

Clare River (Claregalway) Flood Relief Scheme

Response to Further Information Request

DOCUMENT CONTROL SHEET

Client:	Office of Public Works					
Project Title:	Clare River (Claregalway) Flood Relief Scheme					
Document Title:	Response to Further Information Request					
Document No:	MGE0262RP0015					
This Document Comprises:	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	29	1	1	1

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
A01	Approval	P. Kearney/ L. Williams/ PJ Griffin	PJ Griffin	W. Madden	Galway	22 nd May 2013
F01	Final (Incl. Figure 4.1)	P. Kearney/ L. Williams/ PJ Griffin	PJ Griffin	W. Madden	Galway	08 th May 2015

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INTRODUCTION

Following the Public Exhibition for the project held from the 16th November to 13th December 2012, a submission was received by the OPW from the Development Applications Unit of the Department of Arts, Heritage and the Gaeltacht on the nature conservation and underwater archaeology aspects on the Clare River (Claregalway) Flood Relief Scheme

This document is a written response to these observations and the information is presented under Items 1 to 13 below.

A number of new figures or amended figures previously included in the EIS (November 2012) have been prepared in support of this response to the Further Information Request (FIR). These figures are denoted as Figure - FIR 1, FIR 2 etc.

1 ITEM 1

The Department notes the various maps/drawings of aspects of the scheme that are included in the EIS and/or NIS. However, full scheme drawings that show all areas that will be impacted directly or indirectly by the scheme at site preparation, construction and operation stages are lacking. In the absence of full scheme drawings that show all the works proposed, their interrelationships, and the works areas and access routes involved, it is not possible to determine the full scale and significance of the likely effects in the environment or on European sites. The Department considers that the information presented does not suffice for the purposes of EIS or Appropriate Assessment. For the Department to provide further advice, a complete series of detailed technical drawings/maps should be supplied. These should all include all parts of the scheme, all access routes, all storage, infill or recovery sites, all existing and new or modified berms, Environmental River Enhancement Programme Measures, and details of angler access across flood berms. All rivers where in stream rock and silt removal, and bankside protection works are required should also be shown.

In relation to scheme elements that are described as 'indicative only', the OPW should ensure that all potential effects arising from their execution are assessed fully, as any changes to a project at post-consent stage may invalidate the consent and/or the assessment(s) undertaken. This should apply in the case of all lands to be used for disposal, storage or recover of surplus material.

1.1 RESPONSE TO ITEM 1

The full scheme drawings are provided in Figures 6.1 to Figure 6.16, Chapter 6 EIS Volume II Main Report and Figures 2.1 to Figure 2.1 of the NIS, which provides details on the extent of the proposed works, channel widening measures, potential spoil spreading locations and site investigation works, and cross sections. Typical details of landspreading, spoil heaps, and embankment details are provided in Figures 6.18 to 6.20 (EIS) and Figures 2.16 to 2.18 (NIS). Site access and compound locations are provided in Figure 6.21a-b (EIS) and Appendix C (NIS). The distribution of habitats within the study area is shown in Figure 10.4 (EIS) and Figure 4.1 (NIS) with the proposed measures overlain. This figure is complemented by Table 10.11 (EIS) and Table 4.1 (NIS) which provides details of the impacts on each habitat type.

In addition to these drawings, the locations of the Arterial Drainage Maintenance Activities are provided in Appendix A Figure FIR 1.1 (Sheets 1-3) attached.

The Environmental River Enhancement Programme (EREP) has been agreed with Inland Fisheries Ireland (IFI) and EREP works will be carried out between points A and B on the Appendix A Drawing 1 attached. EREP works will comprise the installation of pools and will include placement of boulders and gravels to facilitate juvenile recruitment upstream of Crusheen Bridge in order to compensate for loss of spawning habitat in the vicinity of Crusheen Bridge. Designs will be as per the details in Drawing 1 at locations dictated by IFI during construction. A more detailed plan is not possible at this juncture as the final layout will be subject to a walk over survey at low flow. This is the IFI preferred method.

Regarding angler access, this will be maintained during works by providing pedestrian pathways alongside work sites in accordance with current construction Health and Safety regulations. Similarly OPW have agreed to reinstate any pre-existing pathways to fishing marks affected by the works including the installation of styles where appropriate.

A summary of the Selective Channel Maintenance Measures are provided in Table FIR 1.1 below and a summary of the Historical Maintenance on Major Channels and Tributaries Draining to Lower Lough Corrib are provided in Table FIR 1.2.

Table FIR 1.1: Summary of the extent of proposed “Selective channel maintenance measures” on the Clare River between Lough Corrib and Cregmore Bridge.

ELEMENT	MAP 1 L. Corrib to Claregalway (c.8km)	MAP 2 Claregalway to 300m d/s Crusheeny Bridge (c.3km)	MAP 3 d/s Crusheeny Bridge to Cregmore Bridge (c.2.5km)	TOTALS (c.13.5km)	Apply OPW SOPs for:	Potential Impact with SOPs applied
A - Silt and vegetation management	c. 600m at Montiagh South	700-800m total - 300-400m in short patches within 1 km of Claregalway, remainder in patches from 2km u/s Claregalway	500-600m in total, half d/s of Crusheeny Bridge on one bank, rest u/s of bridge.	1.8-2km (15%)	Lamprey Crayfish	Removal of juvenile lamprey (if present). Removal of crayfish and patches of sub-optimal crayfish habitat ¹ . Silt disturbance may create turbidity downstream for short distance.
B - Aquatic vegetation cutting	c.250m downstream of Curraghmore Bridge c.200m at Montiagh	c.600m in total, mainly on major bends in the river	~	1.05km (8%)	Crayfish	Weed cutting bucket minimises silt generation. No impact on juvenile lamprey (if present). Crayfish and patches of sub-optimal crayfish habitat removal ¹
D- Bush cutting / branch trimming	~	c.600m total in short stretches	100-200m total in short stretches between Islandmore and Grange West	0.7- 0.8km (6%)		Negligible impact on aquatic values. Does not affect habitat of aquatic species of qualifying interest.
E - Tree cutting	c. 500m beginning about 1km downstream of Claregalway	c1.3km in short stretches	100m max. in one reach near Grange West	1.9km (14%)		Negligible impact on aquatic values. Does not affect habitat of aquatic species of qualifying interest.
G – Localised rock removal	~	<200m total within 0.5km of Claregalway + short stretch nearer Crusheeny	~	<0.2km (1.5%)		Limited opportunity for silt generation. Does not affect habitat of aquatic species of qualifying interest.

¹ Note: Crayfish appear to be absent in this part of the Clare system

Table FIR 1.2: Historical maintenance on major channels and tributaries draining to lower Lough Corrib (channels highlighted in blue) are within the current proposed Scheme.

Channel	Section	Last Maintenance Date	River	Location
C3	1	05/07/2006	Clare R. main channel	Lough Corrib confluence
C3	3	24/06/1994	Clare R. main channel	Curraghmore to Montiagh
C3	5	12/01/1996	Clare R. main channel	Montiagh to Claregalway
C3	7	14/11/2012 ²	Clare R. main channel	Claregalway to Gortatleva
C3	8	22/08/2012 ³	Clare R. main channel	Gortatleva to Islandmore
C3	9	19/07/1985	Clare R. main channel	Islandmore to Grange West
C3	10	22/05/1992	Clare R. main channel	Grange West to Grange Lower
C3	21	27/08/1993	Clare R. main channel	Corofin
C3	23	03/09/1993	Clare R. main channel	u/s Corofin
C3	24	01/10/1993	Clare R. main channel	d/s Tuam
C3	26	03/05/1996	Clare R. main channel	Tuam
C3	27	11/09/1998	Clare R. main channel	Tuam
C3	28	18/09/1998	Clare R. main channel	Tuam
C3	29	18/09/1998	Clare R. main channel	Tuam
C3/7		04/04/2012	Clare R. tributary	Islandmore drains
C3/6		16/10/2011	Clare R. tributary	Gortatleva drains
C3/5		05/10/2011	Clare R. tributary	Kiniska stream
C3/4		21/11/2012	Clare R. tributary	Gortadooey stream
C3/3		06/10/2010	Clare R. tributary	Gortcloonmore drains
C3/2		01/05/2013	Clare R. tributary	Montiagh drains
C3/1		27/07/2011	Clare R. tributary	Carrowbrowne drains near L. Corrib confl.
C3/1/1		24/04/2013	Clare R. tributary	Carrowbrowne drains near L. Corrib confl.

² Only pertains to recent and advanced Claregalway Bridge works as part of this scheme – does not include any regular channel maintenance.

³ Only pertains to recent and advanced Crusheeney Bridge works as part of this scheme – does not include any regular channel maintenance.

Channel	Section	Last Maintenance Date	River	Location
C4	1	19/12/2012	Cregg R. main channel	u/s L Corrib confl.
C4	2	12/09/2012	Cregg R. main channel	d/s Addergoole
C4	3	17/10/2012	Cregg R. main channel	Addergoole
C4	4	19/09/2012	Cregg R. main channel	u/s Addergoole
C4	5	24/10/2012	Cregg R. main channel	Liscananaun
C4	6	31/10/2012	Cregg R. main channel	d/s Cregg
C4	7	28/11/2012	Cregg R. main channel	Cregg
C4	8	12/10/2011	Cregg R. main channel	u/s Cregg
C30		24/08/2011	Western lower L. Corrib Drain	Ballynahallia
C31		31/08/2011	Western lower L. Corrib Drain	Moycullen
C32		23/06/2010	Western lower L. Corrib Drain	Tumnasrah
C33		15/08/2012	Western lower L. Corrib Drain	Tumnasrah

1.1.1 Assessment of Potential Impacts of Selective Channel Maintenance Measures

The OPW provided the location, type and reach involved for each proposed 'Selective Channel Maintenance' element as part of the Scheme, Figure FIR 1.1 (Sheets 1-3). Table FIR 1.1 summarises the extent of each of the elements proposed along the lower Clare River between Lough Corrib and Cregmore Bridge.

