

The National Arterial Drainage Maintenance List of Activities 2016-2021

Volume III-Appendices

February 2017

Office of Public Work
Headford
Co. Galway



Contents

JBA Project Manager

Name
24 Grove Island
Corbally
Limerick
Ireland

Revision History

Revision Ref / Date Issued	Amendments	Issued to
Version 1.0 / October 2016		Nathy Gilligan, OPW
Version 2.0 / December 2016	Inclusion of archaeology and cultural heritage sections. Updates following client review.	Nathy Gilligan, OPW
Version 3.0/ February 2017	Final amendments	Nathy Gilligan, OPW

Contract

This report describes work commissioned by The Office of Public Works, by a letter dated (27/01/2016). The Office of Public Works' representative for the contract was Nathy Gilligan. Tom Sampson, Declan Egan and Catalina Herrera of JBA Consulting carried out this work.

Prepared by Catalina Herrera BSc MSc
 Declan Egan BSc MSc CSci CEnv C.WEM MCIWEM
 MCIWM
 Tom Sampson BSc MSc FRGS C.WEM MCIWEM

Reviewed by Declan Egan BSc MSc CSci CEnv C.WEM MCIWEM
 MCIWM

Purpose

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A Consultation Submissions

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
Transport Infrastructure Ireland	SEA should have regard, inter alia, to the following -Consultations should be had with the relevant Local Authority/National Roads Design Office with regard to locations of existing and future national road schemes,	Mitigation Measures (Planning Stage): Section 11	Consultation of 5yr and annual plan with Local Authority/National Roads Design Office
Transport Infrastructure Ireland	-TII would be specifically concerned as to potential significant impacts the development would have on the existing national road network (and junctions with national roads) and structures on the network in the proximity of any proposed development,	Mitigation Measures (Planning Stage): Section 11	Consultation of 5yr and annual plan with Local Authority/National Roads Design Office
Transport Infrastructure Ireland	-In the interest of maintaining the safety and standard of the national road network, the SEA should consider the methods/techniques proposed for any works transversing/in proximity to the national road network,	Mitigation Measures (SoPs, protocols and methods): Section 11	GIS layer of national road network included in GIS database.
Transport Infrastructure Ireland	-TII should be consulted with regard to any specific works affecting any existing structures or proposed structures on national roads resulting from any drainage scheme/works and all such works should be undertaken in accordance with the NRA DMRB. In addition, it should be noted that i. Any structures work where national roads are impacted are required to be in accordance with the NRA DMRB and MCDRW; ii. Works to structures require Technical Acceptance from TII in accordance with DMRB BD02 in advance of any work being undertaken,	Mitigation Measures (Planning Stage): Section 11	Consultation of 5yr and annual plan with Local Authority/National Roads Design Office
Transport Infrastructure Ireland	-Regard should be had to any environmental impact statement and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the areas concerned. In particular, have regard to any potential cumulative impacts,	Mitigation Measures (Planning Stage): Section 11	Would be assessed at 5-year/annual planning stage
Transport Infrastructure Ireland	-In conducting SEA, have regard to the NRA DMRB and the NRA Manual of Contract Documents for Road Works,	Mitigation Measures (SoPs, protocols and methods): Section 11	Incorporate roads manual procedures into OPW procedures and methods where appropriate.
Transport Infrastructure Ireland	-At any individual product stage it would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment to be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site with reference to impacts on the national road networks and junctions of lower category roads with national roads. The Authority's Traffic and Transport Assessment Guidelines (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA,	Mitigation Measures (Planning Stage): Section 11	Consultation of 5yr and annual plan with Local Authority/National Roads Design Office

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Transport Infrastructure Ireland	-At project stage, designers are asked to consult the DMRB Road Safety Audit (HD 19) to determine whether a Road Safety Audit is required, P15	Mitigation Measures (Planning Stage): Section 11	Check requirements for Road Safety Audit for all works and access.
Transport Infrastructure Ireland	-In relation to haul route identification, where relevant the applicant/developer should clearly identify haul routes proposed and fully assess the network to be transverse. Separate structure approvals/permits and other licenses may be required in connection with the proposed haul route and all structures on the haul route should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal load proposed,	Mitigation Measures (Planning Stage): Section 11	Check haul roads for access.
Transport Infrastructure Ireland	-All areas where proposed works are planned should be surveyed for the presence of non-native invasive plant species since rivers, streams etc., are identified to be important vectors in the spread of such plant species. Notwithstanding any of the above the developer should be aware that this list is non-exhaustive thus site and development specific issues should be addressed in accordance with best practice.	Mitigation Measures (Planning Stage): Section 11	Invasive species surveys.
		Mitigation Measures (SoPS, protocols and methods)	Improved methods and processes for managing invasive species and risk of invasive species colonisation, growth and spread.
		Monitoring: Section 11	Monitoring for colonisation by invasive species post-works.
Environmental Protection Agency (EPA)	Chapter 1 – Introduction In Section 1.2 Legislation and Guidelines, there are a number of additional SEA guidance documents available to consider on the EPA website including Integrating Climate Change into SEA, Developing and Assessing SEA Alternatives and recently updated SEA/Plan Integration Guidance and lists of spatial information sources. These can consult at: http://www.epa.ie/pubs/advice/ea/	Introduction: Section 1 Approach to the SEA: Section 4	JBA have reviewed relevant guidance on SEA approach.
Environmental Protection Agency (EPA)	Chapter 2 – Methodology In Section 2.1.1 SEA Process, we note that newly constructed flood relief schemes are outside the scope of the Maintenance Activities and will be recommended through other programmes such as the CFRAMS Programme. The Maintenance Activities should however take into account the potential for cumulative effects which may arise from these new flood relief schemes in combination with activities that may arise in the Maintenance Activities.	Assessment - In-Combination Effects: Section 10	link between Flood Schemes, CFRAM (especially maintenance measures) and drainage maintenance.

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Environmental Protection Agency (EPA)	<p>Chapter 3 – Programme Description</p> <p>In Table 3-1 OPW Schemes carried out under the Arterial Drainage Acts 1945 & 1995, we note the list of various schemes described under the 1945 Act which goes up to 2015. The table could clarify whether future schemes (arising from implementing the Maintenance Activities) will also come under the remit of the Arterial Drainage Act. The link between flood alleviation options, arising from the CFRAMS Programme, and any associated maintenance activities/schemes which may accompany the preferred flood alleviation options, in the context of relationship to the Arterial Drainage Act should also be clarified.</p> <p>There is also merit in coordinating and integrating, the relevant aspects of the CFRAMS and Maintenance Activities where possible. Interactions with the Water Framework could also be coordinated with key stakeholders.</p>	Programme Description: Section 3	Confirm if future schemes will fall under Arterial Drainage Act maintenance. Clarify link to current and future flood schemes maintenance.
Environmental Protection Agency (EPA)	<p>Section 3.3 – Communication with stakeholders (3 Programme Description) on page 10, describes that the OPW communicate the annual arterial drainage maintenance programme to the relevant stakeholders. It would be beneficial if information on how progress on implementing the programme was also disseminated (i.e. when, where and what works carried out). This would be useful for related environmental-related monitoring programmes (i.e. biological, hydrological, hydro-morphological/fluvial geomorphological) in terms of site selection, selecting time of site visit and interpreting results.</p>	Programme Description: Section 3	State what information is shared on programme implementation and progress
		Monitoring: Section 11	Add recommendation to share monitoring findings and progress of maintenance works. E.g. annual report
Environmental Protection Agency (EPA)	<p>The Maintenance Activities could also describe the wider stakeholder consultation which has taken place in the preparation of the Activities. Aspects such as altering water levels may require consideration by other organisations including:</p> <ul style="list-style-type: none"> - Waterways Ireland and ESB, (issues related to altering water levels) - EPA hydrometrics unit and the Catchment Science and Management Unit for WFD related monitoring programmes (short term sediment impacts on monitoring equipment) - Irish Water and National Federation of Group Water Schemes (in terms of potential impacts on drinking water abstraction points) - Local Authorities (Environment and Planning teams involved in aspects such as discharges, local flooding and possible impact on zoned land) - DAFM and Irish Farmers Association - Inland Fisheries Ireland - Bord Na Mona 	Programme Description: Section 3	Report states the consultation undertaken.
		Mitigation Measures (Planning Stage): Section 11	Improved process and procedures to ensure consultation with relevant bodies.
Environmental Protection Agency (EPA)	<p>We understand that the OPW intend establishing an online database to provide information on the nature and extent of the works carried out within the arterial drainage schemes. This will be extremely useful to organisations such as IFI and the EPA. If notification of proposed works could also be incorporated into the design of this database, this will enable new proposed works to be communicated to key stakeholders. This would greatly assist in work programme planning and related environmental monitoring.</p>	Mitigation Measures (Planning Stage): Section 11	Improved process and procedures to ensure consultation with relevant bodies.

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Environmental Protection Agency (EPA)	Section 3.4 – OPW Standard Operating Procedures (SOP) (3 Programme Description) There would be merit in considering incorporating or acknowledging the relevant aspects of the Forestry and Freshwater Pearl Mussel Plan, currently being prepared by the DAFM, into the relevant Standard Operating Procedures (SOPs) where protection of FWPM catchments are concerned.	Mitigation Measures (SoPS, protocols and methods): Section 11	Include elements of forestry and FWPM plans into revised SoPs.
		Mitigation Measures (Planning Stage): Section 11	Improved screening tools for FWPM (e.g. GIS database).
Environmental Protection Agency (EPA)	For any proposed maintenance activities in, or adjacent to, areas of Nationally or European designated (peatland) sites, the relevant aspects of the finalised National Peatlands Strategy and SAC Raised Bog Conservation Management Plan should also be acknowledged and considered. It is also worth noting that the NPWS will be preparing an SAC Blanket Bog Conservation Management Plan, which should also be referred to.	Mitigation Measures (Planning Stage): Section 11	Improved screening tools for interaction with peatlands (and also wetlands) (e.g. GIS database).
		Mitigation Measures (SoPS, protocols and methods): Section 11	Include methods, protocols and standard activities for work where peatlands can be impacted into revised SoPs.
Environmental Protection Agency (EPA)	It would be useful to include an appendix to summarise the relevant OPW SOPs and provide the associated updated web links. Information relating to the control and management of invasive species and associated aspects should also be included.	Programme Description: Section 3	The description of the activities is included in Appendices. Weblink to OPW documents added.
Environmental Protection Agency (EPA)	Section 3.5.3 – Auditing (3 Programme Descriptions) The Plan should clarify (Page 13, Paragraph 1:) whether audits are to be carried out at Environmental River Enhancement Programme (EREP) sites only and whether there are EREP sites in all of the arterial drainage schemes.	Programme Description: Section 3	Audits apply to all works. Current monitoring only applies to EREP schemes. Table added to section 3.3. to show EREP schemes.
Environmental Protection Agency (EPA)	The Plan should also consider existing sites that may not fit into the EREP criteria (i.e. gradient ≥ 0.002 , Q value ≥ 3 , EQR Moderate). Sites that do not fit these criteria are not generally considered suitable for salmonid habitat (i.e. gradient/location in the system unsuitable). However, they are not as resilient to drainage/channelisation impacts compared to sites of higher gradient and could be considered for auditing as fluvial geomorphological processes (e.g. sediment production, water/sediment/wood flux, river channel adjustment, lateral connectivity) which will be altered and other biota, that may be affected due to habitat degradation.	Mitigation Measures (Planning Stage): Section 11	Recommend EREP scheme is expanded to cover habitat/river restoration of all types of channels., river reaches, embankments, etc. and not just for fisheries benefit. GIS database of fluvial geomorphology baseline, pressures with habitat quality and GIS analysis to identify opportunities for restoration.

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Environmental Protection Agency (EPA)	<p>Chapter 4 – Plan and Policy Context</p> <p>Section 4.2 – Plan and Policy Context</p> <p>Table 4-1 – Legislation, policies and plans/programmes adopted at the European Union, National or Regional level:</p> <p>Additional Plans/Programmes/Policies to consider include the following:</p> <ul style="list-style-type: none"> - EU Regulation 1143/2014 on Invasive Alien Species - National Planning Framework (under preparation) - FoodWise 2025 - SAC Raised Bog Conservation Management Plan (SAC Blanket Bog Conservation Management Plan also to commence preparation). - Regional Economic and Spatial Strategies (to commence). - Regional Waste Management Plans 	Interacting Plans and Policies: Section 5	Items on list to be included and considered.
Environmental Protection Agency (EPA)	<p>Section 4.2.1 – Related Studies</p> <p>The EPA Catchment Science and Management unit is developing a fluvial geomorphological assessment tool that will provide an understanding of the fluvial geomorphological condition of rivers, identify morphological pressures and the response of the river to these pressures. This will address the hydro-morphological component of characterisation under Article 5 of the Water Framework Directive. It will be based on the Italian Morphological Quality Index (MQI) method which was recommended by the EU FP7 project, REStoring rivers FOR effective catchment Management (REFORM). The MQI takes a fluvial geomorphological based approach as it considers processes (e.g. sediment production, water/sediment/wood flux, river channel adjustment), along with the features that these processes create. It is multi-scale assessment where the 'reach' scale is the basic spatial unit (1-10km). This method comprises two components, segmentation (to identify morphological typologies to understand how a river will behave in a certain stretch of the river) and condition assessment. This assessment has the potential to contribute to the arterial drainage maintenance programme in the future.</p>	Mitigation Measures (Planning Stage): Section 11)	Recommended mitigation measures include consideration of geomorphology tools.
Environmental Protection Agency (EPA)	<p>Chapter 5 – Baseline Environment</p> <p>The Activities should take into account the relevant aspects of the NPWS Article 17 Reports for 2013 in particular when considering activities in areas where designated sites and protected species may be impacted.</p>	Current State of the Environment: Section 6	NPWS Article 17 Reports are used as a source of info for chapter.
Environmental Protection Agency (EPA)	<p>Section 5.2 – Human Beings</p> <p>Page 19, Landscape: We note the comment on “The Arterial Drainage Maintenance Activities (2016-2021) protect where possible and enhance the landscape character and visual amenity within the river corridor”. The Plan should provide additional clarification on this aspect.</p> <p>The Plan should describe how the arterial drainage maintenance activity protects/enhances the landscape character and visual amenity within the river corridor.</p>	Current State of the Environment: Section 6	Describe how arterial drainage maintenance contributes to landscape character.

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Environmental Protection Agency (EPA)	In 5.2.1 Future Trends, we note the reference that “all agricultural land is now premium for food production”. The Maintenance Activities should consider that marginal agricultural lands may also have significant biodiversity value, support ecological corridors for designated sites/support protected species, act as riparian zones to minimise impacts on water quality from agricultural land management practices and also provide flood attenuation benefits. The challenge will be to support environmentally sustainable land drainage which will assist in supporting and sustaining the ecosystem services provided by these lands (e.g. habitat/species/linkages conservation, flood relief/attenuation considerations, buffer areas for capturing runoff from potential poor land management practises (nutrient management/pesticides etc.).	Current State of the Environment: Section 6	Split discussion on demand of agricultural production into productive and marginal land to highlight potential for marginal land to contribute to sustainable catchment management and mitigate impacts of agricultural intensification.
Environmental Protection Agency (EPA)	Section 5.2.2 – Key Environmental Issues While the example, (on Page 20, Paragraph 4), of how arterial drainage works can increase the risk to flooding is acknowledged (i.e. through removal of riparian vegetation which reduces the ability to retain water/buffer pollutants and sediment/stabilise banks), a more significant issue is that works can often reduce the roughness of the bed and therefore, increases the ease of flow which leads to improved conveyance. Quite often the channel is cut off from the floodplain and so the volume of water in the channel increases, flood peaks are much greater and water rapidly transports itself through the system which may result in flooding further downstream. This can also lead to bank erosion/bed incision. Altered flow conditions due to this modification may also impact ecology.	Current State of the Environment: Section 6	Ensure full range of possible impacts of drainage maintenance activities on flow and sediment are covered, including secondary impacts.
Environmental Protection Agency (EPA)	Section 5.3 – Land Use In relation to the ‘Peatlands’ subsection, we recommend that the reference on page 23 to “lowering of the local water table can benefit and encourage peat cutting ...” be removed or reworded. This is in the context of the promotion that peat cutting should not be considered a benefit given the potential environmental implications for climate change, flood attenuation and impacts on biodiversity. The drainage of wetlands and peatlands is an on-going concern, and the NPWS Article 17 Report highlights the status and integrity of our peatlands and wetlands are in decline, due to land management practices including peatland/wetland drainage.	Current State of the Environment: Section 6	Ensure balanced discussion on peat cutting (e.g. social & heritage benefit vs ecological damage) and at different scales (e.g. local/national heritage - European status of peatlands)
Environmental Protection Agency (EPA)	The Plan should clarify (on Page 21, Paragraph 2) that while CORINE was released in November 2014, it is actually a 2012 dataset.	Current State of the Environment: Section 6	Ensure correct CORINE reference dates.

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Environmental Protection Agency (EPA)	Section 5.5 – Flora, Fauna, Biodiversity The Scoping Report should recognise (on Page 27 - Freshwater Pearl Mussels - Paragraph 1), that the Bundorragha FWPM population are no longer in favourable condition. The Maintenance Activities should also refer to the Forestry and Freshwater Pearl Mussel Plan, currently being prepared, for more recent information in terms of measures required to protect freshwater pearl mussels (FWMP) and to protect priority FWPM catchments.	Current State of the Environment: Section 6	Review and include findings of forestry & FWMP plan. Include details of populations linked to catchments and current status and trends only for catchments with OPW arterial drainage schemes.
Environmental Protection Agency (EPA)	Section 5.6 – Water The proposed new approach to River Basin Management Planning in Ireland under the second cycle of the Water Framework Directive should be described in this section. Ireland will have 1 RBMP and including an international RBMP.	Interacting Plans and Policies: Section 5	Mention change from many to single RBMP in 2nd cycle WFD work.
Environmental Protection Agency (EPA)	Given that drainage/channelisation is the most significant pressure on the hydro-morphological condition of Irish rivers, the WFD hydro-morphological elements should be acknowledged (in Page 32, Surface water, Paragraph 1).	Interacting Plans and Policies: Section 5	In link to RBMP acknowledge link between art drainage maintenance and hydro-morphology.
Environmental Protection Agency (EPA)	Consideration of hydro-morphology within the WFD is regarded by the European Commission as an area of work in need of improvement across the EU. As a result, hydro-morphology will be a major focus in the 2016-2018 Common Implementation Strategy (CIS) work programme.	Interacting Plans and Policies: Section 5	Mention focus on hydro-morphology in 2016-2018 common implementation strategy.

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Environmental Protection Agency (EPA)	<p>Page 32, Surface water: The last line of paragraph 1 (Arterial Drainage Maintenance Activities proposed on the river channels have the potential to change the hydro-morphological condition of the water bodies resulting in alterations in water quality through increased sediment loading from dredging or similar works) focuses on the indirect effect on water quality. The Maintenance Activities should however, also acknowledge how altering both the fluvial geomorphological processes (e.g. sediment production, water/sediment/wood flux, river channel adjustment, lateral connectivity) and the features that these processes create (e.g. pools, riffles, bars) can lead to habitat degradation, which in turn, can affect WFD ecological status. Ecological risk is briefly mentioned in the last paragraph but it should be addressed at the start of the section and also in more detail. The Water section could be subdivided into: 1) water quality and; 2) hydro-morphological condition. As drainage/channelisation is a major hydro-morphological pressure, this should be reflected in the Scoping report.</p> <p>It is also worth noting that at present hydro-morphological conditions can only downgrade High Ecological Status sites. However, fish and macro invertebrates can be affected by arterial drainage so this can affect the entire spectrum of ecological status (High, Good, Moderate, Poor, Bad). As acknowledged, it is difficult to dis-entangle multiple pressures when considering ecological impacts. However, if water quality data does not indicate eutrophication/enrichment, hydro-morphological pressures may be driving status. It is noted that the relationships between ecology and hydro-morphology are not well known, in Ireland or internationally and the approach taken in this case utilises available data, knowledge and experience. It could be acknowledged that this science is rapidly evolving (e.g. the recent EU REFORM project as mentioned previously) and is likely to be required to be taken into account over the next few years.</p>	Current State of the Environment: Section 6	Details and consideration of hydromorphology included.
Environmental Protection Agency (EPA)	Page 33, Surface water, Paragraph 1: The number of lake water bodies downgraded due to hydro-morphological condition is addressed but not for rivers. Where possible, information for rivers should also be included.	Current State of the Environment: Section 6	Focus is on condition as it is not possible to extract any link between arterial drainage activity and river water quality.
Environmental Protection Agency (EPA)	<p>Section 5.6.1 – Future trends</p> <p>Page 37, Paragraph 4: Sentence appears to be incomplete.</p>	n/a	n/a - comment on scoping report
Environmental Protection Agency (EPA)	<p>Section 5.6.2 – Key Environmental Issues</p> <p>Page 37, Paragraph 2-3: Issues highlighted focus more on water quality. The scoping report should make a distinction and highlight whether water quality is in relation to fine sediment or other pollutants such as nutrients. More emphasis on the effects on hydro-morphological condition required, particularly with regard to the WFD and its hydro-morphological elements.</p>	Current State of the Environment: Section 6	Full section on hydromorphology

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Environmental Protection Agency (EPA)	It will be also important to consider and take into account the potential impacts on the trend of water quality status. The Plan should reflect any relevant recommendations which may arise from the second cycle of River Basin Management Planning (and related programmes of measures to protect water quality in implementing the Maintenance Activities.	Mitigation Measures (Monitoring): Section 11	Recommendations for monitoring will help to understand links between arterial drainage maintenance activity and water quality.
Environmental Protection Agency (EPA)	“Arterial Drainage Maintenance Activities (2016-2021) works must ensure that the objectives align with those of the WFD and that the Arterial Drainage Activities proposed will not interfere in accomplishing the goals set out by the WFD, RBMP objectives, and achievement of good ecological status/potential. “ It is not clear what measures will address this. EREP/other restoration projects as discussed in Section 6, focus on the restoration of salmonid habitat which is often implemented at a site scale. It is not clear whether these programmes will be sufficient to achieve the stated aims of supporting WFD objectives.	SEA Objectives: Section 7	Included as objectives for assessment.
Environmental Protection Agency (EPA)	Page 37, Paragraph 7: Further clarity around how water quality can be improved through flood risk management would be useful.	Current State of the Environment: Section 6	Included in opportunities sub-sections.
Environmental Protection Agency (EPA)	The Maintenance Activities should also consider whether potential impacts on drinking water abstraction points downstream of proposed maintenance activities are to be considered.	Current State of the Environment: Section 6	Included in threats sub-section.
Environmental Protection Agency (EPA)	Section 5.9 - Air and Climate Change The Climate Action and Low Carbon Development Act, Climate Change Sectoral Adaptation Plans and National Mitigation Plan should be referenced here in terms of key considerations to be aware of and taken into account.	Current State of the Environment: Section 6	Included.
Environmental Protection Agency (EPA)	Chapter 6 – Draft Environmental Objectives and Targets Page 45, Table (Water Sub-objective): it needs to be noted that the EREP focuses on restoration of salmonid habitat only. The Maintenance Activities should describe whether the EREP alone will be sufficient to meet the environmental objective. Clarification on whether these EREP-related site measures will restore fluvial processes at a larger scale. In addition, the implications for river water bodies outside the EREP should also be considered and described.	Assessment: Section 10	The catchment scale assessment considers the coverage of EREP schemes per catchment.

