Appropriate Assessment Screening for the placement of a footpath along the north boundary of Condell Road, Limerick City

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1. Introduction

Rory Dalton Ecology was appointed by Limerick County Council to undertake an Appropriate Assessment Screening for a proposed footpath along the north boundary of Condell Road, Limerick City work. The proposal involves approximately 2km of footpath along the north boundary of the Condell Rd. Of this, approximately 500m currently exists as the gravel footpath on the south bank of the Westfields Wetlands. The remaining 1.5km is to be placed adjacent to Condell Road, on the north side, and within an existing mound that was left after the construction of Condell Road. This mound is made up of unsorted mixed gravel and soil which resembles mixed alluvial till. The mound is vegetated mainly with grasses and there is a mowing regime in place. The eastern 1200m of the proposal is within the Lower River Shannon SAC and close to (within 15m) the River Shannon and River Fergus Estuaries SPA. The western 800m of the proposal is veers away from these Natura 2000 sites.

This Appropriate Assessment Screening Report outlines the results of a Habitats Directive Stage 1 Screening Assessment for the proposed work. It has been undertaken in order to comply with the requirements of the Habitats Directive Article 6(3). The function of this Screening Statement is to provide information that will facilitate the competent authority in completing a Stage 1 Screening Assessment of the proposed project's potential to result in likely significant effects to the Conservation Objectives of Natura 2000 Sites either alone or in-combination with other plan or projects.

1.1. Appropriate Assessment Process

An Appropriate Assessment is undertaken to establish if any proposed plan or project is likely to have a significant effect or impact on any site that has been designated under: the E.U. Habitats Directive (92/43/EEC) i.e. SAC; or the E.U. Birds Directive (79/409/EEC as amended 2009/147/EC) i.e. SPA. Collectively, SAC's and SPA's are known as Natura 2000 sites. The need to undertake one or more stages of this process has arisen from Articles 6(3) and 6(4) of the aforementioned Habitats Directive; where the former Article is primarily concerned with the protection of sites from likely significant effects and the latter allows derogation from such protection in very specific circumstances involving imperative reasons of overriding public interest.

Article 6(3) of the Habitats Directive requires that:

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."

And Article 6(4) of the Habitats Directive requires that:

"If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative

reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted."

In Stage 1, a screening process is undertaken to identify likely significant effects on a Natura 2000 site are likely to arise from the project or plan in question. If significant effects are likely to occur or if it is unclear whether significant effects are likely to occur, then the process moves on to Stage 2 where an AA considers potential mitigation measures for adverse effects. If it is considered that mitigation measures will not be able to satisfactorily reduce potential adverse effects on a Natura 2000 site then an assessment of alternative solutions is considered in Stage 3. This is then followed by Stage 4 in the event that adverse effects remain and the proposed activity or development is deemed to be of Imperative Reasons of Overriding Public Interest (IROPI), allowing an assessment of compensatory measures to be considered. The outcome of a Stage 2 and higher assessment is presented in a report known as a Natura Impact Statement (NIS). While an AA NIS is provided by the advocate of the plan or project in question, the AA NIS itself is undertaken by the competent authority.

1.2. Methodology

Documents associated with the proposed project and relevant ecology databases were consulted as part of this assessment. Furthermore, the following guidelines were used in the completion of this assessment;

- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – European Commission Methodical Guidance on the provisions of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (European Commission 2001)
- Integrated Biodiversity Impact Assessment – Streamlining AA, SEA and EIA Processes: Practitioner's Manual (EPA 2013)
- Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DoEHLG 2009)
- European Commission (2018). Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. Brussels, 21.11.2018 C(2018) 7621 final.

The Screening Stage of Appropriate Assessment is used to identify whether the Plan, either alone or in combination with other plans or projects, is likely to have a significant effect on a Natura 2000 site. This report follows European Commission (2001) guidance which recommends that screening should follow a four step process as outlined below:

1. : Determine whether the plan is directly connected with or necessary to the management of the site. If it is, then no further assessment is necessary.
2. : Describe the plan and other plans and projects that, 'in combination', have the potential to have significant effects on a European site.
3. : Identify the potential effects on the European site.
4. : Assess the significance of any effects on the European site.

2. Brief Description of the Site and Proposed works

The proposal involves approximately 2km of footpath along the north boundary of the Condell Rd. Of this, approximately 500m currently exists as the gravel footpath on the south bank of the Westfields Wetlands; between Condell Road and the Westfields Wetlands. The remaining 1.5km is to be placed adjacent to Condell Road, on the north side, and within an existing mound that was left after the construction of Condell Road. This mound is made up of unsorted mixed gravel and soil which resembles mixed alluvial till. The mound is vegetated mainly with grasses and there is a mowing regime in place. Underneath this mound there is a drainage system for carrying rainfall from the Condell Road, as evidenced by the manhole covers dotted along the footprint of the proposal.

It is proposed to excavate ~250mm below the level of the kerb and build the road up with various grades of gravel to finish at the kerb level with asphalt. Prior to excavation, it is proposed to "peg out" the works with pegs at 10m intervals for the stretch or footpath that is within the SAC, and no machinery allowed outside the pegged line. The pegs are to be 2.5m from the kerb for the majority, and 3m from the kerb where the slope of the mound requires a 45 degree cut. The finished footpath will be 2m wide; excavation outside of this 2m wide strip will be kept to a minimum and will only be carried out in order to stabilise a slope, if needs be, with a 45 degree cut. All excavated material within the SAC is to be carried off site and managed appropriately within a licensed facility. The existing kerb will prevent run-off from the main road from entering the excavation for the footpath, and eventually potentially entering the Westfields Wetlands.

Section 4.2 of the Westfields Wetlands Consultation Workshop Report (2019) outlined the following infrastructural developments to improve the amenity and educational value of the wetlands area: "upgrading of existing walkways, provision of additional walkways, improved pedestrian access from the road, improved accessibility and family-friendly features...links to other walking routes in the City."

Condell Road is essentially a causeway, being elevated above its surrounding lands. At either side of the western half of the road are the low lying plains of Clonmacken and Caherdavin which are drained by an OPW embankment-sluice scheme. Surrounding the eastern half of the road to the south is the upper reaches of the Shannon Estuary, to the north is Westfields Wetlands.

The Shannon Estuary is part of the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. The Westfields Wetlands are part of the Lower River Shannon SAC. Condell Road itself is part of the Lower River Shannon SAC. A description of segments of the proposal which has been prepared below; these segments are defined by similarities in characteristics rather than being of a set length.

Segment 1
There exists a patch of winter heliotrope underneath adjacent to the hand rail which is to be removed to connect the proposed path to the existing path. This is an invasive plant and as such the excavated soil should be removed separately or else placed on top of the existing winter heliotrope which will not have to be removed to make way for the path. The footprint of the proposed footpath within this section consists of mown grass (GA1, amenity grassland) which is of lower value local importance ecologically. This mown grass area is flat and wide and there is ample room for the proposal. This is outside the SAC and SPA and

there is no direct hydrological connection as precipitation imparting on the existing footprint percolates to groundwater. Some light trimming of vegetation may be required in places.

Segment 2
Within the last 6 months (as of February 2021), earthworks have taken place within this section. What currently exists is exposed unsorted mixed gravel and soil (ED1), with some plant regeneration in places (ED3). There are new kerbs in place also. Two developments are taking place, on each side of the road. To the north of the road is a large housing development. The development to the south could not readily be defined as it was in the early stages. During both site visits, heavy plant, including excavators and dumpers, were operational within both development sites, and a steady stream of trucks were delivering crushed stone to the northern development.

Segment 3
The road is 3-5m above the surrounding lands of Clonmacken and Caherdavin. The slopes of the causeway/embankment are covered in scrub (WS1) which consists of willow, blackthorn, gorse bramble, ash, buddleja, hawthorn and horse chestnut, with some purposely planted oaks which still retain their supporting post and rubber attachment. There was quite a bit of rubbish dumped on the slopes, some of which was contained within larger black plastic bags indicating large scale dumping and not just the discarding of litter. A car was also present at the bottom of the embankment slope; the car had sustained quite a bit of damage from driving it around the lower land as evidenced by flattening of the vegetation and the presence of its various parts next to more robust vegetation. Immediately adjacent to the Condell Road, within the footprint of the proposed footpath, is a linear strip of grass which is regularly mown (GA2).

Segment 4
This section is the section bordering Ted Russel Park. Within the park, there exists a newly placed tarmacadam path running parallel to the Condell road 10m north of the road. It may be decided to utilise the existing tarmacadam path rather than creating a new one adjacent to the road. If not, the path will be carried on adjacent to the road, and will require the removal of a mound 0.7m tall and 3m wide, and would amount to a sizeable amount of excavated material being removed from the site. Excavation of this mound may damage the row of mature/semi-mature ornamental birch trees which have been planted along the road. The current habitat here is scattered trees and parkland (WD5). This segment is within the Lower River Shannon SAC.

Segment 5
Directly east of the entrance to Ted Russel Park, and north of the road, there exists alluvial woodland. It is within the Lower River Shannon SAC and is a designated feature. It consists of a variety of willow species/hybrids, some of which are tall and thin, some of which are short and bushy. The woodland exists approximately 2.5m below the level of the road at what appears to be the original level of the land before the road was built up. Again, between the road and the embankment slope is a relatively flat piece of mown grass ~3m wide; this is the footprint of the 2m wide proposed footpath. Adjacent to the Ted Russel Park entrance, a tall willow from within the woodland has fallen onto the embankment and the footprint of the proposed works. The branches, which are covering the proposed path, will require trimming; these branches would constitute the tip of the tree were it still standing. There is no need to cut the tree itself, just trim the thin, wispy branches which are now lying over the proposed route. This tree is still alive and **will not be removed**. The footprint of the proposed footpath

continues as a strip of mown grass eastwards flanking the woodland to its north. Approximately 300m east of the entrance to Ted Russel Park, the woodland grades to a linear scrub feature (willow, bramble, planted oak and maple, all intertwined with brambles) for ~150m until it grades back into alluvial woodland. At the point R56111 56759 (National Grid 10 Digit), a patch of vegetation 6m long and 3m wide will need to be removed. This patch of vegetation consists of buddleja and bramble growing around the wind-thrown branches of a dead tree which has lost all identifiable features.

