Limerick City Greenway (UL to NTP)

Preliminary WFD Assessment

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1	13/07/2021			First draft for client review	HW
1.1	27/07/2021			Crayfish plague record update	NA
1.2	25/07/2024			Remove River Mulkear	

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1. Introduction

APEM Ltd (APEM) were commissioned by Ryan Hanley to provide information on the possible environmental constraints associated with the proposed upgrade of an existing cycle way on the south bank of the River Shannon, near Limerick (Figure 2-3). The proposed works include the installation of sheet piling as part of works along the bank, which have the potential to adversely impact the aquatic environment.

In Ireland, the Water Framework Directive (WFD) is implemented through The European Union (Water Policy) Regulations 2014. In the event of a proposal which may have impacts on one or more water bodies, a WFD assessment is required. The aim of a WFD assessment is to determine whether a proposed scheme will:

- cause deterioration of the WFD status (or potential) of the affected water body (or water bodies); or,
- prevent the achievement of ecological objectives set for the water body (or water bodies) in the local River Basin Management Plan (RBMP).

For a proposal to be deemed compliant with the WFD, it must be demonstrated that there is a low risk that the activity will cause deterioration of water body status (or potential) or prevent good status (or potential) from being achieved.

This report presents a WFD assessment of the proposed upgrades to the cycle path on the south bank of the River Shannon, near Limerick, conducted by APEM under instruction from Ryan Hanley. This report provides:

- a summary description of the site and the scheme rational (Section 2);
- presents the WFD status and objectives of the water body (Section 3);and
- considers the likely impacts of the scheme on WFD quality elements (Section 5).

2. Site description

As part of a proposed upgrade to the cycle path along the south bank of the River Shannon (Figure 2-5), the installation of sheet piling is proposed for three newe bridges and a new ramp. Whilst these works do not require in-water activities, they have potential to directly or indirectly impact on the species and habitats of the River Shannon.

The current cycle path route follows the length of the River Shannon for approximately 3km, before turning south at two locations to travel over land to Plassey Park Road.

The reaches of the River Shannon that follow the cycle path route are typical of an urbanised river catchment. Banks on either side are dominated by dense weed and low shrub cover, with a sporadic tree canopy throughout. There is evidence of common invasive non-native plant species, including Himalayan balsam (*Impatiens glandulifera*), and giant hogweed (*Heracleum mantegazzianum*). Land use is mixed, with agricultural (livestock), amenity and green urban areas, though some of this has given way to construction and transitional woodland (CLMS, 2018).

There are three proposed locations along the bank of the River Shannon at which construction works will be required. Two locations are sited downstream (Figure 2-1) from the University of Limerick boat house. At this location, the River Shannon is very wide (approximately 90 m), with glide flow typology and densely vegetated banks. Where visible, substrate includes gravels which may be suitable for lamprey spawning, as well as large woody debris providing habitat diversity and enrichment for fish and macroinvertebrate species.

Figure 2-1 The River Shannon at the location of Bridge 1 and Bridge 2 (view downstream)

The third proposed construction location is at the site of the proposed Bridge 5 and proposed ramp at Plassey Beach (Figure 2-2). The River Shannon at this location has a shallow-to-moderate gradient, with a cobble/ boulder bed river, with riffle flow typology. The channel here is split into two distinct halves, with a large island in the middle of the channel, populated by dense shrub and tree cover.

Figure 2-2 The River Shannon at the location of the proposed Bridge 5 and Ramp at Plassey Beach (view upstream)

Further upstream, the river returns to a singular, wide channel, with glide flow typology and moderate flow with a shallow gradient (Figure 2-3). Although not part of the surveyed reach, areas of riffle habitat were visible in the channel upstream from the confluence between the River Shannon and the River Mulkear.