Of the channel maintenance measures indicated on Figure FIR 1.1 (Sheets 1-3), the "Silt and vegetation management" element (A) has the main potential for impacts on aquatic qualifying interests of the cSAC, with "Aquatic weed cutting" (B) carrying potential for impacts to a lesser extent by virtue of the technique used. These elements will be considered in tandem, since both refer to removal of marginal emergent vegetation. By matching details from Figure FIR 1.1 (Sheets 1-3) of the extent of these measures with the aquatic habitat notes and field observations it can be identified that it is principally stands of Common clubrush (*Schoenoplectus lacustris*) combined with Branched burr reed (*Sparganium erectum*) that are affected by Elements A and B between Curraghmore Bridge and the Islandmore confluence. Upstream of Islandmore there are two short reaches where silt and vegetation management / weed cutting which may affect stands of Reed Canary Grass (*Phalaris arundinacea*). This is important because these two aquatic macrophyte communities form under different hydrological/hydraulic conditions and have different habitat qualities for respective Annex II species. The significance of the impacts as a result of Elements A and B depend on the scale and magnitude of the works and the qualifying species / habitats affected.

1.1.1.1 Scale and Magnitude of the Impact

Table FIR 1.1 demonstrates that a linear channel length of c.2km between Lough Corrib and Cregmore Bridge may be affected by Element A and about 1km of the total c.13.5km reach is subject to Element B. Within the reaches marked on Figure FIR 1.1, as being subject to this element, it is important to note that in any one reach earmarked for Elements A or B, the full length and cross section of the highlighted reach will not be affected. The hydraulic nature of the Clare River in this part of the catchment is such that the channel is, currently, largely free of conveyance issues as illustrated by Plates 1, 2 and 3, below. The elements A and B, therefore, will selectively target patches of accumulated silt and vegetation that have developed since prior maintenance, which has not recurred for up to 28 years (see Table FIR 1.2). The element generally applies to one bank/margin in any reach, which may alternate along the affected reach, but does not affect both banks in any one earmarked reach.

OPW Standard Operating Procedures (SOPs) are routinely applied during maintenance such as this, where Annex II species occur, i.e., Brook lamprey, Atlantic salmon and (less likely) crayfish. Generally, only one margin is affected by silt accumulation and vegetation growth and patches of this will be left intact as per the OPW SOPs and mitigation measure for Brook lamprey - "*Skip sections to retain intact habitat either in one long reach or multiple short reaches*". This will offset any negative impacts on lamprey and will also benefit salmonids (cover) and coarse fish.

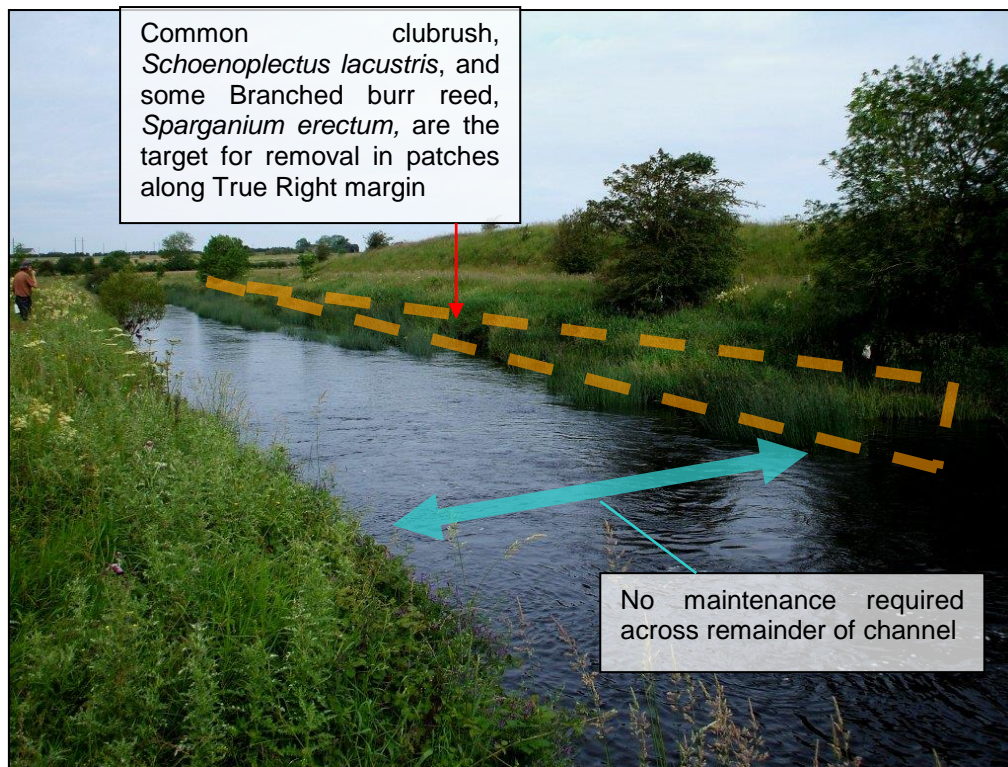


Plate 1: Clare River - reach downstream of Crusheeney Bridge – where the “Silt and vegetation management” proposed, showing growth on one margin whilst much of the channel is unaffected.

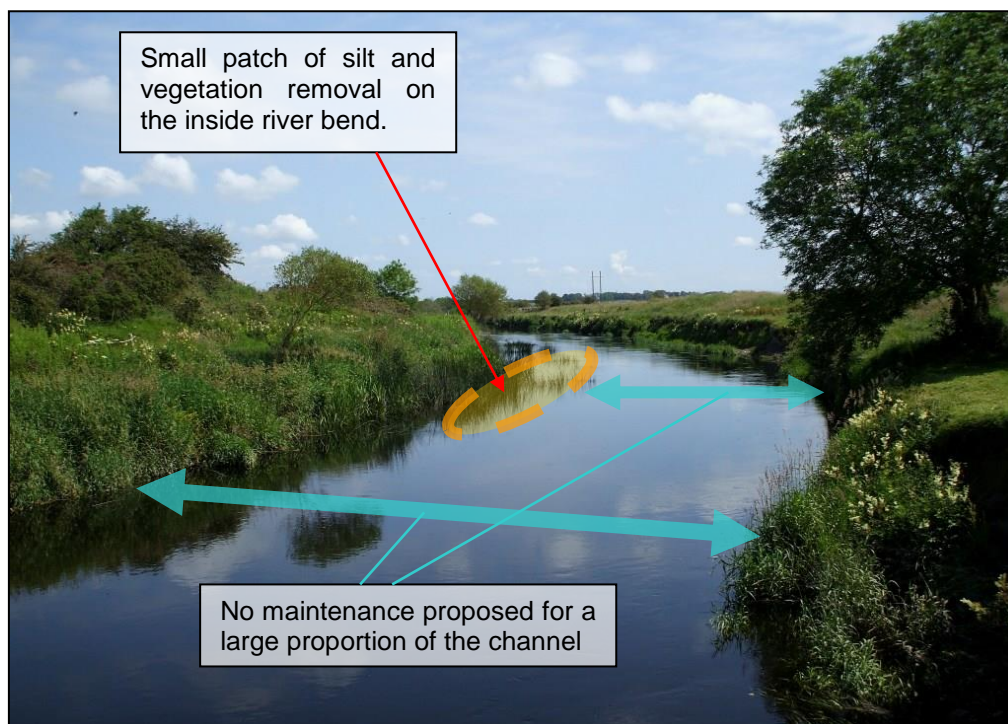


Plate 2: Clare River - reach near Gortatleva – an example of where “Silt and vegetation management” is proposed - a relatively small patch on one margin would be affected.