Segment 6

This section is characterised by a sycamore treeline flanking the proposed pathway to its north, between the pathway and the large open reed swamp (FS1) to the north. The trees are planted half way down the embankment slope. The wetland is approximately 2.5m below the level of the road. Again, between the road and the embankment slope is a relatively flat piece of mown grass 3-4m wide; this is the footprint of the 2m wide proposed footpath.

Segment 7

This section of the pathway already exists. It is a gravel footpath which flanks the lake section of Westfield Wetlands. The gravel road undulates slightly and is 2m lower than the road, just above the level of the lake. The gravel path is flanked by mown grass. This section currently receives heavy pedestrian traffic with families, walkers, dog walkers and cyclists. The bird population appear accustomed to this traffic.

1
2
3
4
5
6
7
200 m

4. Natura 2000 Sites and the Potential for Negative Impacts

4.1 Sources and Pathways for Pollution

The Shannon estuary exists at the opposite side of Condell Road. The Westfield Wetlands exists to the north. As a result, the proposal has the potential to input sediment and other substances which can become soluble or suspended in water into the estuary and the wetlands. The rainfall run-off from Condell road runs into a drain under the road. It could not be determined where the water goes after that, however, the rainfall that will be incident on the footprint of the proposed path will percolate through the ground due to the presence of the concrete kerb which will contain incident rainfall and also prevent water from the road from making its way into the works footprint. The fact that the footprint of the proposal is a long narrow strip on what is essentially flat ground will promote percolation rather than surface run-off. The subsoil of the footprint is unsorted mixed gravel, sand and soil which resembles mixed alluvial till; drainage capacity is high. Suspended solids usually associated with digging and gravel placement will be contained within the footprint of the excavation and will percolate to the ground. The sealing of the path with tarmacadam will cease the permeability of the footprint and rainwater will instead permeate the adjacent soil. Also, since the tarmacadam finish will be brought to the level of the kerb, rainfall run-off will likely be allowed over the kerb onto the road and down the storm drains

4.2 The Natura 2000 sites to be included in this assessment

Natura Site	Reason for Inclusion in the current Screening	Distance From the Project Site
Lower River Shannon SAC (002165)	Proposed works within 15km of protected area	Proposed works would be within the SAC
River Shannon and River Fergus Estuaries SPA (004077)	Proposed works within 15km of protected area	Proposed works would be adjacent to the SPA
Glenomra Wood SAC (001013)	Proposed works within 15km of protected area	Proposed works would be, at the closest point, 10.7 km from this site
Tory Hill SAC (000439)	Proposed works within 15km of protected area	Proposed works would be, at the closest point, 12.5km from this site
Askeaton Fen Complex (002279)	Proposed works within 15km of protected area	Proposed works would be, at the closest point, 12.8 km from this site
Danes Hole, Poulnalecka SAC (00030)	Proposed works within 15km of protected area	Proposed works would be, at the closest point, 14.6 km from this site

4.3 Assessment of Potential Impacts to each Conservation Interest of each Natura 2000 Site

Natura site	Distance from the project	Conservation Interests	Assessment of Potential Impacts	Is mitigation needed?
Lower River Shannon SAC (002165)	Proposed works would be adjacent to, and partially entering, the site	[1110] Sandbanks	No significant negative impacts are envisaged for these habitats. These habitats do not exist within the footprint of the works, they exist further out the estuary. Given the small scale of the project,the manner in which it is being carried out, it is safe to say these habitats won't be impacted.	No
		[1130] Estuaries	The Shannon estuary exists at the opposite side of Condell Road, and as a result, the proposal has the potential to input sediment and other substances which can become soluble or suspended in water into the estuary. As detailed at length in section 4.1 above, the rainfall run-off from Condell road runs into a drain under the road, and it could not be determined where it goes after that, however, the rainfall that will be incident on the footprint of the proposed path will percolate through the ground due to the presence of the concrete kerb which will contain incident rainfall and also prevent water from the road from making its way into the works footprint.	No
		[1140] Tidal Mudflats and Sandflats		No
		[1150] Coastal Lagoons*	A coastal lagoon is a lake or pond that is fully or partially separated from the sea by a permeable barrier that can be entirely natural such as shingle, or can be an artificial embankment. As such, the Westfields Wetlands, due to the particulars of the site, has the potential to be a lagoon. The Conservation Objectives supporting document on Lagoons for the Lower River Shannon SAC lists 4 lagoons as being present within the SAC- Shannon Airport Lagoon 24.2ha; Cloonconeen Pool 3.9ha; Scattery Lagoon 2.8ha; Quayfield and Poulaweala Loughs 2.5ha. There is no mention of the Westfields Wetlands being classified as a lagoon, and so no impacts on this habitat is envisaged	No
		[1160] Large Shallow Inlets and Bays	These habitats do not exist within the footprint of the works, they exist further out the estuary. Given the small scale of the project,the manner in which it is being carried out, it is safe to say these habitats won't be impacted.	No
		[1170] Reefs		No
		[1220] Perennial Vegetation of Stony Banks	These habitats do not exist within the footprint of the works. Given the small scale of the project,the manner in which it is being carried out, it is safe to say these habitats won't be impacted.	No
		[1230] Vegetated Sea Cliffs	These habitats do not exist within the footprint of the works, they exist further out the estuary. Given the small scale of the project,the manner in which it is being carried out, it is safe to say these habitats won't be impacted.	No

		[1310] Salicornia Mudflats	These habitats do not exist within the footprint of the work. Given the small scale of the project,the manner in which it is being carried out, it is safe to say these habitats won't be impacted.	No
		[1330] Atlantic Salt Meadows		No
		[1410] Mediterranean Salt Meadows		No
		[6410] Molinia Meadows		No
		[3260] Floating River Vegetation		No

		[91E0] Alluvial Forests*	Alluvial forest exists within much of the Westfields Wetlands. It mostly exists within the western half of Westfields Woodlands. It exists adjacent to Segment 5 of the proposed footpath, and and does not exist adjacent to any other Segments. The woodland exists approximately 2.5m below the level of the road at what appears to be the original level of the land before the road was built up. As seen across the site, between the road and the embankment slope is a relatively flat piece of mown grass ~3-3.5m wide; this is the footprint of the 2m wide proposed footpath. Adjacent to the Ted Russel Park entrance, a tall willow from within the woodland has fallen onto the embankment and the footprint of the proposed works. The branches, which are covering the proposed path, will require trimming; these branches would constitute the tip of the tree were it still standing. It is **not** proposed to cut the tree itself, just trim the thin, wispy branches which are now lying over the proposed route out towards the road. This tree is still alive and will not be removed. This work does not constitute a loss of the overall habitat area as it is trimming of the tip of a tree which has fallen out towards the road; no works will be carried out inside the woodland. The footprint of the proposed path continues as a strip of mown grass eastwards flanking the alluvial woodland to its north. Approximately 300m east of the entrance to Ted Russel Park, the woodland grades to a linear scrub feature (willow, bramble, planted oak and maple, all intertwined with brambles) for ~150m until it grades back into alluvial woodland. At the point R56111 56759 (National Grid 10 Digit), a patch of vegetation 6m long and 3m wide will need to be removed. This patch of vegetation consists of buddleja and bramble growing around the wind-thrown branches of a dead tree which has lost all identifiable features. It is proposed to remove the buddleja carefully by hand along with the fallen tree to bring the edge of the vegetation back in line with nearby vegetation. The buddleja are large and producing a large quantity of seed; their removal will lessen risk to the nearby alluvial woodland in terms of invasive plant ingress. Invasive plants are identified as a threat within the conservation objectives document for the SAC and within the woodlands supporting document for the SAC Disruption to the water table/drainage regime of an alluvial woodland is often a threat associated with the placement of a linear development such as a road or even a footpath. In this case however, the footpath is elevated 2.5m above the woodland upon the causeway, and the foundation for the footpath will have no influence on the hydrological regime of the woodland as it is perched well above the woodland. Infilling of alluvial woodland from developments (or other sources) is listed in the woodlands supporting document as a threat to the conservation of alluvial woodlands. However, in this case, all excavated material will be carried off site and disposed of appropriately. In addition to this, prior to excavation, it is proposed to “peg out” the works with pegs at 10m intervals for the stretch that is within the SAC, and no machinery allowed outside the pegged line. The pegs are to be 2.5m from the kerb for the majority, and 3m from the kerb where the slope of the mound requires a 45 degree cut. The finished footpath will be 2m wide; excavation outside of this 2m wide strip will be kept to a minimum and will only be carried out in order to stabilise a slope, if needs be, with a 45 degree cut	No

		[1029] Freshwater Pearl Mussel (Margaritifera margaritifera)	Freshwater Pearl Mussel do not occur in the Shannon Estuary.	No
		[1095] Sea Lamprey (Petromyzon marinus)	A deep bed of soft sediment exists under much of the Westfield Wetlands, however, the wetlands are not suitable for any of the 3 lamprey species as there is no suitable spawning habitat draining into the wetlands. Adult and, depending on salinity, juvenile lamprey exist within the estuary across the Condell road, however, due to the nature and scale of the works, no impacts to these species are envisaged.	No
		[1099] River Lamprey (Lampetra fluviatilis)		No
		[1096] Brook Lamprey (Lampetra planeri)		No
		[1106] Atlantic Salmon (Salmo salar)	This species does not exist within the Westfieelds Wetlands. Upward migrating adults and downward migrating smolts occupy the Shannon Estuary across the Condell road, however, due to the nature and scale of the works, no impacts to this species are envisaged.	No
		[1349] Bottle-nosed Dolphin (Tursiops truncatus)	These animals exist out in the open estuary far downstream of the proposed works.	No
		[1355] Otter (Lutra lutra)	An otter holt survey was carried out on 16.2.2021 and found no holts present on or near the site. Disturbance from machinery is not likely to be elevated greatly from the normal traffic of the town and road and work will most likely be carried out during daylight hours in line with normal ground works practice; otter tend to be a crepuscular creature operating mainly at dawn and dusk. No impacts are envisaged for this species	No