Figure 2-3 The River Shannon upstream of the proposed Bridge 5 and ramp at Plassey Beach (view upstream)

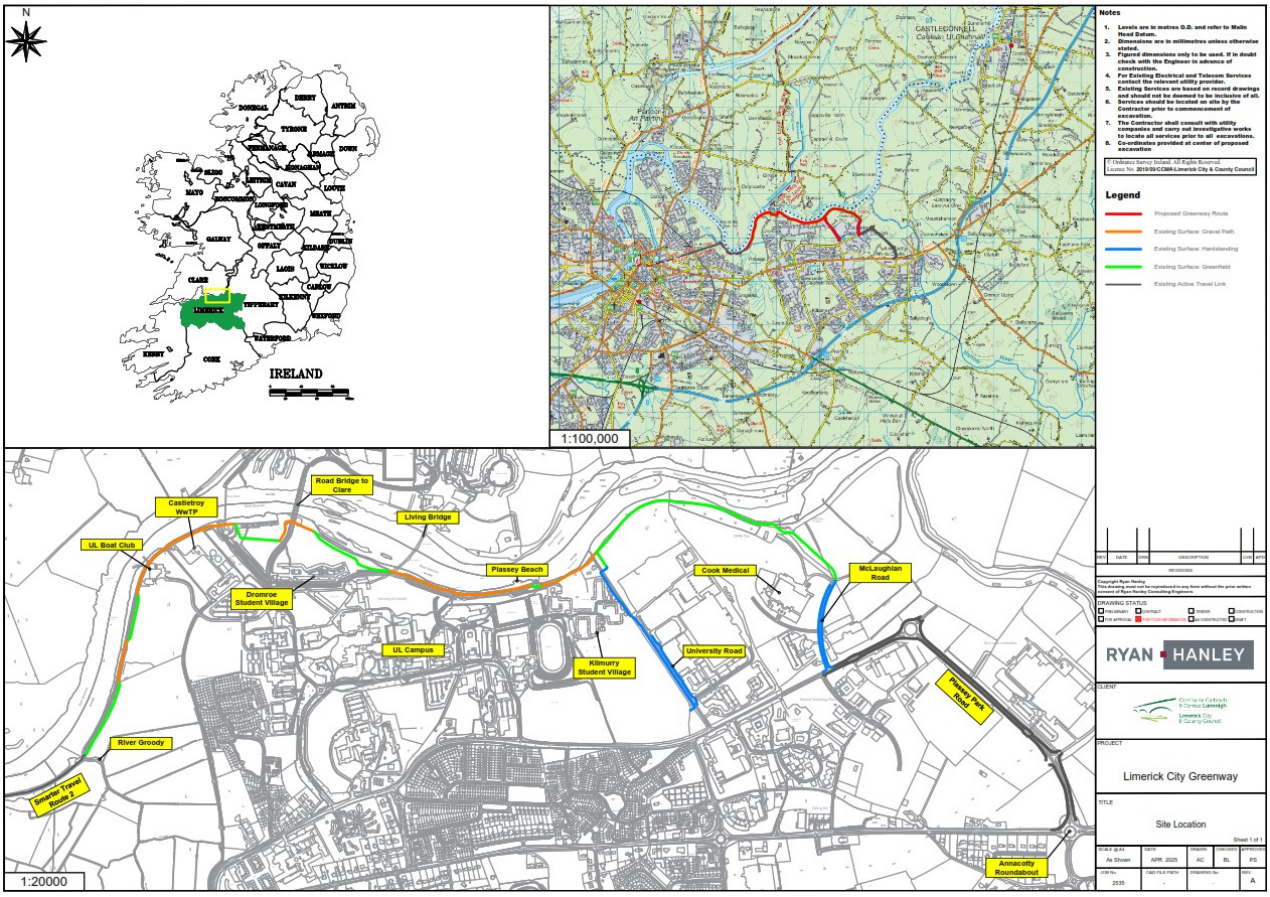

Figure 2-4 Route of the proposed cycle path upgrade

3. WFD Baseline Data

The WFD water body affected by the proposed cycle path upgrade is the 'Shannon (Lower)_060' (IE_SH_25S012600)

Although WFD cycle 2 survey data is not available for this water body, it is not listed as a priority. The 'Shannon (Lower)_060' water body WFD status is 'Unassigned', is classified as 'not at risk' (EPA, 2018). WFD classes and Q-Values were obtained from the National River Macroinvertebrate Surveys in Ireland, 2007 – 2018 (Feeley *et al*, 2020).