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Environmental Protection Agency (EPA)	The EREP has been a valuable starting point to address the ecological impacts of physical modification. Since the development of this programme along with the development of the physical habitat assessment (RHAT), our understanding of hydromorphology/fluvial geomorphology has greatly improved. Many initiatives/projects have been set up throughout Europe, and further afield, to develop assessments that acknowledge processes, spatio-temporal variability and geomorphic responses to human modification in addition to improvements to river restoration measures. As mentioned previously, the EPA is developing a fluvial geomorphological assessment that has the potential to contribute to the arterial drainage maintenance programme, along with its associated works such as EREP, in the future. The relevant aspects should be reflected in the Plan and SEA Environmental Report.	Mitigation Measures (Planning Stage): Section 11	Added to recommended mitigation measures.
Environmental Protection Agency (EPA)	Page 45, Table (Water Monitoring): Ensure that the arterial drainage works will not conflict with achieving good water quality status of the waterbodies. This section should include an acknowledgement of biological (all WFD water bodies) and hydro-morphological status (if high ecological status), where relevant.	Mitigation Measures (Planning Stage): Section 11	These elements should be addressed as planning process evolves.
Environmental Protection Agency (EPA)	Chapter 7 – Proposed Monitoring Programme Section 7.3.1 – Water Page 55: As referred to previously, the EPA is developing a fluvial geomorphological assessment that has the potential to contribute to the arterial drainage maintenance programme, along with its associated works such as EREP, in the future.	Monitoring: Section 11	Recommendations added.
Environmental Protection Agency (EPA)	We also refer you to www.catchments.ie which the EPA has launched to serve as a key portal for integrated catchment management from a EPA WFD perspective. Resources, data and maps are available to consider incorporating into the SEA monitoring programme, as appropriate and relevant to the Maintenance Activities.	Current State of the Environment: Section 6	Info used and referenced as a data source going forward.
Environmental Protection Agency (EPA)	1. Are there any key constraints/issues that you feel have been missed out Cumulative Effects / Regional Considerations The Maintenance Activities could make greater reference to regional considerations and associated cumulative catchment level environmental implications of any channel maintenance/arterial drainage activities. This may be in the context of addressing how an issue in the upper catchment (requiring drainage/maintenance) may cause problems further downstream, for Floods Directive implementation, or the implementation of other Directives, such as WFD, Habitats etc.	Assessment - In-Combination Effects: Section 10	The SEA is for maintenance activity and so the report does not address the impact of the original drainage schemes and the interaction with Floods Directive. The in-combination effects section does consider impacts of maintenance activity on other plans.
Environmental Protection Agency (EPA)	In terms of assessing and selecting preferred channel drainage maintenance options, the preferred flood alleviation options identified in the various CFRAMS (and related Flood Risk Management Plans) should be taken into account in terms of supporting an integrated methodology for flood alleviation and channel maintenance/drainage activities while also providing for the appropriate protection environmental sensitivities.	Assessment - In-Combination Effects: Section 10	See above.

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Environmental Protection Agency (EPA)	Biodiversity/Flora/Fauna Additional aspects to consider in relation to Biodiversity/Flora/Fauna include: - Changes to the flooding regime may have an impact on habitats and species which require particular inundation periods or in the case of groundwater dependent ecosystems (e.g. fens) particular water supply mechanisms and water chemistry.	N/A	Maintenance activity does not alter flooding regime of original drainage scheme in the medium to long term. Maybe very local short term impact but this is not the regime.
Environmental Protection Agency (EPA)	Geology/Soils and Land Use - The relationship with forestry and forest management should be taken into account also in terms of potential influence on channel maintenance/arterial drainage works. - On aspects pertaining to soil, the permeability of the soils should be summarised, as from a flood risk perspective, this is potentially of greater relevance than soil type. For example gley soils are typically of low permeability and will contribute to greater surface runoff.	Assessment - In-Combination Effects: Section 10	Considered in assessment at the catchment scale. Recommended mitigation measures will address local issues.
Environmental Protection Agency (EPA)	Water - For groundwater related aspects, it would be useful to include an aquifer classification map where possible	Current State of the Environment: Section 6	Included.
Environmental Protection Agency (EPA)	-The issue of rejected recharge should also be considered in The context of The unproductive aquifers. These aquifers have low permeability, storage and transmissivity which may contribute to greater surface runoff during storm events.M64	Current State of the Environment: Section 6 and Mitigation Measures (Planning Stage): Section 11	Considered at the catchment scale for assessment at the project/plan level. Not appropriate to consider recharge scaled up to the catchment scale.
Environmental Protection Agency (EPA)	-The role of wetlands and peatlands for the attenuation of flood waters should also be considered. A stronger emphasis on hydro-morphology is required in the water section. The impact of hydro-morphological alteration should be elaborated on, especially as land drainage/channelisation is a significant hydro-morphological pressure in Ireland	Mitigation Measures (Planning Stage): Section 11	The maintenance activities are will not result in any further medium or long term hydromorphology changes to catchments, however the potential impacts of works on hydromorphology have been considered. Recommended mitigation measures have been presented to address some of the impacts.
Environmental Protection Agency (EPA)	More information is required on how the WFD objectives will be affected by hydro-morphological alteration. Hydro-morphological classification of high ecological status sites and hydro-morphological characterisation under Article 5, should also be considered. Evaluation of restoration/enhancement works should also be considered. The evaluation of these works was highlighted during the EU FP7 REFORM project as an important component of the restoration process in order to understand the effectiveness of restoration/enhancement efforts. This will need clearly defined evaluation criteria.	Mitigation Measures (Planning Stage): Section 11	The recommended mitigation measures include consideration of how REFORM / MQI related tools can be of use in catchment planning of maintenance activities.

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Environmental Protection Agency (EPA)	<p>2. Are you aware of any other sources of environmental data or plans/policies/programmes that would be of use for this study</p> <p>Data</p> <p>A number of additional data sources are provided below to be considered as appropriate</p> <p>Biodiversity</p> <ul style="list-style-type: none"> - DAHG (aspects including The Status of EU Protected Habitats and Species in Ireland (DAHG/NPWS, 2013) - DAFM (Forestry, Agriculture, Fisheries, Shellfisheries) - DCENR (Energy related infrastructure including hydroelectric, tidal etc) - National Biodiversity Data Centre (including ecological indicators useful in monitoring) - Loughs Agency - Heritage Council, Local Authority Biodiversity Plans/ - Coillte / Forest Service, Bord na Mona, Irish Peatlands Conservation Committee - EU Regulation 1143/2014 on Invasive Alien Species 	Current State of the Environment: Section 6	Data sources considered and also recommended to be of use in detailed planning of activities.
Environmental Protection Agency (EPA)	<p>Population & Human Health</p> <ul style="list-style-type: none"> - (Population) The Regional Planning Guidelines (and Regional Economic and Spatial Strategy) once prepared, within the lifetime of the Plan, will set out updated/reviewed population targets up and identify key areas for growth and development which may need to be supported by arterial drainage and maintenance activities. 	Current State of the Environment: Section 6	Too premature to consider long term plans for population change, however recommended mitigation measures will continue to monitor for changes in demand or approach to arterial drainage maintenance activity.
Environmental Protection Agency (EPA)	(Human Health) Locational data on known combined sewer overflows should also be incorporated in terms of potential pathogen exposure which may arise from flood related discharges (and possible implications for maintenance activities in proximity to these discharge areas). In addition, Local Authority data on the location of Section 4 discharges should be considered for inclusion along with the location of Irish Water assets (plants and networks).	Current State of the Environment: Section 6 and Mitigation Measures (Planning Stage): Section 11	Included as a consideration.
Environmental Protection Agency (EPA)	<p>Water</p> <ul style="list-style-type: none"> - Waterways Ireland - Local Authorities - Inland Fisheries Ireland - EPA WFD Catchment Management guidance and mapping information available on www.catchments.ie - A national risk screening data set is available on the WFD Application which is available through the Eden portal (to registered users at: https://www.edenireland.ie/). Further risk data will become available through the sub-catchment and catchment reports that are currently being prepared, to inform the second cycle of River Basin Management Plans. There should be ongoing liaison with EPA on the status of the WFD Application and related outputs. 	Current State of the Environment: Section 6	Details included.

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
	<ul style="list-style-type: none"> - EU Flood Directive <p>Approval has been reached by the European Committee for Standardisation (CEN) Committee that hydro-morphology standards EN14614:2004 (Water Quality – Guidance standard for assessing the hydro-morphological features of rivers) and EN15843:2010 (Water Quality – Guidance standard for determining the degree of modification of river hydro-morphology) will be revised. It is now formally registered as a 'Preliminary Work Item'. Revision of these standards will begin at the end of this year.</p> <ul style="list-style-type: none"> - EU Floods Directive (mentioned on page 18) - Rural Development Plan 2014-2020 (including GLAS) - National Peatland Strategy (mentioned on page 23) - Bog Conservation Plans 		
Environmental Protection Agency (EPA)	<p>Plans/Programmes</p> <p>The second cycle of the River Basin Management Plan(s) (and associated programme of measures) should also be taken into account here and, the relevant aspects should be integrated. The updated RBMP (s) will provide updates of recommendations to achieve the requirements of the Water Framework Directive. Additionally, Irish Water and the National Federation of Group Water Schemes should also be consulted, in terms of assessing potential flood risk and flood alleviation/drainage maintenance activities. The relevant aspects of the following plans/programmes should be considered, where appropriate:</p> <p>SEE LETTER FOR PLANS</p> <p>Considering the relevant aspects of the above plans would be useful to determine potential impacts of channel maintenance activities and drainage options on aquaculture, agricultural activities etc. Critical service infrastructure investment and associated water management activities may need to take account of additional activities arising out of implementation of the Plan.</p>	Mitigation Measures (Planning Stage): Section 11	Details included.
Environmental Protection Agency (EPA)	<p>Additional Transboundary consideration:</p> <p>The Maintenance Activities should consider describing any potential transboundary-related plans/programmes which may need to be taken into account. These may include draft flood risk management plans and any draft updates to river basin management plans for Northern Ireland.</p>	Mitigation Measures (Planning Stage): Section 11	Included as a recommended mitigation measure at the planning stage.

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
Environmental Protection Agency (EPA)	<p>3. Do you agree with the draft SEA objectives and monitoring proposals</p> <p>We acknowledge the proposed draft SEA Objectives and associated monitoring proposals as established.</p> <p>Due to the nature of works associated with Maintenance Activities, the challenge will be to align the SEA objectives and monitoring proposals with the objectives of the WFD particularly in relation to hydro-morphology.</p>	None	This appears more a general statement
Environmental Protection Agency (EPA)	<p>With particular regard to the EREP and other IFI restoration projects, these sites are a small subset of rivers within the arterially drained river network and focus primarily on salmonid habitat. The SEA should acknowledge that the current approach is unlikely to contribute to mitigating against the larger scale impacts of drainage works on the hydro-morphological characteristics of rivers. Nevertheless, the science to enable such work to be undertaken is not currently clear. The EREP has been a good starting point to introduce the concept of river restoration to Ireland and address the ecological impacts of physical modification. There is merit in considering a recommendation that further guidance or research is needed.</p>	Mitigation Measures (Planning Stage): Section 11)	Recommended mitigation measures include extension of EREP to other catchment restoration drivers and review of REFORM deliverables.
Environmental Protection Agency (EPA)	<p>Since the development of this programme, along with the development of the physical habitat assessment RHAT, our understanding of hydro-morphology/fluvial geomorphology has greatly improved. This area has progressed greatly in the last few years with many initiatives/projects set up throughout Europe, and further afield, to develop assessments that acknowledge fluvial geomorphological processes, spatio-temporal variability and geomorphic responses to human modification in addition to improvements to river restoration measures (taking into account how appropriate and cost effective they will be).</p>	Mitigation Measures (Planning Stage): Section 11	Recommended mitigation measures include consideration of REFORM deliverables.
Environmental Protection Agency (EPA)	<p>The EPA is developing a fluvial geomorphological assessment based on the Italian Morphological Quality Index (MQI) method. This approach has the potential to contribute to the arterial drainage maintenance programme, along with its associated works such as EREP, in the future. We would suggest a review of the Arterial Drainage Maintenance Activities programme be considered at the end of 2018, to determine whether there are any improvements that could be made given the development of the science/technology in the interim.</p>	Monitoring: Section 11	See above

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
Environmental Protection Agency (EPA)	The draft SEA Objectives and monitoring proposals (including monitoring frequency) should be closely linked with those of the National CFRAMS Programme (Flood Risk Management Plans and associated SEAs). These are due to issue for consultation in July / August 2016. This would provide for a consistent methodology for assessing and monitoring how well both the CFRAMS and Arterial Drainage Maintenance Activities are being implemented, taking into account potential for cumulative effects.	Monitoring: Section 11	Recommended in monitoring section.
Irish Creamery Milk Suppliers (ICMSA)	ICMSA welcomes the OPW Arterial Drainage Activities 2016-2021, however, the timescale and budgets provided for this activity will clearly be very important for a sizeable number for rural dwellers in particular farmers and rural areas	n/a	General comment
Irish Creamery Milk Suppliers (ICMSA)	In assessing this report and the wider matter of the arterial drainage maintenance activity being planned for the next six years, ICMSA believe regard must also be had to the Draft Climate Change Sectoral Adoption Planned Flood Risk Management (2012-2019) document also prepared by OPW. Clearly there is an overlap between flood risk and abatement and drainage and this linkage is highlighted a number of times in the document currently under review.	Current State of the Environment: Section 6	Considered. Also as a recommended mitigation measure for incorporating climate adaptation and adaptive capacity
Irish Creamery Milk Suppliers (ICMSA)	In this context and with regard to the Climate Change Sectoral Adoption Planned Flood Risk Management document and the inter-linkage with the Arterial Drainage Maintenance Activities 2016-2021, ICMSA would like to make the following specific comments:	n/a	n/a
Irish Creamery Milk Suppliers (ICMSA)	The preservation of the existing agricultural land bank and its inherent productivity and fertility in the medium and the long-term is clearly of critical importance as the global demand for food increases significantly and rapidly. While it is extremely difficult to predict or model for this, we believe this issue should be addressed in the final report.	Assessment - In-Combination Effects: Section 10	Included in the assessment and objectives.
Irish Creamery Milk Suppliers (ICMSA)	The Climate Change Sectoral Adoption Planned Flood Risk Management Document proposed that an assessment should be carried out on the IL and Commission Embankments. It appears that no one has actual and meaningful statutory responsibility for these embankments. That report highlights the lack of a central record of the standard of protection provided by each embankment and their physical condition. Therefore, it is highly probable that the protection afforded by these embankments which were first constructed on the nineteenth century has deteriorated and is possibly inadequate for the level of flooding that existed up to now. Even if there was no increased risk of flooding arising from climate change the current situation is untenable. With the expected increase in the risk of flooding, not alone must the existing Land Commission Embankments be retained and maintained but they will require enforcement. In addition, it is highly probable that there will be a need for an extension of the actual embankments system over the longer term	Mitigation Measures (Planning Stage): Section 11 and Monitoring: Section 11	Mitigation to include climate change in planning considerations. Monitoring of climate and environmental change impacts also included.

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
Irish Creamery Milk Suppliers (ICMSA)	Food Harvest 2020 has been referenced a number of times in the document and ICMSA believe the more recent strategy document for the sector, Food Wise 2025 should be analysed for the purposes of the report.	Throughout	Reference to strategies included throughout.
Irish Creamery Milk Suppliers (ICMSA)	The Climate Change Sectoral Adoption Planned Flood Risk Management document also gave a commitment that future options for the management of the embankments will be examined and ICMSA believe there is a need for the statutory responsibility to be clarified and that a single agency should be responsible. ICMSA believe that the statutory responsibility for all embankments should rest exclusively with the OPW. These embankments should include the existing Land Commission Embankments, the embankments which are part of the arterial drainage system, which are already within the statutory responsibility of the OPW, and embankments which form an integral part of drainage under the Drainage district schemes which currently fall within the remit of Local Authorities.	See above	See above
Irish Creamery Milk Suppliers (ICMSA)	In the section 5.2.1 the following is stated-"At the moment, Arterial Drainage Schemes benefit rural populations as it allows landowners to install field drainage, which reduces waterlogging of land and enables it to carry more livestock or produce higher crop yields. If the shift from rural to urban continues, it may be worth considering a shift of maintenance regime to more urban areas, however, this could conflict with agricultural productivity goals. Maintaining a close look at population dynamics will be essential for planning future Arterial Maintenance Activities". ICMSA has concerns that this could amount to a major shift in resources and may actually not be in conformity with the Arterial Drainage Acts. ICMSA believe it is essential maintenance programmes are not based solely on population as this may have a detrimental effect on rural areas and the agri-food sector.	Monitoring: Section 11	The proposed activities do not include any shift to urban areas and this would be assessed in the 5-year and annual maintenance programmes. The recommended mitigation measures include details of how this could be assessed.
Irish Creamery Milk Suppliers (ICMSA)	At section 5.2.2 the following is stated-"Arterial Drainage cannot eliminate the risk of flooding. Most of the schemes carried out by the OPW aimed to reduce flooding of agricultural fields from the main channel on average at a 'three year return' flood period. Therefore, flood risk from climate change and changes in land management practices (new developments in flood sensitive area) may not be mitigated through Arterial Drainage Maintenance Activities on Channels". ICMSA believe it is important that the OPW provide unqualified assurances on the need to at least maintain the existing protection for beneficial lands in terms of adequate land drainage outfalls and the avoidance of flooding.	None	Not appropriate for the SEA to address such assurances.

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
Irish Creamery Milk Suppliers (ICMSA)	A related matter, ICMSA believe that the design or redesign of the arterial drainage maintenance programme which may involve the establishment or re-establishment of floodplains to the detriment of the agricultural value of such lands should only be taken after full public consultation and proper and full compensation being paid to the landowners affected	None	Not appropriate for the SEA.
Irish Creamery Milk Suppliers (ICMSA)	<p>The following paragraph 5.3.2 raises major issues from the view of agriculture and farmers-"In accordance with the SEA Regulations [S.I 435 of 2004], considerations have been given to whether the environmental effects, both positive and negative, of the Arterial Drainage Maintenance Activities (2016-2021) are likely to be significant on each receptor. There are several issues that should be considered while planning and carrying out the Arterial Drainage Maintenance Scheme and maintenance work:</p> <ul style="list-style-type: none"> -the extent and intensity of land drainage in both the uplands and lowlands could have an impact on the regime of the waterways, and increase flood risk. -Inappropriate land management practices, especially on more sensitive soil types could reduce water infiltration into the soil resulting in an increase of surface water runoff. -The management of grassland, semi-natural vegetation, wetlands, and woodlands can assist in the storage of rapid surface runoff and floodplain flows upstream of flood risk receptors. -Natural flood storage areas on flood plains including wetlands should be protected from development pressures. -Inappropriate or intensive land-use practices can result in erosion, modification of channel geomorphology or discharge of receiving sediments". <p>Each of these issues, on their own, if incorporated into the maintenance activity programme for any river could have a major impact on individual farmers or indeed groups of farmers. ICMSA has serious concern that this represents a substantial deviation and modification to the arterial maintenance activities carried out to date by OPW under the Act and would welcome some clarification on the issue.</p>	Assessment - In-Combination Effects: Section 10	If the recommended mitigation measures are implemented, the consideration of such issues will be addressed in more detail and in consultation with relevant stakeholders.
Irish Creamery Milk Suppliers (ICMSA)	ICMSA would like to seek clarification and assurances regarding the issues raised in paragraph 5.4.2 in relation to floodplains and land use. Specifically, in relation to the references to flood plains in this paragraph does it imply, or mean, the non-maintenance of drainage of some flood plains resulting in the "re-wetting" of these lands with the resultant reduction in their productive use.	None	Not appropriate for the SEA to address such assurances.
Irish Creamery Milk Suppliers (ICMSA)	ICMSA broadly agree with the objectives and details of the objectives as set out in section 6 of the scoping report. With regard to agriculture and agriculture land under the broad objective of economic aspects, it is reassuring that specific sub-objectives are given in relation to continuation of arterial drainage to ensure the drainage of the lands concerned. However, these assurances or sub objectives must be interpreted having regard to the reservations and qualifications in the earlier part of the report and which are dealt with above.	SEA Objectives: Section 7 and Evaluation/Assessment: Section 10	The assessment is fair and based upon multiple benefits. Due consideration is given to uncertainty and conflicting interests.