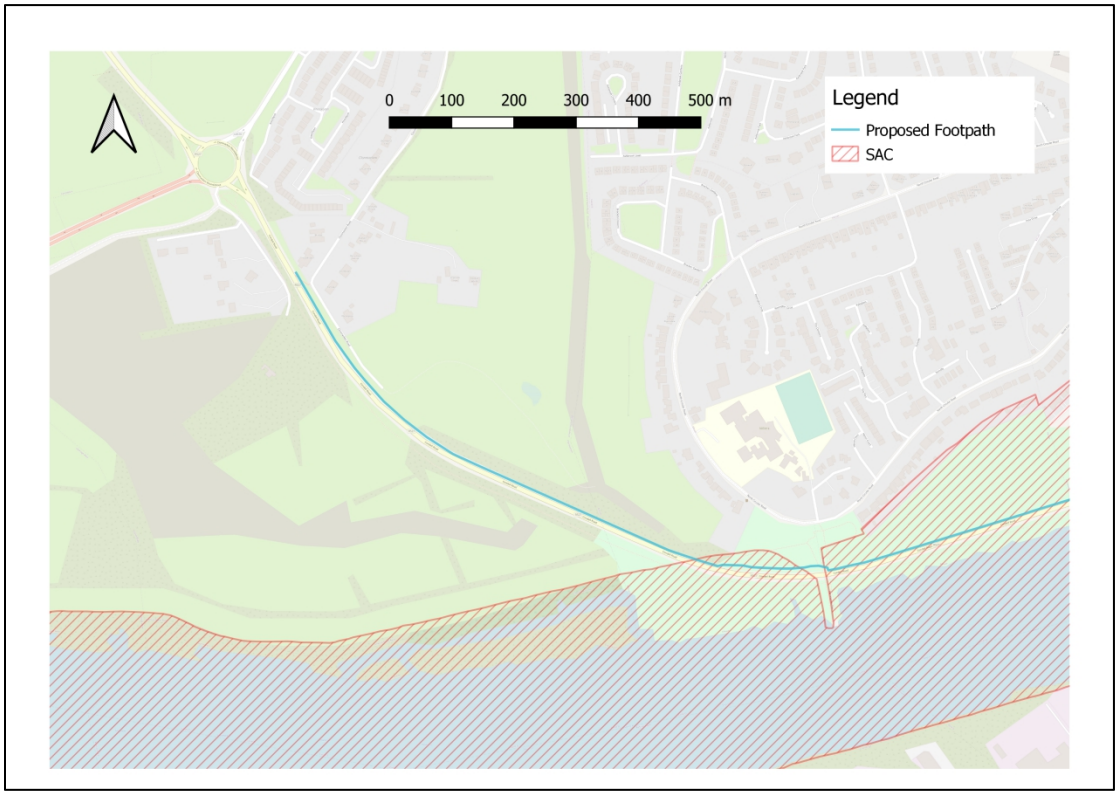
Natura site	Distance from the project	Conservation Interests	Assessment of Potential Impacts	Is mitigation needed?
River Shannon and River Fergus Estuaries SPA (004077)	The SPA boundary is 3-5m south of Condell road, the proposed path is immediately north of Condell road	[A017]Cormorant (Phalacrocorax carbo)	For a stretch of ~800m of Condell Road, the SPA is approximately 30m south of the proposed path, across the Condell Road. The Westfields Wetlands is not within the SPA. The SPA is designated for 20 wintering bird species and one wintering and breeding bird species (cormorant). The low tide counts surveyed between October 2010 and February 2011 show that the activity of most designated birds took place further out the estuary with 3 exceptions; redshank (mild activity near the city), cormorant (mild activity near the city) and black headed gull (heavy activity near the city). This area of the estuary is separated from the proposed works by a treeline, a pedestrian walkway and the Clondell road. In terms of disruption, both the construction and operational phase of the project are not likely to be elevated much above the disruption levels already present with large amounts of urban traffic and heavy plant using the road. At the eastern end of the proposed site, a large number of waterbirds were using the open water section of the Westfields Wetlands. Of these, scaup, teal and black-headed gull were designated as being protected in the nearby SPA. Surrounding this area of open water, is an existing pedestrian walkway; there is little or no vegetative cover between the path and the water, and dispite this, the birds seemed at ease with the presence of people. It is planned to join the proposed footpath to this existing pedestrian footpath. West of this section, between the wetlands and the site, there is a thick strip of vegetation (partly woodland, partly scrub, partly treeline), this will reduce visibility and provide a barrier to the reed dominated areas of the wetlands further west which, though not within the SPA, are important to a variety of bird species, both wintering and breeding.	No
		[A038]Whooper Swan (Cygnus cygnus)		No
		[A046]Light-bellied Brent Goose (Branta bernicla hrota)		No
		[A048]Shelduck (Tadorna tadorna)		No
		[A050]Wigeon (Anas penelope)		No
		[A052]Teal (Anas crecca)		No
		[A054]Pintail (Anas acuta)		No
		[A056]Shoveler (Anas clypeata)		No
		[A062]Scaup (Aythya marila)		No
		[A137]Ringed Plover (Charadrius hiaticula)		No
		[A140]Golden Plover (Pluvialis apricaria)		No
		[A141]Grey Plover (Pluvialis squatarola)		No
		[A142]Lapwing (Vanellus vanellus)		No
		[A143]Knot (Calidris canutus)		No
		[A149] Dunlin (Calidris alpina)		No
		[A156]Black-tailed Godwit (Limosa limosa)		No
		[A157]Bar-tailed Godwit (Limosa lapponica)		No
		[A160]Curlew (Numenius arquata)		No
		[A162]Redshank (Tringa totanus)		No
		[A164]Greenshank (Tringa nebularia)		No
		[A179]Black-headed Gull (Chroicocephalus ridibundus)		No
		[A999]Wetland and Waterbirds		No

Natura site	Distance from the project	Conservation Interests	Assessment of Potential Impacts	Is mitigation needed?
Glenomra Wood SAC (001013)	Proposed works would be, at the closest point, 10.7km from this site	[91A0] Old sessile oak woods with Ilex and Blechnum in the British Isles	The scale and nature of the works, in combination with the distance from Glenomra Wood ensure that there will be no negative impacts.	No
Tory Hill SAC (000439)	Proposed works would be, at the closest point, 12.5km from this site	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	The scale and nature of the works, in combination with the distance from Tory Hill ensure that there will be no negative impacts.	No
		Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210]		No
		Alkaline fens [7230]		No
Askeaton Fen Complex SAC (0002279)	Proposed works would be, at the closest point, 12.8 km from the site	[7210]Calcareous fens with Cladium mariscus and species of the Caricion davallianae	The scale and nature of the works, in combination with the distance from Askeaton Fen Complex ensure that there will be no negative impacts.	No
		[7230]Alkaline fens		No
Danes Hole, Poulnalecka SAC (00030)	Proposed works would be, at the closest point, 14.6km from this site	Caves not open to the public [8310]	The scale and nature of the works, in combination with the 14.6km distance from this SAC ensure that there will be no negative impacts on any of it's designated features.	No
		Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]		No
		Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]		No

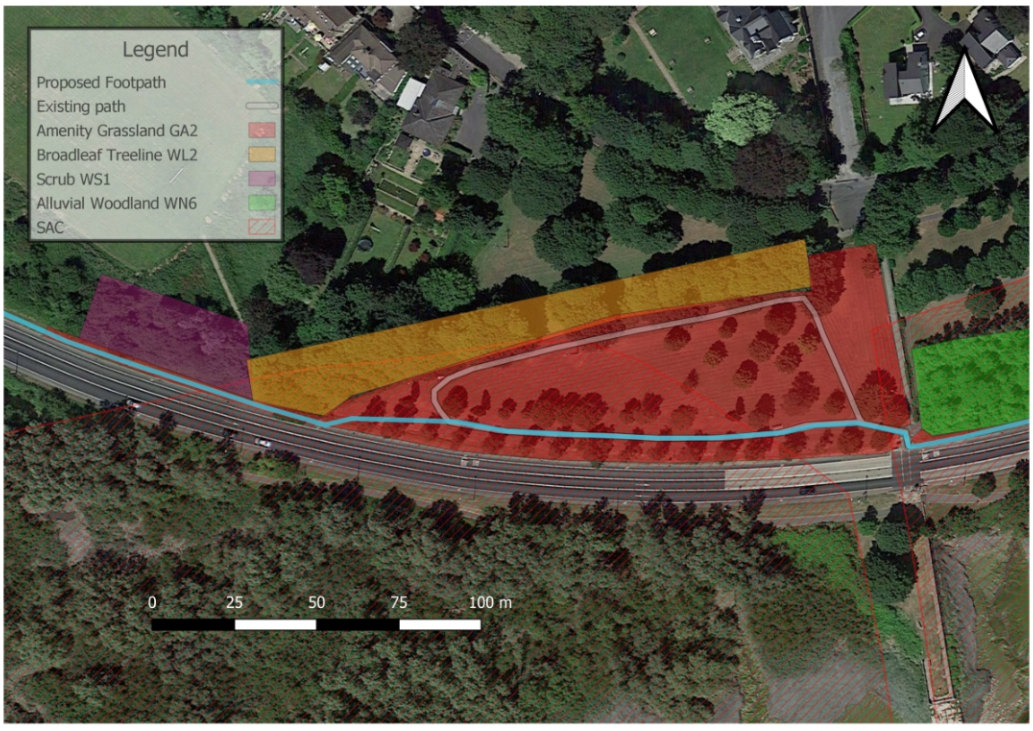
4.4 Assessment of each Segment with respect to Natura 2000 Sites

As discussed in section 4.3 above, Glenomra Wood, Tory Hill, Askeaton Fen Complex and Danes Hole SACs are left out of this section due to a combination of the scale and nature of the works along with the distance from the proposal. Therefore the following paragraphs are concerned with the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA, and how each segment of the proposed path relates to those two Natura sites.