Table 3-1 WFD information for Shannon (Lower) 060

Water body name	Shannon (Lower)_060	
Water body ID	IE_SH_25S012600	
Water body length (km)	60.21	
Cycle 1 RBD	Shannon	
Heavily modified	Unknown	
Q-Value (Feeley *et al*, 2020)	3-4; slightly polluted	
WFD Class (Feeley *et al*, 2020)	Moderate	
Classification element	**2010 - 2012**	**2013 - 2018**
Ecological Status or Potential	Unassigned	Unassigned
Supporting Chemistry Conditions	Pass	Pass
General Conditions	Pass	Pass
• Oxygenation Conditions	Pass	Pass
- *Dissolved Oxygen (% sat)*	Not assessed	Pass
- *Other determinand for oxygenation conditions*	Not assessed	High
• Acidification Conditions	Pass	Pass
- *pH*	Pass	Pass
• Nutrient Conditions	Pass	Pass
- *Nitrogen Conditions*	High	High
- *Nitrate*	High	High
- *Ammonium*	High	High
• Phosphorous Conditions	High	High
- *Orthophosphate*	High	High

From the Environmental Protection Agency; catchments.ie

Data concerning significant pressures for the Shannon (Lower)_060 water body were not available. However, the adjoining upstream water body, 'Shannon (Lower)_50' is cited as being under significant pressure from 'hydromorphology' and 'urban wastewater treatment plants' (EPA, 2018).

4. Scheme Proposals

A final design for the upgrade of the current cycle path has not been decided upon, but it is understood that this will largely consist of upgrades to the surface of the current cycle path, with three areas requiring bridge structures to be constructed.

A summary of the proposed works is presented in Table 4-1. The works programme and methodologies for the works and subsequent upgrade of the cycle path will be selected by the Works Contractor at a later date. Therefore, design drawings and a method statement are unavailable at this time.

Table 4-1 Summary of construction proposals on southern bank of the River Shannon

Locations	R 60618 58504, R 60761 58585, R 61883 58394
Modification type	Sheet piles to be driven into the riverbank at all three locations for temporary periods during summer periods
Channel component modified	Bank material and geometry; single bank.
Length of river modified	**Not Applicable**.
Construction materials	Sheet piling, concrete.
Extent of impact	Limited to temporary, short-term in-channel impacts

5. Preliminary assessment of impacts

A preliminary assessment has been undertaken to evaluate the possible impacts of the proposed cycle way upgrade on the range of biological, chemical, hydromorphological and physico-chemical elements defined under the WFD. The assessment involved a five-step process which is summarised in the following sub-sections.

5.1 Impact of the scheme on WFD quality elements

A summary of likely impacts of the proposed cycle way upgrade on WFD classification elements is presented in Table 5-1. Overall, the proposal is not expected to result in long- term deterioration of ecological potential of the River Mulkear or the River Shannon, though there may be short-term impacts on local water quality and habitat quality within the footprint of the works and downstream.

5.2 Cumulative effects

Although individually a scheme may have an insignificant impact on WFD quality elements within a reach, the combined effect of several schemes within a water body may cause deterioration. The cumulative effects of existing pressures and other planned schemes that may have similar effects within a water body must be considered in combination with the impacts of the proposed scheme.
The proposed Bridge and Ramp construction works represent a standalone project relating to the improvement of the current cycle path, which is not part of a broader scheme of physical modifications planned on the River Shannon.

5.3 Impacts on critical habitats or species

If a scheme is likely to impact critical or sensitive habitats or species, either directly or indirectly, additional investigations may be required. Critical habitats are either of unique importance or offer a rare combination of features that are critical to the ecological health of the water body. Sensitive habitats are those which are intolerant to change and have low recoverability.

The Shannon (Lower)_060 water body is part of the Lower River Shannon SAC, which is designated for a number of species and one habitat type found in rivers. Whilst the works do not require work to be carried out in the channel itself, the proximity of these works to the watercourse may cause a number of impacts on the species and habitats of the River Shannon, both within the footprint of the works and further downstream. These impacts are discussed further in Table 5-1 , but are broadly categorised as follows:

- Noise and disturbance. Increased human activity and the use of construction and hydraulic piling equipment in the vicinity of designated sites may cause noise and/ or disturbance to designated species and habitats.