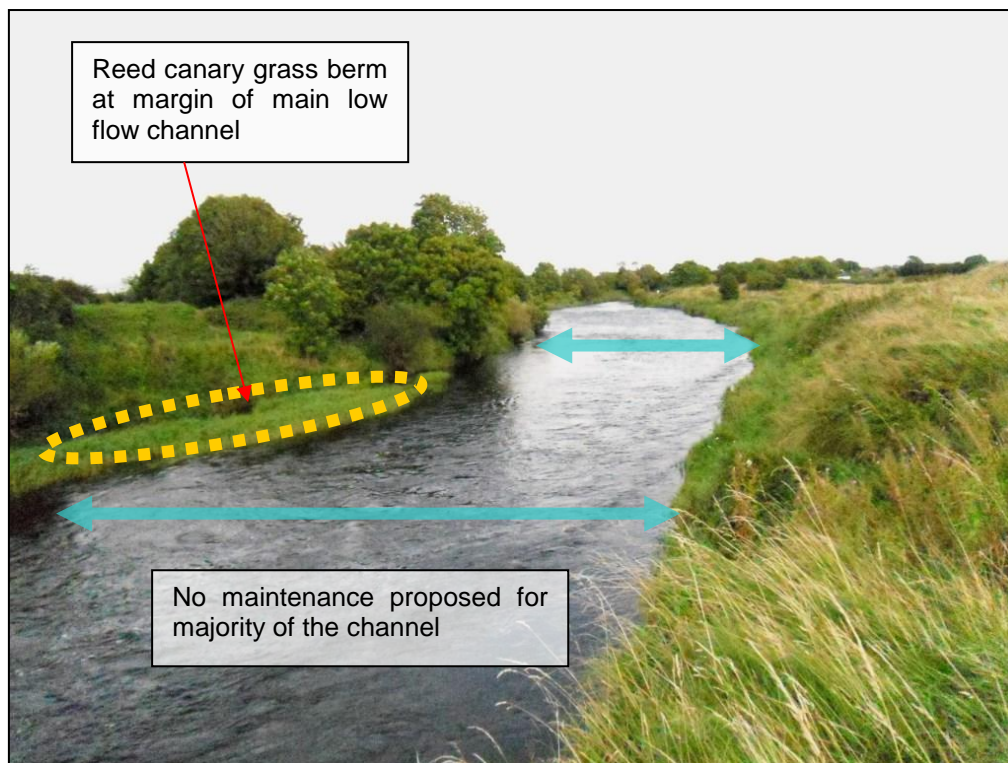


Plate 3: Clare River - reach between Islandmore and Grange West – a short reach where “Silt and vegetation management” is proposed in relation to Reed canary grass on one margin

Plate 1 illustrates the reach downstream of Crusheeny Bridge where Element A is proposed targeting patches of accumulated silt and vegetation within a reach of approx. 300m linear channel length. Silt and vegetation management applies to the True Right bank/margin as shown, whilst $\frac{2}{3}$ to $\frac{3}{4}$ of the channel is open water. This reach was observed during field studies to have the greatest extent of this type of instream marginal emergent growth of any reach that is earmarked for Element A. Other areas earmarked for silt and vegetation management with this type of marginal emergent growth have less dense and extensive instream growth affecting small patches of the overall reach earmarked. Plate 2 illustrates a typical example of this, where only a small patch on an inside river bend is targeted.

Plate 3 illustrates the nature of the Clare River between Islandmore confluence and Grange West (Cregmore Bridge). The river is fast flowing and does not favour silt accumulation and vegetation growth in the main, apart from in small pockets where Reed canary grass (*Phalaris arundinacea*) tends to form vegetated berms under such conditions. This hydromorphological feature signifies a self-narrowing of the river corridor where the edge of the berm defines the typical low flow channel. A short stretch is earmarked in this reach for Elements A and B. OPWs maintenance approach in such cases is to top the berm only. This protects the low flow channel and leaves some embedded silt and *Phalaris* roots. The rest of the channel remains untouched; hence the magnitude and scale of Elements A and B can be seen to be low in this reach. *Phalaris* tends to grow back quite rapidly atop the slightly lowered berm which can increase channel capacity without affecting the low flow channel and aquatic, especially fisheries, values.

In summary, upon detailed investigation, the scale and magnitude of Elements A and B of the selective channel maintenance measures are not as great as they may appear from looking at highlighted reaches on Figure FIR 1.1. It can be seen that, overall, only patches of vegetation will be targeted with some patches left intact owing to OPW SOPs, and the majority of the channel will not be touched as it is largely free from conveyance issues.

1.1.1.2 Recurring Channel Maintenance Frequency

In relation to the question about recurring maintenance the OPW have provided historical maintenance data which shows their schedule of maintenance is naturally infrequent on the lower Clare River (Table FIR 1.2). This is owing to the hydraulic nature of the river there, which is, to some extent, self-cleaning. Table FIR 1.2 indicates that it has been up to 28 years (and generally around 15-20) since routine maintenance was carried out on OPW's lower Clare River Sections (see Table FIR 1.2 – channel C3 – Sections 1 to 10). Note that previous maintenance dates for C3, Sections 7 and 8 of the lower Clare relate only to advanced works at Claregalway and Crusheeny Bridges as part of this scheme, whilst previous routine channel maintenance occurred in the same time frame as for other lower Clare Sections, i.e., mid 1990's.

Owing to the general hydraulic nature of the lower Clare, there will not be any requirement for higher frequency of recurring, regular maintenance following the proposed selective maintenance measures under this scheme. The OPW state that *"the Clare is already a channel forming part of the Corrib Clare Arterial Drainage Scheme, which OPW has a statutory obligation to maintain. The only "new periodic maintenance" that this channel will be subject to is the maintenance of the berm upstream of Crusheeny bridge. This maintenance will not involve instream works and will mostly consist of bush cutting."* Therefore, the only recurring maintenance that may be of higher frequency than that which already exists is the need for bush cutting on the new second stage channel berm to facilitate conveyance. Any future OPW drainage maintenance activities are and will be subject to screening for appropriate assessment and Natura Impact Statement, as required.

1.1.1.3 Impacts on Aquatic qualifying interests

Impacts on Annex I habitat No. 3206: *Watercourses of plain to montane levels with the Ranunculon fluitantis and Callitricho-Batrachion vegetation*

The 'Silt and vegetation management' and 'Aquatic weed cutting' elements will have no negative impacts on Habitat 3206. The aquatic plant species being managed / removed are almost exclusively the marginal emergent species - Common clubrush and Branched burr reed and to a far lesser extent, Reed Canary Grass. These are not typical species of Habitat 3206 watercourses, which are instead characterised by submerged or floating-leaved vegetation including, primarily the Crowfoots (*Ranunculus* spp.), with Pond weeds (*Potamogeton* spp.) and Starworts (*Callitriche* spp.) among others (Hatton-Ellis & Grieve, 2003). Pockets of these typical 3206 submerged species are present on the main Clare River channel in the study area, but are relatively sparse and poorly distributed. They are generally not found in association with the emergent species that are targeted under Elements A and B and will not be targeted separately as part of proposed maintenance. In the event that minimal amounts of the characteristic species of 3206 are removed by virtue of being in proximity to patches of the targeted marginal emergent, the impact of Elements A and/or B on Habitat 3206 will be **neutral** or **imperceptible**, locally. The removal of marginal emergent vegetation and underlying silt, therefore, does not affect the structure, function, range or area of Annex I Habitat 3206 in the cSAC, and hence does not affect the integrity of the cSAC with regard to this qualifying interest.

Impacts on Annex II Species 1106: Atlantic Salmon

Stands of Common clubrush and Branched burr reed may provide some cover for migrating salmon and may provide refuge during high flow periods when velocities are naturally lower at river margins, but these areas are not optimal juvenile salmon habitat and are totally unsuitable for spawning. Overall, the removal of patches of marginal emergent Common clubrush / Branched burr reed will not significantly impact on the conservation objectives of this species, representing an **imperceptible, short to moderate** term impact at most. Topping of *Phalaris* berms upstream of Islandmore in a channel the size of the lower Clare, where the low flow channel is protected and plenty of optimal main channel alternative habitat exists, represents a **neutral** impact with respect to Atlantic Salmon. The prime, sensitive habitat for salmon in the Clare system is in the upper reaches of the Clare and in its tributaries, especially the Abbert and the Grange, where spawning occurs. Elements A and/or B of channel maintenance on the lower Clare, are limited in scale and magnitude and will have no adverse impact on conservation objectives for Atlantic Salmon and will not affect the integrity of the cSAC overall with regard to this qualifying species.

Impacts on Annex II Species 1096: Brook Lamprey

There is a possibility that juvenile Brook lamprey may be present in the more loosely packed silt deposits beneath stands of Common clubrush / Branched burr reed within the study reach. However, from observations of the *Phalaris* berms upstream of Islandmore, underlying silt deposits were more embedded and hence not ideal as juvenile lamprey nursery areas, although their presence there in loose sediments cannot be ruled out. The mitigation measure as stated in the OPW SOPs with reference to Brook Lamprey apply, i.e., “*Skip sections to retain intact habitat either in one long reach or in multiple short reaches*”. It is important to note, in addition that, work by O'Connor (2007)⁴ has shown that conditions on the lower Clare are largely sub-optimal for the group. Of sites surveyed that contained lamprey, all but one were mainly in Clare tributary streams or the upper reaches of the Clare, i.e., well upstream of the reaches targeted for this element of maintenance. OPW SOPs that are routinely applied to channel maintenance will limit impacts to **slight-to-moderate, negative, short-medium term** locally, but an **imperceptible** impact in the context of the cSAC, since the entire prime habitat for lamprey spawning and nursery is higher in the catchment. Future maintenance frequency is not likely to increase and therefore recurring impacts are naturally limited as evidenced by the historical infrequency of regular maintenance on the lower Clare (see Table 2). Overall the structure, function, area and range of the species and its habitat within the cSAC will not be significantly negatively affected, nor reduced. Conservation objectives for this species and the integrity of cSAC, overall, will not be adversely affected.