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
National Parks and Wildlife Services (NPWS)	<p>The Department refers to JBA's correspondence of 20/05/16, on behalf of the OPW, in respect of the proposed or planned five-year national programme of 'Arterial Drainage Maintenance Activities 2016-2021'. It has been outlined that consultation at this stage is in relation to the scope of the SEA that is or appears to be required, and the 'Arterial Drainage Maintenance List of Activities 2016-2021: Strategic Environmental Assessment Scoping Report' (May 2016) is noted.</p> <p>The following observations are made at SEA scoping/pre-draft programme stage in the context of the Department's role in relation to nature conservation, including as an environmental authority under SEA legislation. The observations are not exhaustive but are offered to assist the OPW in meeting the obligations that arise in relation to European sites, other nature conservation sites, protected species and natural habitats, biodiversity and environmental protection in general in the context of this programme, the environmental assessments required, and the drainage maintenance activities that will be undertaken from this year to 2021. They are made without prejudice to any observations or recommendations that may be made by the Minister and this Department in the future.</p> <p>The current observations reiterate many points previously made by the Department to the OPW in relation to their environmental assessments five-year and annual programmes, and individual schemes, including particularly at two meetings in 2013; two key earlier submissions of 04/03/13 and 14/12/15 are particularly relevant, some extracts of standardised advice from which are appended to these observations. The latter was related to the OPW's consultation about this five-year programme. The Department also notes the response received from the OPW to the letter of 14/12/15. The Department would be happy to make the correspondence available to JBA, with the OPW's agreement, given its relevance to this assessment process, or JBA may obtain it directly from the OPW.</p> <p>The Department recommends that these observations are read in conjunction with all other observations that have issued to the OPW in recent years, as they highlight a range of relevant environmental and ecological sensitivities that may or are affected by Arterial Drainage, and in the interests of efficiency, the Department will not repeat those here.</p>	<p>Mitigation Measures (Planning Stage): Section 11</p> <p>Mitigation Measures (SoPs, Protocols): Section 11</p> <p>Monitoring: Section 11</p>	<p>Recommendations for mitigation and monitoring include the issues that have been raised by NPWS as a means of continual improvement.</p> <p>Many of the catchment and local scale issues raised by NPWS are to be addressed in the 6-year and annual maintenance programmes as well as individual projects as they arise.</p>
National Parks and Wildlife Services (NPWS)	<p>It is expected that previous advice given by this Department regarding approaches to screening for appropriate assessment, and appropriate assessment in the case of annual and multi-annual drainage maintenance programmes will be taken into account. In this context, the OPW should have regard to a recent judgment of Justice Barton (Irish High Court, January 2016), namely in the case of Balz et al versus An Bord Pleanála and the obligations of decision-making authorities to resolve scientific matters raised by other parties in relation to the potential effects of a proposal on European sites, and their appropriate assessments. Essentially the Court found that an appropriate assessment must address situations where there are differing scientific opinions and the appropriate assessment determination must demonstrate that such differing opinions were addressed and the particular reasons for preferring one view over another must be recorded.</p>	See above	See above

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
National Parks and Wildlife Services (NPWS)	The Department has been consulted on the scope of the SEA Environmental Report. It is understood that the OPW has also determined that an appropriate assessment is required, presumably because it cannot be excluded, on the basis of objective information, that the programme, individually or in combination with other plans and projects will have a significant effect on a European site or sites. The current consultation has been taken as an opportunity to provide observations to the OPW and their consultants on the appropriate assessment process and on the scope of the NIS required. The responsibilities of the OPW under the Arterial Drainage Acts are noted. These must be balanced against the duties of the OPW as a public authority within the meaning of the European Communities (Birds and Natural Habitats) Regulations, 2011 to safeguard European sites. These duties include the specific requirements of appropriate assessment, as expanded below, and also place obligations on the OPW to exercise its statutory powers and functions in compliance with and, as appropriate, so as to secure compliance with the requirements of the Birds and Habitats Directives, and the Regulations. Appropriate steps must be taken by the OPW to prevent the deterioration of natural habitats and the habitats of protected species as well as significant disturbances of species in European sites.	Appropriate Assessment: Appendix A	
National Parks and Wildlife Services (NPWS)	Status of the programme and relationship with other OPW activities, plans and programmes It is noted that the cover letter received by this Department states that SEA is mandatory for these activities. While there are some comments in the scoping report which may be inconsistent with this view, this Department notes the definitive statement in the covering letter, which would benefit from reflection within any subsequent SEA Reports.	See above	See above
National Parks and Wildlife Services (NPWS)	It is also advised that a definitive position should be taken as to whether this five-year programme of drainage maintenance activities is or is not a plan for the purposes of the Birds and Natural Habitats Regulations, 2011, and as defined in Part 1 of the Regulations. The Regulations are available in full at: http://www.irishstatutebook.ie/2011/en/si/0477.html	Appropriate Assessment: Appendix A	
National Parks and Wildlife Services (NPWS)	It is noted that the proposed programme commences in 2016, seemingly to dovetail with Water Framework Directive reporting schedules. However, further consideration should be given to this timeframe for reasons that are set out below: 1. Given the further programme development and consultations required, it is unlikely that the programme will be prepared and adopted, (and the appropriate assessment completed), or otherwise given effect by the OPW, until late 2016.	no action	This is the timescale.
National Parks and Wildlife Services (NPWS)	2. Arterial drainage maintenance activities are already underway and on-going for 2016 so must themselves be compliant with relevant legislation, and must have been subject to screening for appropriate assessment and appropriate assessment by the OPW, where necessary. The OPW is required to maintain records of all relevant screening and appropriate assessment determinations for their works or activities in 2016 (see B&NH 2011, Regulation 61 in relation to Retention of Records).	no action	ongoing work covered by appropriate assessments already in place

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
National Parks and Wildlife Services (NPWS)	3. The previous five-year programme, 2011-2016, began preparation in 2011 in the same way as the current programme preparation is occurring in 2016. As the sequencing has not caught up sufficiently, consideration should be given to completing, assessing and adopting the current programme in 2016 so that it is ready for roll out in 2017. This could be done in conjunction with revised or new procedures being put in place by the OPW to ensure that all annual drainage maintenance programmes can be streamlined, and clearly demonstrated to be compliant with relevant legislation when notified to various bodies and authorities at the beginning of each year (i.e. the supply of the 'books of drawings').	Mitigation Measures (Planning Stage): Section 11	
National Parks and Wildlife Services (NPWS)	4. The relationships between the five-year national programme and the annual catchment, scheme or channel programmes require further examination by the OPW; the necessary explanation of these relationships should be provided in the five-year programme. Note that this is required in particular in this case for any overlap between the activities that are occurring this year, and the activities in the five-year programme that will occur this year. This is particularly important in ensuring all "lower-level" programmes of work are subject to any ecological assessments that may be required, particularly in view of obligations of the Birds and Natural Habitats Regulations.	See above	See above
National Parks and Wildlife Services (NPWS)	5. What are the reasons for aligning the OPW's five-year programmes with those of the Water Framework Directive, and what are the relationships between the OPW's programmes and the forthcoming CFRAM Flood Risk Management Plans?	no action	This is the timescale.
National Parks and Wildlife Services (NPWS)	The OPW will be aware that many of the above points were raised previously by this Department in relation to the preparation and assessment of the first five-year programme, 2011-2016, and on a series of occasions subsequently.	See above	See above
National Parks and Wildlife Services (NPWS)	Particular consideration also needs to be given to the relationship between the programme and projects or series of projects that are undertaken in each year, and their screenings for appropriate assessment, and appropriate assessments, where necessary.	See above	See above
National Parks and Wildlife Services (NPWS)	The Programme It is understood that the five-year programme will encompass the normal range of drainage, embankment, structural, and flood relief scheme maintenance activities that are carried out by or on behalf of the OPW in general. In addition to the specific channels and structures, and the general and specific works and activities involved, the programme must consider the full extent of all works areas and all lands required or likely to be required during the implementation of the programmes, including, for example, access points and access routes, site compounds, temporary	Programme Description: Section 3	No change. The programme is the "Activities" not the location of these, however the location is considered in the baseline environment and assessment.

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
	and permanent storage and disposal locations, and all associated, ancillary and accommodation works, including reinstatement or reseeded of lands. Any river enhancement works (e.g. EREP), if proposed, should be included. All parts of the programme should be described and assessed in the NIS; temporary, permanent and cumulative effects must be taken into account. The need for the works should also be set out.		
National Parks and Wildlife Services (NPWS)	It is particularly important that further consideration be given by the OPW as to how to ensure compliance with the Birds and Habitats Directive at the project/site-level for works that are or may be undertaken as part of this programme, or supporting annual programmes. The Department is aware of a number of examples where arterial drainage maintenance activities have been undertaken without project-level AA screenings or appropriate assessments being undertaken, including at least one occasion where serious ecological issues have arisen as a result (e.g. alluvial woodland clearance in an SAC in County Cork). There appears to be an on-going reliance on the use of standard operating procedures to avoid the risk of site-damage at the project-level which does not meet the standards and tests of Article 6 of the Habitats Directive. The Department has noted some specific examples below, but please also refer to the attached correspondence. It is expected that such matters, and all those raised within this submission, will be clearly addressed in the development of the Programme documentation and the Natura Impact Statement that is to be submitted to the Minister in due course. In summary, OPW needs to address this issue to ensure that it is meeting its legal obligations and to avoid the potential for legal challenges to be taken either at a national level or at a European level. Environmental assessments should be carried out on the basis of final project design, or the specifics of the programme elements, and not a general outline of works that may occur or a specimen design that could be subject to future changes or alterations. The hydraulic, hydrological or hydrogeological and disturbance impacts resulting from each element should be considered, in addition to the ecological impacts. Any necessary method statements that establish the details of the construction methods, the works areas involved, and the mitigation measures required, should form part of the application so that a robust and informed appropriate assessment may be carried out.	See above	See above
National Parks and Wildlife Services (NPWS)	In the event that advance intrusive site or ground investigations, or archaeological testing, are required, these activities should also be subject to screening and, if necessary, assessment, with details of any specific mitigation measures for separate phases of works set out as necessary. As noted above, the OPW has developed Environmental Management Protocols and Standard Operating Procedures (SOP), and requires drainage maintenance activities to comply with these measures. It is recommended that it should be clear in all cases how this is achieved in practice, and where the responsibilities for correct implementation, and supervision and enforcement lie, and whether there is sufficient expertise to enable interpretation and correct application.	See above	See above
National Parks and Wildlife Services (NPWS)	Where these constitute ecological mitigation measures for the avoidance of significant effects on European sites in view of their conservation objectives, adverse effects on European sites, or adverse effects on the environment (including European sites, NHAs, protected species and natural habitats, etc.), full details of mitigation measures should also be provided and shown in maps and	See above	See above

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
	drawings, as appropriate. In sensitive locations, the likely effects of ecological and other mitigation measures should be assessed, e.g. the installation and subsequent removal of silt control measures, or archaeological testing. Mitigation measures should be demonstrated to be effective in addressing and ameliorating the full scale and nature of the effects arising, at all relevant project stages, and should be demonstrated to be feasible within the specific characteristics and constraints of each scheme. Whether silt control measures, if necessary, will work in low and high water conditions, both during and after the works are carried out, should be considered and risks assessed accordingly. As well as a reliance on standard procedures which may or will not be sufficient in all or many instances to avoid damage to European sites, noted earlier, this Department has a concern that on occasion there can be an assumption that this Department will undertake work on behalf of the OPW rather than through the undertaking of required ecological assessments. An example is as follows: "Freshwater Pearl Mussel: The OPW channels listed in Table 5-7 have been identified as containing FWPM. Any works carried out in the vicinity will have to follow procedures recommended by NPWS."		
National Parks and Wildlife Services (NPWS)	The OPW is reminded of its own responsibilities in undertaking its functions in a manner that ensures compliance with the Directives and the Birds and Habitats Regulations; this includes the undertaking of complete, precise and definitive appropriate assessments, that include scientific analysis of the implications of a programme for European sites. It will be for the OPW to undertake such assessments and to develop the necessary procedures to meet these obligations. The OPW is also reminded of the following, set out in the Department's correspondence of 04/03/2013: "As discussed at the 10/01/2013 meeting, the OPW should note that it is no longer acceptable to agree procedures on the ground with Rangers and machine operators in lieu of a more formal agreement in advance of the works taking place".	Mitigation Measures (Planning Stage): Section 11	See above
National Parks and Wildlife Services (NPWS)	With respect to Otter it is stated "Dense areas with access directly to water should be noted and avoided where feasible. If there are any recognisable signs of otter presence observed such as spraints, footprints, or suspected holts. If any features have been found, no maintenance activities should take place within 30m or 150m if a breeding holt is found".	Mitigation Measures (planning stage) and (SoPs, Protocols): Section 11 - see row 93	Too specific for national SEA
National Parks and Wildlife Services (NPWS)	As non-intervention is always likely to be feasible (except in health & safety emergencies), this means that often areas of the densest growth causing obstruction to water flow would be left intact. The Department would welcome clarification on the issues that will be considered in relation to "feasibility" in subsequent documentation, including with respect to the incomplete sentence above.	See above	Too specific for national SEA
National Parks and Wildlife Services (NPWS)	Nature conservation issues The drainage maintenance activities will be occurring within, upstream and downstream of various European sites, NHAs, and other nature conservation sites. They will also be occurring in and near natural habitats and the habitats of protected species, including the breeding sites and resting places of strictly protected (Habitats Directive Annex IV) species.	Assessment - In-Combination Effects: Section 10	See above

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
National Parks and Wildlife Services (NPWS)	Cumulative / in combination effects The likely effects of each programme and element of the works must be assessed cumulatively or in combination with other plans and projects. This should include the on-going annual or multi-annual drainage maintenance activities, and other plans and projects that could act in combination to affect, for example, water quality, siltation, hydrology, flow rates, scouring, bank erosion, etc.	Assessment - In-Combination Effects: Section 10 and Monitoring: Section 11	See above
National Parks and Wildlife Services (NPWS)	Other Specific Comments Figure 2.1 – flowchart of steps and timeline should include 'Assessment and preparation of NIS' an explanation of how it was determined what ecological and other surveys were required and, specifically in the context of the NISs, the rationale for the distance criterion of "within 100m of associated Natura 2000 sites". It is stated in the Mitigation and Monitoring Section that "An Ecological Impact Assessment (EclA) is needed if the works are not within the Natural [sic] 2000 site but if they still have influence over the broader protected habitat". The OPW is reminded that obligations in relation to appropriate assessment also apply to works to occur outside a Natura site that may affect the habitats within the site.	Mitigation Measures (Planning Stage): Section 11	See above
National Parks and Wildlife Services (NPWS)	The Department welcomes the OPW's proposal to develop its own monitoring programme as this Department's Article 17 and Article 12 monitoring programmes are not designed to identify impacts and effects specifically arising from the OPW's programmes. Details of the programmes and the methodologies employed are available on the Department's website and should be examined to explore potential opportunities for complementarity with the OPW's programme. The Department also notes that it is stated that "An OPW supplementary monitoring programme could carry out walkover surveys of Arterial Drainage Channels in order to provide annual reporting of change (length of channel, invasive species reporting etc.)." The Department notes that such a methodology would not identify many of the effects that may arise from arterial drainage activities.	Monitoring: Section 11	See above
National Parks and Wildlife Services (NPWS)	Available information Data and information about European sites, and other nature conservation sites, including GIS datasets, are available from www.npws.ie. This includes site boundaries, site synopses, lists of qualifying interests (SACs) and special conservation interests (SPAs), conservation objectives (European sites), features of interest (NHAs), and dates of site designation.	Current State of the Environment: Section 6	Included and recommended to be incorporated into OPW GIS systems for planning.

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
National Parks and Wildlife Services (NPWS)	The most up-to-date version of the conservation objectives for each site should be sourced, referenced and used in the NISs. Site-specific conservation objectives, and associated supporting documents and GIS datasets, are available for some sites. For all other European sites, generic conservation objectives are available. Where site-specific conservation objectives and supporting documents are available for relevant qualifying interests or special conservation interests, these will assist in understanding the sensitivities of the habitats and species, and the potential for impacts on them, as well as assisting in the understanding of the nature and scope of the generic conservation objectives. It should be noted that the generic conservation objectives are "to maintain or restore the favourable conservation condition" of the qualifying interests or special conservation interests of the sites in question. In the absence of site specific conservation objectives, and where qualifying interest habitats are in unfavourable status at a national level, a precautionary approach should be adopted in the interpretation of the generic conservation objectives.	Current State of the Environment: Section 6	Included and recommended to be incorporated into OPW GIS systems for planning.
National Parks and Wildlife Services (NPWS)	GIS datasets are available for download for certain habitats and species arising from various sources, including national surveys. Of these, the mapped 'Margaritifera Sensitive Areas' are of particular importance to the OPW's operations and drainage schemes. Other NPWS-held data on habitats and species may be requested by submitting a 'Data Request Form' ⁵ . The Habitats Directive Article 17 reports for 2007 and 2013, which should also be consulted, are available from http://www.npws.ie/article-17-reports-0 , as is the recent national report on Article 12 of the Birds Directive, at http://www.npws.ie/news/birds-directive-article-12-reporting .	Current State of the Environment: Section 6	Included and recommended to be incorporated into OPW GIS systems for planning.
National Parks and Wildlife Services (NPWS)	The Department's 'Irish Wildlife Manual' Series should be consulted for available data, information and survey methodologies (and associated constraints), including, for example, on the following: <ul style="list-style-type: none"> • No. 76, 23: Otters • No. 45, 37, 1: White-clawed Crayfish • No. 27, 24, 22, 21, 15, 14, 5: Lamprey • No. 12, 9, 8: Freshwater Pearl Mussel 	Current State of the Environment: Section 6	This will be considered as methods and approaches evolve as per the recommended mitigation measures.
National Parks and Wildlife Services (NPWS)	Peer-reviewed literature should also be reviewed to inform the appropriate methodologies, surveys and associated constraints, including the recent research undertaken by O'Briain, funded by the OPW, concerning crayfish in arterially drained rivers.	Current State of the Environment: Section 6	This will be considered as methods and approaches evolve as per the recommended mitigation measures.

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
National Parks and Wildlife Services (NPWS)	Data on ecological features in or near the programme areas will be available from various other sources including, for example: <ul style="list-style-type: none"> • Other organisations, e.g. National Biodiversity Data Centre, BirdWatch Ireland, IFI, Bat Conservation Ireland, etc.; • EISs, NISs and other reports for projects in the general area, including previous EISs and NISs for OPW activities and schemes; • NIRs and SEA environmental assessments of plans in the general area, including County Development Plans. 	Current State of the Environment: Section 6	Recommended to be incorporated into OPW systems for planning.
National Parks and Wildlife Services (NPWS)	Appendix 1 - Notes on screening for appropriate assessment (reflecting the Department's previous advice of 04/03/13 to the OPW) SEE LETTER	Appropriate Assessment: Appendix A	
National Parks and Wildlife Services (NPWS)	Appendix 2 - Notes on the preparation and content of an NIS SEE LETTER	Appropriate Assessment: Appendix A	
National Parks and Wildlife Services (NPWS)	Appendix 3 - Freshwater Pearl Mussel SEE LETTER	See above	See above
National Parks and Wildlife Services (NPWS)	The Department has the following observations to make in relation to underwater archaeology and the SEA scoping report for OPW arterial drainage maintenance activities for 2016-2021. The Department would be happy to meet the OPW in due course to discuss any of the issues raised below in more depth.	Current State of the Environment: Section 6	

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
National Parks and Wildlife Services (NPWS)	The Department has reviewed the cultural heritage section (page 37-8) of the Baseline Environment chapter and notes that no reference is made to the Shipwreck Inventory of Ireland Database (SIID). Underwater archaeology is protected under the National Monuments Act 1930 – 2004 with the protection of Historic Wrecks specifically addressed in 1987 and 1994 (Amendment) Acts. Section 3(4) of the 1987 Act provides that a person shall not dive on, damage, or generally interfere with, any wreck which is more than one hundred years old or an archaeological object which is lying on, in or under the sea bed or on or in land covered by water except in accordance with a licence issued by the Minister for Arts, Heritage & Gaeltacht under Section 3 (5) of the Act. The National Monuments Service has compiled an inventory of shipwrecks for the coastal and inland waterways of Ireland, the records of which are stored in the official register of historic shipwrecks known as the Shipwreck Inventory of Ireland Database (SIID). To date over 18,000 wrecks are recorded in the Shipwreck Inventory of Ireland Database, which is available for consultation by appointment through the Archive Unit of the National Monuments Service. Works associated with arterial drainage may have the potential to negatively impact known or potential wrecks or submerged archaeology. It is therefore recommended that the SEA includes and references the Shipwreck Inventory of Ireland as a Key Environmental Issue when compiling the Cultural Heritage Section of the SEA report.	Current State of the Environment: Section 6	
National Parks and Wildlife Services (NPWS)	In addition, no reference is made to archaeological objects which are also protected under the National Monuments Acts. The National Museum of Ireland maintains the register of archaeological objects which should be consulted for background and contextual information as part of the SEA of the proposed arterial drainage programme.	Current State of the Environment: Section 6	
National Parks and Wildlife Services (NPWS)	It should be noted that any proposed work to or in proximity to National Monuments in State or Local Authority care or subject to a preservation order will require the consent of the Minister for Arts, Heritage and the Gaeltacht under section 14 of the National Monuments Act 1930 as amended by Section 5 of the National Monuments (Amendment) Act 2004. Similarly, for recorded monuments, which are not national monuments, under Section 12 of the 1994 National Monuments Acts, written notification is required to be given to the Minister for Arts, Heritage and the Gaeltacht two months in advance of any works commencing.	Current State of the Environment: Section 6	
National Parks and Wildlife Services (NPWS)	It shall also be noted that there are also National Monuments which are afforded the highest level of statutory protection, namely World Heritage Sites. Examples include Brú na Bóinne in Co. Meath and Skellig Micheal off the Co. Kerry coast. These sites are inscribed on the World Heritage List, under the 1972 UNESCO World Heritage Convention. Further information can be found on these sites from www.worldheritageireland.ie . Any activity which may affect these World Heritage Sites requires a consent from the Minister for Arts, Heritage and Gaeltacht.	Current State of the Environment: Section 6	

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
National Parks and Wildlife Services (NPWS)	Further clarification is sought in relation to the last paragraph of section 5.7 (page 38). It is unclear from an archaeological perspective what is meant by "it is important to be sensible when carrying out the works" and what exactly "appropriate methodologies" refers to and how this will help ensure the protection of the archaeological heritage. This section is vague and unclear and should be expanded and rewritten clearly outlining what the probable impacts will be on known or potential archaeology and what type of mitigation may be suitable to ensure that the archaeological heritage is not negatively impacted.	Current State of the Environment: Section 6	
National Parks and Wildlife Services (NPWS)	It is recommended that the archaeological heritage section of the SEA should be compiled by a suitably qualified archaeologist experienced in underwater archaeology.	Current State of the Environment: Section 6	
National Parks and Wildlife Services (NPWS)	In order to achieve the aims/goals listed in section 5.7.2 (Key Environmental Issues), a comprehensive archaeological assessment and impact statement will be required to be completed of the proposed drainage maintenance programme and its impact (including cumulative effects) on known or potential archaeological heritage. This will enable the Department to make an informed archaeological recommendation before works proceed.	Current State of the Environment: Section 6	
National Parks and Wildlife Services (NPWS)	It is also recommended that an archaeological monitoring programme be put in place similar to those proposed in section 7.3 relating to Flora, Fauna, Biodiversity, Water, Human Beings and Climate Change etc. The Underwater Archaeology Unit of this Department would be willing to provide advice to the OPW in setting up such a monitoring programme.	Current State of the Environment: Section 6	
National Parks and Wildlife Services (NPWS)	Protected wrecks, archaeological objects and world heritage sites should be included as on page 52 of the report. 'Subobjectives'	Current State of the Environment: Section 6	
National Parks and Wildlife Services (NPWS)	To ensure that 'Maintenance activity causes no detrimental impact upon or loss of unknown cultural heritage features' (see page 53, column 4), it is recommended that a detailed archaeological mitigation and plan, approved by this Department, be completed by a suitably qualified archaeologist to ensure that previously unknown archaeological sites, archaeological objects, areas of archaeological potential and wrecks are not negatively impacted by the proposed works.	Current State of the Environment: Section 6	
National Parks and Wildlife Services (NPWS)	The SEA should also assess the potential impact that the proposed drainage programme may have on known or potential monuments, archaeological objects and on known or potential wrecks should waterlogged sites adjacent to drainage channels become dried out as a result of the works.	Current State of the Environment: Section 6	

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
Environmental Protection Agency (EPA)	The nature and extent of what constitutes "channel maintenance activities and arterial drainage" should be clearly described.	Programme Description: Section 3	The section will state the "activities" and the schemes, channels, embankments these may apply too.
Environmental Protection Agency (EPA)	<p>Consideration should be given to including a specific section in the Maintenance Activities on Governance and Implementation. Provisions should be included for robust and transparent mechanisms to oversee the implementation of the Maintenance Activities' commitments and actions. Where possible, the implementation of the Maintenance Activities should be aligned and/or integrated with other relevant national agriculture, water, biodiversity, climate, land use and related policies, plans and programmes. An integrated catchment based approach, along the lines of the approach being implemented for the second cycle of river basin management planning in Ireland, should be considered to assist in assessing the potential for likely significant effects on water quality in implementing the Maintenance Activities.</p> <p>The inclusion of a specific commitment to establish an Implementation Steering Group, with relevant sub groups, as appropriate; to oversee and review the implementation of the Maintenance Activities should also be considered, if appropriate. The inclusion of an environmental component with a focus on oversight of implementing relevant environmental commitments as well as monitoring of the environmental performance of the Maintenance Activities and associated reporting should also be considered. The model set up by for the implementation stage of the Offshore Renewable Energy Development Plan (OREDPP) is a model which merits considering in this regard.</p>	Mitigation Measures (Planning Stage): Section 11	Recommended mitigation measure at planning stage to align arterial drainage maintenance planning with catchment management.
Environmental Protection Agency (EPA)	<p>The SEA process should identify and assess any significant impacts likely to result from the implementation of the proposed Activities. The focus should be on addressing the key issues and related likely significant environmental effects. The potential cumulative effects associated with multiple drainage activities within individual rivers (and on a river catchment level) need to be considered. Where significant adverse effects on the environment are identified, specific mitigation measures to prevent reduce and as fully as possible offset these effects environment should be identified. These should be reflected as commitments in the Maintenance Activities. The positive effects likely to arise from implementation of the Activities should also be assessed and highlighted. The achievement of these positive outcomes should be reflected in the monitoring programme for the Maintenance Activities' implementation and the associated environmental monitoring.</p> <p>The EPA has prepared a range of SEA Guidance resources including an SEA Scoping guidance document (updated regularly), an SEA Pack, SEA Process Checklist, SEA Spatial Information Sources and guidance on Integrating Climate Change into SEA, is available on the EPA website and should be considered in the preparation of the SEA. Guidance on Developing and Assessing Alternatives in SEA will also be relevant in the context of the Plan. These SEA resources can be consulted at: http://www.epa.ie/pubs/advice/ea/</p>	Assessment - In-Combination Effects: Section 10	SEA guidance followed.