- Spread of invasive non-native species (INNS). Movement of personnel and equipment into and out of the construction area represents a risk of introducing, spreading and translocating invasive non-native species (INNS), to the detriment of designated species and habitats. Several INNS are already present within the Shannon catchment, including Himalayan balsam (*Impatiens glandulifera)* and giant hogweed (*Heracleum mantegazzianum*).

- Loss of riparian and/ or marginal habitat. There may be temporary or permanent loss of riparian and marginal habitat during both the pre- and post-construction phases.
- Reduction in habitat and/ or water quality. The works are unlikely to increase the rate of erosion of the riverbank and will have mitigation measures to prevent sediment entering the watercourse. Failure to implement mitigation measures could cause reductions in local habitat and water quality, with impacts on a number of protected fish and macroinvertebrate species.
- Pollution. The use of construction equipment in the vicinity of the watercourse presents a risk of chemical discharges in the form of fuel spills.

5.4 Impacts on proposed RBMP improvement measures

Water bodies at less than good status or potential have a series of proposed improvement and/ or mitigation measures that are intended to bring the water body up to Good Ecological Status (GES) or Good Ecological Potential (GEP). Any new scheme or activity could potentially compromise or render proposed improvement or mitigation measures ineffective which could prevent the water body from meeting its ecological objective. Under WFD, activities cannot prevent a water body from meeting the GES/ GEP by the objective deadline, by invalidating improvement measures.

The River Shannon is achieving a Passing Ecological Status/ Potential but is classed as slightly polluted and achieving a 'Moderate' WFD class with regard to macroinvertebrate communities.

Although the river does not have Reasons for Not Achieving Good status (RNAG), the River Shannon is considered to be under significant pressure from hydromorphology and urban wastewater treatment plants. The proposed works are not anticipated to cause significant changes to river hydromorphology, nor to interact with urban runoff, and are not considered to contradict objectives for the River Shannon.

5.5 Inclusion of GES/ GEP improvement measures

The approximate length of the River Shannon which will be impacted by the proposed works is 3 km, compared to a total length of 360.5 km for the entire River Shannon watercourse. It is therefore not considered feasible to incorporate GEP improvement measures into a scheme of this scale, i.e. it will not be possible to realise measurable benefits at the water body scale.

Table 5-1 Summary of impacts on WFD classification elements

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
Fish	Noise and disturbance during works.	Localised to within works footprint (<25 m), but over a length of approximately 3km of the water body (i.e. the full length of the cycle path along the riverbank). Possible temporary delays to migratory movements during seasonal windows.	Conduct work during standard daylight operating hours; avoid construction works during key periods of seasonal sensitivity if feasible.	No deterioration in WFD potential is anticipated.	No.
	Introduction and/ or spread of invasive non-native species.	Movement of INNS into and out of the construction area.	Adopt 'Check, Clean, Dry' procedures[1] when working around site.		
	Loss of riparian and/ or marginal habitat within the immediate footprint of the works.	Any permanent loss of riparian habitat is localised to works footprint; temporary loss of marginal habitat may occur during the works.	None required – any in-stream habitat loss will be temporary and limited to the duration of the works.		
	Reduction in habitat and/ or	Construction works have potential to increase	Use of silt fences during bridge and ramp constrcution works to		

[1] http://www.nonnativespecies.org/checkcleandry/

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
	water quality during works.	the volume of sediment entering the river. Generally short-term (i.e. during construction), but over a length of approximately 2km of the water body (i.e. from the most upstream construciton site to the downstream extent of the cycle path), with the possibility of further downstream impacts.	temporarily trap sediment.		
	Pollution during works.	Risk of localised pollution incidents with the possibility of effects extending further downstream.	Conduct works in accordance with best practice guidance for pollution prevention.		
Macroinvertebrates	Noise and disturbance during works.	None – noise and disturbance on the riverbank is not likely to affect this species group.	None required – negligible impact.	No deterioration in WFD potential is anticipated.	No.
	Introduction and/or spread of invasive non-native species.	Generally short-term (i.e. during construction), but over a length of approximately 3km of the water body, with the possibility of further	Adopt 'Check, Clean, Dry' procedures when working around site.		