Segments 1, 2 and 3 are outside the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. The footprint of the proposal within these sections is highly disturbed due to the presence of the road, and the habitat of the footprint (mostly GA2 amenity grassland) is of low ecological value, therefore direct damage to habitats and species within the Natura 2000 sites is not likely to occur. The placement of a linear development can however cause indirect damage to habitats and species by way of water quality issues. The topography of the area is such that the footprint of the proposal is perched 2.5-5m above the surrounding grounds and 0.3m above the surface of the road. The elevated nature of the footprint ensures that no precipitation which has fallen elsewhere can flow into the excavated site in a manner that will flood the excavation and mobilize sediment. The excavation will only have to deal with precipitation that has fallen directly on it, and the drainage capacity of the soil and subsoil will ensure that that rainfall will percolate through the ground rather than flowing overland to a watercourse. This ensures no impacts to water quality, and to the species and habitats that depend on it. Additionally, the excavation will be refilled with gravel and covered with tarmacadam a short while after opening, ensuring a low temporal exposure of the particulate matter.



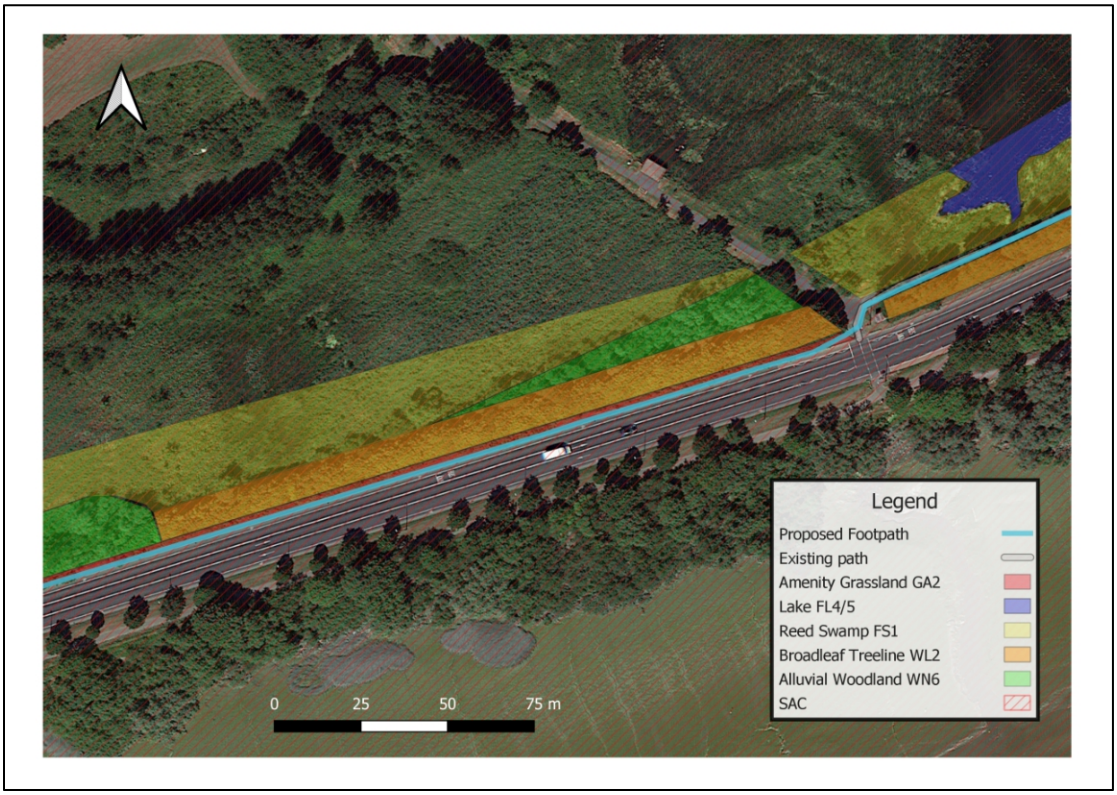
Segment 4 is within the Lower River Shannon SAC, in the Ted Russel Park (see map below). The habitats within the Ted Russel Park are "scattered trees and parkland WD5" and "buildings and artificial surfaces BL3." The scattered trees and parkland refers to the mown grass and trees dotted around the park. The artificial surfaces refers to the existing walkways present within the park. As of yet (March 2021) it is undecided whether to utilise the existing tarmacadam path or create a new path adjacent to the road. Both options are acceptable in terms of the appropriate assessment process as the habitats upon which they are being build are not designated habitats within the SAC and both habitats are of low value ecologically, and therefore not of use to the species designated within the SAC. In a broad environmental sense however, it would make far more sense to utilise the existing footpath than to excavate and remove the mound adjacent to the road and its mature birch trees .



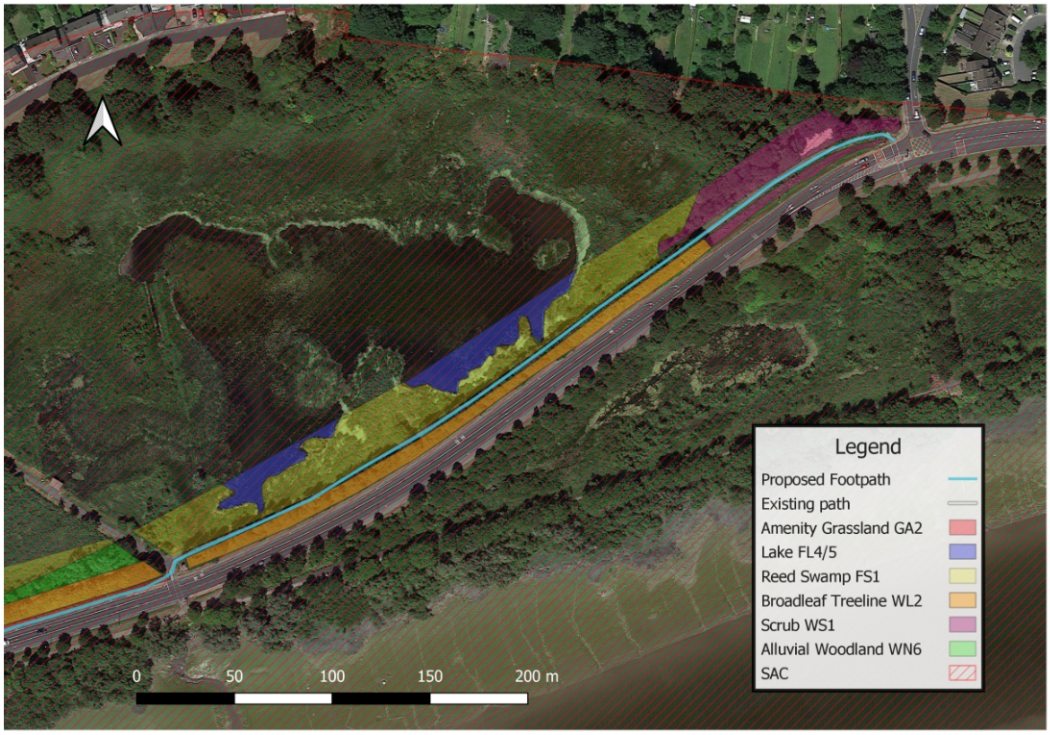
Segment 5 is within the Lower River Shannon SAC. The existing habitat that occupies the footprint of the proposal within this section is “amenity grassland” GA2; this habitat is of low ecological value. Flanking this section to the north is a slope down to the alluvial woodland. The slope is vegetated with bramble mainly, the alluvial woodland is encroaching up the slope by way of saplings. The border between the amenity grassland and the larger vegetation is maintained by hedge cutting, resulting in a sharp straight line of dense vegetation approximately 3 - 3.5m from the road. The proposed footpath, 2m in width, is to be placed within this space. The routine of vegetation maintenance by way of hedge cutting is set to continue keeping the existing border between the mown grass and the taller vegetation where it is. Two patches of vegetation are to be removed within this section:

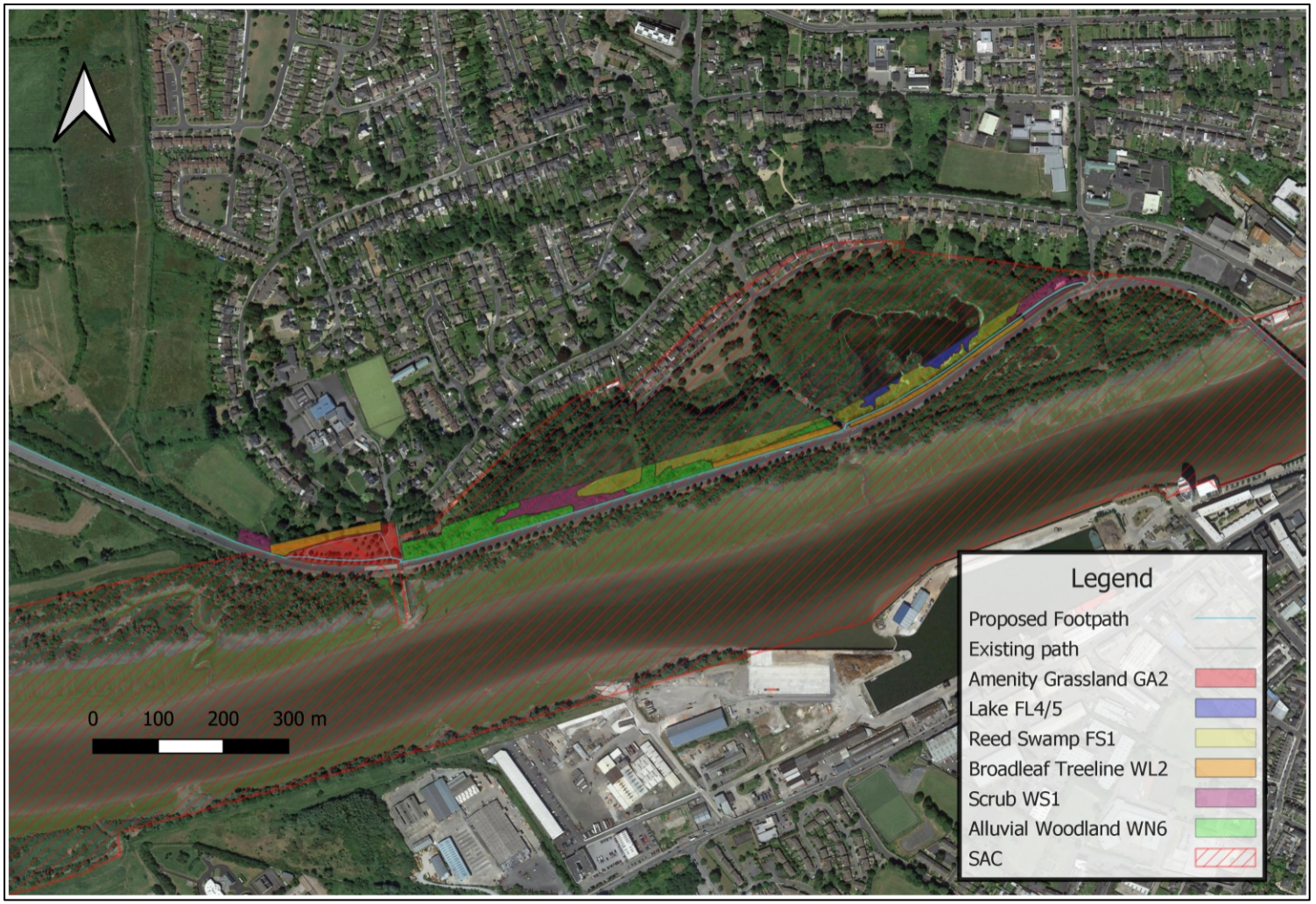
1) Adjacent to the Ted Russel Park entrance, a tall willow from within the woodland has fallen onto the embankment and the footprint of the proposed works. The branches, which are covering the proposed path, will require trimming; these branches would constitute the tip of the tree were it still standing. It is not proposed to cut the tree itself, just trim the thin, wispy branches which are now lying over the proposed route out towards the road. This tree is still alive and will not be removed. This work does not constitute a loss of the overall habitat area as it is trimming of the tip of a tree which has fallen out towards the road; no works will be carried out inside the woodland
2) At the point R56111 56759 (National Grid 10 Digit), a patch of scrub 6m long and 3m wide will need to be removed. This patch of scrub consists of buddleja and bramble growing around the wind-thrown branches of a dead tree which has lost all identifiable features. It is proposed to remove the buddleja carefully by hand along with the fallen tree to bring the edge of the vegetation back in line with nearby vegetation. The buddleja are large and producing a large quantity of seed; their removal will lessen risk to the nearby alluvial woodland in terms of invasive plant ingress. Invasive plants are identified as a threat within the conservation objectives document for the SAC and within the woodlands supporting document for the SAC. Though this section of vegetation is next to a patch of alluvial woodland, it is not considered part of the woodland as it contains a large proportion of non native invasive plants, clearly has grown in response to the fact that a fallen tree has occupied the space to be mown, and is 2-3m in height containing only plants that correspond to scrub habitat (buddleja and bramble).

Segment 6 is within the Lower River Shannon SAC. The existing habitat that occupies the footprint of the proposal within this section is “amenity grassland” GA2, a habitat of low ecological value. Bordering this section to the north is a slope down to the wetlands approximately 2.5m in height. Half way down this slope is a row of sycamore trees which is approximately 200m long. The sycamore are within the young mature / semi-mature age bracket, with a trunk diameter of 20-40cm at 1m height, and an overall height of 9 - 12m. The sycamore treeline is approximately 5m from the roads kerb, and the flat section of amenity grassland between the road and the treeline is 3.5-4m wide. The crown of the sycamore treeline is stretching half way over this gap. Beyond the sycamore treeline is a large open reed swamp (FS1). None of the habitats near this section of the proposal correspond to those designated within the SAC. The soil of the swamp is sometimes covered with water, and more times exposed, and always waterlogged. It is not suitable for the species for which the SAC is designated (Freshwater Pearl Mussel, sea lamprey, river lamprey, brook lamprey, Atlantic salmon, bottle-nosed dolphin) except for otter; and it is sub optimal foraging habitat for otter. Even if it were optimal foraging habitat for otter, the proposal is not envisaged to impact the conservation status of otter within the SAC.

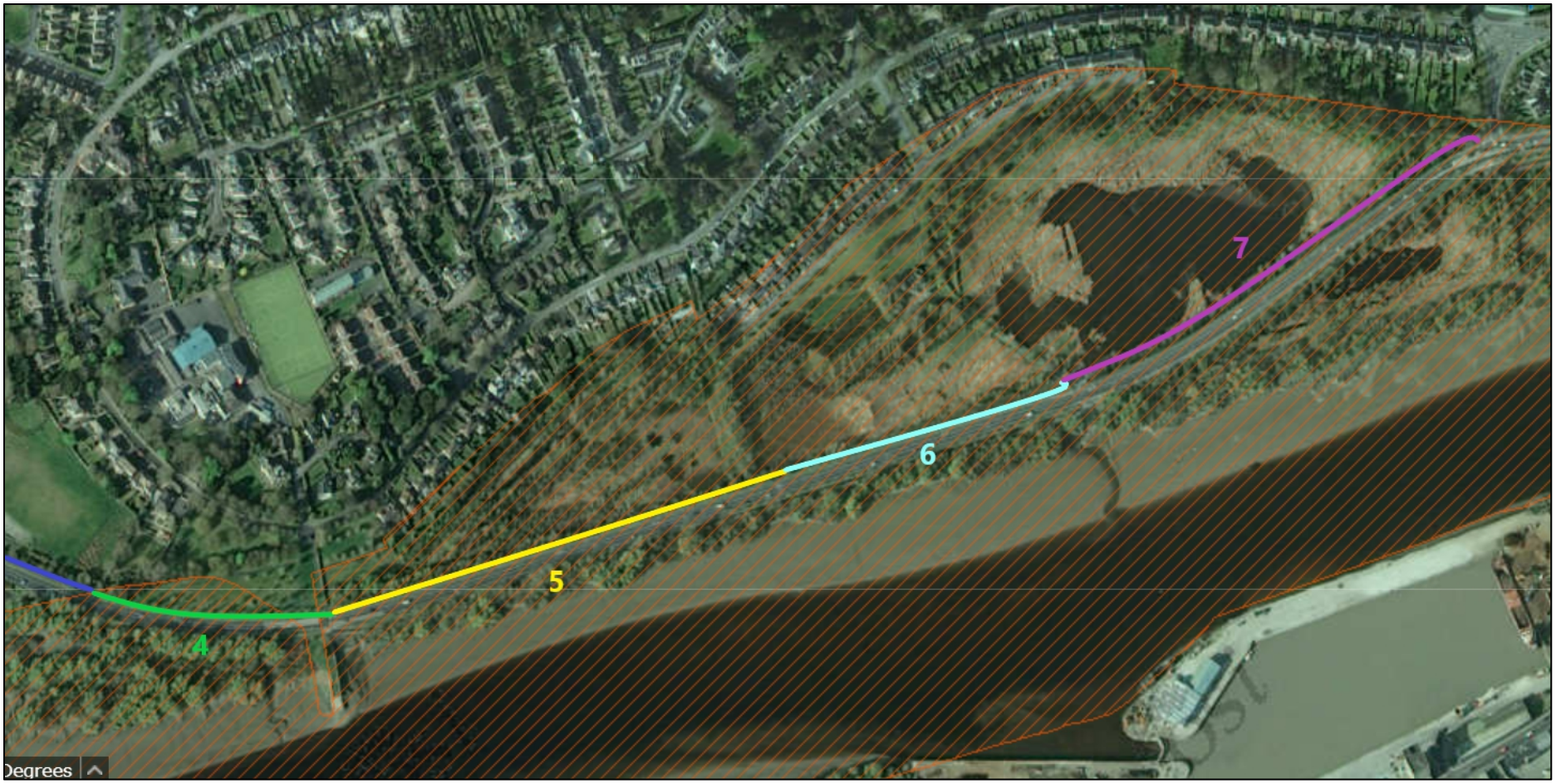


Segment 7 is also within the Lower River Shannon SAC (see map below). The habitat that currently occupies the footprint of the proposal within this section is a gravel path, and is classified as “buildings and artificial surfaces” BL3, a habitat of little or no ecological value. Immediately to the south is the slope up the embankment that makes up the Condell road. The Condell road is approximately 2.5-3m above the footpath. Growing on the slope are mixed broadleaf trees with a scrub understorey. Immediately to the north of the gravel path is a body of water within the Westfields Wetlands. This body of water is either a mesotrophic lake (FL4) or a eutrophic lake (FL5), and is fringed with stands of reed swamp (FS1). None of the habitats near this section of the proposal correspond to those designated within the SAC. In terms of species for which the SAC is designated, the lake is suitable for otter, however, no impacts to this species are envisaged from the proposal, particularly since the path already exists. Though suitable lamprey ammocoete habitat exists, there is no suitable spawning stream running into the lake and so it is not suitable for sea lamprey, river lamprey or brook lamprey. It is not suitable Freshwater Pearl Mussel, Atlantic salmon or bottle-nosed dolphin either.





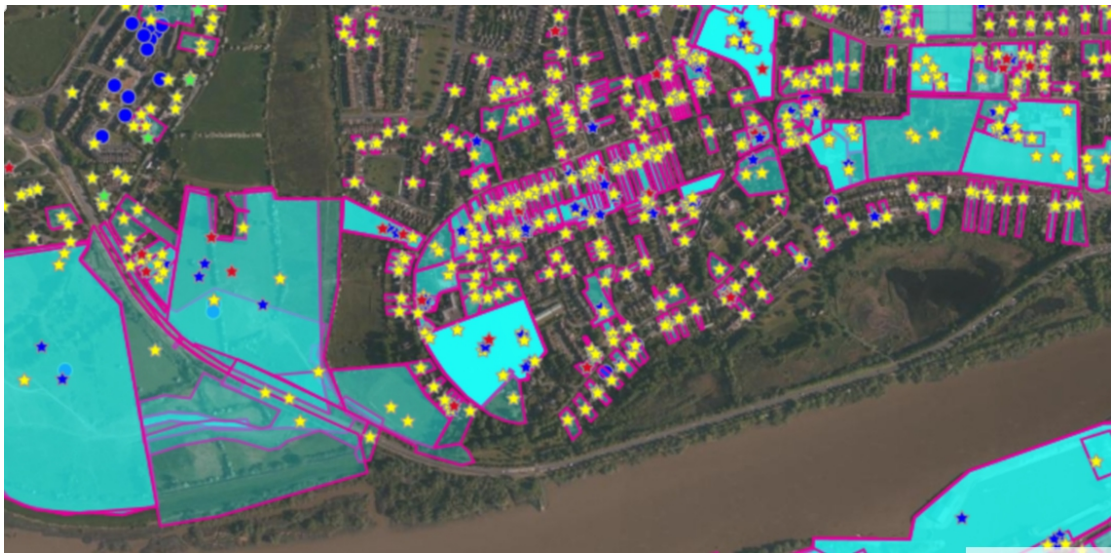
Habitat map of area within the SAC



A map showing the sections of the proposed pathway which are within the SAC; the SAC is shaded red.