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
Environmental Protection Agency (EPA)	The various options available which fall under the remit of the Maintenance Activities should be described and incorporated into the scope of the associated environmental assessments (SEA and AA). Any assumptions, selection and assessment criteria for various maintenance activities should be clearly set out in the preparation and assessment of the Activities. The recently published EPA publication on Developing and Assessing Alternatives in SEA should be of assistance in determining possible approaches to considering alternatives. https://www.epa.ie/pubs/advice/ea/SEA-Alternatives-157-Published_web.pdf	Alternatives: Section 9	Alternatives are limited by the Arterial Drainage Acts providing a legal requirement to maintain channels. The processes for planning and undertaking maintenance (i.e. the decision of what to do where, and how it is done) are not a standalone alternative and so covered in the recommendations for mitigation measures.
Inland Fisheries Ireland (IFI)	Eight lakes are listed as containing Zebra Mussel populations, there are however many more including Lough Conn, Lough Arrow and the River Glyde catchment. All catchments sources of invasive species with the relevant biosecurity procedures followed for all plant / equipment. should be treated as potential	Current State of the Environment: Section 6	Included in recommended mitigation measures
Inland Fisheries Ireland (IFI)	It is important to note that while many surface waters maintained for Arterial Drainage are not designated under the Habitats Directive, they hold species that are designated under that directive. Atlantic salmon for example, are listed as an Annex II Species under the European Habitats Directive. The Report of the Standing Scientific Committee of the National Salmon Commission "Status of Irish Salmon Stocks in 2006 and precautionary catch advice for 2007" states that in applying the Habitats Directive consideration must be given to all of the populations and not just specifically to the 26 SAC designated Rivers. In determining the likely significant effects of the Arterial Drainage Maintenance Programmes 2016-2021, regard should be had to the need for the sustainable development of the inland and marine fisheries resource (including the conservation of fish and other species of fauna and flora, aquatic habitats and the biodiversity of inland and marine water ecosystems). Some key issues for consideration include: <ul style="list-style-type: none"> • Water quality • Surface water hydrology / hydromorphology • Fish spawning and nursery areas • Passage of migratory fish • Biological Diversity • Ecosystem structure and functioning • Sport and commercial fishing and angling • Amenity and recreational areas 	Current State of the Environment: Section 6	Included in recommended mitigation measures
Inland Fisheries Ireland (IFI)	National Fisheries Legislation must be considered as part of the SEA process for Drainage Maintenance operations. County Heritage plans (e.g. Monaghan Heritage Plan 2012 - 2017 and the County Louth Heritage Plan) should also be included as plans of relevance to Arterial Drainage Maintenance.	Interacting Plans and Policies: Section 5	Legislation is included in table. Not appropriate to list all in the national scale SEA

Organisation	Comments on Scoping Report	How will JBA address the report Section	Details
Inland Fisheries Ireland (IFI)	The implementation of all relevant environmental SOP's and the promotion of environmental management best practice through the continued development of the Environmental River Enhancement Programme (EREP) in addition to the provision of ongoing formal environmental training to OPW staff is regarded as critical over the coming arterial drainage phase. It is essential that OPW monitoring programmes continue to fully assess the impacts of Arterial Drainage Maintenance activities on water / habitat quality and on the fisheries resource itself.	Monitoring: Section 11	See other comments on monitoring

B Summary of the plans, policies, and programmes of relevance to the draft Arterial Drainage Maintenance Activities (2016-2021)

Topic	Level	Plan / Programme / Policy	Description	Influence on / Relevance for draft Arterial Drainage Maintenance Activities (2016-2021)
Biodiversity Flora and Fauna	International	EU Bird Directive (2009/147/EC)	Europe has more than 500 wild bird species and at least 32% of these are not in a good conservation status. The Bird Directive aims to protect all 500 wild bird species naturally occurring in the EU. All member states must abide by the requirements of the Directive which includes reporting on the status and trend of bird populations, as well as potential designations. (European Commission)	These Directives are directly relevant to the Arterial Drainage Maintenance Activities (2016-2021) because any work that is carried out within the river channel, on the river banks, or surrounding areas, can alter or damage habitat, directly or indirectly affecting species of flora and fauna. It is crucial to acknowledge which sites are within Natura 2000 sites or any other European or International designation in order to ensure appropriate procedures and management of the works and appropriate conservation of habitats and species. In addition, maintenance activities particularly in upland areas will need to be cognisant of the wetland and the species it supports. Work in a wetland, depending on its extent may require an environmental impact statement and appropriate assessment.
		EU Biodiversity Action Plans- Heritage the loss of Biodiversity by 2010	The EU Biodiversity action plan aimed at reinforcing action to halt the loss of biodiversity in the EU by 2010. Accelerating the progress towards the recovery of habitats and natural systems in the EU. As well as, optimising the EU's contributions towards the rate of biodiversity loss worldwide by 2010.	
		The Habitats Directive (Council Directive 92/43/EEC)	The Habitats Directive ensure the conservation of a wide of a wide range of rare, threatened or endemic animal and plant species. Approximately 200 rare and important habitats are targeted for conservation.	
	National	The Wildlife Act, 1976	The Wildlife Act, 1976 provided a good legislative base for nature conservation. The species protection provisions, including those regulating hunting, are quite comprehensive, to the extent, for example, that they largely foresaw similar aspects of the EU Birds and Habitats Directives. However, the habitat/site protection measures in the 1976 Act were relatively weak, and were almost completely limited to measures which could be introduced in agreement with landowners. There was very limited power to ensure protection, even in the case of outstanding habitats or sites, where agreement of landowners was not forthcoming.	The Wildlife Act 1976 (as amended 2000) is the principle mechanism for the legislative protection of wildlife in Ireland. The Act protects species from injury, disturbance and damage to breeding and resting areas. All the species protected under the Act must be subject to material consideration in the planning process. Nature Reserves and Wildfowl Sanctuaries were positive outcomes that resulted from the Wildlife Act, 1975. Natural Heritage Areas are legally protected from damage from the date they are formally proposed for designation under the Wildlife (Amendment) Act, 2000. This legislation is important and pertinent to the Arterial Drainage Maintenance Activities (2016-2021) because any work that is carried out within the rivers channel, on the river banks, or surrounding areas, can alter or damage habitat, directly or indirectly affecting species of flora and fauna. It is crucial to be aware of NHA and pNHA in order to ensure appropriate procedures and management of the works and appropriate conservation of habitats and species.
		The Wildlife (Amendment) Act, 2000	The Wildlife Act, 1975 Nature conservation legislation was substantially enlarged and improved by the Wildlife (Amendment) Act, 2000	

			and the Birds and Natural Habitats Regulation	
		The Flora Protection Order 1999	The current list of plant species protected by Section 21 of the Wildlife Act, 1976 is set out in the Flora (Protection) Order, 2015, which supercedes orders made in 1980, 1987 and 1999.	It is illegal to cut, uproot or damage the listed species in any way, or to offer them for sale. This prohibition extends to the taking or sale of seed. In addition, it is illegal to alter, damage or interfere in any way with their habitats. This protection applies wherever the plants are found and is not confined to sites designated for nature conservation.
		Actions for Biodiversity 2011-2016. Ireland's 2nd National Biodiversity Plan	The National Biodiversity Plan outlines the measures that will be taken to conserve biodiversity in Ireland, presented as 102 actions under a series of 7 Strategic Objectives. This second plan builds on the achievements since 2002 and focuses on actions that were not fully completed in the lifetime of the first plan and addresses emerging issues. The overarching target of this plan is "that biodiversity loss and degradation of ecosystems are reduced by 2016 and progress is made towards substantial recovery by 2020"	It is also an action to ensure that all significant drainage is assessed for its implications for biodiversity and particularly for wetlands. Other targets in the plan likely to be relevant to the Arterial Drainage Maintenance Activities (2016-2021) are: reducing pollutant pressures, controlling harmful invasive species, progressing towards "good ecological status", maintaining/ restoring fish stock levels, safeguarding the Natura 2000 network and moving towards favourable conservation status.
		National Species Action Plans (SAPs) (various SAPs are likely to contain actions relevant to the Western RBD and flood risk management, including those for Otter and bats)	Under Action 26 of the National Biodiversity Action Plan, NPWS is committed to preparing SAPs for species of highest conservation concern. Threat response plans have also been produced for several species.	The purpose of a SAP is to outline the work to be done and strategies to be followed for the conservation of the species. Given the broad range of actions within them, they inform the policy of all Government agencies, including the OPW and a number of actions within them relate to works within watercourses.
		National Peatland Strategy	The aim of the cross-governmental approach to managing peatlands including compliance with EU environmental law, climate change, forestry, flood control, energy, nature conservation, planning, and agriculture. The strategy also sets out proposals for the development of a new regulatory regime for turf contractors.	Peatland are very important habitats in Ireland, their conservation, is crucial from a biodiversity point of view and their deterioration results in extensive environmental problems. The reason this strategy is of relevance to the Arterial Drainage Maintenance Activities (2016-2021) because special precautions should be taken if the any work are carried out in close proximity to peatlands. Its gives suggestions on guidelines and targets for peatland conservation.
		National Forestry Programme	The National Forestry Programme 2014-2020 produced by the Department of Agriculture, Food, and the Marine (DAFM) identified four specific needs of Ireland's forestry sector: •Increase on a permanent basis, Ireland's forest cover to capture carbon, produce wood and help mitigation. •Increase and sustain the production of forest-based biomass to meet renewable energy targets.	The National Forestry Programme 2014-2020 is of relevance to the Arterial Drainage Maintenance Activities (2016-2021) because it is crucial to be aware of the goals and objectives of other industries, especially if carrying out maintenance works adjacent to forests. It is important to understand their targets, especially in relation to conservation and environmental management. Significant budget to increase for native woodland conservation and increased focus on its application in relation to important native woodland types and opportunities for habitat linkages, and on environmentally

			<ul style="list-style-type: none"> •Support forest holders to actively manage their plantation •Optimise the environmental and social benefits of new and existing forests 	<p>sensitive areas, with a view to realising wider eco-system services such as water protection.</p> <p>A requirement within various water sensitive areas to include Native Woodland Establishment plot alongside watercourses within conifer plantations design.</p>
		Ireland's National Biodiversity Plan	<p>This is Ireland's second National Biodiversity plan, published in 2011 and covers the period to 2016.</p> <p>This Plan was prepared against a background of increasing biodiversity pressures and losses at both European and global level. It contains 102 actions that aim to better understand and protect biodiversity.</p>	<p>Some key actions for the agriculture sector and of relevance to the draft Arterial Drainage Maintenance Activities 2016-2021 are as follows:</p> <ul style="list-style-type: none"> • Develop measures in future rural development programmes for the protection and enhancement of ecosystem services and biodiversity; • Further develop criteria to identify High Nature Value (HNV) farmland and develop measures to address threats to HNV; • Effective implementation of cross-compliance and statutory management requirements to ensure conservation of biodiversity; • Conduct a systematic evaluation process for any agri-environmental schemes delivered, involving a robust ecological monitoring programme. <p>Increased habitat diversity and connectivity can provide beneficial pollination and natural biological control of pests.</p> <p>The impacts of drainage maintenance activity will vary by location, catchment and habitats. It is not possible to assess the impacts at this scale and Appropriate Assessment of catchment and project scale activities is necessary.</p>
	Regional/Local	Biodiversity Action Plan for County/City/Town	Each county has developed Local Biodiversity Action Plans to promote, protect and enhance the biodiversity of each County/City Council area. These local area biodiversity action plans mirror the objectives of the National Biodiversity Plan.	<p>The overarching aim of all the plans is to promote, protect and enhance biodiversity and key habitats and species within each County/City.</p> <p>Some of the actions within the local Biodiversity Action Plans relate to the freshwater environment and potential interact with the Arterial Drainage Maintenance Activities (2016-2021), for example, in seeking to protect and enhance the water and habitat quality of rivers and lakes.</p>
		Freshwater Pearl Mussel Sub-basin Management Plans (various)	The purpose of the Freshwater Pearl Mussel Sub-basin Management Plans is to address catchment-wide issues that are impacting upon mussel populations (physical modification, pollution, recreation, agricultural activities, forestry). The plans also contain Summary Action Programmes which contain the site specific measures needed to bring the populations back into favourable condition.	Several plans recognise that with the Arterial Drainage Maintenance Activities (2016-2021) in the vicinity of the freshwater pearl mussel are a significant risk. In the Action Programme all plans therefore suggest that necessary legislative change to control morphological alterations of surface waters are implemented.

Fisheries	National	National Report for Ireland on Eel Stock Recovery Plan (2008)	This plan assesses the status and threats to Eels in Ireland and contains a number of measures to allow the recovery of the stock of European eel. It also establishes the basis for the development of Eel Management Plans in river basin districts.	This plan contains a number of management actions to assist in the recovery of Eel stocks.
	Local	Shellfish Water Action Programmes	Shellfish Waters Directive translated into Irish Law by European Communities (Quality of Shellfish Waters) Regulations 2006 (SI No 268) establishes measures to protect shellfish waters, against pollution and to safeguard certain shellfish populations from various harmful consequences, resulting from the discharge of pollutant substances into the sea. There are 14 Shellfish Waters in Ireland and Pollution Reduction Programmes and action plans have been devised for each that describe the shellfish area catchment, the pressures and risks in the area and sets out the actions proposed to alleviate risks.	<p>There are currently various Shellfish Waters with Shellfish Action Programmes in Ireland.</p> <p>The Arterial Drainage Maintenance Activities (2016-2021) works will have to ensure that the water quality of the Shellfish areas is not impacted upon by the flood risk management options proposed.</p>
Heritage	National	National Heritage Plan (Department of Arts, Heritage, Gaeltacht and the Islands, 2002)	The national plan sets out a clear and coherent strategy and framework for the protection and enhancement of Ireland's heritage, including natural heritage, cultural landscapes, archaeology and architectural heritage.	Originally published in 2002 the National Heritage's Plan life was considered to be five years; however, it set the framework and requirement for production of Local Heritage plans at the County/City level.
		Conserving Ireland's Maritime Heritage, 2006	This report advocates greater recognition of Ireland's maritime heritage and the significant role heritage can play in the development of Ireland's marine and coastal resources. It identifies actions to improve the protection, conservation and management of these resources.	<p>The report advocates the concept of heritage sustainability for use in assessing planning and development proposals in marine and coastal areas.</p> <p>The report recommends a number of actions to protect maritime heritage, relating to a range of factors including water quality, biodiversity and fisheries along with maritime archaeology, built heritage and cultural heritage.</p>

		The National Monuments Acts 1930-2004	Irish legislation for the protection of archaeological heritage is based on the National Monuments Acts 1930-2004, which is in accordance with the Valletta Convention. The Act secures the archaeological heritage in several key areas such as the protection monuments and areas, objects, control of archaeological excavation	The National Monuments Acts, the Architectural Heritage, and Historic Monuments Act, and Planning and Development Act, have set out to protect artefacts, buildings, and landmarks of cultural, historical, archaeological, or architectural significance. These Acts are relevant to the Arterial Drainage Maintenance Activities (2016-2021) because when works are carried out it is crucial to be aware of the potential for items to be uncovered and also that any works taking place in close proximity to areas of important cultural or historical significance follow specific guidelines.
		Architectural Heritage (National Heritage) and Historic Monuments (Miscellaneous Provisions) Act 1999	The national legislation advocates for the identification, recording, and evaluation of post-1200 architectural heritage of Ireland, as a way to build and protect. The National Inventory of Architectural Heritage (NIAH) is now a state initiative under the administration of the Department of Arts, Heritage and Gaeltacht.	
		Archaeology Codes of Practice made by National Monument Service (NMS)	The cultural heritage section should include the various policy documents published between key semi-state bodies and the NMS: Coillte; NRA; Railway Procurement; Iarnród Éireann; Bord na Mona; Irish Concrete Federation; ESB Networks; EirGrid; Bord Gáis Éireann (see: https://www.archaeology.ie/codes-of-practice).	The documents set out common procedures and protocols for the assessment, identification, mitigation and resolution of archaeological sites, features and artefacts that are encountered in the course of a project, as well as procedures for managing the archaeological/cultural heritage resource.
		The Planning and Development Acts (2000-2014) Cultural Heritage And Landscape	In the Planning and Development Act 2000, there is a requirement that obliges planning authority to compile and maintain Record of Protected Structures (RPS). It also contains provisions for the preservation and conservation of the landscape under the Act in Section 10, 202, and 204. Section 10 of the Planning and Development Act, 2000, requires Local Authorities to include objectives for the following in their development plans: (2)(e) the preservation of the character of the landscape where, and to the extent that, in the opinion of the planning authority, the proper planning and sustainable development of the	This Act is relevant to the Arterial Drainage Maintenance Activities (2016-2021) because when works are carried out it is crucial to be aware of the potential for items to be uncovered and also that any works taking place in close proximity to areas of important cultural or historical significance follow specific guidelines.

			<p>area requires it, including the preservation of views and prospects and the amenities of places and features of natural beauty or interest.</p> <p>Section 202, of the 2000 Act, gives Local Authorities the power to designate areas of special amenity:</p> <p>(1) Where, in the opinion of the planning authority, by reason of:</p> <p>(a) its outstanding natural beauty, or</p> <p>(b) its special recreational value,</p> <p>and having regard to any benefits for nature conservation, an area should be declared under this</p> <p>Section to be an area of special amenity...</p> <p>The second type of special landscape is a Landscape Conservation Area. Section 204, of the Planning and Development</p>	
	Local	County Mayo Heritage Plan 2011 – 2016	<p>Each County/City has developed Local Heritage Plans, although the specified life of the plans in some cases has expired and they are in the process of being updated. These plans have been developed following issue of the National Heritage Plan.</p> <p>The aims of the plans are promoting best practice in heritage management; raising awareness and enjoyment of heritage; and the collection and dissemination of heritage information.</p>	<p>The Arterial Drainage Maintenance Activities (2016-2021) should ensure that the objectives of the County/City Heritage Plans are not compromised. This includes objectives such as promoting best practice standards for heritage management and conservation and maintaining and improving the water quality of surface waters (rivers & lakes), groundwater and coastal waters.</p> <p>The Heritage Plans also often contain actions relating to the natural environment, such as protecting and enhancing habitat and species diversity and management of invasive species.</p>
Water	International	EU Drinking Water Directives	<p>The Drinking Water Directive concerns with the quality of water intended for human consumption. Its objective is to protect human from adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean. The laid down the essential standards at EU level. Member states are required to transpose the law into national legislation and can include additional</p>	<p>Ensuring the maintenance or improvement of water quality is important to fulfilling the WFD targets and objectives. It is important that the works carried out for the Arterial Drainage Maintenance Activities (2016-2021) satisfy these aims and do not pose any threats to water quality.</p>

			requirements.	
		EU Bathing Water Directive (2007/7/EC)	The general purpose of the Directive was to create provisions to encourage monitoring and classification of bathing waters, management of bathing water quality, the provision of information to the public on bathing water quality.	
		EU Water Framework Directive (WFD)	The EU-Wide Law introduced in 2000 to bring a common approach to safeguarding all Community waterbodies and water-dependent ecosystems.	
	National	Water Services Act 2007	The Water Service Act 2007 (No.30 of 2007) places a duty of care on the owner of a waste water treatment system (Section 70) to ensure that 'it is kept so as not to cause or be likely to cause a risk to human health or the environment. It also gives powers to a person authorised by the WSA to direct the owner to take such measures as are considered necessary to deal with the risk. Inspections other than the risk-based inspections may be undertaken by authorised persons under the Water Pollution Act.	The standards that domestic waste water treatment systems shall meet are set out in the Water Services Acts 2007 and 2012 (Domestic Waste Water Treatment Systems) Regulations 2012 (S.I. No. 223 of 2012). These regulations were published in June 2012 following a public consultation process by the DoECLG. The regulations prescribe the actions to be taken by owners of domestic waste water treatment systems to ensure compliance with their obligations under Section 70(C)(1) of the Water Services (Amendment) Act 2012 It is important that the Arterial Drainage Maintenance Activities (2016-2021) help fulfil these regulations by maintenance and monitoring.
		The Water Services (Amendment) Act, 2012 (No. 2 of 2012) And Waste Water Discharge (Authorisation) Regulation, 2007 (S.I.No.684 of 2007	The Water Services (Amendment) Act, 2012 (No. 2 of 2012) provides for the registration of domestic waste water treatment systems, the preparation of a National Inspection Plan and the inspections and remediation of treatment systems that are impacting on health or the environment.	

