction Site

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1. Introduction

This report presents the results of a validation survey carried out in the River Shannon within the Parteen Basin to assess the aquatic ecology and sensitivities at and in the vicinity of the proposed abstraction location for the Water Supply Project (WSP). An initial survey was undertaken in August 2017 to assess the existing aquatic ecology at the location, to identify the occurrence or suitability for any habitats or species listed as qualifying interests for the Lower River Shannon Special Area of Conservation (SAC Site code no 002165), and to determine the presence and abundance of invasive alien species as listed under as listed under the Third Schedule (Part 1) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No 477 of 2011). This survey was undertaken to determine if there was any change, significant or otherwise, in the baseline conditions at or in the vicinity of the site.

2. Methodology

A SCUBA survey of the aquatic environment in the vicinity of the proposed WSP abstraction location was undertaken by EirEco Environmental Consultants on 26th August 2019. The survey was undertaken by a team of three HSE Part III Qualified divers using a 4.5m RIB to gain access to the site. Two divers operated in the water while the third functioned as dive supervisor and boat coxswain. The weather at the time of survey was dry, bright (cloud cover 2/8) and warm (temperature 18°C) with light variable winds (F1-2).

The survey methodology employed mirrored that of the 2017 survey which entailed undertaking a series of three transects from the shore to approximately 50m offshore at locations on and in the vicinity of the proposed abstraction point (location shown in Figure 1). The central transect was in the middle of the abstraction location while the upstream and downstream transect locations were to provide a comparative assessment of the habitats in the area. Transects were defined by laying a weighted and graduated line at right angles from the shore. The divers recorded onto slates at intervals along each transect depth, substrate, macrophytes present, suitability of the substrate as lamprey ammocoete habitat, fish spawning or nursery habitat, and the presence and abundance of biota including invasive alien species. Underwater photographs were taken using a Cannon Powershot SX 700 with underwater housing, strobe and wide-angle lens and a Fuji Finepix XP70. A series of 15cm cores (using a section of plastic piping) were taken from potentially suitable areas of soft silt to determine presence or absence of ammocoetes, though soft sediments were only encountered in water greater than 2m in depth. The cores were subsequently sieved through a 2mm mesh net. The shoreline was also surveyed for signs of otter activity including presence or suitability for couches and holts.

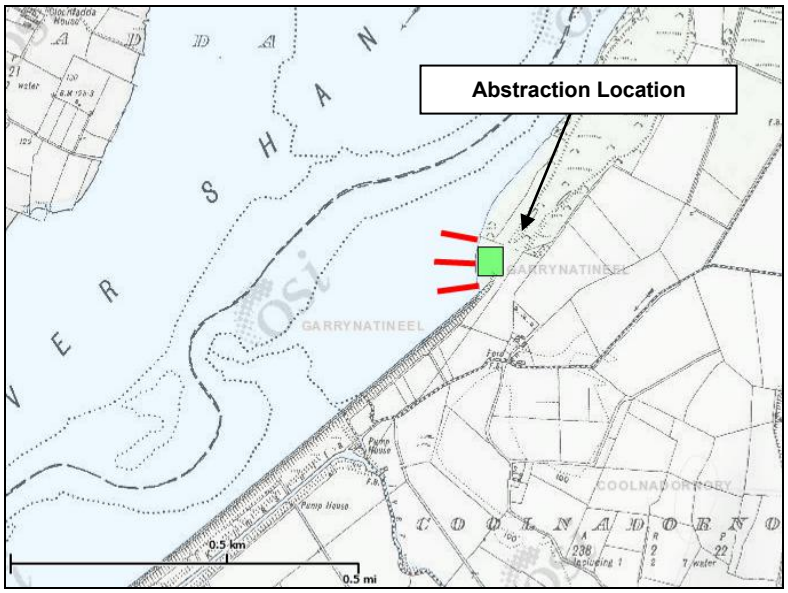

Figure 1. Survey and Transect locations (red lines) for WSP Abstraction Location.

A Biosecurity protocol was rigidly followed to avoid the potential for transfer of invasive alien species to or from the site in accordance with guidance produced by Invasive Species Ireland and Inland Fisheries Ireland (*Decontamination and Disinfection procedures for equipment and personnel*). A specific Biosecurity Method Statement was produced for the survey operation.