Impacts on Annex II Species 1092: White clawed crayfish

White clawed crayfish appear unlikely to be present on the lower Clare River, although, as stated in the EIS, it cannot be ruled out. The main range for the species in the Clare system is primarily the upper Clare and the upstream tributaries such as the Abbert and Grange. With application of OPW SOPs for this species, the NPWS will be notified should any crayfish be identified and further recommendations will be made in consultation with an ecologist. Stands of Common clubrush / Branched burr reed are not ideal habitat and are utilised less preferably by crayfish when there are other habitat options such as there are on the lower Clare. Plenty of more optimal residual crayfish habitat will be left intact even after removal of the dominant Common clubrush / Branched burr reed emergent macrophyte community. On the other hand, stands of *Phalaris* are commonly associated with high densities of crayfish and topping them has the potential to remove both crayfish and residual habitat. Intensive manual searching of this habitat type, however, revealed no crayfish presence in the lower Clare and it is very unlikely that *Phalaris* is being utilised by the species in this part of the system. If found to be present, and with a specific mitigation/rescue strategy applied, the impacts on this species would be **slight** and either **temporary** (since crayfish can be recovered from spoil and returned to the river) or **short term** locally, but in the context of the entire cSAC, are likely to be **imperceptible**. The relative scale and magnitude of works at *Phalaris* berms, which represent the more optimal crayfish habitat, are so small in the context of the cSAC and the likelihood of crayfish presence is remote. Given this, Elements A and/or B do not negatively affect the conservation objectives for this qualifying species, nor affect integrity of the cSAC overall.

1.1.2 References

Hatton-Ellis TW & Grieve N (2003). *Ecology of Watercourses Characterised by Ranunculus fluitantis and Callitriche-Batrachion Vegetation*. Conserving Natura 2000 Rivers Ecology Series No. 11. English Nature, Peterborough.

⁴ O'Connor, W. (2007) *A Survey of Juvenile Lamprey Populations in the Corrib and Suir Catchments*. Irish Wildlife Manuals No. 26. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

2 ITEM 2

Appropriate Assessment

*The NIS outlines the qualifying interests of Lough Corrib cSAC (site code 000297) and considers the potential effects of the scheme. It is noted, however, that the justification for determining whether or not habitats conform to Annex I types is generally not presented, other than reference to the EU's Interpretation Manual. The OPW should note and use additional information on Annex I habitats presented in Article 17 Report and backing documents, and in the national survey reports, notably the Irish Semi-Natural Grasslands Survey reports (available from www.npws.ie). Further information should be presented to confirm the determinations in the NIS, including in the case of 'Semi-natural Dry Grassland and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites)' which is deemed not to occur in the receiving environment.*

2.1 RESPONSE TO ITEM 2

Grasslands found within the study area were classified as Dry Calcareous and Neutral Grassland GS1 in accordance with Fossitt (2000) Habitats. This habitat was also assessed for associations with Annex I habitats, particularly those which are qualifying interests of Lough Corrib cSAC. The EIS describes where these grasslands are found,

'Grasslands of this type where they occur within the study area are generally more neutral in character, but some calcareous grassland was found on spoil heaps beside the Clare River where limestone rubble has been deposited.'

For the Annex I Priority and Non-Priority habitat, Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (important orchid sites) (6210/6211), the conservation status assessment methodologies which were established for this habitat by Dwyer et al. (2007) and Martin et al. (2007) were referred to in the assessment of these grassland habitats.

The Annex I grassland habitat is the most readily identifiable since it typically occurs on obvious geological features such as eskers and in association with limestone pavement. This habitat has been well documented (Dwyer et al. (2007), Ivimey-Cook & Proctor (1966), O'Donovan (1987), Keane & Sheehy Skeffington (1995), Tubridy (2006), Breen & O'Brien (1995), Bleasdale (1998), Byrne (1996)).

The Irish Semi-natural Grasslands Surveys were consulted for lists of indicator species for this habitat type. The grasslands where found in agricultural fields which were classified as Dry Calcareous and Neutral Grassland GS1 do not host the indicator species for the Annex I habitat type and due to the negative indicator species including agricultural grasses and herbs. On the earth banks beside the Clare River, species characteristic of strongly calcareous soils were found, including Quaking-grass (*Briza media*) and Lady's Bedstraw (*Galium verum*), however the other species found on these banks did not correspond to the indicator species. Therefore, none of the calcareous grasslands in the study area correspond to any of the Annex I Habitats associated with this habitat type.

3 ITEM 3

Temporary or permanent negative effects, or uncertain effects, are recorded as likely to occur in the case of three Annex I habitats occurring in the SAC in the vicinity of the scheme (e.g. Table 6.2), but there is no assessment of whether these effects represent adverse effects on the integrity of the SAC. In addition, there will be permanent alteration of about 13ha of the SAC through infilling of floodplain, much of which is wetland habitat that will be converted to non wetland. Again, an assessment of whether these losses will affect the integrity of the SAC is lacking. To assist in reaching these determinations, available detailed conservation objectives for the types of habitat in question should be consulted to provide an outline of the parameters that contribute to habitat and structure and function, and favourable conservation condition (see, for example, Lower River Shannon cSAC (site code 002165))

3.1 RESPONSE TO ITEM 3

Impacts identified in Section 6 of the NIS (including table 6.2) are potential impacts and exist only in the absence of mitigation measures.

The three Annex I habitats include;

1. Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation (3260),
2. Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. (3140), and
3. *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinia caerulea*) (6410).

Conservation objectives for the Lough Corrib cSAC aim to define the favourable conservation status of each qualifying interest at site level and will be supported by specific targets for, in this case, each of these 3 habitat types. Targets will be based on the criteria set out in the Habitats Directive to define favourable conservation status. Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

Habitat 3260: *Watercourses of plain to montane levels with the Ranunculus fluitantis and Callitriche-Batrachion vegetation*

Under measures 4b, the in-channel works will remove plant cover by Claregalway Bridge causing damage to a short stretch of Annex I habitat No. 3206. This impact will be highly localised and temporary (expected to recolonise in the short term). The impact is low in magnitude and scale, occurring over an area representing a very tiny fraction of the overall area of this habitat type in the cSAC. EREP measures at and upstream of Claregalway will compensate for a slight alteration of habitat structure as a result of channel deepening and overall the physical components of the habitat ("structure") and the ecological processes that drive it ("functions") will remain, at least stable, and the current area and range of the habitat type in the cSAC will not be affected.

The aquatic plant species that are targeted for management / removal are the marginal emergent species - Common clubrush and Branched burr reed and to a far lesser extent, Reed Canary Grass. These are not characteristic species of Habitat 3206 watercourses, which are instead characterised by submerged or floating-leaved vegetation including, primarily the Crowfoots (*Ranunculus* spp.), with

Pond weeds (*Potamogeton* spp.) and Starworts (*Callitriche* spp.) among others (Hatton-Ellis & Grieve, 2003). Pockets of these typical 3206 submerged species are present on the main Clare River channel in the study area, but are relatively sparse and poorly distributed. They are generally not found in association with the emergent species that are targeted under Elements A and B and will not be targeted separately as part of proposed maintenance. In the event that minimal amounts of the characteristic species of 3206 are removed by virtue of being in proximity to patches of the targeted marginal emergent, the impact of Elements A and/or B on Habitat 3206 will be **neutral** or **imperceptible**, locally. The removal of marginal emergent vegetation and underlying silt, therefore, does not affect the structure, function, range or area of Annex I Habitat 3206 in the cSAC, and hence does not affect the integrity of the cSAC with regard to this qualifying interest.

Habitat 3140: *Hard oligo-mesotrophic waters with benthic vegetation of Chara spp*

Lough Corrib lower corresponds to the Annex I habitat Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. (3140).

The potential impacts on Lough Corrib were assessed for the EIS on the basis of a literature review and have now been combined with an analysis of the duration and frequency of sediment generating operations in those catchments feeding into the Lower Corrib. The primary issue for this Annex I habitat type in relation to this Flood Relief Scheme is the potential for an increase in turbidity during operations, and the effects on water column transparency.

As detailed in Section 6.2 of the Natura Impact Statement, potential run-off of pollutants during the construction phase of the proposed Flood Relief Scheme could impact the water quality of the lake, subsequently having a negative effect on the Annex I Habitat 3140 if pollution control measures are not implemented.

Mitigation measures for the control of water-borne pollutants are provided in section 7.2 of the NIS. These will be combined with detailed continuous turbidity monitoring (see Item 4) with agreed levels that would trigger pre-determined operational responses, e.g. a temporary halt to operations or a change in the sequencing or intensity of activity at a given time or location.

The proposed works, after mitigation, are unlikely to have an adverse impact on the receiving waters of Lower Lough Corrib and any qualifying interests present in the lake. Therefore, the scheme will not affect the structure, function, range or area of Annex I Habitat 3140 in the cSAC, and hence will not affect the integrity of the cSAC with regard to this qualifying interest.

Habitat 3260: *Molinia meadows on calcareous, peaty or clayey-silt-laden soils*

The *Molinia* meadows will not be impacted.

It is proposed to land spread up to a maximum of 13ha of floodplain, 8.4ha comprise wet grassland (i.e., 2.3% of a total of 361.94ha of wet grassland in floodplain), with Improved Agricultural Grassland, Dry Neutral Calcareous Grassland and Marsh comprising the remainder. The proposed infilling of excavation material in the floodplain will change the slope of the existing lands in some areas which consequently may have an impact on the existing surface water drainage pattern. This is mitigated through the maintenance of the existing surface water flow paths by providing regular breaks in any temporary or permanent stockpiles to ensure overland surface water flow is not restricted. Any impacts on the existing surface water drainage regime in the upstream vicinity of the embankment will be minimised by maintaining the existing drainage channels / ditches discharging to Clare River. Therefore it is concluded that this will not affect the structure and function of the cSAC.