	Groundwater Protection Schemes	Groundwater Protection Schemes aim to maintain the quantity and quality of groundwater, and in some cases improve it, by applying a risk assessment-based approach to groundwater protection and sustainable development. A scheme provides guidelines for the planning and licensing authorities in carrying out their functions, and a framework to assist in decision-making on the location, nature and control of developments and activities in order to protect groundwater.	Groundwater Protection Schemes have two main components: (a) land surface zoning; and (b) groundwater protection responses for potentially polluting activities. Land surface zoning is presented on a Groundwater Protection Map which delineates land areas in terms of groundwater vulnerability to pollution and groundwater potential. Groundwater protection responses for the different zones indicate the acceptability of a particular activity with respect to the potential hazard, aquifer category or source protection area, and groundwater vulnerability. A scheme also provides for the delineation of Source Protection Areas around significant groundwater supply sources.
	OPW Minor Flood Mitigation Works Programme	<p>The Minor Flood Mitigation Works & Coastal Protection Scheme was introduced by the Office of Public Works in 2009. The purpose of the scheme is to provide funding to Local Authorities to undertake minor flood mitigation works or studies to address localised flooding and coastal protection problems within their administrative areas.</p> <p>Under the scheme, applications are considered for projects that are estimated to cost not more than €500,000 in each instance. Funding of up to 90% of the cost is available for approved projects.</p>	All minor works completed and proposed must be considered as part of the Arterial Drainage Maintenance Activities (2016-2021) proposed works of the FRMPs to ensure that all factors influencing flooding and flood risk are considered.
	Second Nitrates Action Programme 2010-2013	This Programme has been devised in line with the Nitrates Directive (91/676/EEC) which is concerned the protection of waters against pollution by nitrates from agricultural sources. In accordance with the Directive each Member State is obliged to put in place a Nitrates Action Programme and to review and if necessary revise their action programme at least every four years. Ireland's first Nitrates Action Programme was reviewed in 2010 and the second programme has now been enacted through the European Communities (Good Agricultural Practice for the Protection of Waters) Regulations 2010 – SI No. 610 of 2010. It is due to be reviewed again in 2013.	<p>The regulations introduced as part of the Nitrates Action Programme strengthened statutory protection of waters against pollution from agricultural sources (e.g. by phosphorus or nitrogen). They require avoidance of farming practices which create a risk of pollution to water courses and provide for inspections and enforcement by local authorities. Specific provisions are included in relation to fertilisers and manures. The review of the programme in 2010 did not make substantial revisions, but strengthened protection measures, for example by increasing buffer zones for fertiliser application adjacent to watercourses and amending maximum nitrogen and phosphorous fertilisation rates.</p> <p>Flooding of agricultural land and farm properties potentially provides a pathway for nutrients and other agricultural chemicals to enter into watercourses. The Arterial Drainage Maintenance Activities (2016-2021) works must recognise and ensure, where possible that waters are protected from pollution from agricultural sources.</p>

	Regional	River Basin Management Plans	The River Basin Management Plan (RBMP) were produced in accordance with the requirements of the Water Framework Directive (WFD). The WFD requires governments to take a new approach to managing their waters (i.e. rivers, lakes, groundwater, estuaries (transitional) and coastal waters). Waterbodies must achieve at least good status (or for artificial or heavily modified waterbodies; potential) by 2015 and ensure that status doesn't deteriorate.	<p>The RBMP outlines the aims and objectives for achieving the requirements of the WFD of each RBD. The plan aims to achieve good status for 74% of rivers by 2015, with the step to 100% compliance to be achieved over the following two planning cycles to 2027. It is considered that the key factors contributing to poor water quality are discharges (e.g. nutrients from agricultural activities and municipal wastewater treatment works). Industrial discharges, wastewater from unsewered properties and discharges from other activities have also been identified as issues, along with water abstraction and physical modification.</p> <p>The RBMP identifies a Programme of Measures to protect and restore water status by addressing the main pressures in the RBD. The Arterial Drainage Maintenance Activities (2016-2021) works must give full regard to the objectives of the RBMP and the Programme of RBMPs.</p>
		Environmental River Enhancement Programme	The Environmental River Enhancement Programme (EREP) is an OPW funded project that is being co-ordinated and managed by Inland Fisheries Ireland. The programme focuses on the enhancement of drained salmonid rivers in Ireland.	The programme involves two different approaches to enhancement, these being capital enhancement and enhanced maintenance respectively. The EREP and the Arterial Drainage Maintenance Activities (2016-2021) works potentially could work together to deliver further environmental benefits.
Other	International	EU Common Agricultural Policy	The Common Agricultural Policy allows European farmers to meet the need of 500 million Europeans. Its objectives are to ensure a decent standard of living for farmers and to provide a stable and safe food supply at affordable prices for consumers	The Arterial Drainage Maintenance Activities (2016-2021) is important for Ireland because it creates waterways or embankments in order to drain land and prevent field from being flooded on a yearly basis. It indirectly assists in the efforts to maintain and increase sustainable productivity.
		The Clean Air for Europe (CAFÉ) Directive (2008/50/EC)	CAFÉ was published in 2008 and it replaced first, second, and third Daughter Directives. The Clean Air for Europe objectives are to develop, collect, and validate scientific information on the effect of air pollution, to support, correct legislation and review the effectiveness of existing legislation and to develop new proposals as and when, necessary. To ensure that the requisite measures are taken at the relevant level, and to develop structural links with the relevant policy areas.	<p>The Arterial Drainage Maintenance Activities (2016-2021) should be aware the importance of CAFÉ and its objectives and similarly should be influenced by these during the works, ensuring appropriate machinery and equipment are used.</p> <p>The Irish Legislation introduced to fulfil the EU Directive are just as important and pertinent, yet its recommendations and objectives are more relevant to Irish laws and practices.</p>
		The Fourth Daughter Directive (2004/107/EC)	The Fourth Daughter Directive (2004/107/EC) will be included in CAFÉ at a later stage.	
		Air Quality Standards Regulations	The CAFÉ directive were transposed into Irish	

		2011 (S.I.No.180 of 2011)	Legislation Air Quality Standards Regulations. It also replaces the Air Quality Standards Regulations 2002 (S.I.No.271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I No. 53 of 2004) and S.I. No. 33 of 1999.	
		Mercury, Nickle, and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I No.58 of 2009).	The fourth Daughter Directive (2004/107/EC) was transposed into Irish legislation by the Arsenic, Cadmium, Mercury, Nickle, and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulation 2009 (S.I. No 58 of 2009).	
		National Emissions Ceiling (NEC) Directive	The substantive objective of the directive is to reach the national ceilings by 2010 and in later years (Article 4). In addition, the directive requires the Member States to draft and report National Programmes and to report emissions and projections to the Commission and the European Environment Agency. These additional obligations serve as important measures to be taken by Member States to ensure that the ceilings are met by 2010.	
	National	Ireland Rural Development Programme 2007-2013	The Rural Development Programme for Ireland 2007-2013 (RDP) was approved by the European Commission in July 2007 and is based on the EU funding framework for Agriculture and Rural Development. The EU framework requires each country to submit a rural development strategy which they subsequently translate into a practical programme with measures, funding allocations, targets and mechanisms for delivery.	The RDP is structured around three key axes: - Improving the competitiveness of agriculture; - Improving the environment and land management; and - Improving rural quality of life, With a fourth axis focusing on the implementation of the LEADER approach.
		Rural Environmental Protection Scheme (REPS)	The REPS offers payment rewards to farmers who undertake farming methods in an environmentally friendly way. The objectives of the scheme are: Establish farming practices and production methods which reflect the increasing concern for conservation, landscape protection and wider environmental problems; Protect wildlife habitats and endangered species of flora and fauna; Produce quality food in an extensive and environmentally friendly manner.	Participants in REPS, AEOS, and GLAS must comply with eleven basic measures, including to protect and maintain all watercourses and wells and cease using herbicides, pesticides and fertilisers in and around hedgerows, lakes, ponds, rivers and streams (except with consent). REPS, AEOS, and GLAS recognise the importance of the riparian zone in rural areas and the Arterial Drainage Maintenance Activities (2016-2021) should make recommendations that are compatible with those in the current environmental protection schemes, which at the moment is GLAS.

		Agri-Environmental Options Scheme (AEOS)	A scheme launched in 2010 aiming to build on the Rural Environment Protection Scheme (REPS) in order to promote biodiversity, improve water quality and combat climate change.	This plan recognises that agriculture can have significant impacts on the environment, including the provision of environmental services, such as biodiversity, flood and drought control, and as a carbon sink. The role agricultural land can play in flood control and mitigation and drainage maintenance will need to be considered as part of the Arterial Drainage Maintenance Activities (2016-2021), as will the importance of protecting key agricultural areas within the RBD.
		Green-Low Carbon Agri-Environmental Scheme (GLAS)	GLASS is the new agri-environmental scheme under the Rural Development Plan 2014-2020, which rewards farmers for carrying out environmentally sound practices that meet the criteria set out by the scheme.	
		Food Harvest 2020: A vision for Irish agri-food and fisheries	This plan is a strategy for the medium-term development of the agri-food (including drinks) fisheries and forestry sector for the period to 2020. It outlines the key actions needed to ensure that the sector contributes to the maximum possible extent to our export-led economic recovery and the full development of the smart economy.	
		Food Wise 2025 and the associated Implementation Plan (DAFM)	<p>The Food Wise 2025 Committee developed, based on their broad experience and knowledge of the Irish agri-food sector, a vision for the strategic sustainable growth of the sector over the next decade to 2025. The draft report of the Committee was published in July 2015 and presented to Government.</p> <p>The Government noted the report and made a commitment to putting in place an implementation structure which would ensure a robust whole of Government approach to activate the recommendations/actions in Food Wise 2025. This implementation process will seek to enhance the regulatory and administrative environment in which the sector operates, and facilitate the achievement of the sustainable growth potential of the sector set out in Food Wise 2025, thus optimising the sector's contribution to the economy, the environment and the social wellbeing of the country</p>	

		National Rural Development Programme 2014-2020 (DAFM)	<p>Arising from the most recent reform of CAP agreed under the Irish Presidency of the EU, a new suite of rural development measures has been designed to enhance the competitiveness of the agri-food sector, achieve more sustainable management of natural resources and ensure a more balanced development of rural areas.</p> <p>There is a broad range of schemes and supports contained in Ireland's new RDP for the period 2014-20. Ireland's RDP was formally adopted by the EU Commission on 26th May 2015.</p>	<p>Climate change is identified as one of the important elements that needs to be addressed when assessing future flood relief measures in Ireland.</p> <p>In relation to adaptive measures, the strategy recognises that the OPW has been appointed as the lead agency to implement flooding policy in Ireland and that they are currently developing a strategy to manage flood risk in conjunction with other relevant state agencies; the Arterial Drainage Maintenance Activities (2016-2021) programme is a key aspect of this.</p> <p>Also, the Planning and Development Act 2000 also empowers local planning authorities to provide, in their development plans policies so that development in areas at risk of flooding may be regulated, restricted or controlled. Therefore, if development is proposed in a flood-risk area, the risk of flooding can be carefully evaluated and planning permission refused, if necessary.</p>
		National (Climate) Mitigation Plan (In preparation /SEA underway)	<p>The focus of the NMP will be to identify sector based mitigation measures to be adopted by the various government departments to mitigate GHG. The plan will also track the implementation of measures already underway and identify additional measures in the longer term to reduce GHG and progress the overall national low carbon transition agenda to 2050.</p>	
		Sectoral Climate Adaptation Plans (In: preparation)	<p>An analysis of Ireland's capacity to adapt to the impacts of climate change in the context of regional and global actions and developments was carried out in 2010. The aim of the analysis was to inform options for developing Ireland's approach to climate change adaptation. It provided: (i) a policy context review within which adaptation will take place; (ii) an assessment of current adaptive capacity; and (iii) recommendations for possible actions for enhancing adaptive capacity.</p>	
		Ireland National Climate Change Strategy 2007 - 2012	<p>This strategy sets out a range of measures, building on those already in place under the first National Climate Change Strategy (2000) to ensure Ireland reaches its target under the Kyoto Protocol. It provides a framework for action to reduce Ireland's greenhouse gas emissions in the most efficient and equitable manner while continuing to support economic growth and preparing Ireland for the more ambitious commitments that will be required after 2012.</p>	

		Code of Best Forest Practice	The Code of Best Practice is designed to ensure that forest operations in Ireland are carried out in a way which meets high environmental, social and economic standards. It provides direction for forest managers by describing how forestry operations should be undertaken, specifically focusing on impacts on landscape, water quality, heritage and biodiversity.	<p>The Code recognises the impacts forestry can have on water quality, ecology and stability. Harvesting and access for forestry operations in particular can impact on the hydrology, chemistry and level of sedimentation in aquatic zones, through compaction by heavy machinery, soil displacement, increased run-off through drainage, and contamination with fertilisers, chemicals and fuel.</p> <p>The importance of riparian woodlands, in relation to water quality, bank stabilisation and biodiversity, is also recognised. There are also related guidance documents on issues including archaeology, fisheries, landscape and biodiversity, among others</p>
		Tourism Product Development Strategy, 2007 – 2013	The strategy proposes a framework and policy guidance for the long-term development of the tourism product in Ireland.	The strategy recognises the importance of Ireland's inland waters to the national tourism product, however, although currently of a relatively high standard, their decline threatens tourism. The strategy recognises that pollution of rivers and streams is a key threat, particularly to salmon and trout stocks which are an important tourist resource. The strategy also recognises the importance of the coastline and off-shore islands to tourism.
		GRID25: A Strategy for the Development of Ireland's Electricity Grid for a Sustainable and Competitive Future	Over the next 15 to 20 years, major changes will take place in Ireland's electricity needs, in its sources of fuel and in its fleet of power stations. GRID25 provides an outline of how the development of the Grid should be undertaken to support a long-term sustainable and reliable electricity supply. It also supports the Government's priority actions of increasing the penetration of renewable energy technologies and of improving energy efficiency and energy savings.	<p>GRID25 will bring new levels of wind generation, both on and off-shore and an introduction of commercial ocean technology-based generation to Ireland. The north-west is recognised as being particularly rich in wind and ocean renewable energy resources.</p> <p>It will be important that the Arterial Drainage Maintenance Activities (2016-2021) protects these critical infrastructure assets, and recognises that future development proposed in this strategy may require protection from flooding.</p>
		National Renewable Energy Action Plan to 2020	The 2009 Renewable Energy Directive (2009/28/EC) requires each Member State to adopt a national renewable energy action plan and submit these to the European Commission. Ireland's National Renewable Energy Action Plan is the Framework within which Ireland has set out the detailed schemes, policies and measures to deliver the trajectory of growth from renewable sources.	<p>The development of renewable energy is central to overall energy policy in Ireland. The significant growth in electricity from renewable sources in recent years is largely attributable to onshore wind. Moving towards, and beyond 2020, the Irish Government is looking for significant opportunities to develop Ireland's abundant offshore renewable energy resources, including offshore wind, wave and tidal energy.</p> <p>A key challenge in Ireland, which has been highlighted in national guidelines on wind energy development, is that many of the best wind energy sites are also the most sensitive environmentally and hydrologically (e.g. peat lands and other wetlands, uplands, mountains and coastal areas).</p>

				<p>The Arterial Drainage Maintenance Activities (2016-2021) provides opportunity to help protect critical infrastructure assets and could influence their development in hydrologically sensitive areas. The installation of hydroelectric power generation facilities will require specific consideration in relation to flood risk.</p>
		Strategy for Renewable Energy: 2012 – 2020	<p>This high level Strategy is underpinned by the detailed National Renewable Energy Action Plan and sets out the Government's Strategic Goals for Renewable Energy, including the key Actions underway and those planned in the short and medium term for each of the renewable energy sectors. A number of counties in the Western RBD also have, or are planning to develop, county-level Renewable Energy Strategies.</p>	<p>The Government's overriding energy policy objective is to ensure competitive, secure and sustainable energy for the economy and for society. Renewable energy, allied with energy efficiency, is crucial to achieving secure sustainable and competitive energy supplies and reducing dependency on expensive fossil imports and underpinning the move towards a low carbon economy. The Arterial Drainage Maintenance Activities (2016-2021) programme provides opportunity to help protect critical infrastructure assets, although their impact on flooding and flood risk management will need to be considered.</p>
		Delivering a Sustainable Energy Future for Ireland - The Energy Policy Framework 2007-2020	<p>The action plan aimed determining actions to ensure security of energy supply, promotion of sustainable/green energy supply and use, and enhance the competitiveness of energy supply.</p>	<p>These strategies have been introduced in order to meet national and international climate change targets. Through public consultation, communication between various departments and Ministries, guidance documents, plans and strategies have been developed to introduce more sustainable practices in Ireland. These are continuously changing and being updated. It is crucial for the Arterial Drainage Maintenance Activities (2016-2021) to be aware of the existence of these plans and to acknowledge their targets.</p>
		The National Bioenergy Action Plan	<p>This plan aims at promoting Ireland's potential to provide bio-energy resources to generate electricity. The sustainable development of bioenergy as a resource will contribute to policy objectives in energy, environmental, climate change mitigation, rural and regional development policies. Targets were set in various departments:</p> <ul style="list-style-type: none"> - Electricity sector - Transport fuel sector - Heat Sector -Department of Finance -Department of Communications, Marine, and Natural Resources -Department of Agriculture and Food -Development of Environment, Heritage, and Local Government 	
		The National Energy Efficiency Action Plan	<p>Ireland's third National Energy Efficiency Action Plan (NEEAP 3) reaffirmed Ireland's commitment</p>	

			to delivering a 20% reduction in energy demand across a whole of the economy by 2020, along with 33% reduction in public sector energy use. The plans outline energy efficiency measures that will be implemented to reach the national energy saving targets.	
		Smarter Travel- A Sustainable Transport Future- A New Transport Policy for Ireland 2009-2020	The policy document focuses on coming up with a strategy that will help achieve a sustainable travel and transport system by 2020.	
	Regional	Coillte District Strategic Plans:	Coillte's estate is divided into 317 forests, which are combined into 13 forest management districts. Coillte has developed plans for each of these districts, known as District Strategic Plans (DSPs), which describe Coillte's forests in the area and set out the long-term vision for the management of these forests as well as short-term objectives for the district.	DSPs address a wide range of economic, social and environmental objectives and include details of how the forest will be expanded and restructured, how the mix of tree species in the forests will change over time, how nature will be conserved and recreational facilities provided, among other issues. They specifically recognise the impact forestry can have on water quality, and propose measures such as the introduction of riparian buffer zones to protect watercourses.
	Local	Local and County Development Plans	County and local development plans are developed in order develop strategies that will lead to the economic, social, and cultural progress of the town and/or county.	These plans are influential for the Arterial Drainage Maintenance Activities (2016-2021). It is crucial to be aware of the local policies and legislations of the towns and counties, as well, as international and national policies and legislations.

C Assessment of Alternatives

Catchment: National Scale
Schemes: All

				Change in impact from existing (before recommended mitigation measures)			
				Do Minimum (reduction in funding by 50%)	Alternative 1 (an evolved approach to the current activities)	Alternative 2 (different methods to achieve the objectives of Arterial Drainage)	Alternative 3 (modification of arterial drainage)
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	-	+	+	????
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	-	+	+	????
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	-	+	+	????
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	-	+	+	????
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	-	+	+	????
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	-	+	+	????
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	-	+	+	????
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	-	+	+	????
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	-	+	+	????
		C2	Ensure no adverse effects on commercial shellfisheries.	-	+	+	????

				Change in impact from existing (before recommended mitigation measures)			
				Do Minimum (reduction in funding by 50%)	Alternative 1 (an evolved approach to the current activities)	Alternative 2 (different methods to achieve the objectives of Arterial Drainage)	Alternative 3 (modification of arterial drainage)
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	-	+	+	+
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	-	+	+	+
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	-	+	0	+
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	-	+	0	+
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	-	+	0	+
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	-	0	0	+
		E3	Maintain access to local services and transport networks up to the design standard of protection.	-	0	0	-
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	-	+	+	????
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	-	0	0	-
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	-	+	+	????
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	-	+	+	????
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	-	+	+	????

Change in Impact

More positive impacts than proposed activities	+
No change	0
More negative impacts than proposed activities	-
Uncertain	????

D Catchment Assessment Tables

Catchment: Ballyteigue-Bannow
Schemes: Ballyteigue/Kilmore Arterial Drainage Schemes

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	0	MT	L	M1, M2, M3, M4, M7	√	LT	R	No EREP schemes within the catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√√√	LT	R	
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	X	MT	R	M1, M2, M3, M4, M7	√√√	LT	R	
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	Ballyteigue Burrow SPA and SAC sites within the estuarine and coastal section of catchment. Channels drain to these and embankments contain Natura 2000 sites.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Ballyteigue Burrow pNHA has same impacts as SAC and SPA. Long length of embankments are ideal habitats for mammals.
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	High proportion of catchment is covered by waterbody (10%). Ballyteigue/Kilimor Arterial Drainage Scheme and Embankments only cover a small proportion of catchment, however does have a substantial area of benefitting lands that drain into the lagoon.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Catchment has moderate proportion of woodland/forest land cover (10%). Potential for notable length of linear riparian woodland.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	No salmonid waters
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	Catchment contains shellfish waters, however none of scheme channels drain to these.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts. Coastal embankments likely to be very sensitive to climate change.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	L	M1, M2, M3, M4, M7	√	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√	MT	R	Small benefitting area however highly productive agricultural land so important for local economy.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√	LT	R	Embankments constrain natural input of nutrients deposited from coastal flooding.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through distrubance or change in hydraulics in estuaries.