3. Results

3.1 Overview of Abstraction Location

The Parteen Basin is an artificial waterbody (a Reservoir FL7 using the Heritage Council Classification (Fossitt, 2000)), which was developed as part of the Ardnacrusha Power Plant constructed between 1925 and 1929. The Parteen regulating weir, located at the head of the headrace canal, servers to divert the main flow of the River Shannon to the power station. The Parteen Basin immediately upstream of the regulating weir provides supplementary impounded water and extends upstream as far as the narrow channel between Ballina and Killaloe. The proposed WSP abstraction is located at the north end of the Fort Henry Embankment in the townland of Garrynatineel. The site is under coniferous plantation (WD4) with occasional willow (*Salix* spp.) along the shoreline. The entire Parteen Basin and abstraction location is within the Lower River Shannon SAC.

3.2 Substrate and Aquatic vegetation

The shore in the vicinity of the proposed abstraction is gently shelving with the upper shore comprised of cobble and gravel (see Figure 2). This profile is relatively uniform both upstream and downstream of the abstraction location. The lake bed gently dips to a depth of approximately 5m at a distance of 50m offshore. At about 1m depth of water, the substrate changes from cobble and gravel to a silty, sandy gravel with scattered coble and small boulder. This continues to a depth of approximately 2.5m where it becomes a silty sand, while from 3m and deeper it is comprised of a fine silt.

The shallow upper shore zone (to approximately 0.5m) has cobbles covered with krustenstein, a blue-green algal crust associated with oligotrophic alkaline waters. The substrate has a dense covering of horned pondweed (*Zannichellia palustris*) with small amounts of stonewort (*Chara virgata*) (Figure 3). A moderate amount of algal cover, was noted which was not evident during the survey in 2017. Willow moss (*Fontinalis antipyretica*) is present though primarily confined to the roots of fringing trees that are exposed on the lake shore. The invasive alien zebra mussel (*Dreissena polymorpha*) is occasional in small quantities on cobbles.

In water from 1.0 to 1.5m in depth, small amounts of stonewort are present, though much of it appears to be unrooted drift material. Yellow water lily (*Nuphar lutea*) and the submerged form of bulrush (*Schoenoplectus lacustris*) are occasional to frequent, and the submerged form of arrowhead (*Saggitaria sagittifolia*) forms isolated dense stands. Both shining pondweed (*Potamogeton lucens*) and perfoliate pondweed (*P. perfoliatus*) occur in small amounts along with Nuttall's pondweed (*Elodea nuttallii*). Cobbles still retain some krustenstein cover along with small amounts of zebra mussel. Areas devoid of vegetation have a thin mat of coalescing algae cover, while there are pockets of cloud algae in slightly deeper water.

Figure 2. Shoreline in the vicinity of the abstraction location at Parteen.

Figure 3. Shallow water with horned pondweed, stonewort and Krustenstein.

In water from 1.5m to 2.5m in depth, both bulrush and arrowhead form dense stands with occasional clumps of yellow waterlily (Figure 4). The bulrush forms emergent reed beds while the arrowhead remains in submerged form. Both dominant species thin out towards 3.0m depth and small amounts of ivy-leaved duckweed (*Lemna trisulca*) occur on the lake bed. No macrophytes were recorded below 3.5m (euphotic depth) though zebra mussels were recorded in small amounts to 5m in depth, forming dense aggregations on any hard substrate.