4 ITEM 4

In the case of Lough Corrib and the Annex I habitat, Hard oligo-mesotrophic waters with benthic vegetation of Chara spp., the main concern is in relation to sediment loss, particularly of fines. Further consideration should be given to potential effects on this Annex I habitat arising during construction and operation, taking in combination effects of recurring maintenance and other drainage maintenance schemes in the Corrib catchment into account. As mitigation, the programme for water quality sampling (Section 7.2.2) should be developed at pre-consent stage and should involve this Department in addition to the OPW and IFI.

4.1 RESPONSE TO ITEM 4

As outlined previously in Section 1.1.1.2, this stretch of the Clare River does not require regular maintenance (generally around 15-20 years) and this infrequent level of maintenance is expected to continue in the future. The construction activities involving the construction of the two stage channel will take place over 12 km upstream from Lough Corrib and due to the hydraulic nature of the downstream stretch of the river the potential for sediment transport to the lake is negligible. Nevertheless, a water quality monitoring programme is proposed for the Clare River (Claregalway) Flood Relief Scheme.

Changes in turbidity and hence water clarity in lower Lough Corrib as a result of the scheme may have potential to impact on Habitat 3140 although, as stated in the EIS this is not envisaged to occur as to change the current situation “*silt generated by the proposed works would have to significantly reduce the transparency within the lower lake for extended periods during the growing season which does not seem likely*”.

Turbidity could alter the transparency of the water column in the lower lake and thereby cause temporary changes in the growth and distribution of *Chara* in the lake. *Chara* are sensitive to water clarity (Curtis *et al.*, 2009) which affects the depth at which they are found growing in lakes. A study by Van den Berg *et al* (2003) found that water depth and light extinction were the most important factors determining the succession and zonation of macrophytes in five, shallow, Dutch lakes. The occurrence of *Chara* was negatively correlated with both increased turbidity and water depth.

Periodic alterations to turbidity / transparency in lower Lough Corrib would, ordinarily, be expected in any year. Water clarity is likely to be affected by a combination of turbidity generated by high run-off events, phytoplankton growth (chlorophyll levels), as well as, and possibly in combination with, the effects of various activities and operations in the catchment that may generate turbidity. OPW's regular drainage maintenance schemes within the lower Corrib catchment are one activity with the potential to generate changes to turbidity that, depending on scale and distance upstream from Lough Corrib, may affect suspended solids and transparency in the lower lake.

4.1.1.1 Construction phase

Potential for cumulative effects leading to temporarily increased turbidity levels and frequency in lower Lough Corrib.

Section 11.4.3 of the EIS listed the measures with potential for suspended solids generation. Of these Measures 8b (second stage channel construction upstream of Crusheen Bridge) and 10 (selective channel maintenance) were of the most significance, although it was noted that the sequencing of these measures over the planned 2 year construction phase and use of dams and other land-based silt control measures reduce the overall potential for suspended solids loss during construction. It has also been determined that of Measure 10, it is only the ‘Silt and Vegetation’ element (Element A) that has potential to generate turbidity (see ITEM 1 above).

4.1.1.2 Mitigation during the Construction Phase

Section 11.3.5 of the EIS reported EPA data that showed Lower Lough Corrib presently has a very strong representation of *Chara* species, which contributes to its good macrophyte status, concurring with its overall Good water chemistry status. A mean transparency in the lake of about 4.25m means that across most or all of the lower lake light penetrates to the bottom most of the time, which supports the current success of *Chara*. This is the situation in the lake presently under the current maintenance regime employed by the OPW in the main drainage channels to the lower lake. Therefore, in the absence of existing data on the background / existing turbidity regime in the lower lake, it is only possible, in relation to the current proposal, to ensure that the necessary works are sequenced in such a way that there is no change to the level and frequency of turbidity expected in the lower lake as a result of the scheme. The sequencing will take into account in combination effects of individual measures as part of the scheme as well as other, regular, catchment drainage works. For this reason, the in-combination effects of these Measures and other regular maintenance of channels flowing into lower Lough Corrib have been investigated.

Table FIR 1.2 in Item 1 above, lists OPW channels and channel segments that flow into lower Lough Corrib along with their dates of previous maintenance, these broadly encompass, on the eastern shore, the Clare River (channel code C3) and Cregg River (channel code C4) and their tributary streams and drains; and to the western shore, four unnamed drainage channels (C30-33). Figure FIR 4.1 below shows the locations of the main OPW channels that flow to lower Lough Corrib.

OPW note that maintenance will normally take place between 4 and 5 years after the last date of maintenance. Larger channels do not come under the same cycle due to their size and different frequency of maintenance compared to that of a smaller channel and larger channels are maintained in sections as required, rather than in their entirety.

OPW note that channels C30-C33 are all at lake level and have little or no grade or flow, consequently a negligible contribution to transported sediments and turbidity in the lake. They are not due for maintenance until between 2015 and 2017, which is outside the construction period for this proposal, and therefore in terms of cumulative impacts during the construction phase represent, overall a **neutral or imperceptible** impact.

Channel C4, the Cregg River, is sourced by a spring, has a lot of gravels, and is maintained annually using a weed-cutting boat, a method by which changes to turbidity level or frequency in the lake are expected to be imperceptible.

Channel C3, the Clare River, is divided into sections, beginning at C3 Section 1, closest to the confluence with lower L. Corrib. Sections are then numbered sequentially in an upstream direction with sections varying in linear length as shown in Table FIR 1.2. Sections 1 to 10 are included within the current proposed scheme, as are the tributary/drains C3/2 to C3/5 and C3/7. Table FIR 1.2 shows the schedule of maintenance is naturally infrequent on the lower Clare River. This is owing to the hydraulic nature of the river, which is, to some extent, self-cleaning. It has been up to 28 years (and generally around 15-20) since routine maintenance was carried out on OPW's lower Clare River sections. Note that previous maintenance dates for C3, Sections 7 and 8 of the lower Clare relate only to advanced works at Claregalway and Crusheeny Bridges as part of this scheme, whilst previous routine channel maintenance occurred in the same time frame as for other lower Clare Sections, i.e., mid 1990's.

All tributaries/drains earmarked for maintenance under this proposed scheme have recently been cleaned, except the Gortcloonmore drain. Gortcloonmore would ordinarily be due for maintenance in 2014/2015, but can be brought forward so as to coincide with Measures 8b and Element A of Measure 10. All the other relevant channels are not due for maintenance until between 2015 and 2017 at earliest, which is outside of the construction phase for this project.



Table FIR 1.2 shows that OPW channel sections between Corofin and Tuam are also subject to very infrequent maintenance, with last maintenance occurring between 15 and 20 years ago. These sections are unlikely to require maintenance in the two year construction phase on the lower Clare. Even if some maintenance was required in those sections, the distance upstream from Cregmore Bridge (>12km to Corofin and >20km to Tuam) is great enough that any suspended solids generated as a result would be very unlikely to have cumulative downstream effects in association with Measures 8b and 10 on the lower Clare and would be extremely unlikely to reach the lake another c.13km downstream.

The large Clare tributaries, the Abbert and Grange Rivers (OPW channels C3/8 and C3/9) were both last maintained in sections between 2005 and 2008. Theoretically these channels may be scheduled for maintenance over the next 2 years, but given the time that has lapsed since last maintenance, these can be further delayed to occur outside of the lower Clare construction phase. In any case, the distance upstream from Cregmore Bridge to their confluences are great enough (>c.10km and >c.14km) that it is very unlikely to have cumulative downstream effects in association with Measures 8b and 10 on the lower Clare and would be extremely unlikely to reach the lake another c.13km downstream. The Dalgan River is located >c.40km upstream of the Cregmore Bridge and any maintenance activity in this tributary of the Clare is extremely unlikely to have in-combination effects with works on the lower Clare.

To strengthen the above sequencing and scheduling of activities, a water quality monitoring programme is proposed for the Clare River (Claregalway) Flood Relief Scheme to monitor for any potential impacts during construction of the scheme, specifically turbidity which may arise from release of suspended solids which have the potential to be generated during excavation of a second stage channel along 1.3km of the Clare River. Monitoring of water quality will be conducted using multi-parameter probes (e.g. TROLL 9500). OPW propose to install three monitoring locations along the Clare River, the locations are as follows:

1. One permanent station at Curraghmore Bridge for the duration of the project and an equal duration after the project (potentially six years in total).
2. One mobile monitoring station immediately upstream of instream work locations.
3. One mobile monitoring station immediately downstream of instream work locations.

In summary, to protect water clarity in lower Lough Corrib, it has been demonstrated that the relevant major and minor OPW channels can be sequenced for regular maintenance to avoid the construction phase associated with Measures 8b and 10 of the proposed scheme. A rigorous water quality monitoring programme will be implemented that includes both turbidity and lake transparency measurements. Through this approach, it is extremely unlikely that the turbidity regime with lower Lough Corrib will alter compared to that which can be expected in any ordinary year. Therefore, the potential conservation targets (i.e., not yet devised for this SAC, but based on the overall conservation objectives for the site) for Annex I habitat 3140 - *Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.* will not be affected by this proposal since the physical components of the habitat ("structure") and the ecological processes that drive it ("functions") are not being altered, and the current area and range of the habitat type in the SAC will not be affected. Hence, the integrity of the SAC overall will not be affected by the Scheme. The residual impact on *Chara spp.* will therefore be **neutral** or **imperceptible** at most.