Catchment: Bandon-Ilen
Schemes: River Bandon (Dunmanway) Flood Relief Scheme

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	0	-	-	M1, M2, M3, M4, M7	√	LT	L	No EREP schemes within the catchment. Limited extent for potential environmental enhancement as OPW maintenance activities only apply to Dunmanway Flood Relief Scheme, however localised enhancement could be possible.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√	LT	L	Major negative impacts due to concentration of environmental sensitivities close to scheme channels and embankments. local scale of OPW maintenance activity within the catchment.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	LT	R	M1, M2, M3, M4, M7	√	LT	L	Major negative impacts as freshwater pearl mussel population located in close proximity to flood relief scheme. Local scale of OPW maintenance activity within the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XXX	LT	R	M1, M2, M3, M4, M7	√	LT	L	Flood relief scheme is within the Bandon River SAC. Features of interest include freshwater pearl mussel, brook lamprey and alluvial woodland. All can be directly impacted by maintenance activity.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	X	ST	L	M1, M2, M3, M4, M7	√	ST	L	Bandon Valley South Of Dunmanway pNHAs. Potential for minor negative impacts off maintenance on mammal species which may burrow in embankments. Impact is minor, local and short term as length of embankments for maintenance is limited and so surrounding alternative habitats not subject to maintenance should be available.
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XXX	MT	R	M1, M2, M3, M4, M7	√	MT	L	Establishment of maintenance access corridor following Arterial Drainage Maintenance Activities 2016-2021 through alluvial woodland has major negative impacts on alluvial woodland and freshwater pearl mussel through removal of shading.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XXX	MT	L	M1, M2, M3, M4, M7	√	MT	L	Established woodland habitat along riparian zone at risk of removal when following Arterial Drainage Maintenance Activities 2016-2021.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Transfer of machinery to and from localised sites has potential to spread invasive species, despite limited maintenance activity in the catchment.
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	River Bandon at Dunmanway is not a salmonid river.
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	River Bandon at Dunmanway does not have connectivity to shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	X	P	L	M1, M2, M3, M4, M6, M7	√	P	L	Maintenance activity in the catchment is to maintain Flood Relief Schemes and not to maintain land drainage function. Therefore no impact upon sequestered greenhouse gases, however removal of mature woodland or drainage of wet soils around watercourse through maintenance activities could have localised release of stored carbon.
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	L	M1, M2, M3, M4, M7	√	MT	L	Potential for flood relief scheme embankments to be maintained in a manner which enhances public recreation and safety.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√√	MT	L	M3, M5, M6, M7	√√	MT	L	Small benefitting area however maintenance will continue to protect properties at risk of flooding.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√	MT	L	M3, M5, M6, M7	√	MT	L	Small benefitting area however maintenance will continue to protect local roads from flooding, maintaining access for communities.
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	0	-	-	M1, M2, M3, M4, M6, M7	0	-	-	No agricultural land is protected by flood relief schemes in the catchment and so no impact on soil quality.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	0	-	-	M1, M2, M3, M4, M5, M6, M7	0	-	-	No agricultural land is protected by flood relief schemes in the catchment and so no impact on agricultural productivity.
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through maintenance works although unlikely.

Catchment: Boyne
Schemes: Boyne

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	√	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales. There are some EREP projects present in the catchment.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√	LT	R	The catchment received a poor ecological status in the water quality assessment 2010-2012.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	MT	R	M1, M2, M3, M4, M7	√	LT	R	Major negative impacts possible due to salmonid protected watercourses. There catchment contains nutrient sensitive areas, recreational waters, drinking water, and water dependent habitats. and it received a status of poor ecological status in 2010-2012 assessment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XXX	LT	R	M1, M2, M3, M4, M7	√	LT	R	There are NHA, SAC, and SPAs present . The catchment contains salmonid protected watercourses. There are protected species such as king fisher, otters, crayfish, bats. badger, and pine marten.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XXX	LT	R	M1, M2, M3, M4, M7	√	LT	R	A high portion of the catcment is agriculture (50%) and peatland (15%).
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	X	LT	R	M1, M2, M3, M4, M7	√	LT	R	
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	X	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Catchment has a woodland/forest land cover of 15%, however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	An invasive species management plan would help minimise the potetial spread.
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	XXX	MT to LT	L/R	M1, M2, M3, M4, M7	√	LT	R	The Boyne catchment has salmonid protected watercourses. EREP projects generally provide localised fisheries improvements. Activities on other parts of catchment have potential for negative impacts.
		C2	Ensure no adverse effects on commercial shellfisheries.	0	LT	L	M1, M2, M3, M4, M7	0	LT	R	Boyne catchment does not contain shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	X	T	R	M1, M2, M3, M4, M7	√	ST	R	There are recreational waters and water dependant habitats in the catchment. Regional impacts due to high profile fisheries in the Boyne Catchment.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√√	MT	R	Large benefitting area with numerous rural communities within the Boyne catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√√	LT	R	Large benefitting area with numerous rural communities within the catchment.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Colligan-Mahon
Schemes: Brickey

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	There are no EREP activities in the catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	VVV	LT	R	The ecological status of the surface water was found to be good, as was the groundwater status.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	MT	R	M1, M2, M3, M4, M7	V	LT	R	Major negative impacts possible due to Freshwater Pearl Mussel present in catchment, therefore FPM sensitive area. The catchment contains recreational waters and drinking waters. There are also shellfish areas present in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are NHA, SAC, and SPAs present . The catchment contains shellfish protected areas and Fresh Water Pearl Mussel. There are protected species such as king fisher, otters, bats, badger, and pine marten.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	A high portion of the catcment is agriculture (60%) and woodland/forest/shrub (20%).
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hvdromorphological conditions.	X	LT	R	M1, M2, M3, M4, M7	V	LT	R	
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	X	LT	R	M1, M2, M3, M4, M7	VV	LT	R	Catchment has a woodland/forest land cover of 20%, however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	XXX	MT to LT	L/R	M1, M2, M3, M4, M7	V	LT	R	The Colligan-Mahon catchment has shellfish protected areas and Fresh Water Pearl Mussel sensitive areas. Activities on other parts of catchment have potential for negative impacts.
		C2	Ensure no adverse effects on commercial shellfisheries.	XXX	LT	L	M1, M2, M3, M4, M7	V	LT	R	The Colligan-Mahon catchment does contain shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	X	T	R	M1, M2, M3, M4, M7	V	ST	R	There are assigned recreational waters within the catchment.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	VV	MT	L	M3, M5, M6, M7	VVV	MT	R	Benefitting area within the Colligan-Mahon catchment only covers one sub-catchment within the full catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	V	MT	R	M3, M5, M6, M7	VVV	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VVV	LT	R	Large benefitting area with numerous rural communities within the catchment.
	Support agricultural activity without conflicting with environmental	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	L	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	V	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Corrib
Schemes: Corrib

Objectives				Impact of Maintenance Activity			Recommended	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent	Mitigation Measures	Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	0	MT	L	M1, M2, M3, M4, M7	√	LT	R	Multiple EREPs in Catchment. EREP will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√√√	LT	R	
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	MT	R	M1, M2, M3, M4, M7	√√	LT	R	Major negative impacts possible due to freshwater pearl mussel populations present in varioius locations in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XXX	LT	R	M1, M2, M3, M4, M7	√	LT	R	Multiple Natura 2000 sites within the catchment, which also overlap with arterial drainage channels.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XXX	LT	R	M1, M2, M3, M4, M7	√	LT	R	Freshwater Pearl Mussel present in some rivers. Blanket Bog NHA and pNHA tend to be upstream of Moy scheme channels. A number of lake, raised bog, river valley and turlough pNHAs intersect Moy scheme channels.
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	High proportion of catchment is covered by peatland (10% of catchment area) and waterbody (30%).
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Catchment has low woodland/forest land cover (5%), however significant length of linear riparian woodland is present, possibly not included in the CORINE land-cover data.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	XXX	MT to LT	L/R	M1, M2, M3, M4, M7	√	LT	R	Corrib catchment has salmonid rivers. EREP projects generally provide localised fisheries improvements. Activities on other parts of catchment have potential for negative impacts.
		C2	Ensure no adverse effects on commercial shellfisheries.	XXX	LT	L	M1, M2, M3, M4, M7	√√√	LT	R	Corrib catchment contains shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	√	ST	R	Regional impacts due to high profile fisheries in the Corrib Catchment.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√√	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√√	LT	R	Large benefitting area covering significant agricultural land within the catchment.
	Support agricultural activity without conflicting with environmental objectives	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	Large benefitting area covering significant agricultural land within the catchment.
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Dunmanus-Bantry-Kenmare
Schemes: Ouvane

Objectives			Imapct of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments	
			Significance	Duration	Extent		Significance	Duration	Extent		
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme	X	MT	L	M1, M2, M3, M4, M7	v	LT	R	There are no EREP activities in the catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	vvv	LT	R	The ecological status of the surface water was found to be good, as was the groundwater status.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	MT	R	M1, M2, M3, M4, M7	v	LT	R	Major negative impacts possible due to Freshwater Pearl Mussel present in catchment, therefore FPM sensitive area. The catchment contains drinking waters and water dependant habitats. There are also shellfish areas present in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XXX	LT	R	M1, M2, M3, M4, M7	v	LT	R	There are NHA, SAC, and SPAs present . The catchment contains shellfish protected areas and Fresh Water Pearl Mussel. There are protected species such as king fisher, otters, bats, badger, natterjack toad, common newt, and pine marten.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XXX	LT	R	M1, M2, M3, M4, M7	v	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XXX	LT	R	M1, M2, M3, M4, M7	v	LT	R	Catchment has a peatland cover of 60%.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	X	LT	R	M1, M2, M3, M4, M7	vv	LT	R	
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	vvv	LT	R	The Dunmanus-Bantry-Kenmare catchment does not contain salmonid protected watercourses.
		C2	Ensure no adverse effects on commercial shellfisheries.	XXX	LT	L	M1, M2, M3, M4, M7	v	LT	R	The Dunmanus-Bantry-Kenmare catchment does contain shellfish protected areas.Activities on other parts of catchment have potential for negative impacts.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	vv	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	vv	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	vv	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to	????	MT to LT	R	M5, M6	vv	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	X	T	R	M1, M2, M3, M4, M7	v	ST	R	There are assigned recreational waters within the catchment.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	v	MT	R	M3, M5, M6, M7	vv	MT	R	Large benefitting area with numerous rural communities within the Dunmanus-Bantry-Kenmare catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	vv	MT	R	M3, M5, M6, M7	vvv	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	vv	LT	R	Small area of benefitting areas with numerous rural communities within the catchment.The benefitting lands are located within agricultural land cover.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	vv	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	v	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Erne
Schemes: Abbey, Duff, and Kilcoo

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance A			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales. There are some EREP projects present in the catchment, however, only in the Duff Scheme.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	V	LT	R	The ecological status of the surface water was found to be poor, while the groundwater status was found to be good
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	MT	R	M1, M2, M3, M4, M7	V	LT	R	Major negative impacts possible due to Freshwater Pearl Mussel present in catchment, therefore FPM sensitive area. The catchment contains drinking waters and water dependant habitats.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are NHA, SAC, and SPAs present . The catchment contains Fresh Water Pearl Mussel. There are protected species such as king fisher, otters,crayfish, bats, badger, common newt, and pine marten.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	Catchment has an agricultural cover of 60%.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	X	LT	R	M1, M2, M3, M4, M7	VV	LT	R	
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	The catchment does not contain designated protected salmonid waters.
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	The catchment does not contain protected shellfish areas.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	X	T	R	M1, M2, M3, M4, M7	V	ST	R	There are assigned recreational waters within the catchment.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	L	M3, M5, M6, M7	VVV	MT	L	Large benefitting areas located on agricultural land with numerous rural communities within the catchment, however only covers part of catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	VV	MT	L	M3, M5, M6, M7	VVV	MT	L	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VVV	LT	L	Large benefitting areas located on agricultural land with potential to increase soil quality and function of productivity.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	L	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	V	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Foyle
Schemes: Donegal

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	There are no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives	XX	MT	R	M1, M2, M3, M4, M7	V	LT	R	The ecological status of the surface water was found to be poor, while the groundwater status was found to be good
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	MT	R	M1, M2, M3, M4, M7	V	LT	R	Major negative impacts due to Freshwater Pearl Mussel present in catchment, therefore FPM sensitive areas. There are also salmonid protected watercourses in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are NHA, SAC, and SPAs present . The catchment contains FPM (FPM sensitive areas) and salmonid protected watercourses. There are protected species such as king fisher, otters, bats, badger, common newt, and pine marten.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	Catchment has an agricultural cover of 50%, peatland cover of 25% and woodland cover of 20%..
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	X	LT	R	M1, M2, M3, M4, M7	VV	LT	R	
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	XXX	MT to LT	L/R	M1, M2, M3, M4, M7	V	LT	R	The catchment contains designated protected salmonid waters.
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	The catchment does not contain protected shellfish areas.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	X	T	R	M1, M2, M3, M4, M7	V	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	L	M3, M5, M6, M7	VVV	MT	L	Local benefitting areas located on agricultural land with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	VV	MT	L	M3, M5, M6, M7	VVV	MT	L	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VVV	LT	R	Local benefitting areas located on agricultural land with potential to increase soil quality and function of productivity.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	L	M1, M2, M3, M4, M5, M6, M7	????	MT	L	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	V	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Galway Bay South East
Schemes: Gort and Lackan

n.b. maintenance of the many Drainage Districts within the catchment is not included in this assessment

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	0	-	0	M1, M2, M3, M4, M7	√	LT	L	No EREP schemes within the catchment. Limited for potential environmental enhancement as OPW maintenance activities only apply to Gort Flood Relief Scheme, however minor potential for enhancement could be possible.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√	LT	L	Minor negative impacts. Due to local scale of OPW maintenance activity within the catchment.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	X	MT	R	M1, M2, M3, M4, M7	√	LT	L	Minor negative impacts. Due to local scale of OPW maintenance activity within the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	0	-	R	M1, M2, M3, M4, M7	0	-	-	Nature of the Gort and Lackan Flood Relief Schemes are to protect local properties and as these do not have impacts upon local hydrology and karst hydrogeology , maintaining these should have minimal impact on nearby Natura 2000 sites.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	X	ST	R	M1, M2, M3, M4, M7	√	ST	L	Impact on NHA and pNHAs is similar to Natura 2000 sites. Potential for minor negative impacts off maintenance on mammal species which may burrow in embankments. Impact is minor, local and short term as length of embankments for maintenance is limited and so surrounding alternative habitats not subject to maintenance should be available.
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	X	MT	R	M1, M2, M3, M4, M7	√	MT	L	Localised extent of maintenance activity by OPW to protect local property will only have localised impacts.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	X	MT	R	M1, M2, M3, M4, M7	√	MT	L	Localised extent of maintenance activity by OPW to protect local property will only have localised impacts.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Transfer of machinery to and from localised sites has potential to spread invasive species, despite limited maintenance activity in the catchment.
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	Watercourses covered by the Lackan and Gort Flood Relief Schemes do not have connectivity to Galway Bay due to significant karst hydrogeology interaction.
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	Watercourses covered by the Lackan and Gort Flood Relief Schemes do not have connectivity to Galway Bay due to significant karst hydrogeology interaction and are a significant distance to shellfish waters in the Bay.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	0	-	N	M1, M2, M3, M4, M6, M7	0	-	-	Maintenance activity in the catchment is to maintain Flood Relief Schemes and not to maintain land drainage function. Therefore no impact upon sequestered greenhouse gases.
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts. Complex groundwater interaction increases level of uncertainty.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	L	M1, M2, M3, M4, M7	√	MT	L	Potential for flood relief scheme embankments to be maintained in a manner which enhances public recreation and safety.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√	MT	L	Small benefitting area however maintenance will continue to protect properties at risk of flooding.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√	MT	R	M3, M5, M6, M7	√	MT	L	Small benefitting area however maintenance will continue to protect local roads from flooding, maintaining access for rural communities.
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	0	-	R	M1, M2, M3, M4, M6, M7	0	-	-	No agricultural land is protected by flood relief schemes in the catchment and so no impact on soil quality.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	0	-	R	M1, M2, M3, M4, M5, M6, M7	0	-	-	No agricultural land is protected by flood relief schemes in the catchment and so no impact on agricultural productivity.
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through maintenance works although unlikely.

Catchment: Laune-Maine-Dingle Bay
Schemes: Maine Scheme

Objectives				Impact of Maintenance Activity			Recommended	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent	Mitigation Measures	Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	√	MT	L	M1, M2, M3, M4, M7	√√√	LT	R	EREP projects will enhance fisheries habitat locally. Cumulative length of EREP projects near Castleisland will enhance benefit of individual works. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√√	LT	R	
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	X	MT	R	M1, M2, M3, M4, M7	√√√	LT	R	
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	Castlemaine Harbour SAC and SPA sites within the estuarine and coastal section of catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	x	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Anna More Bog NHA and Castlemaine Harbour pNHA overlap or could be impacted upon. Other raised bog NHAs in catchment notably upstream of channels. Long length of embankments are ideal habitats for mammals.
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	High proportion of catchment is covered by peatland (45% of catchment area) and waterbody (10%). Maine Arterial Drainage Scheme and Embankments only cover a small proportion of catchment.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Catchment has moderate proportion of woodland/forest land cover (10%).
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	????	MT to LT	L/R	M1, M2, M3, M4, M7	√√√	LT	R	EREP projects generally provide localised fisheries improvements. Activities on other parts of catchment have potential for negative impacts.
		C2	Ensure no adverse effects on commercial shellfisheries.	X	LT	L	M1, M2, M3, M4, M7	√√√	LT	R	Castlemaine Harbour contains shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts. Coastal embankments likely to be very sensitive to climate change.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	L	M1, M2, M3, M4, M7	√	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√√	MT	R	Small benefitting area however highly productive agricultural land so important for local economy.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√√	LT	R	
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	Large area of benefitting lands within catchment (2,353km ²).
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through distrubance or change in hydraulics in estuaries.

Catchment: Liffey Valley and Dublin Bay
Schemes: Ryewater and Hazelhatch (Shinkeen), Leixlip (Kildare)

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales. There are some EREP projects present in the catchment, however, only in the Liffey Scheme (Hartwell River).
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	V	LT	R	The ecological status of the surface water was found to be poor, yet the groundwater status was good.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	MT	R	M1, M2, M3, M4, M7	V	LT	R	There are FPM sensitive areas in the catchment, however, there are no shellfish areas, and no salmonid protected watercourses.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are NHA, SAC, and SPAs present . There are protected species such as king fisher, otters, crayfish, bats, badger, common newt and pine marten.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	X	LT	R	M1, M2, M3, M4, M7	V	LT	R	
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	X	LT	R	M1, M2, M3, M4, M7	VV	LT	R	Catchment has a woodland/forest land cover of approximately 5%, however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	The Liffey Valley and Dublin Bay catchment does not have salmonid protected watercourses.
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	The Liffey Valley and Dublin Bay catchment does not have protected shellfish areas.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	X	T	R	M1, M2, M3, M4, M7	V	ST	R	There are assigned recreational waters within the catchment.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	L	M3, M5, M6, M7	V	MT	L	There is only a small area of benefiting lands in this catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	V	MT	L	M3, M5, M6, M7	V	MT	L	Sufficient major roads are present and would not be disrupted from minor flooding.
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VV	LT	R	There is only a small area of benefiting lands in this catchment.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	L	M1, M2, M3, M4, M5, M6, M7	????	MT	L	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	V	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Lough Neagh and Lower Bann
Schemes: Monaghan Blackwater

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial <u>drainage maintenance programme</u> .	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales. There are some EREP projects in the catchment in close <u>proximity to Milltown Co. Monaghan</u> .
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of <u>water body objectives</u> .	XX	MT	R	M1, M2, M3, M4, M7	V	LT	R	The ecological status of the surface water in the catchment is poor, while the groundwater status is good. M
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	VVV	LT	R	There are no FPM sensitive areas in catchment. There are protected species such as kingfishers, otters, crayfish, badgers, bats, common newt, and pine marten found in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, <u>protected species and habitats</u> .	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are Natural Heritage Areas (NHA) but no Natura 2000 sites within the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	Peatland makes up 10% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	VVV	LT	R	Catchment has low woodland/forest land cover (10%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or <u>terrestrial species</u> .	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial <u>shellfisheries</u> .	0	-	-	M1, M2, M3, M4, M7	0	-	-	Lough Neagh and Lower Ban catchment does not contain shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage <u>maintenance activity</u>	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of <u>climate change impacts</u> .
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based <u>leisure activities</u> .	0	T	R	M1, M2, M3, M4, M7	V	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	R	M3, M5, M6, M7	VVV	MT	R	Large benefitting area with numerous rural communities within the catchment.Agriculture composes (70%) of the land cover in the catchment. Community directly benefits from arterial drainage and <u>maintenance activities</u> .
		E3	Maintain access to local services and transport networks up to the design standard of protection.	VV	MT	R	M3, M5, M6, M7	VVV	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the <u>soil resource</u> .	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VVV	LT	R	
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	VV	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Lough Swilly
Schemes: Donegal

Objectives				Impact of Maintenance Activity			Recommended	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent	Mitigation Measures	Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme	X	MT	L	M1, M2, M3, M4, M7	√	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√	LT	R	The ecological status of the surface water in the catchment is poor, while the groundwater status is good. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity within the catchment
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	√	LT	R	There are FPM sensitive areas in catchment, as well as protected salmonid watercourse, and shellfish areas.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Peatland makes up 25% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Catchment has low woodland/forest land cover (15%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	X	LT	L	M1, M2, M3, M4, M7	√√√	LT	R	Lough Swilly catchment does contain shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	√	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√√	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√√	LT	R	
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	Large benefitting area with numerous rural communities within the catchment.
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Lower Shannon (A)
Schemes: Brosna, Tullamore

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	√	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales. There are some EREP projects in the catchment .
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√√	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	MT	R	M1, M2, M3, M4, M7	√√√	LT	R	
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, lamprey, crayfish, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Peatland makes up 30% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Catchment has low woodland/forest land cover (10%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	Lower Shannon (A) catchment does not contain shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	√	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√√	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√√	LT	R	Agriculture composes (55%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Lower Shannon (C)
Schemes: Clareen, Nenagh, Woodford, Killmor, and Carrigahorig

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales. There are some EREP projects in the catchment in the Killimor, Carrigahorig, and Nenagh Schemes.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	VV	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	V	LT	R	There are Freshwater Pearl Mussel (FPM) and FPM sensitive areas in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, crayfish, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	Peatland makes up 10% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	VVV	LT	R	Catchment has low woodland/forest land cover (20%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	Lower Shannon (C) catchment does not contain shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	V	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	R	M3, M5, M6, M7	VVV	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	VV	MT	R	M3, M5, M6, M7	VVV	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VVV	LT	R	Agriculture composes (40%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	VV	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Lower Shannon (D)
Schemes: Groody, Mulkear, Ballymackeogh, Mulkear Cappamore

Objectives				Impact of Maintenance Activity			Recommended	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent	Mitigation	Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	v	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	vv	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	v	LT	R	There are Freshwater Pearl Mussel (FPM) and FPM sensitive areas in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, crayfish, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	Peatland makes up 10% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	vvv	LT	R	Catchment has low woodland/forest land cover (15%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	Lower Shannon (D) catchment does not contain shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	vv	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	vv	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	vv	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	vv	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	v	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	v	MT	R	M3, M5, M6, M7	vvv	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	vv	MT	R	M3, M5, M6, M7	vvv	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	vvv	LT	R	Agriculture composes (55%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	vv	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	vv	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Mal Bay
Schemes: Creegh and Cloghauninchy