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
		downstream impacts.			
	Loss of riparian and/ or marginal habitat within the immediate footprint of the works.	Temporary loss of marginal habitat may affect some macroinvertebrate groups which use this habitat, but this impact would be negligible when considering the number of individuals affected.	None required – negligible impact.		
	Reduction in habitat and/ or water quality during works.	Construction works could cause an increase in the volume of sediment entering the river. Generally short-term (i.e. during construction), but over a length of approximately 2km of the water body (i.e. from the most upstream construction site to the downstream extent of the cycle path), with the possibility of further downstream impacts.	Use of silt fences during the works to temporarily trap sediment.		
	Pollution during works.	Risk of localised pollution incidents with the possibility of effects extending further	Conduct works in accordance with Guidance for Pollution Prevention.		

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
		downstream.			
Macrophytes	Noise and disturbance during works.	No impact pathway, therefore, no impact.	None required – no impact.	No deterioration in WFD potential is anticipated.	No.
	Introduction and/or spread of invasive non-native species.	As works will not be taking place in the water, the risk of introduction of aquatic INNS is negligible in tandem with standard 'Check, Clean, Dry' procedures.	Adopt 'Check, Clean, Dry' procedures when working around site.		
	Loss of riparian and/ or marginal habitat within the immediate footprint of the works.	No impact likely – loss of riparian and marginal habitat is not expected to affect in-stream macrophytes.	None required – no impact.		
	Reduction in habitat and/or water quality during the works.	Construction works could cause an increase in the volume of sediment entering the river. Generally short-term (i.e. during construction), but over a length of approximately 2km of the water body (i.e. from the most upstream construction site to the	Use of silt fences during works to temporarily trap sediment.		

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
		downstream extent of the cycle path), with the possibility of further downstream impacts.			
	Pollution during works.	Risk of localised pollution incidents with the possibility of effects extending further downstream.	Conduct works in accordance with Guidance for Pollution Prevention.		
White-clawed crayfish	Noise and disturbance during works.	Noise and disturbance should not impact crayfish or their habitat – impacts are therefore anticipated to be negligible.	None required – negligible impact.	No deterioration in WFD potential is anticipated.	No.
	Introduction and/or spread of invasive non-native species.	Ireland remains the only part of the EU with no introduced crayfish species. Multiple occurrences of crayfish plague have been reported in a number of rivers in Ireland since 2015, though no records have been reported on the River Shannon (NBDC, 2021). The risk of introduction of INNS significant to crayfish is therefore considered to	None required – negligible impact.		

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
		be negligible in tandem with standard 'Check, Clean, Dry' procedures.			
	Loss of riparian and/or marginal habitat within the immediate footprint of the works.	White-clawed crayfish show a preference for large stony substrate as refugia (Peay, 2002), and are therefore not likely to be impacted by loss of marginal habitat.	None required – no impact.		
	Reduction in habitat and/or water quality during the works.	Siltation and reductions in water quality are identified as two main threats to white-clawed crayfish (Peay, 2002). Excess sediment runoff may reduce local habitat quality and cause an increase in the volume of sediment settling on the substrate in areas of slower flow further downstream.	Use of silt fences during works to temporarily trap sediment.		
	Pollution during works.	Risk of localised pollution incidents with the possibility of effects extending further downstream.	Conduct works in accordance with Guidance for Pollution Prevention.		

6. Summary and conclusions

A preliminary WFD assessment has been conducted to determine the likely impacts of upgrading the cycle path from The Groody River bridge to 50m west of Troy Castle in Castletroy, Co. Limerick. The proposals involve upgrading the existing path, with bridge and ramp construction works planned at three locations on the southern bank of the River Shannon.

There is one WFD water body affected by the proposal. The 'Shannon (Lower)_060 - IE_SH_25S012600' water body does not currently have a WFD status assigned to it but is classified as 'not at risk' (EPA, 2018), and is achieving a Moderate WFD classification for macroinvertebrates (Feeley *et al*, 2020).

Based on the current initial plans for implementation of the upgrade, the proposed works are not expected to cause the WFD classification of either water body to deteriorate, or to prevent either water body from achieving their objective of GEP.

On this basis, a detailed impact assessment is not considered necessary, as the proposed works are deemed to be compliant with the WFD. However, this may need to be re-evaluated once a method statement and design drawings have been made available by the Works Contractor.

7. References

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