4.1.1.3 Operation Phase

Recurring maintenance in the lower Clare as a result of the scheme is not expected to alter the current turbidity regime in lower Lough Corrib. The OPW state that the only new periodic maintenance will be bush-cutting on the second stage channel, which is located upstream of Crusheeny Bridge and well upstream of Lough Corrib, and will not lead to increased silt or suspended solids. Other than that, maintenance on the main channel is expected to remain infrequent, and tributaries and drains will

undergo cleaning in the same frequency as currently employed, which will not alter the current level of transparency over the existing. Overall, this on-going maintenance can be expected to have a **neutral** impact on the current turbidity regime in lower Lough Corrib.

4.1.1.4 Mitigation during the Operational Phase

Any future OPW drainage maintenance activities are and will be subject to screening for appropriate assessment and Natura Impact Statement, as required.

REFERENCES

- Curtis, T., Downes, S. and Ní Catháin, B. (2009) The ecological requirements of water dependant habitats and species designated under the Habitats Directive. *Biology and Environment: Proceedings of the Royal Irish Academy*, 109B, 261 – 319.
- Van den Berg, M.S, Joosse, W. and Coops, H. (2003) A statistical model predicting the occurrence and dynamics of submerged macrophytes in shallow lakes in the Netherlands. *Hydrobiologia*, 506–509: 611–623.

5 ITEM 5

Temporary or permanent negative effects are recorded as likely to occur in the case of some of the Annex II species that are qualifying interests of the SAC (E.G. Table 6.3), but there is no assessment of whether these effects represent adverse effects on the integrity of the SAC. As above, available detailed conservation objectives for the species in question should be consulted to provide and outline of the parameters that contribute to favourable conservation condition (see, for example, Lower River Shannon cSAC (site code 002165)). The Annex II species that will be impacted are Salmon, Otter and Brook Lamprey, and possibly also White-clawed Crayfish. In the case of Salmon, the permanent loss of nursery habitat in Section 6.2.7.3 is not reflected in Table 6.3. Impacts on species should also be considered in the context of habitat loss and fragmentation through the creation of barriers associated with non-return valves.

5.1 RESPONSE TO ITEM 5

There are presently no specific targets for Annex II species in the Lough Corrib cSAC. However, conservation objectives, which are ultimately underpinned by the setting of such targets, are set out here:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

In simple terms, targets must therefore be established for qualifying species to ensure (i) viable population, (ii) stable or increasing habitat area, and (iii) stable or increasing habitat range. In assessing whether the integrity of the Lough Corrib cSAC will be affected these potential targets with respect to fulfilling the Lough Corrib cSAC conservation objectives are addressed with regard to each Annex II qualifying interest, as below.

Atlantic Salmon

The only Annex II species for which, in the absence of mitigation, a permanent negative impact was predicted within the EIS was Atlantic Salmon. The EIS indicated that the changes to the channel in the Crusheeney Bridge stretch (Chainage 94-87) combined with the re-grading of the channel at Claregalway Bridge reduce the attractiveness of the affected reaches for juvenile salmon. There is also a possibility that the works at Crusheeney Bridge have reduced the likelihood that salmon may spawn in the reach as a result of reduced velocities at higher flows caused by changes that have taken place and are proposed. EREP measures recommended were that in addition to the provision of a pools or the improvement of existing pools in the stretch between Crusheeney and Cregmore Bridge, which could be seen mainly as an angling improvement, other measures including the provision of suitable spawning substrate and random boulders for example, must also be included within the measures, as these are aimed at enhancing the overall recruitment from the system.

The EIS stated that it was only in the absence of these fisheries enhancement measures upstream of Crusheeney Bridge that a local, permanent, negative impact on salmon may occur. In this regard, and as part of this response, further consultation was sought with IFI, who have confirmed the following:

- EREP (fisheries enhancement) measures have now been agreed and will be implemented in the Crusheen to Cregmore reach (John Conneely, *pers. comm.*) in addition to the EREP measures already agreed at Claregalway Bridge, and;
- IFI data shows that Atlantic Salmon populations within the Clare system are currently meeting conservation targets for the species, and would be considered to be meeting the cSAC conservation objectives for this Annex II species in the Lough Corrib cSAC. John Conneely of the IFI states: *From a salmon conservation point of view, the Corrib catchment which includes the Clare river system is managed as a single stock fishery. The Standing Scientific Committee (SSC) which reviews the status of all salmon rivers in Ireland annually has confirmed that the Corrib system has a total allowable catch of 4,235 salmon for 2013⁵. In simple terms, the SSC has confirmed that 4,235 salmon can be harvested from the Corrib system and it will still achieve its conservation limit i.e., the number of salmon required to spawn to maintain a healthy population. I can also confirm that the Clare River system is the principal contributory system to salmon stocks in the Corrib catchment which are currently achieving their spawning target and providing a significant exploitable surplus. In short, the Corrib system receives a run of salmon significantly above its conservation limit.*

Furthermore, it must be reiterated, as was stated in the EIS, that the vast majority of salmon spawning within the Clare system takes place in the upper reaches of the Clare and in its tributaries, especially the Abbert and the Grange. The main channel of the River Clare in the reach affected by the proposed Scheme is, overall, not optimal for salmon spawning: *"In general, the main channel of the Clare is not currently utilised by salmon for spawning although it is recognised that some pockets of spawning may occur (M. O'Grady, IFI, pers comm.)"*. [p.223 EIS]. IFI fish monitoring data, also reported in the EIS, confirmed that some spawning is likely to be occurring in pockets.

With EREP now agreed, the natural range, habitat extent and population conservation objectives for Atlantic salmon will not likely be reduced nor significantly adversely affected. With these mitigations in place, it is now considered extremely unlikely that the proposed works will have an adverse impact on the conservation objectives for salmon in the Clare system and will have no adverse impact on the integrity of the cSAC as a whole.

Brook Lamprey

The EIS called for an electrofishing survey to be undertaken in the lower reaches of the Islandmore stream because the substrate there may possibly have supported brown trout or brook lamprey spawning. It must be noted that the habitat in question was not optimal for either species and there is no certainty that either would occur there. It has since been reported that the Islandmore drain runs dry at times near the Clare confluence meaning that it most certainly does not comprise an important relative constituent of the natural spawning or nursery habitat range for either brook lamprey (or trout) in the cSAC. Furthermore, in the case of lamprey, work by O'Connor (2007)⁶ has shown that conditions on the lower Clare are sub-optimal for the group and that, of sites surveyed that contained lamprey, all but one were upstream of the outflow of the Islandmore drain, mainly in Clare tributary streams or the upper reaches of the Clare. It would appear that the lack of suitable silt deposits which are the nursery areas for Brook lamprey (the only recorded species in the Clare system) is the main reason for the sub-optimal condition. Given this, the possible use of the gravel in the lower Islandmore by spawning Brook lamprey, would have no bearing on the integrity of the species within the system, because there is no indication that a scarcity of spawning sites might be limiting the species numbers. The removal of some of the lower reaches of the stream and the construction of the non-return valve therefore will not impact the integrity of Brook lamprey in the cSAC.

⁵ Refer to schedule 2 of S.I. No. 556 of 2012 -Wild Salmon and Sea Trout Tagging Scheme Regulations 2012

⁶ O'Connor, W. (2007) *A Survey of Juvenile Lamprey Populations in the Corrib and Suir Catchments*. Irish Wildlife Manuals No. 26. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

IFI have confirmed presence of trout in the Gortadooey stream and have a successful existing agreement about reduced maintenance and environmental management in a short, lower (spawning) reach of that stream. Any agreement that benefits trout in that short stretch of the Gortadooey stream also benefits potential brook lamprey spawning which would, if it occurs at all, form a very tiny fraction of lamprey spawning habitat in the Clare or cSAC as a whole. It is worth noting that the work by O'Connor (2007) did not find juvenile lamprey to be present downstream of the confluence of the Gortadooey stream with the Clare River. The existing agreement for that reach means that the integrity of the Clare system and the cSAC as a whole is not adversely affected with respect to conservation objectives for brook lamprey.

White clawed crayfish

In the case of crayfish, presence is either unlikely or very low (currently undetectable using a combination of targeted standard survey methods) in the affected stretch. Given the apparent absence of crayfish within the affected reaches, the works, as proposed, are highly unlikely to impact on any of the conservation objectives for white clawed crayfish in this cSAC and thus, unlikely to affect the integrity of the cSAC with respect to this Annex II species. The main range of this species in the Clare system is in the upper tributaries, e.g., Abbert, Grange and Sinking Rivers, and these areas will not be affected in any way by the proposed scheme. Crayfish habitat size / extent and range is not reduced as a result of the works, and potential crayfish habitat area within the cSAC may even increase in the reach upstream of Crusheeny Bridge through the creation of a second stage channel which has the effect of reducing channel velocity and developing more optimal marginal habitat in proximity to the second stage channel – features which can benefit white clawed crayfish..

Capture/relocation work will only be required if in-channel works do reveal crayfish presence. This is detailed in the EIS and NIS, as were the OPW SOPs, which state that NPWS will be notified and the services of an ecologist will be sought if crayfish do appear in spoil during any operations. Any licences for disturbance or capture/relocation of White-clawed crayfish will be obtained and work carried out by suitably qualified and experienced personnel as would be standard procedure in such cases.

6 ITEM 6

Strengthened mitigation measures are required for Otter, including preventing destruction or disturbance of the two holts during any of the works or through the use of machinery in their vicinity (see, for example, the NRA guidance for exclusion distances). Whether any licences are required to exclude and excavate holts should be confirmed (Section 7.2.7.4). Any licences should be secured from this Department, at least in principle, in advance of reaching a decision to proceed with the scheme. Similarly, any works involving disturbance, capture or relocation of White-clawed Crayfish may only be undertaken under the relevant licence from the department.