4.6 Cumulative Impacts

Due to the position of the site within the urban fabric of Limerick City, there are a large amount of planning applications as seen in the map below. All of these are outside the SAC and SPA, The vast majority of these are for housing, including one 76 apartment development just off Condell Road. The proposal does not have an outfall, and so it will not impact cumulatively with the other planning proposals in terms of water quality within the estuary during its operational phase. In terms of the construction stage, the fact that the footprint of the proposal is a long narrow strip on what is essentially flat ground will promote percolation rather than surface run-off. The subsoil of the footprint is unsorted mixed gravel, sand and soil which resembles mixed alluvial till; drainage capacity is high. Suspended solids usually associated with digging and gravel placement will be contained within the footprint of the excavation and will percolate to the ground. This is explained in detail in section 4.6 above. The footprint of the proposed footpath is upon land which is managed by way of mowing, is of low ecological value, and is situated on a man made embankment. None of the habitats lost correspond to habitats designated within the Lower River Shannon SAC. Neither are they habitats of importance for species designated within the Lower River Shannon SAC or the River Shannon and River Fergus Estuaries SPA. Therefore no cumulative impacts are envisaged



5. Conclusion

It is concluded beyond reasonable scientific doubt that there are not likely to be significant effects from the proposed works on the European sites identified for consideration (or any other European site beyond 15km) either alone or in combination with other plans or projects. No effects on the European Sites listed below are predicted. Therefore, the following five European sites have been 'screened out' within the Stage 1 Appropriate Assessment Screening Report: Lower River Shannon SAC (002165); River Shannon and River Fergus Estuaries SPA (004077) Glenomra Wood SAC (001013); Tory Hill SAC (000439); Askeaton Fen Complex SAC (0002279); and Danes Hole, Poulnalecka SAC (00030)

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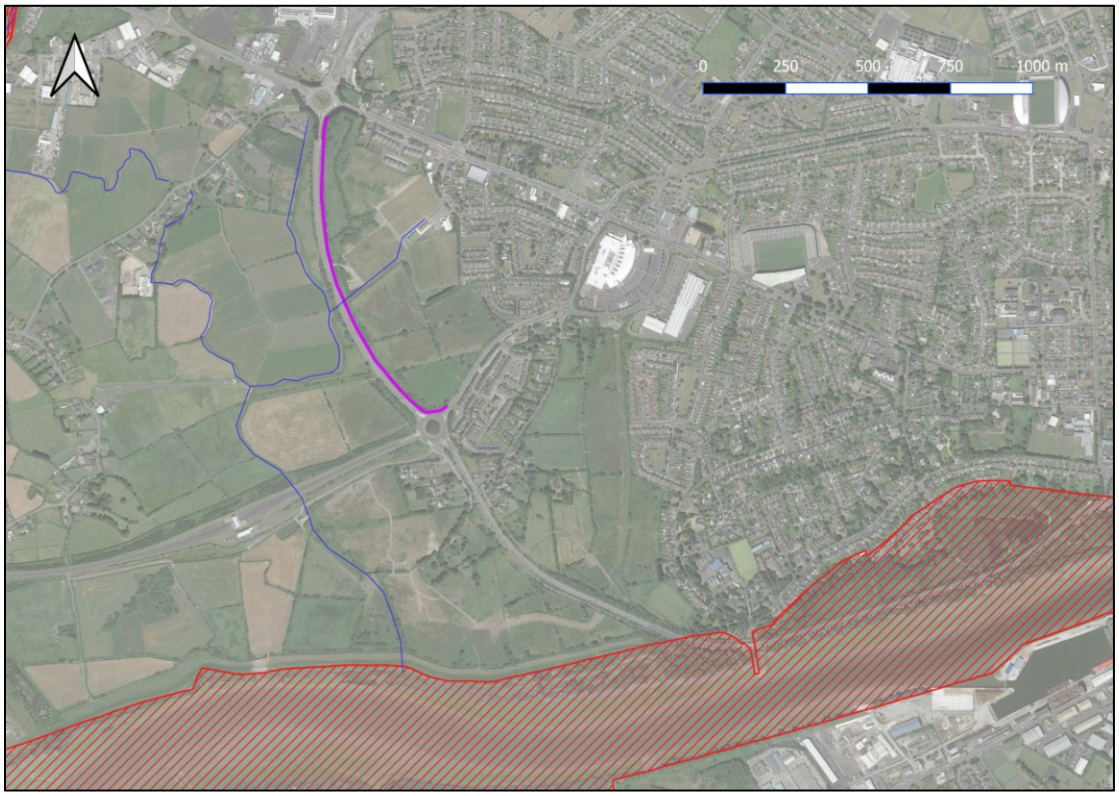
7 Appendices

7.1. Appended Section of Footpath

After this report had been written, it was decided to extend the proposed footpath from the Clonmacken Roundabout to the Coonagh Roundabout to complete pedestrian and cycle access from the Knockhill/Caherdavin area and the City Centre via the Condell Road.



Section A Existing Environment

The road, highlighted in purple above, is 2-3m above the surrounding lands of Coonagh East and Caherdavin. The slopes of the causeway/embankment are covered in reed bracken and bramble scrub. Patches of more mature scrub exist which consists of willow, blackthorn, gorse and bramble. . Immediately adjacent to the Condell Road, within the footprint of the proposed footpath, is a linear strip of grass which is regularly mown. The entire footprint of the works consists of this regularly mown grass. Half way between the Clonmacken Roundabout and the Coonagh Roundabout, the road crosses the North Ballycannon Stream (highlighted in blue in the map above). The stream rises 300m upstream of the road crossing. It is of a very low gradient, contains very low flow velocity and volume, is heavily silted and has a dense growth of macrophytes, particularly reed. It is a highly modified watercourse and now resembles a drainage ditch.

Assessment of Likely Impacts to Natura Sites

This Section is outside the Lower River Shannon SAC (highlighted in red in the map above) and the River Shannon and River Fergus Estuaries SPA. The footprint of the proposal within

these sections is highly disturbed due to the presence of the road, and the habitat of the footprint (GA2 amenity grassland) is of low ecological value, therefore direct damage to habitats and species within the Natura 2000 sites is not likely to occur.

The topography of the area is such that the footprint of the proposal is perched 2-3m above the surrounding grounds and 0.3m above the surface of the road. The elevated nature of the footprint ensures that no precipitation which has fallen elsewhere can flow into the excavated site in a manner that will flood the excavation and mobilize sediment. The excavation will only have to deal with precipitation that has fallen directly on it, and the drainage capacity of the soil and subsoil will ensure that that rainfall will percolate through the ground rather than flowing overland to a watercourse. This ensures no impacts to water quality, and to the species and habitats that depend on it. Additionally, the excavation will be refilled with gravel and covered with tarmacadam a short while after opening, ensuring a low temporal exposure of the particulate matter.

The bridge crossing of the Ballycannon stream will not be altered, and the footpath will be briefly constricted to pass through the existing bridge deck. As such, there will be minimal disturbance to the stream in terms of physical disturbance and in terms of sediment input. The stream rises 300m upstream of the road crossing. It is of a very low gradient, contains very low flow velocity and volume, is heavily silted and has a dense growth of reed and other macrophytes. It is a highly modified watercourse and now resembles a drainage ditch. It joins the SPA and SAC ~ 1.5km downstream, a distance which, in combination with the streams low flow velocity and excessive macrophytes, would ensure that no siltation will be imparted upon the SAC/SPA. Additionally, the stream is unsuitable for all aquatic species for which the SAC is designated except for otter, and so it is not the case that the stream might be important to provide salmon nursery habitat to the SAC for example. It should be noted here that no signs of otter were found and that is likely that they use this stretch of stream occasionally if at all.

Conclusion
In all, it is reasonable to conclude that the construction of this section of footpath will not have any impact on any Natura 2000 site.

7.2. Lower River Shannon SAC (002165)

This very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120 km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. Rivers within the sub-catchment of the Feale include the Galey, Smearlagh, Oolagh, Allaughaun, Owveg, Clydagh, Caher, Breanagh and Glenacarney. Rivers within the sub-catchment of the Mulkear include the Killeenagarriff, Annagh, Newport, the Dead River, the Bilboa, Glashacloonaraveela, Gortnageragh and Cahernahallia.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):
[1110] Sandbanks
[1130] Estuaries
[1140] Tidal Mudflats and Sandflats
[1150] Coastal Lagoons*
[1160] Large Shallow Inlets and Bays
[1170] Reefs
[1220] Perennial Vegetation of Stony Banks
[1230] Vegetated Sea Cliffs
[1310] Salicornia Mud
[1330] Atlantic Salt Meadows
[1410] Mediterranean Salt Meadows
[3260] Floating River Vegetation
[6410] Molinia Meadows
[91E0] Alluvial Forests*
[1029] Freshwater Pearl Mussel (Margaritifera margaritifera)
[1095] Sea Lamprey (Petromyzon marinus)
[1096] Brook Lamprey (Lampetra planeri)
[1099] River Lamprey (Lampetra fluviatilis)
[1106] Atlantic Salmon (Salmo salar)
[1349] Bottle-nosed Dolphin (Tursiops truncatus)
[1355] Otter (Lutra lutra)

The Shannon and Fergus Rivers flow through Carboniferous limestone as far as Foynes, but west of Foynes Namurian shales and flagstones predominate (except at Kerry Head, which is formed from Old Red Sandstone). The eastern sections of the Feale catchment flow through Namurian rocks and the western stretches through Carboniferous limestone. The Mulkear flows through Lower Palaeozoic rocks in the

upper reaches before passing through Namurian rocks, followed by Lower Carboniferous shales and Carboniferous limestone. The Mulkear River itself, immediately north of Pallas Green, passes through an area of Rhyolites, Tuffs and Agglomerates.