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	√	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√√	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern	xxx	MT	R	M1, M2, M3, M4, M7	√	LT	R	There are Freshwater Pearl Mussel (FPM) and FPM sensitive areas in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Peatland makes up 20% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Catchment has low woodland/forest land cover (20%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	Mal Bay catchment does not contain shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	√	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	L	M3, M5, M6, M7	√√√	MT	L	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	L	M3, M5, M6, M7	√√√	MT	L	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	L	M1, M2, M3, M4, M6, M7	√√√	LT	L	Agriculture composes (40%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities, but only benefits part of catchment.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	L	M1, M2, M3, M4, M5, M6, M7	????	MT	L	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Moy & Killala Bay
Schemes: Moy Scheme

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	0	MT	L	M1, M2, M3, M4, M7	√	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√√	LT	R	
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	√√√	LT	R	Major negative impacts possible due to freshwater pearl mussel populations present in varioius locations in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	Multiple Natura 2000 sites within the catchment, which also overlap with arterial drainage channels.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Freshwater Pearl Mussel present in some rivers. Blanket Bog NHA and pNHA tend to be upstream of Moy scheme channels. A number of lake, raised bog, river valley and turlough pNHAs intersect Moy scheme channels.
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	High proportion of catchment is covered by peatland (20% of catchment area) and waterbody (10%).
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Catchment has low woodland/forest land cover (5%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	XX	MT to LT	L/R	M1, M2, M3, M4, M7	√√	LT	R	EREP projects generally provide localised fisheries improvements. Activities on other parts of catchment have potential for negative impacts.
		C2	Ensure no adverse effects on commercial shellfisheries.	X	LT	L	M1, M2, M3, M4, M7	√√√	LT	R	Moy & Killala Bay catchment contains shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	√	ST	R	Regional impacts due to high profile of River Moy fisheries.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√√	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√√	LT	R	
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Nanny Delvin
Schemes: Duleek (Nanny), Matt, Broadmedow and Ward

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	V	LT	R	The ecological status of the surface water in the catchment is poor, while the groundwater status is good. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	V	LT	R	There are shellfish areas in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	Peatland makes up 75% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	VVV	LT	R	Catchment has low woodland/forest land cover (2%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	X	LT	L	M1, M2, M3, M4, M7	VVV	LT	R	Nanny Delvin catchment contains shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	V	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	R	M3, M5, M6, M7	VVV	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	VV	MT	R	M3, M5, M6, M7	VVV	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VVV	LT	R	Agriculture composes (75%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	VV	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Newry, Fane, Glyde, and Dee
Schemes: Glyde and Dee

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme	X	MT	L	M1, M2, M3, M4, M7	v	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales. There are some EREP projects in the catchment in the Glyde and Dee Scheme
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	vv	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	v	LT	R	There are protected shellfish areas in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	Peatland makes up 10% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	vvv	LT	R	Catchment has low woodland/forest land cover (10%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	X	LT	L	M1, M2, M3, M4, M7	vvv	LT	R	Newry, Fane, Glyde, and Dee catchment contains protected shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	vv	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	vv	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	vv	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	vv	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	v	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	v	MT	R	M3, M5, M6, M7	vvv	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	vv	MT	R	M3, M5, M6, M7	vvv	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	vvv	LT	R	Agriculture composes (60%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	vv	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	vv	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Nore
Schemes: Kilkenny

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	V	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	V	LT	R	There are Freshwater Pearl Mussel (FPM) and FPM sensitive areas in the catchment, as well as, salmonid protected watercourse.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, crayfish, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	Peatland makes up 15% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	VVV	LT	R	Catchment has low woodland/forest land cover (10%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	XX	MT to LT	L/R	M1, M2, M3, M4, M7	VV	LT	R	There are protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	Nore catchment does not contain protected shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	V	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	R	M3, M5, M6, M7	VVV	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	VV	MT	R	M3, M5, M6, M7	VVV	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	0	-	R	M1, M2, M3, M4, M6, M7	0	-	-	No agricultural land is protected by flood relief schemes in the catchment and so no impact on soil quality.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	0	-	R	M1, M2, M3, M4, M5, M6, M7	0	-	-	No agricultural land is protected by flood relief schemes in the catchment and so no impact on agricultural productivity.
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	VV	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Owenavorrhagh
Schemes: Owenavorrhagh

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	There are no EREP activities in the catchment.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	V	LT	R	The Owenavorrhagh catchment received a poor ecological status in the water quality assessment 2010-2012.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	XXX	MT	R	M1, M2, M3, M4, M7	V	LT	R	Major negative impacts due to freshwater pearl mussel populations present in varioius locations in the catchment. There Catchment is at risk of not acieving a good ecological status and it received a status of poor ecological status in 2010-2012 assessment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are NHA, SAC, and SPAs present . The catchment contains salmonid protected watercourses and Freshwater Pearl Mussel. There are protected species such as King Fisher, Otters, Crayfish, Badger, Pine Marten, and the rare Common Newt present in catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XXX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	X	LT	R	M1, M2, M3, M4, M7	V	LT	R	The catchment is composed of primarily agriculture.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	X	LT	R	M1, M2, M3, M4, M7	VV	LT	R	Catchment has low woodland/forest land cover (5%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	XXX	MT to LT	L/R	M1, M2, M3, M4, M7	V	LT	R	Owenavorrhagh catchment has salmonid rivers.
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	The Owenavorrhagh catchment contains no desginated shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	X	T	R	M1, M2, M3, M4, M7	V	ST	R	There are recreational waters and water dependant habitats in the catchment. Regional impacts due to high profile fisheries in the Owenavorrhagh Catchment.
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	R	M3, M5, M6, M7	VVV	MT	R	Large benefitting area with numerous rural communities within the Owenavorrhagh catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	VV	MT	R	M3, M5, M6, M7	VVV	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VVV	LT	R	Large benefitting area with numerous rural communities within the catchment.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	V	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Shannon Estuary North
Schemes: Shannon Embankment North, Sixmilebridge (Owenagarney),

Objectives				Impact of Maintenance Activity			Recommended	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent	Mitigation Measures	Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme	X	MT	L	M1, M2, M3, M4, M7	√	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	√	LT	R	There are Freshwater Pearl Mussel (FPM) and FPM sensitive areas in the catchment, as well as, salmonid protected watercourse.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Peatland makes up 10% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Catchment has low woodland/forest land cover (20%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	The Shannon Estuary North catchment does not contain protected shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	√	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√√	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√√	LT	R	Agriculture composes (45%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Shannon Estuary South
Schemes: Deel, Maigue, Shannon Embankment South , Maigge outfall

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	√	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales. There are some EREP projects in the catchment in the Maigue Scheme.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√	LT	R	The ecological status of the surface water in the catchment is poor, while the groundwater status is good.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	√	LT	R	There are protected shellfish waters in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, crayfish, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Peatland makes up 2% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Catchment has low woodland/forest land cover (3%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	X	LT	L	M1, M2, M3, M4, M7	√√√	LT	R	The Shannon Estuary South catchment does contain protected shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	√	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√√	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√√	LT	R	Agriculture composes (80%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Sligo Bay and Drowse
Schemes: Bonet

Objectives				Impact of Maintenance Activity			Recommended	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent	Mitigation	Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	V	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	V	LT	R	There are protected shellfish waters, Freshwater Pearl Mussel (FPM) and FPM sensitive areas in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, crayfish, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	Peatland makes up 20% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	VVV	LT	R	Catchment has low woodland/forest land cover (15%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	X	LT	L	M1, M2, M3, M4, M7	VVV	LT	R	The Sligo Bay and Drowse catchment does contain protected shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	V	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	R	M3, M5, M6, M7	VVV	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	VV	MT	R	M3, M5, M6, M7	VVV	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VVV	LT	R	Agriculture composes (40%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	VV	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Suir
Schemes: Carrick-on-Suir

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	v	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	vv	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	v	LT	R	There are protected shellfish waters, salmonid protected watercourses, Freshwater Pearl Mussel (FPM) and FPM sensitive areas in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, crayfish, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	Peatland makes up 20% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	Catchment has low woodland/forest land cover (15%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are protected salmonid watercourses in the catchment.
		C2	Ensure no adverse effects on commercial shellfisheries.	X	LT	L	M1, M2, M3, M4, M7	v	LT	R	The Suir catchment does contain protected shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	vv	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	vv	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	vv	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	vv	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	v	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	v	MT	R	M3, M5, M6, M7	vvv	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	vv	MT	R	M3, M5, M6, M7	vvv	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	0	-	R	M1, M2, M3, M4, M6, M7	0	-	-	No agricultural land is protected by flood relief schemes in the catchment and so no impact on soil quality.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	0	-	R	M1, M2, M3, M4, M5, M6, M7	0	-	-	No agricultural land is protected by flood relief schemes in the catchment and so no impact on agricultural productivity.
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	vv	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Tralee Bay-Feale
Schemes: Feale

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial <u>drainage maintenance programme</u> .	X	MT	L	M1, M2, M3, M4, M7	v	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	vv	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern.	xxx	MT	R	M1, M2, M3, M4, M7	v	LT	R	There are protected shellfish waters, salmonid protected watercourses, Freshwater Pearl Mussel (FPM) and FPM sensitive areas in the catchment.
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and <u>local conservation importance</u> .	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and <u>hydromorphological conditions</u> .	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	Peatland makes up 20% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and <u>woodlands within the riparian corridor</u> .	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	Catchment has low woodland/forest land cover (30%), however significant length of linear riparian woodland is <u>present</u> .
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial <u>species</u> .	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained <u>catchments</u> .	C1	Maintain existing habitat supporting salmonid fisheries and <u>carry out enhancement where possible</u> .	XX	MT to LT	L/R	M1, M2, M3, M4, M7	v	LT	R	There are protected salmonid watercourses in the catchment.
		C2	Ensure no adverse effects on commercial shellfisheries.	X	LT	L	M1, M2, M3, M4, M7	v	LT	R	The Tralee Bay-Feale catchment does contain protected shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	vv	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks <u>such as peatlands and forests</u> .	XX	P	N	M1, M2, M3, M4, M6, M7	vv	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	vv	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	vv	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	v	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities <u>including local employment</u>	v	MT	R	M3, M5, M6, M7	vvv	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the <u>design standard of protection</u> .	vv	MT	R	M3, M5, M6, M7	vvv	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	vvv	LT	R	Agriculture composes (40%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with <u>environmental objectives</u> .	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	vv	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation <u>Areas (ACAs)</u> .	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National <u>Monument and Archaeological Sites</u> .	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	vv	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Upper Shannon (B)
Schemes: Boyle

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme	X	MT	L	M1, M2, M3, M4, M7	V	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	VVV	LT	R	The ecological status of the surface water in the catchment is good as well as the groundwater status.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern	xxx	MT	R	M1, M2, M3, M4, M7	VVV	LT	R	
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, otters, lamprey, crayfish, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	VV	LT	R	Peatland makes up 30% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	VVV	LT	R	Catchment has low woodland/forest land cover (10%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	V	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	Upper Shannon (B) catchment does not contain shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	VV	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	VV	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	VV	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	VV	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	V	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	V	MT	R	M3, M5, M6, M7	VVV	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	VV	MT	R	M3, M5, M6, M7	VVV	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	VVV	LT	R	Agriculture composes (40%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	VV	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	VV	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	VV	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Upper Shannon (E)
Schemes: Ballyglass (Knockcrohery)

Objectives				Impact of Maintenance Activity			Recommended Mitigation	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme	X	MT	L	M1, M2, M3, M4, M7	v	LT	R	The area no EREP activities in this catchment. Recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales.
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	v	LT	R	The ecological status of the surface water in the catchment is poor, while the groundwater status is good. Many waterbodies in the catchment are identified as nutrient sensitive areas due to the high percentage of agricultural activity
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern	xxx	MT	R	M1, M2, M3, M4, M7	vvv	LT	R	
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, crayfish,otters, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	vv	LT	R	Peatland makes up 5% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	vvv	LT	R	Catchment has low woodland/forest land cover (10%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	v	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment.
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	The Upper Shannon (E) catchment does not contain protected shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	vv	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	vv	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	vv	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	vv	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	v	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	v	MT	R	M3, M5, M6, M7	vvv	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	vv	MT	R	M3, M5, M6, M7	vvv	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	vvv	LT	R	Agriculture composes (30%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	vv	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	vv	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	vv	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

Catchment: Upper Shannon (F)
Schemes: Inny

Objectives				Impact of Maintenance Activity			Recommended Mitigation Measures	Residual Impact of Maintenance Activity			Catchment Specific Comments
				Significance	Duration	Extent		Significance	Duration	Extent	
Environmental (Water)	Support the objectives of the Water Framework Directive (WFD).	A1	Enhance natural fluvial processes in support of WFD objectives, through delivery of new, and maintenance of existing, EREP and other river restoration works that are part of the arterial drainage maintenance programme.	X	MT	L	M1, M2, M3, M4, M7	√	LT	R	EREP projects will enhance fisheries habitat locally, however recommended mitigation measures have the potential for significant environmental improvement at broader spatial and longer temporal scales. There are some EREP projects in the catchment within the Inny Scheme
		A2	Provide no impediment to the achievement of water body objectives and contribute to the achievement of water body objectives.	XX	MT	R	M1, M2, M3, M4, M7	√	LT	R	The ecological status of the surface water in the catchment is poor, while the groundwater status is good.
		A3	Ensure water quality remains adequate to support a healthy aquatic biological community and that it meets environmental standards established for general physiochemical conditions and specific pollutants of concern	xxx	MT	R	M1, M2, M3, M4, M7	√√√	LT	R	
Environmental (Flora, Fauna & Biodiversity)	Protect the flora and fauna within the river, river corridor and along vehicular access points and where possible enhance biodiversity.	B1	Support the objectives of the EU Habitats and Birds Directives by avoiding detrimental effects to, and where possible enhance, Natura 2000 network, protected species and habitats.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	There are Natural Heritage Areas (NHA) and Natura 2000 sites within the catchment. There are protected species such as kingfishers, crayfish, otters, badgers, bats, common newt, and pine marten found in the catchment.
		B2	Avoid damage to, and where possible enhance, legally protected sites/habitats and species of national, regional and local conservation importance.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	
		B3	Protect existing riverine, wetland and peatland habitats to maintain naturally functioning ecosystems and hydromorphological conditions.	XX	LT	R	M1, M2, M3, M4, M7	√√	LT	R	Peatland makes up 20% of the land cover in the area.
		B4	Protect, and where possible enhance, hedgerows and woodlands within the riparian corridor.	XX	LT	R	M1, M2, M3, M4, M7	√√√	LT	R	Catchment has low woodland/forest land cover (5%), however significant length of linear riparian woodland is present.
		B5	Minimise the risk of spread of any invasive aquatic or terrestrial species.	XX	LT	R	M1, M2, M3, M4, M7	√	LT	R	
Environmental (Fisheries)	Protect and, where possible, enhance the integrity of fisheries within the Arterially Drained catchments.	C1	Maintain existing habitat supporting salmonid fisheries and carry out enhancement where possible.	0	-	-	M1, M2, M3, M4, M7	0	-	-	There are no protected salmonid watercourses in the catchment.
		C2	Ensure no adverse effects on commercial shellfisheries.	0	-	-	M1, M2, M3, M4, M7	0	-	-	The Upper Shannon (F) catchment does not contain protected shellfish waters.
Environmental (Climate Change)	Minimise the climate change impacts of Arterial Drainage maintenance activities	D1	Reduce greenhouse gas emissions from machinery and equipment used in Arterial Drainage maintenance activity	XX	P	N	M1, M2, M3, M7	√√	P	N	
		D2	Minimise release of sequestered greenhouse gases from sinks such as peatlands and forests.	XX	P	N	M1, M2, M3, M4, M6, M7	√√	P	N	
	Adaptation to climate change	D3	Performance of arterial drainage scheme channels, embankments and flood relief schemes over time.	????	MT to LT	R	M5, M6	√√	MT to LT	R	Uncertainty in adaptation to climate change will reduce over time with further climate change assessments and with monitoring of climate change impacts.
		D4	Adaptive capacity of ongoing maintenance activities to current and potential future demands.	????	MT to LT	R	M5, M6	√√	MT to LT	R	
Social	Public access and recreation	E1	Avoid negative impacts to existing water-based leisure activities.	0	T	R	M1, M2, M3, M4, M7	√	ST	R	
	Contribute to viable and sustainable local communities	E2	Contribution to health and wellbeing of local communities including local employment	√	MT	R	M3, M5, M6, M7	√√√	MT	R	Large benefitting area with numerous rural communities within the catchment.
		E3	Maintain access to local services and transport networks up to the design standard of protection.	√√	MT	R	M3, M5, M6, M7	√√√	MT	R	
Economic	Avoid damage to, and where possible improve, the function and quality of the soil resource.	F1	Maintain soil quality and function for productivity on agricultural lands.	X	LT	R	M1, M2, M3, M4, M6, M7	√√√	LT	R	Agriculture composes (60%) of the land cover in the catchment. Community directly benefits from arterial drainage and maintenance activities.
	Support agricultural activity without conflicting with environmental objectives.	F2	Maintain lands available for economic activity and no change as to render existing economic activity unviable.	√√	MT	R	M1, M2, M3, M4, M5, M6, M7	????	MT	R	
Cultural Heritage	Protect known features of cultural heritage.	G1	Protect architectural buildings and structures listed on the Record of Protected Structures (RPS) and designated areas of architectural importance such as Architectural Conservation Areas (ACAs).	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
		G2	Protect archaeological features listed on the Record of Monuments and Places (RMP) or other listed National Monument and Archaeological Sites.	X	P	R	M1, M2, M3, M5, M6, M7	√√	P	R	
	Protection of unknown features of cultural heritage	G3	Protect undiscovered archaeological features.	????	P	N	M1, M2, M3, M5, M6, M7	√√	P	N	Unknown archaeological heritage could be exposed through drainage of peatlands and wetlands.

E Arterial Drainage Scheme, Embankment and Flood Relief Scheme Catchment Maps

Catchment: Donagh-Moville



0 2,300 4,600 6,900 9,200 11,500 km

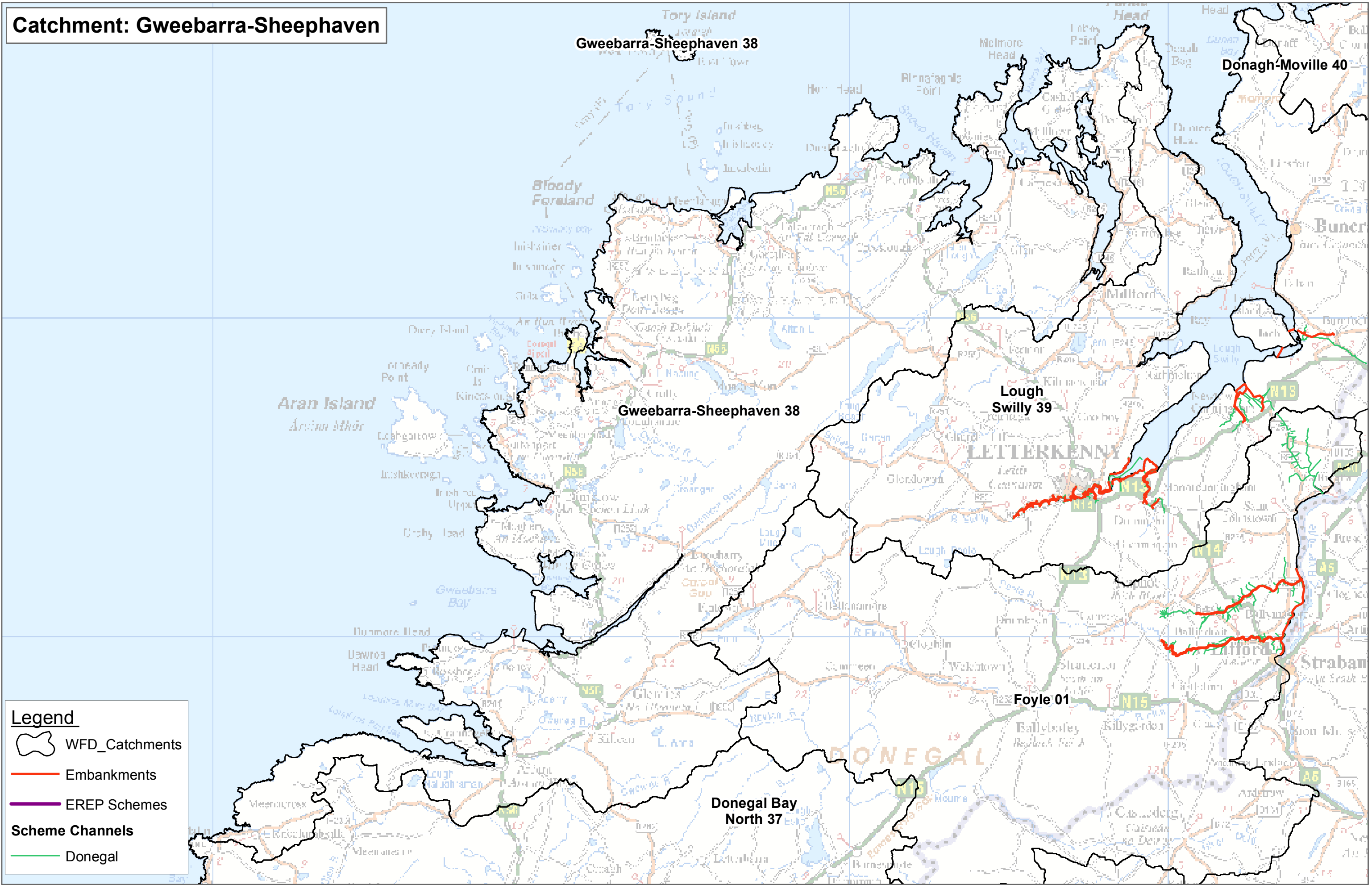
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Catchment: Lough Swilly