6.1 RESPONSE TO ITEM 6

Two holts were found within the study area. Both holts were deemed active in the 2012 survey. The details of the otter observations are provided in Table 10.17 Volume 2 EIS and Table 4.11 of the NIS. It is also discussed in Table 6.3 of the NIS of the potential impacts to Annex II Species during the Flood Relief Works and Channel Maintenance.

Otter will not be directly impacted by the flood relief works. The holts are located 2.17km and 2.6km respectively downstream of the proposed works. As discussed in the EIS and NIS there are potential short term indirect impacts to this Annex II and IV species during the construction period only, from potential run-off of pollutants. Mitigation measures to minimise these short term local impacts are outlined in these documents.

Details of the proposed maintenance works proposed on the Clare River from the outfall to Lough Corrib to Clare Galway and from Claregalway to Cregmore Bridge, are outlined in Table 6.10 (EIS) and Table 2.4 (NIS), and shown in Figures 6.15 and 6.16 (EIS) and Figures 2.13 and 2.14 (NIS). In the tables, points ID No. 11, 12, 13 and 15 are located in proximity to active otter holts. Point ID No. 10 and 16 and located 70m downstream and upstream of the nearest holt. The works proposed at these locations include; D – Bush Cutting / Branch Trimming and E – Tree Cutting. The otter holts are found amongst the roots of trees in the left bank.

It is proposed that no works will be carried out in the vicinity of the two holts. A buffer zone of 50m will be placed around the holts in accordance with the OPW Otter SOP. Therefore licences will not be required to exclude and excavate holts as no works will be undertaken near holts.

Any future works if required along this stretch will be subject to a further otter survey and appropriate measures taken in accordance with the OPW Otter SOP and consultation with the NPWS.

7 ITEM 7

Seasonal exclusion restrictions are set out in relation to in stream works in order to protect Salmon. Comparable seasonal restriction should also be set out as necessary for White-clawed Crayfish and Lamprey, particularly Brook Lamprey.

7.1 RESPONSE TO ITEM 7

Table 7.1 clarifies restrictions with respect to conservation interests of aquatic species within the study area, and defines the period that instream works are possible based on the likely presence of each species/group. Note that the restriction for Brook and River Lamprey is related to spawning, which cannot be entirely ruled out in pockets along the main Clare River channel within the study area (in the same way that IFI do not rule out the salmon spawn in pockets there). The OPW's Series of Ecological Assessments on Arterial Drainage Maintenance No. 9 states: "Presently OPW maintenance is restricted in salmonid spawning channels from October to May. However, this time frame does not encompass the entire breeding cycle of the three Irish lamprey species. ..By extending the maintenance restriction to the start of June in lamprey-bearing channels, a mitigation would be introduced that would essentially eliminate any adverse impact of maintenance on spawning of adult Brook and River lamprey." Therefore the OPW observe that "For River or Brook Lamprey, no works on relevant spawning channel from end March to start June" as stated in the SOPS.

Table FIR 7.1 Seasonal Exclusion Restrictions for Aquatic Species

Species of conservation interest	Period of no in-stream disturbance (inclusive)	Likelihood of presence in the affected areas and comments	Period instream works allowed (inclusive)
Salmon	October to end April (spawning / hatching)	Migration route to upper tributaries (to main spawning areas such as the Abbert and Grange rivers)> nursery area> spawning (spawning possibility very limited on main channel of Clare)	May to September
Brook and River Lamprey	March to May (spawning / hatching)	Spawning potential is very low as habitat is generally suboptimal. Juvenile presence has been recorded in one location in the study area, but habitat considered sub-optimal (limited silt deposition).	June to February
Sea Lamprey	May to July (spawning / hatching)	Spawning and juvenile presence both highly unlikely owing to there being no evidence of this species within the Corrib system since the introduction of the Galway Regulating Weir.	August to April (<i>Note – species not considered likely to be present</i>)
White clawed crayfish	November-late June (breeding / berried females + hatching)	No recent evidence of this species in the study area, and inconclusive evidence of historical presence.	July to October (<i>Note - apparent absence in the study area</i>)
Trout	October to May	Presence in Gortadooey channel confirmed by IFI, but main spawning occurs in upper catchment. Main channel in study area = holding, nursery + very limited spawning possibility.	June to September
Combined restrictions			Instream works possible: June to September⁷ (inclusive)

⁷ Sea lamprey and white clawed crayfish restriction has been removed as these species appear unlikely to be present and/or absent from the study area.

8 ITEM 8

To complete the appropriate assessment, a determination must be made in relation to whether adverse effects on the integrity of the SAC will arise from the scheme, taking recurring impacts arising from the requirement from new periodic maintenance into account. In this regard, there are inconsistencies between the conclusions summarised in Table 6.5 and the text of the NIS. The OPW should note that the question of whether minor but permanent negative effects on qualifying interests of an SAC are allowable under Article 6(3) of the Habitats Directive is currently under consideration in the European Court of Justice Case C-258/11 – Peter Sweetman and others v An Bord Pleanála (see Opinion of Advocate General Sharpston delivered on 22 November 2012)

8.1 RESPONSE TO ITEM 8

The EREP measures proposed are outlined in Item 1 above. Therefore, the natural range, habitat extent and population conservation objectives for Atlantic salmon are very unlikely to be reduced or significantly impacted. It is considered extremely unlikely that the proposed works will have an adverse impact on the conservation targets (and hence fulfilling conservation objectives for the cSAC) for salmon in the Clare system and will have no adverse impact on the integrity of the cSAC as a whole.

Recurring channel maintenance frequency

In relation to the question about recurring maintenance the OPW have provided historical maintenance data which shows their schedule of maintenance is naturally infrequent on the lower Clare River (Table FIR 1.2). This is owing to the hydraulic nature of the river there, which is, to some extent, self-cleaning. There will not be any requirement for higher frequency of recurring, regular maintenance following the proposed selective maintenance measures under this scheme. Table 2 indicates that it has been up to 28 years (and generally around 15-20) since routine maintenance was carried out on OPW's lower Clare River Sections (see Table 2 – channel C3 – Sections 1 to 10). Note that previous maintenance dates for C3, Sections 7 and 8 of the lower Clare relate only to advanced works at Claregalway and Crusheeny Bridges as part of this scheme and does not relate to routine channel maintenance.

The Clare is already a channel forming part of the Corrib Clare Arterial Drainage Scheme, which OPW has a statutory obligation to maintain. The only "new periodic maintenance" that this channel will be subject to is the maintenance of the berm upstream of Crusheeny bridge. This maintenance will not involve instream works and will mostly consist of bush cutting. Therefore, the only recurring maintenance that may be of higher frequency than that which already exists (which is naturally infrequent) is the need for bush cutting on the new second stage channel berm to facilitate conveyance. Any future OPW drainage maintenance activities are and will be subject to screening for appropriate assessment and Natura Impact Statement, as required.

It is acknowledged that there is also maintenance ongoing annually within the Corrib catchment comprising the following sub-catchments (Corrib-Clare, Corrib-Headford, Corrib-Mask-Robe). The annual maintenance programmes are subject also Appropriate Assessment.

Table FIR 8.1 outlines the typical scale of maintenance, based on the last five years programmes, where approximately 14.4km of main channel is programmed annually, and approximately 244km of minor channel is programmed annually 70.6km of which is maintained using weed cutting boats

Table FIR 8.1: Corrib Catchment Maintenance Programme

Works	2009	2010	2011	2012	2013
Programmed main channel	11.5 km	7.8 km	3.6 km	20 km	29 km
Programme minor channel	255 km	200 km	236 km	266 km	263 km
Total km of channel	266.5 km	207.8 km	239.6 km	186 km	292 km
of which aquatic vegetation cutting only	71 km	69 km	72 km	70 km	71 km

9 ITEM 9

Any monitoring programmes, such as water quality monitoring, should be developed and agreed at pre-consent stage

9.1 RESPONSE TO ITEM 9

The monitoring programme is set out under Item 4 above.

10 ITEM 10

In combination issues

Contrary to what is indicated in the NIS, the new Tuam, Milltown and Claregalway wastewater treatment plants are permitted, not proposed, and each was subject to full appropriate assessment, not just screening. Similarly, the Claregalway riverside walk is permitted.

In relation to the advance works on the two bridges, the appropriate assessments of these two projects, and the works areas/compounds used in each case, the OPW should provide confirmation that all works areas/compounds used in each case, the OPW should provide confirmation that all outstanding mitigation measures will be implemented and that these areas will be reinstated to their original (pre-development) condition.

At operation stage, in the case of periodic channel maintenance, the OPW should note that all such works will require screening for appropriate assessment or the preparation of an NIS to inform the OPW's decision to proceed including the details of any mitigation measures required. If/when consulted, the National Parks and Wildlife Service if this Department should be supplied with the relevant screening or NIS report(s)

10.1 RESPONSE TO ITEM 10

Table 18.2 (EIS) and Table 5.1 (NIS) discuss the potential in-combination effects of other plans and projects in the area. It is concluded that the Tuam WWTP discharge will not have a significant negative impact on Lough Corrib cSAC, either alone or in combination with the estimated future discharges from the proposed WWTPs at Claregalway and Milltown Village. The reference to 'proposed' is to acknowledge that the wastewater treatment plants at Claregalway and Milltown Village are not yet in operation.