The Shannon and Fergus Estuaries form the largest estuarine complex in Ireland. They form a unit stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon Estuary (considered to be a line across the narrow strait between Kilcredaun Point and Kilconly Point). Within this main unit there are several tributaries with their own 'sub-estuaries' e.g. the Deel River, Mulkear River, and Maigue River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulnasherry Bay, Ballylongford Bay, Clonderalaw Bay and the Feale or Cashen River estuary.

Both the Fergus and inner Shannon Estuaries feature vast expanses of intertidal mudflats, often fringed with saltmarsh vegetation. The smaller estuaries also feature mudflats, but have their own unique characteristics, e.g. Poulnasherry Bay is stony and unusually rich in species and biotopes. Plant species are typically scarce on the mudflats, although there are some eelgrass (Zostera spp.) beds and patches of green algae (e.g. Ulva sp. and Enteromorpha sp.). The main macro-invertebrate community which has been noted from the inner Shannon and Fergus estuaries is a MacomaScrobicularia-Nereis community.

In the transition zone between mudflats and saltmarsh, specialised colonisers of mud predominate. For example, swards of Common Cord-grass (Spartina anglica) frequently occur in the upper parts of the estuaries. Less common are swards of Glasswort (Salicornia europaea agg.). In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as Common Reed (Phragmites australis) and club-rushes (Scirpus maritimus, S. tabernaemontani and S. triquetrus). In addition to the nationally rare Triangular Club-rush (Scirpus triqueter), two scarce species are found in some of these creeks (e.g. Ballinacurra Creek): Lesser Bulrush (Typha angustifolia) and Summer Snowflake (Leucojum aestivum).

Saltmarsh vegetation frequently fringes the mudflats. Over twenty areas of estuarine saltmarsh have been identified within the site, the most important of which are around the Fergus estuary and at Ringmoylan Quay. The dominant type of saltmarsh present is Atlantic salt meadow occurring over mud. Characteristic species occurring include Common Saltmarsh-grass (Puccinellia maritima), Sea Aster (Aster tripolium), Thrift (Armeria maritima), Sea-milkwort (Glaux maritima), Sea Plantain (Plantago maritima), Red Fescue (Festuca rubra), Creeping Bent (Agrostis stolonifera), Saltmarsh Rush (Juncus gerardi), Long-bracted Sedge (Carex extensa), Lesser Sea-spurrey (Spergularia marina) and Sea Arrowgrass (Triglochin maritima). Areas of Mediterranean salt meadows, characterised by clumps of Sea Rush (Juncus maritimus) occur occasionally. Two scarce species are found on saltmarshes in the vicinity of the Fergus estuary: a type of robust saltmarsh-grass (Puccinellia foucaudii), sometimes placed within the species Common Saltmarsh-grass (P. maritima) and Hard-grass (Parapholis strigosa).

Saltmarsh vegetation also occurs around a number of lagoons within the site, two of which have been surveyed as part of a National Inventory of Lagoons. Cloonconeen Pool (4-5 ha) is a natural sedimentary lagoon impounded by a low cobble barrier. Seawater enters by percolation through the barrier and by overwash. This lagoon represents a type which may be unique to Ireland since the substrate is composed almost entirely of peat. The adjacent shore features one of the best examples of a drowned forest in Ireland. Aquatic vegetation in the lagoon includes typical species such as Beaked Tasselweed (Ruppia maritima) and green algae (Cladophora sp.). The fauna is not diverse, but is typical of a high salinity lagoon and includes six lagoon specialists (Hydrobia ventrosa, Cerastoderma glaucum, Lekanesphaera hookeri, Palaemonetes varians, Sigara stagnalis and Enochrus bicolor). In contrast, Shannon Airport Lagoon (2 ha) is an artificial saline lake with an artificial barrier and sluiced outlet. However, it supports two Red Data Book species of stonewort (Chara canescens and Chara cf. connivens).

Most of the site west of Kilcredaun Point/Kilconly Point is bounded by high rocky sea cliffs. The cliffs in the outer part of the site are sparsely vegetated with lichens, Red Fescue, Sea Beet (Beta vulgaris subsp. maritima), Sea Campion (Silene vulgaris subsp. maritima), Thrift and plantains (Plantago spp.). A rare endemic type of sealavender, Limonium recurvum subsp. pseudotranswallianum, occurs on cliffs near Loop Head. Cliff-top vegetation usually consists of either grassland or maritime heath. The boulder clay cliffs further up the estuary tend to be more densely vegetated, with swards of Red Fescue and species such as Kidney Vetch (Anthyllis vulneraria) and Common Bird's-foot-trefoil (Lotus corniculatus).

The site supports an excellent example of a large shallow inlet and bay. Littoral sediment communities in the mouth of the Shannon Estuary occur in areas that are exposed to wave action and also in areas extremely sheltered from wave action. Characteristically, exposed sediment communities are composed of coarse sand and have a sparse fauna. Species richness increases as conditions become more sheltered. All shores in the site have a zone of sand hoppers at the top, and below this each of the shores has different characteristic species giving a range of different shore types.

The intertidal reefs in the Shannon Estuary are exposed or moderately exposed to wave action and subject to moderate tidal streams. Known sites are steeply sloping and show a good zonation down the shore. Well developed lichen zones and littoral reef communities offering a high species richness in the sublittoral fringe and strong populations of the Purple Sea Urchin Paracentrotus lividus are found. The communities found are tolerant to sand scour and tidal streams. The infralittoral reefs range from sloping platforms with some vertical steps, to ridged bedrock with gullies of sand between the ridges, to ridged bedrock with boulders or a mixture of cobbles, gravel and sand. Kelp is very common to about 18 m. Below this it becomes rare and the community is characterised by coralline crusts and red foliose algae.

Other coastal habitats that occur within the site include stony beaches and bedrock shores (these support a typical zonation of seaweeds such as Fucus spp., Ascophyllum nodosum and kelps), shingle beaches (with species such as Sea Beet, Sea Mayweed - Matricaria maritima, Sea Campion and Curled Dock - Rumex crispus), sandbanks which are slightly covered by sea water at all times (e.g. in the area from Kerry Head to Beal Head) and sand dunes (a small area occurs at Beal Point, where Marram – Ammophila arenaria is the dominant species).

Freshwater rivers have been included in the site, most notably the Feale and Mulkear catchments, the Shannon from Killaloe to Limerick (along with some of its tributaries, including a short stretch of the Kilmastulla River), the Fergus up as far as Ennis, and the Cloon River. These systems are very different in character: the Shannon is broad, generally slow flowing and naturally eutrophic; the Fergus is smaller and alkaline; while the narrow, fast flowing Cloon is acid in nature. The Feale and Mulkear catchments exhibit all the aspects of a river from source to mouth. Semi-natural habitats, such as wet grassland, wet woodland and marsh occur by the rivers, but improved grassland is the most common habitat type. One grassland type of particular conservation significance, Molinia meadows, occurs in several parts of the site and the examples at Worldsend on the River Shannon are especially noteworthy. Here are found areas of wet meadow dominated by rushes (Juncus spp.) and sedges (Carex spp.), and supporting a diverse and species-rich vegetation, including such uncommon species as Blue-eyed Grass (Sisyrinchium bermudiana) and Pale Sedge (C. pallescens).

Floating river vegetation characterised by species of water-crowfoot (Ranunculus spp.), pondweeds (Potamogeton spp.) and the moss Fontinalius antipyretica are present throughout the major river systems within the site. The rivers contain an interesting bryoflora with Schistidium alpicola var. alpicola recorded from in-stream boulders on the Bilboa, new to Co. Limerick.

Alluvial woodland occurs on the banks of the Shannon and on islands in the vicinity of the University of Limerick. The woodland is up to 50 m wide on the banks and somewhat wider on the largest island. The most prominent woodland type is gallery woodland where White Willow (Salix alba) dominates the tree layer with occasional Alder (Alnus glutinosa). The shrub layer consists of various willow species with Rusty Willow (Salix cinerea ssp. oleifolia) and what appear to be hybrids of S. alba x S. viminalis. The herbaceous layer consists of tall perennial herbs. A fringe of bulrush (Typha sp.) occurs on the river side of the woodland. On slightly higher ground above the wet woodland and on the raised embankment remnants of mixed oak-ashalder woodland occur. These are poorly developed and contain numerous exotic species but locally there are signs that it is invading open grassland. Alder is the principal tree species, with occasional Pedunculate Oak (Quercus robur), elm (Ulmus glabra and U. procera), Hazel (Corylus avellana), Hawthorn (Crataegus monogyna) and the shrubs Guelder-rose (Viburnum opulus) and willows. The ground flora is speciesrich.

While woodland is infrequent within the site, however Cahiracon Wood contains a strip of old oak woodland. Sessile Oak (Q. petraea) forms the canopy, with an

understorey of Hazel and Holly (Ilex aquifolium). Great Wood-rush (Luzula sylvatica) dominates the ground flora. Less common species present include Great Horsetail (Equisetum telmeteia) and Pendulous Sedge (Carex pendula).

In the low hills to the south of the Slievefelim Mountains, the Cahernahallia River cuts a valley through the Upper Silurian rocks. For approximately 2 km south of Cappagh Bridge at Knockanavar, the valley sides are wooded. The woodland consists of birch (Betula spp.), Hazel, oak, Rowan (Sorbus aucuparia), some Ash (Fraxinus excelsior) and willow (Salix spp.). Most of the valley is not grazed by stock, and as a result the trees are regenerating well. The ground flora features prominent Great wood-rush and Bilberry (Vaccinium myrtillus), along with a typical range of woodland herbs. Bracken (Pteridium aquilinum) is a feature in areas where there is more light available.