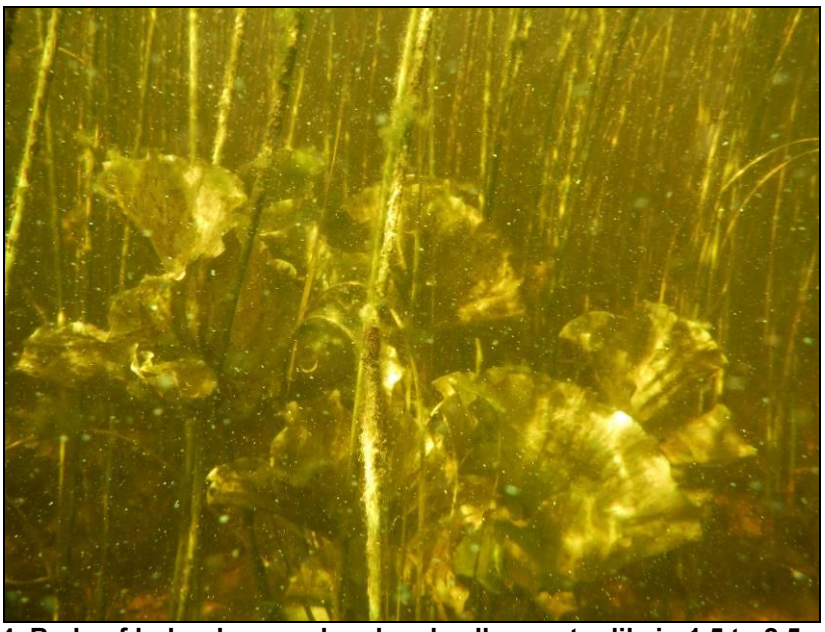

Figure 4. Beds of bulrush, arrowhead and yellow water lily in 1.5 to 2.5m depth.

3.3 Aquatic Fauna

A series of 15cm cores were taken in soft substrates at depths from c2 to 3.5m to check for lamprey ammocoetes. No ammocoetes were retrieved from any of the cores taken and there was no visible evidence of ammocoete burrows recorded in any of the soft sediments. There is no suitable spawning habitat for salmon or lamprey species in the Parteen Basin and the nearest suitable spawning habitat for salmon or lamprey is approximately 5km upstream of Killaloe in the Annacarriga River. There is therefore no immediate source of lamprey ammocoetes which undergo a passive downstream migration during the larval phase (Maitland, 2003). The preferred spawning habitat for salmon and lamprey species comprise areas of riffle or swift glide (often at the tail end of pools) in water up to 2m in depth, where well-aerated gravels are present. Both species excavate shallow depressions (known as redds) into which they lay their eggs, with salmon frequently utilising the previously excavated redds of sea lamprey where they occur.

The beds of bulrush and arrowhead provide potential spawning habitat for various coarse fish species. Most coarse fish spawn the spring between the period mid-March to mid-May. Pike commence spawning earlier in the year between mid-January upto mid-April. As macrophytes tend to die-off over winter these beds are therefore not likely to be suited for pike which may preferentially utilise beds of stonewort's which remain throughout the year.

The alien invasive zebra mussel is widespread within Lough Derg where it forms dense reefs in places. Previous surveys undertaken by EirEco have recorded large aggregations in depths of water upto 6m though typically abundance is at a maximum in depths of between 2 and 4m where all hard substrates are heavily encrusted. Where soft substrates occur mussels will settle on any hard surface and often form clumps on duck mussel (*Anodonta anatina*) or on other zebra mussels. Zebra mussel were widespread in the vicinity of the abstraction location and occurred in large numbers on suitable surfaces. Small numbers of dead duck mussel shells were recorded from the area but no live specimens were encountered.

4. Conclusion

The location of the proposed abstraction point is within the Lower River Shannon SAC. A SCUBA survey was undertaken at and in the vicinity of the proposed WSP abstraction point on the Parteen Basin in September 2017 and in September 2019. With the exception of a slight increase in the amount of algal cover, there was no difference in plant communities, zonation, or euphotic depth between the two surveys. The shoreline is gently sloping from the shore to approximately 5m in depth at a distance of 50m offshore. The upper shore is comprised of gravel and cobble and supports beds of horned pondweed with small amounts

of stonewort. The substrate grades from this to a sandy gravel at c1m and then to a soft silt at 2m. In water from 1.5m to 2.5m in depth, both bulrush and arrowhead form dense stands with occasional stands of yellow waterlily. The euphotic depth is 3.5m.

No lamprey ammocoetes were retrieved from any of the cores taken in soft sediments and there was no visible evidence of ammocoete burrows noted in the sediments. There is no suitable spawning habitat for salmon or lamprey species downstream of Ballina / Killaloe. The beds of bulrush and arrowhead may provide spawning habitat for coarse fish species but are unlikely to support spawning by pike as they will have died back during their principle spawning period.

Zebra mussel were widespread in the vicinity of the abstraction location and occurred in large numbers on suitable surfaces.

No signs of otter activity was recorded from the site during the survey and there is no evidence of any holt or couches in the vicinity of the abstraction location.

5. References

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