With regard to the advance works on the Crusheeny and Claregalway Bridge, the works on Crusheeny Bridge are complete and all mitigation measures have been implemented. The EREP that has now been agreed for the reach upstream of Crusheeny Bridge will include measures that enhance salmon spawning/recruitment in this part of the Clare system and this offsets any reduction in the attractiveness of the reach around Crusheeny Bridge for juvenile salmon.

Works are still on going on Claregalway Bridge and all mitigation measures will be complied with including the EREP provision.

All OPW drainage maintenance activities are and will be subject to screening for appropriate assessment and Natura Impact Statement as required.

11 ITEM 11

Post consent mitigation/assessments

The OPW should address, at the current stage, any references to post-consent surveys or assessments that are necessary to determine the likely significant effects on the environment (EIS) or on European sites (NIS). All relevant baseline information on the receiving environment, and on likely significant effects of the scheme, should be available to the OPW to inform its decision to proceed and to determine what mitigation measures are required. In this regard the Department advises that any electro-fishing surveys to determine the fisheries value of watercourses should be carried out at the pre-consent stage.

The OPW should note that any requirement for developing or agreeing mitigation measures and/or method statement, or aspects of scheme design at the post-consent stage suggests that the effects are not fully known at consent stage. In the case of appropriate assessment, there should be no doubt as to the absence of adverse effects on the integrity on a European site when considering whether a project may proceed.

Method statements with mitigation incorporated should form part of the pre-consent documentation for the scheme and should be subject to assessment. If method statements are drawn up by the OPW or the contractor after consent, an approach that is not recommended, then the OPW must ensure that a system is in place whereby there is review and approval by a suitably qualified and experienced ecologist, preferably with a direct reporting relationship to the OPW and with the authorisation to contact or report to the Department if necessary.

For mitigation measures to be implemented fully and in a timely fashion by or on behalf of the OPW, the ongoing supervision and involvement of a suitably qualified and experienced ecologist will be necessary.

It is the OPW's responsibility as the consent authority to ensure that all parts of the scheme and all mitigation measures are delivered in full and as necessary during construction and operation, and to ensure that the necessary systems are in place to that end. Such responsibilities and the obligations to ensure that mitigation is delivered on the ground may not be devolved to an overseeing steering group.

11.1 RESPONSE TO ITEM 11

As a result of further consultation with OPW and IFI, electrofishing surveys are not now required in the short sections of the Islandmore and Gortadooey tributaries (see Section 5.1). The Gortadooey tributary was cleaned in 2012 under the OPW's drainage programme. The normal maintenance cycle for this tributary would be 4-5 years. Measures to protect trout habitat in the Gortadooey stream protect brook lamprey if indeed they are spawning in the short stretch of hard substrates for which OPW have an agreement with IFI during maintenance.

The requirements for ecological supervision are outlined as part of the mitigation measures for the project as discussed in Tables 10.25 and 10.26, Section 11.5.1, and included in Table 19.1 Schedule of Mitigation Measures of the EIS and in Section 7.2.3 of the NIS.

The Method Statement will include the Schedule of Mitigation measures as provided in Chapter 19 of the EIS.

12 ITEM 12

EIA and Wetlands

The scheme will involve loss of floodplain and wetlands through infilling and drainage; the thresholds for requiring planning permission and EIS under S.I. 454 of 2011 and S.I. 464 of 2011 will be exceeded. Taking this new legislation into account, the OPW, preferably in consultation with the planning authority, should confirm whether or not planning permission is required for any part of the proposed scheme.

Further information is required, as outlined above, to complete the NIS and for the OPW to undertake the appropriate assessment. No decision should be reached by the OPW to proceed with the scheme if, as is currently the case, there is uncertainty as to the absence of adverse effects on the integrity of a European Site.

12.1 RESPONSE TO ITEM 12

The Browne Commission (Report of The Drainage Commission 1938-1940), which examined flooding and improvement of land through drainage, commenced its deliberations in 1938 and resulted in the development of the Arterial Drainage Act, 1945. This is the primary piece of legislation with which the OPW have operated under for the last 50 years, and empowers the OPW to undertake catchment-wide arterial drainage schemes to reduce flooding. The Act is described as:

“An Act to make provision for the drainage and improvement of land by the execution of works of arterial drainage, to provide for the maintenance of those works and make further and better provision for the maintenance of existing drainage works, and to provide for matters incidental to or connected with the matter aforesaid or relating generally to the drainage of land”.

The emphasis of the 1945 Act was on the improvement of agricultural land. Following severe flooding of a number of towns in the mid to late 1980's and early 1990's, the Act was amended in 1995 by the Arterial Drainage (Amendment) Act 1995, when the emphasis of flood management activity shifted to the protection of urban areas subject to flooding. This amendment empowered the OPW to undertake localised flood relief schemes to protect and reduce flood risk in individual urban areas.

Between 1945 and 1995 the OPW completed 34 Arterial Drainage Schemes on river catchments, and maintenance has been ongoing on all schemes since their completion. The Clare River forms part of the Corrib-Clare Arterial Drainage Scheme which commenced in 1954 and was completed in 1964. The OPW has a statutory responsibility for the maintenance of completed Arterial Drainage Schemes and completed Flood Relief Schemes, which is delivered through their arterial drainage maintenance programme. The OPW does not have powers to undertake river or channel maintenance other than where these rivers form part of an arterial drainage scheme or flood relief schemes.

Therefore works specified in a drainage scheme confirmed by the Minister for Finance under Part II of the Arterial Drainage Act 1945 (No. 3 of 1945) or the Arterial Drainage (Amendment) Act 1995 (No. 14 of 1995), carried out by, on behalf of, or in partnership with, the Commissioners, with such additions, omissions, variations and deviations or other works incidental thereto, as may be found necessary by the Commissioners or their agent or partner in the course of the works, shall be exempted development in accordance with S.I. No. 454/2011 — Planning and Development (Amendment) (No. 2) Regulations 2011.

13 ITEM 13

Underwater Archaeology

There does not appear to have been any underwater archaeological impact assessment carried out as part of the main Archaeological Assessment undertaken and included in the EIS. Such an assessment shall therefore need to be carried out and the results forwarded to the Underwater Archaeology Units for consideration and response before any works commence within the riverine environment. This shall take the following format;

- The service of a suitable qualified underwater archaeologist /archaeological company shall be engaged to carry out the underwater archaeological assessment.*
- The assessment to be carried out under licence to this Department and shall include a Dive Survey licence and Detection Device Licence, the latter to cover the use of a hand held metal detector as part of the overall survey of all water courses – the Clare River, Kinska Stream and area where the proposed channel maintenance from Lough Corrib to Curraghmore Bridge is proposed. The assessment shall also include looking at the area where Crusheeny Bridge was replaced and Claregalway Bridge to identify any dislodged material from earlier structures that still remain in the river or artefactual material that may have been disturbed by the works.*
- The assessment shall also assess the riverbanks along the course of the waterways for any identifiable structures, features or elements that may represent cultural evidence. Particular attention to be paid to the river banks that run from Crusheeny Bridge upstream for 1.3km and that are due to be impacted by the proposed works.*
- As the Kiniska/Stream bed is to be fully cleared, details survey shall be carried out of this water course.*
- The old Clare River Channel is due to be infilled and assessment of this shall form part of the underwater archaeological assessment.*
- A detailed desktop study that addresses the use of the watercourses and their uses at Claregalway over time*
- A report that contained a detailed Impact Statement which shall include proposed mitigation for further archaeological requirements, if necessary, to be forwarded to the UAU for consideration*
- The results of all previous archaeological assessment associated with riverine works, including with Claregalway Bridge, to be taken into consideration as part of this UAIA*

Archaeological Test Excavation for artefacts contained in river deposits within the embankments:

- A targeted programme of archaeological test excavations/shovel testing shall be carried out of the existing embankments that are made up of riverine deposits. This to test for potential artefactual content. The shovel testing to be guided by metal detection survey.*
- This to be carried out under licence to this department and can be done in advance or as part of the assessment of the material immediate to its removal.*

- *In tandem with this and in keeping with the recommendations contained in the EIS for assessment of this dredged material during the course of its removal for the proposed works, is also acceptable and a strategy for this, to include metal detection, to be included in the method statement attached to the licence application.*
- *If material is to be spread, then this may offer the opportunity to assessment (visual and metal detection) it for artefactual bearing content.*

Reason: To ensure the continued preservation (either insitu or by record) of places, caves, sites, features or other objects of archaeological interest.

13.1 RESPONSE TO ITEM 13

A request is made for an underwater assessment of the entire 1.3km of Clare River banks to be widened as part of the works (including channel and banks). This was not recommended at the time of the original assessment due to the ongoing dredging and canalisation of the river that has taken place during the latter part of the 19th and 20th centuries. In some places the river does not follow its original course as depicted on the first edition OS map. Huge amounts of sediments have been removed from the river and it is highly unlikely that widening of the river will impact on the underwater archaeological resource. Archaeological testing has been recommended for the footprint of the widening in order to assess the survival of terrestrial remains.

A request was made for an underwater assessment along the Kiniska Stream. It should be noted that a large portion of this stream has been widened and deepened and therefore no negative impact is anticipated upon the underwater archaeological resource.

Headland Archaeology carried out all the relevant archaeological assessments and were engaged to carry out archaeological monitoring at the Crusheeney Bridge replacement. Further inspection at these locations is unlikely to identify any features or structural remains.

APPENDIX A

FIGURE FIR 1.1 (SHEETS 1-3)

DRAWING 1