The valley sides of the Bilboa and Gortnageragh Rivers, on higher ground north-east of Cappamore, support patches of semi-natural broadleaf woodland dominated by Ash, Hazel, oak and birch. There is a good scrub layer with Hawthorn, willow, Holly and Blackthorn (Prunus spinosa) common. The herb layer in these woodlands is often open, with a typically rich mixture of woodland herbs and ferns. Moss species diversity is high. The woodlands are ungrazed. The Hazel is actively coppiced in places.

There is a small area of actively regenerating cut-away raised bog at Ballyrorheen. It is situated approximately 5 km north-west of Cappamore in Co. Limerick. The bog contains some wet areas with good cover of bog mosses (Sphagnum spp.). Species of particular interest include Cranberry (Vaccinium oxycoccos) and White Sedge (Carex curta), along with two regionally rare mosses, including the bog moss S. fimbriatum. The site is being invaded by Downy Birch (Betula pubescens) scrub woodland. Both commercial forestry and the spread of Rhododendron (Rhododendron ponticum) has greatly reduced the overall value of the site.

A number of plant species that are listed in the Irish Red Data Book occur within the site, and several of these are protected under the Flora (Protection) Order, 1999. These include Triangular Club-rush (Scirpus triquetrus), a species which is only found in Ireland only in the Shannon Estuary, where it borders creeks in the inner estuary. Opposite-leaved Pondweed (Groenlandia densa) is found in the Shannon where it passes through Limerick City, while Meadow Barley (Hordeum secalinum) is abundant in saltmarshes at Ringmoylan and Mantlehill. Hairy Violet (Viola hirta) occurs in the Askeaton/Foynes area. Golden Dock (Rumex maritimus) is noted as occurring in the River Fergus estuary. Finally, Bearded Stonewort (Chara canescens), a brackish water specialist, and Convergent Stonewort (Chara connivens) are both found in Shannon Airport Lagoon.

Overall, the Shannon and Fergus Estuaries support the largest numbers of wintering waterfowl in Ireland. The highest count in 1995-96 was 51,423 while in 1994-95 it was 62,701. Species listed on Annex I of the E.U. Birds Directive which contributed to these totals include: Great Northern Diver (3; 1994/95), Whooper Swan (201;

1995/96), Pale-bellied Brent Goose (246; 1995/96), Golden Plover (11,067; 1994/95) and Bartailed Godwit (476; 1995/96). In the past, three separate flocks of Greenland Whitefronted Goose were regularly found, but none were seen in 1993/94.

Other wintering waders and wildfowl present include Greylag Goose (216; 1995/96), Shelduck (1,060; 1995/96), Wigeon (5,976; 1995/96), Teal (2,319; 1995-96), Mallard (528; 1995/96), Pintail (45; 1995/96), Shoveler (84; 1995/96), Tufted Duck (272; 1995/96), Scaup (121; 1995/96), Ringed Plover (240; 1995/96), Grey Plover (750; 1995/96), Lapwing (24,581; 1995/96), Knot (800; 1995/96), Dunlin (20,100; 1995/96), Snipe (719, 1995/96), Black-tailed Godwit (1,062; 1995/96), Curlew (1,504; 1995/96), Redshank (3,228; 1995/96), Greenshank (36; 1995/96) and Turnstone (107; 1995/96). A number of wintering gulls are also present, including Black-headed Gull (2,216; 1995/96), Common Gull (366; 1995/96) and Lesser Black-backed Gull (100; 1994/95). This is the most important coastal site in Ireland for a number of the waders including Lapwing, Dunlin, Snipe and Redshank. It also provides an important staging ground for species such as Black-tailed Godwit and Greenshank.

A number of species listed on Annex I of the E.U. Birds Directive breed within the site. These include Peregine Falcon (2-3 pairs), Sandwich Tern (34 pairs on Rat Island, 1995), Common Tern (15 pairs: 2 on Sturamus Island and 13 on Rat Island, 1995), Chough (14-41 pairs, 1992) and Kingfisher. Other breeding birds of note include Kittiwake (690 pairs at Loop Head, 1987) and Guillemot (4,010 individuals at Loop Head, 1987).

There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary. This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. The population is estimated (in 2006) to be 140 ± 12 individuals. Otter, a species also listed on Annex II of this Directive, is commonly found on the site.

Five species of fish listed on Annex II of the E.U. Habitats Directive are found within the site. These are Sea Lamprey (Petromyzon marinus), Brook Lamprey (Lampetra planeri), River Lamprey (Lampetra fluviatilis), Twaite Shad (Allosa fallax fallax) and Salmon (Salmo salar). The three lampreys and Salmon have all been observed spawning in the lower Shannon or its tributaries. The Fergus is important in its lower reaches for spring salmon, while the Mulkear catchment excels as a grilse fishery, though spring fish are caught on the actual Mulkear River. The Feale is important for both types. Twaite Shad is not thought to spawn within the site. There are few other river systems in Ireland which contain all three species of lamprey. Two additional fish species of note, listed in the Irish Red Data Book, also occur, namely Smelt (Osmerus eperlanus) and Pollan (Coregonus autumnalis pollan). Only the former has been observed spawning in the Shannon. Freshwater Pearl Mussel (Margaritifera margaritifera), a species listed on Annex II of the E.U. Habitats Directive, occurs abundantly in parts of the Cloon River.

There is a wide range of land uses within the site. The most common use of the terrestrial parts is grazing by cattle, and some areas have been damaged through over-grazing and poaching. Much of the land adjacent to the rivers and estuaries has

been improved or reclaimed and is protected by embankments (especially along the Fergus estuary). Further, reclamation continues to pose a threat, as do flood relief works (e.g. dredging of rivers). Gravel extraction poses a major threat on the Feale. In the past, cord-grass (Spartina sp.) was planted to assist in land reclamation. This has spread widely, and may oust less vigorous colonisers of mud and may also reduce the area of mudflat available to feeding birds. Domestic and industrial wastes are discharged into the Shannon, but water quality is generally satisfactory, except in the upper estuary where it reflects the sewage load from Limerick City. Analyses for trace metals suggest a relatively clean estuary with no influences of industrial discharges apparent. Further industrial development along the Shannon and water polluting operations are potential threats

. Fishing is a main tourist attraction on the Shannon and there are a large number of angler associations, some with a number of beats. Fishing stands and styles have been erected in places. The River Feale is a designated Salmonid Water under the E.U. Freshwater Fish Directive. Other uses of the site include commercial angling, oyster farming, boating (including dolphin-watching trips) and shooting. Some of these may pose threats to the birds and dolphins through disturbance. Specific threats to the dolphins include underwater acoustic disturbance, entanglement in fishing gear and collisions with fast moving craft.

This site is of great ecological interest as it contains a high number of habitats and species listed on Annexes I and II of the E.U. Habitats Directive, including the priority habitats lagoon and alluvial woodland, the only known resident population of Bottle-nosed Dolphin in Ireland and all three Irish lamprey species. A good number of Red Data Book species are also present, perhaps most notably the thriving populations of Triangular Club-rush. A number of species listed on Annex I of the E.U. Birds Directive are also present, either wintering or breeding. Indeed, the Shannon and Fergus Estuaries form the largest estuarine complex in Ireland and support more wintering wildfowl and waders than any other site in the country. Most of the estuarine part of the site has been designated a Special Protection Area (SPA), under the E.U. Birds Directive, primarily to protect the large numbers of migratory birds present in winter.

7.3. River Shannon and River Fergus Estuaries SPA

The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat from Limerick City westwards as far as Doonaha in Co. Clare and Dooneen Point in Co. Kerry. The site has vast expanses of intertidal flats which contain a diverse macroinvertebrate community, e.g. Macoma-Scrobicularia-Nereis, which provides a rich food resource for the wintering birds. Salt marsh vegetation frequently fringes the mudflats and this provides important high tide roost areas for the wintering birds. Elsewhere in the site the shoreline comprises stony or shingle beaches. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Cormorant, Whooper Swan, Lightbellied Brent Goose, Shelduck, Wigeon, Teal, Pintail, Shoveler, Scaup, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank and Black-headed Gull. It is also of special conservation

interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds. The site is the most important coastal wetland site in the country and regularly supports in excess of 50,000 wintering waterfowl (57,133 - five year mean for the period 1995/96 to 1999/2000), a concentration easily of international importance. The site has internationally important populations of Light-bellied Brent Goose (494), Dunlin (15,131), Black-tailed Godwit (2,035) and Redshank (2,645). A further 17 species have populations of national importance, i.e. Cormorant (245), Whooper Swan (118), Shelduck (1,025), Wigeon (3,761), Teal (2,260), Pintail (62), Shoveler (107), Scaup (102), Ringed Plover (223), Golden Plover (5,664), Grey Plover (558), Lapwing (15,126), Knot (2,015), Bar-tailed Godwit (460), Curlew (2,396), Greenshank (61) and Black-headed Gull (2,681) - figures are five year mean peak counts for the period 1995/96 to 1999/2000. The site is among the most important in the country for several of these species, notably Dunlin (13 % of national total), Lapwing (6% of national total) and Redshank (9% of national total). The site also supports a nationally important breeding population of Cormorant (93 pairs in 2010). Other species that occur include Mute Swan (103), Mallard (441), Red-breasted Merganser (20), Great Crested Grebe (50), Grey Heron (38), Oystercatcher (551), Turnstone (124) and Common Gull (445) - figures are five year mean peak counts for the period 1995/96 to 1999/2000. Apart from the wintering birds, large numbers of some species also pass through the site whilst on migration in spring and/or autumn. The River Shannon and River Fergus Estuaries SPA is an internationally important site that supports an assemblage of over 20,000 wintering waterbirds. It holds internationally important populations of four species, i.e. Light-bellied Brent Goose, Dunlin, Black-tailed Godwit and Redshank. In addition, there are 17 species that have wintering populations of national importance. The site also supports a nationally important breeding population of Cormorant. Of particular note is that three of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Golden Plover and Bar-tailed Godwit. Parts of the River Shannon and River Fergus Estuaries SPA are Wildfowl Sanctuaries.