Catchment: Gweebarra-Sheephaven



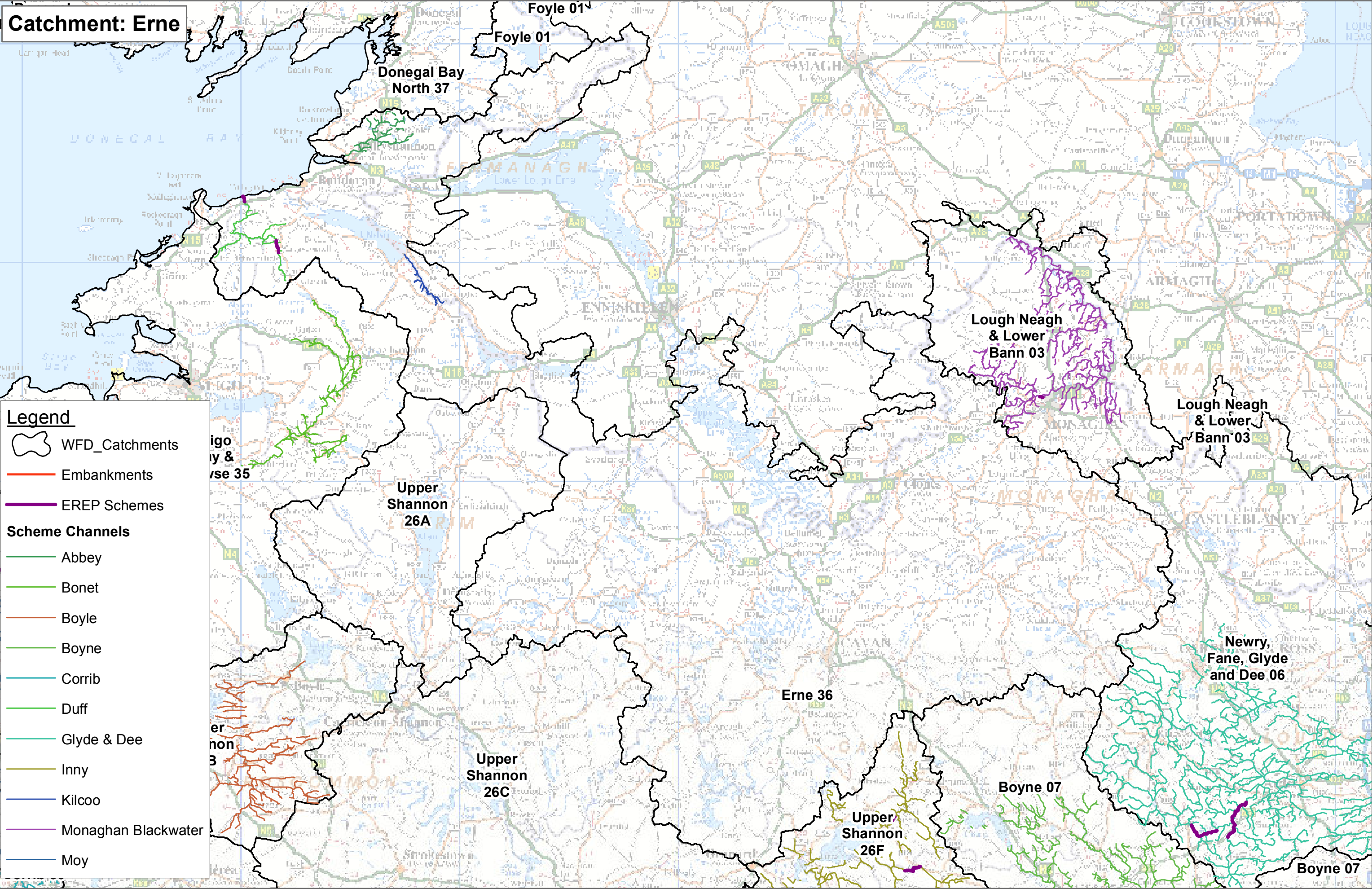
Catchment: Donegal Bay North



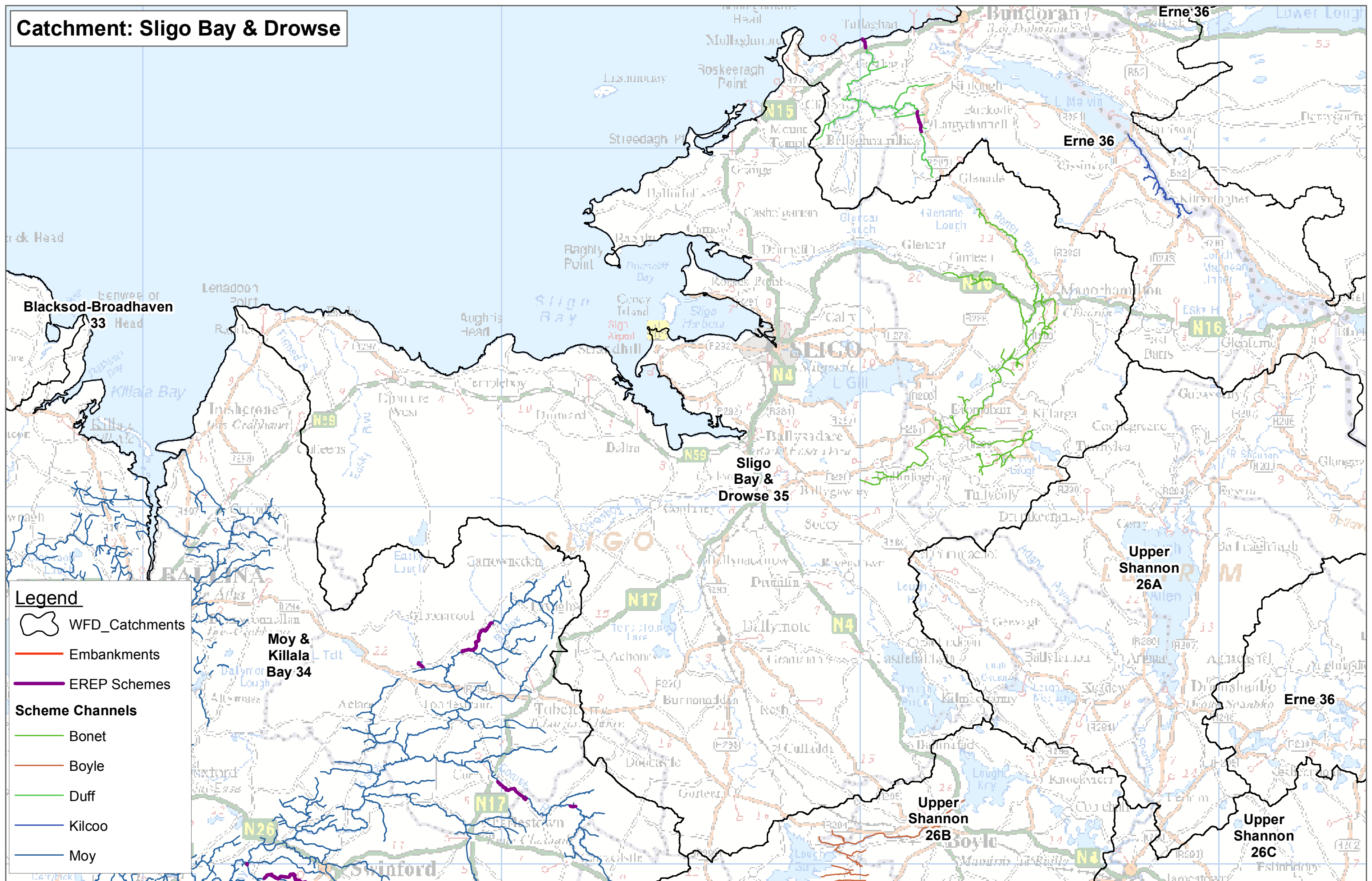
Catchment: Erne

Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Abbey
 - Bonet
 - Boyle
 - Boyne
 - Corrib
 - Duff
 - Glyde & Dee
 - Inny
 - Kilcoo
 - Monaghan Blackwater
 - Moy



Catchment: Sligo Bay & Drowse



0 3,400 6,800 10,200 13,600 17,000 km

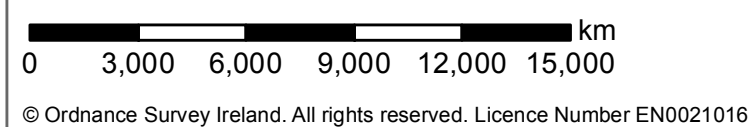
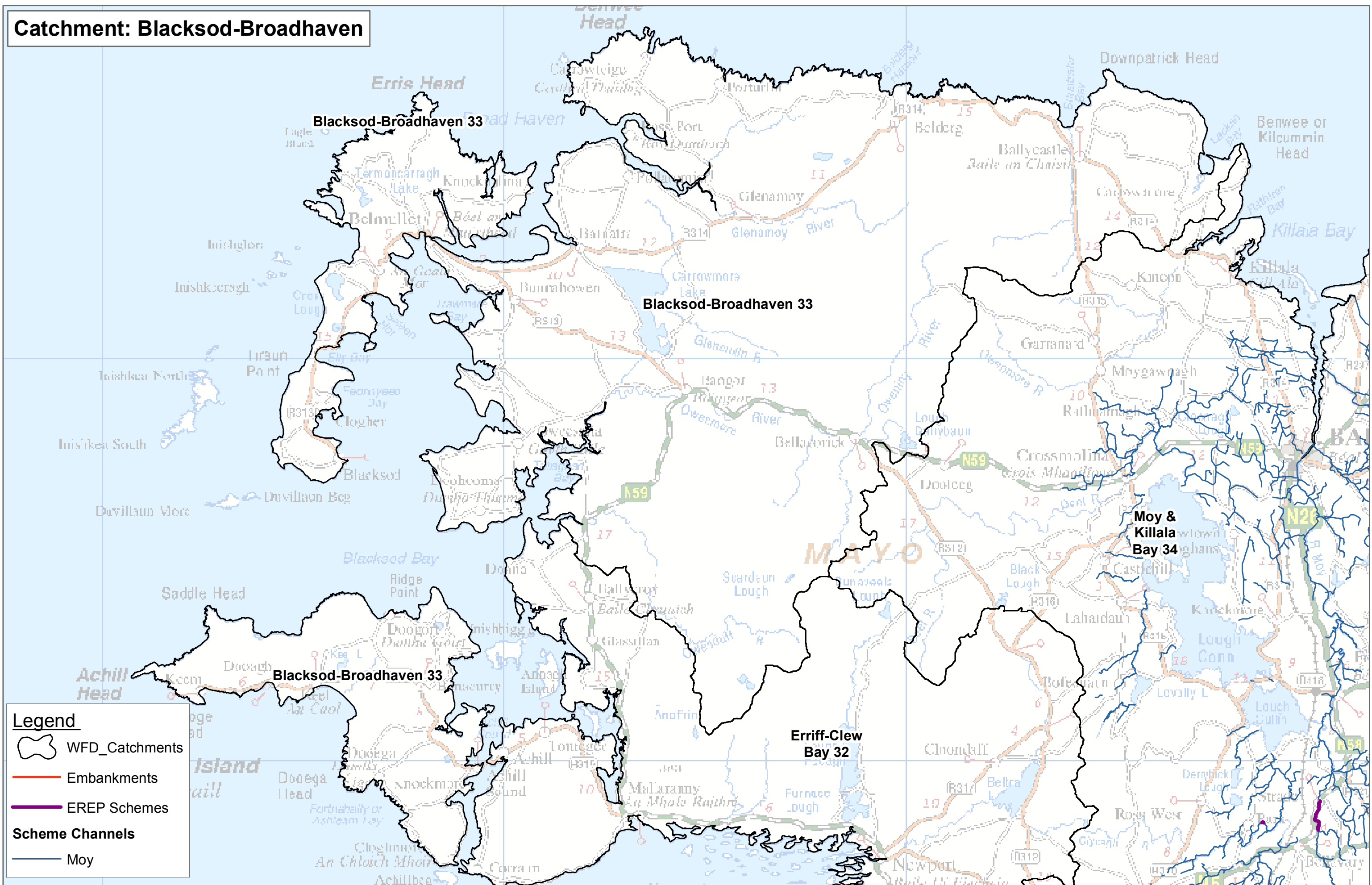


Catchment: Moy & Killala Bay

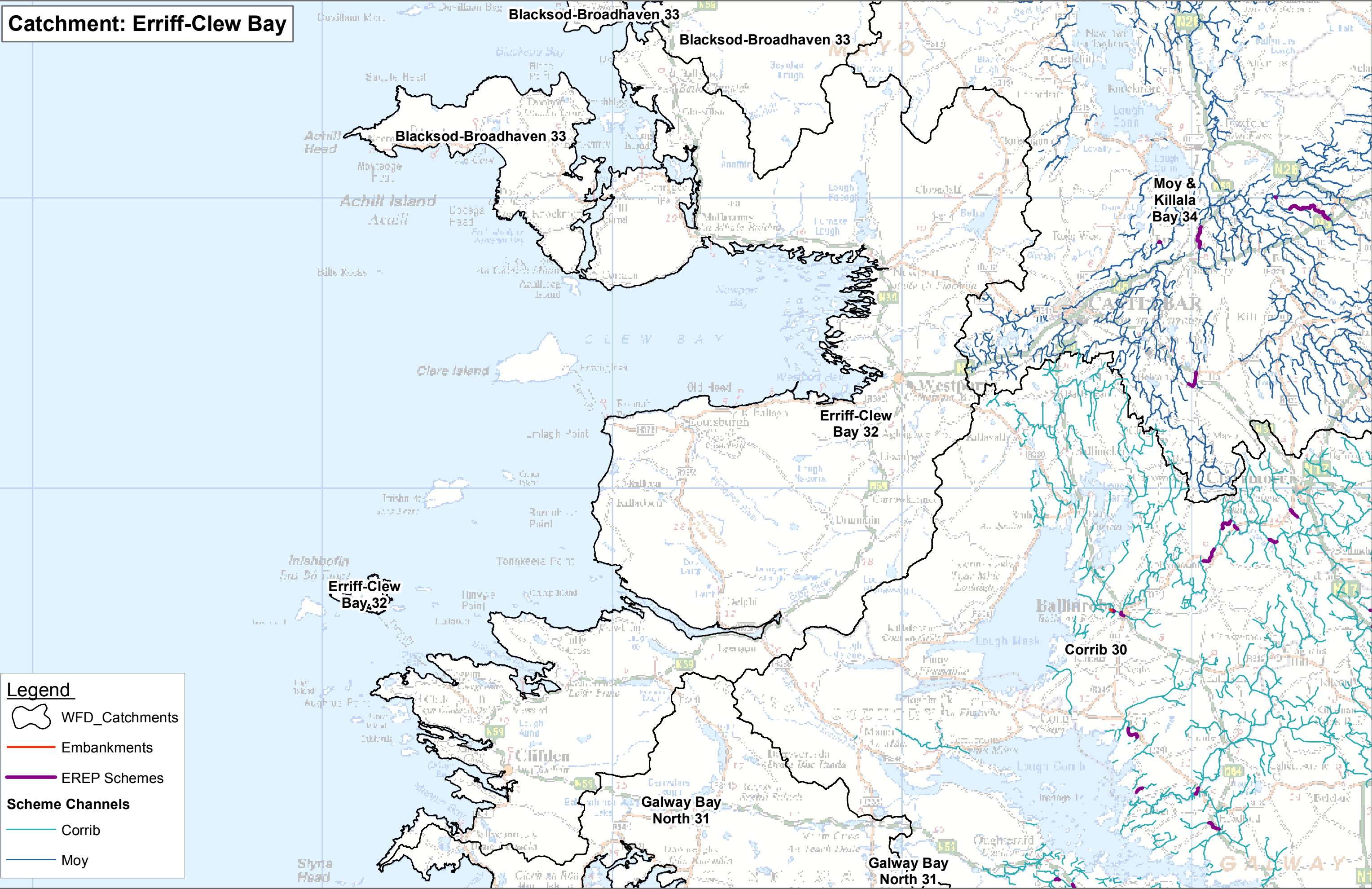
Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Bonet
 - Boyle
 - Corrib
 - Moy

Catchment: Blacksod-Broadhaven



Catchment: Erriff-Clew Bay



Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
- Corrib
- Moy

0 4,250 8,500 12,750 17,000 21,250 km

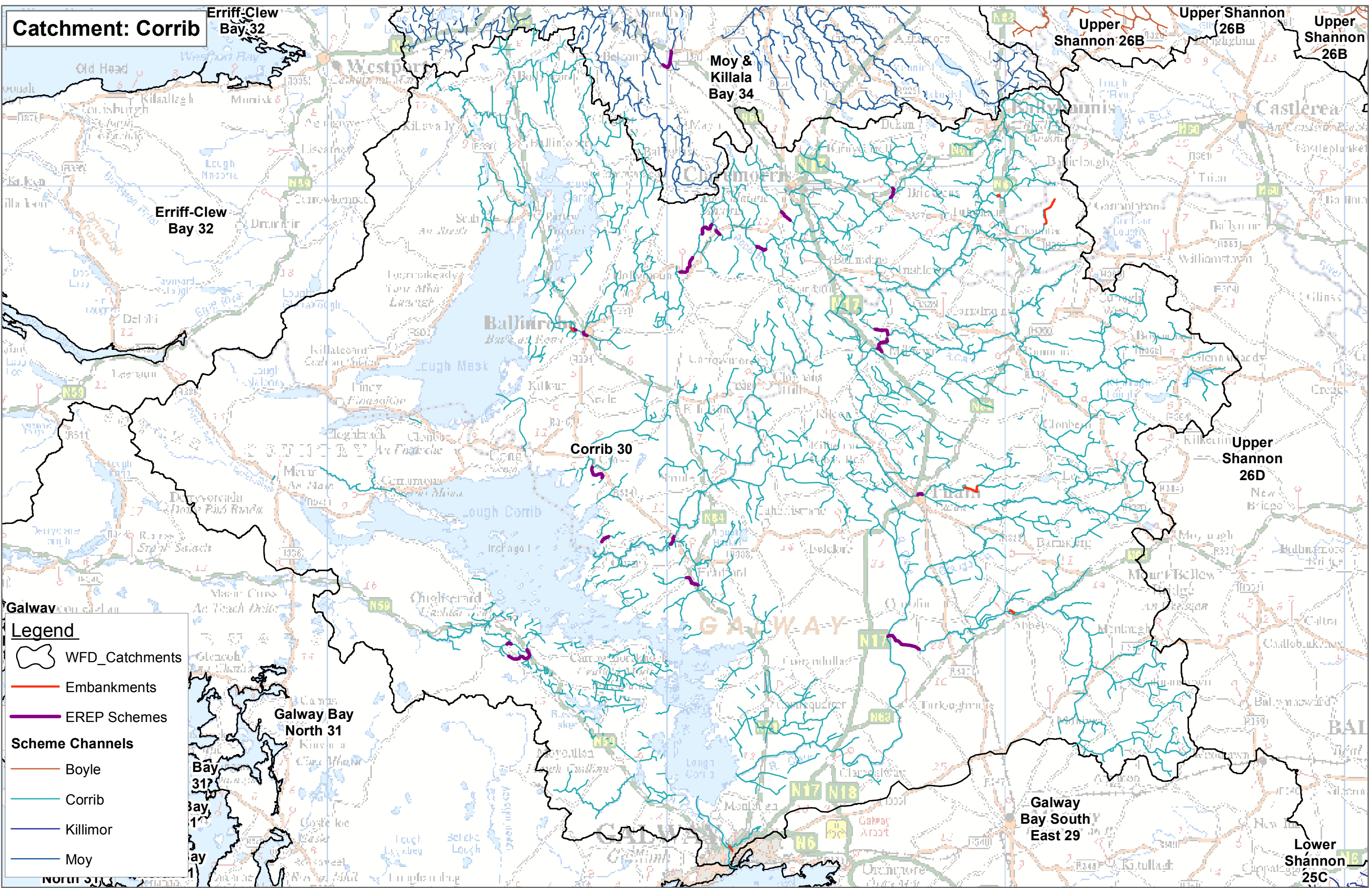


Catchment: Galway Bay North



0 3,400 6,800 10,200 13,600 17,000 km





Galway

Legend

- WFD_Catchments
- Embankments
- EREP Schemes

Scheme Channels

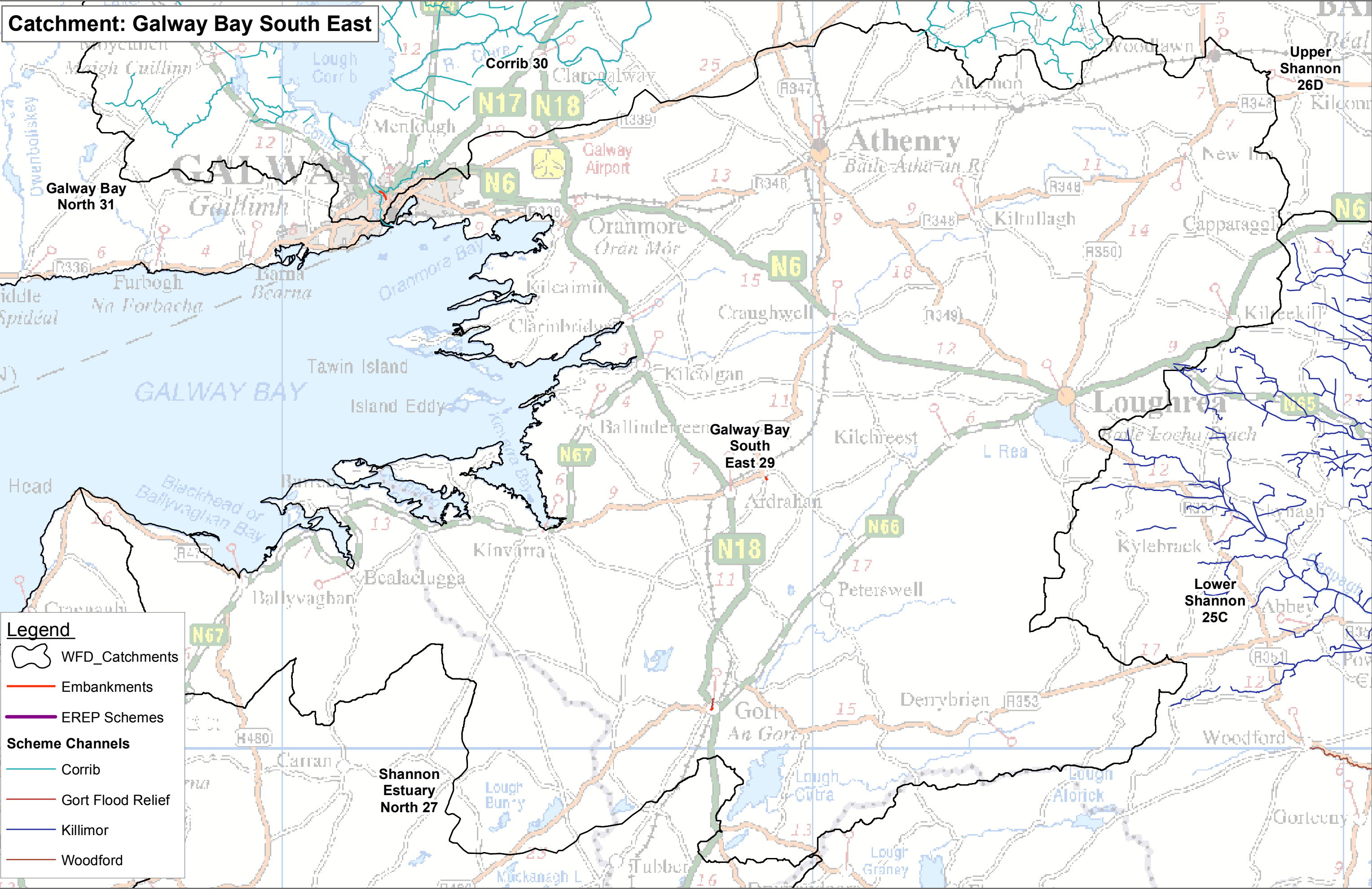
- Boyle
- Corrib
- Killimor
- Moy



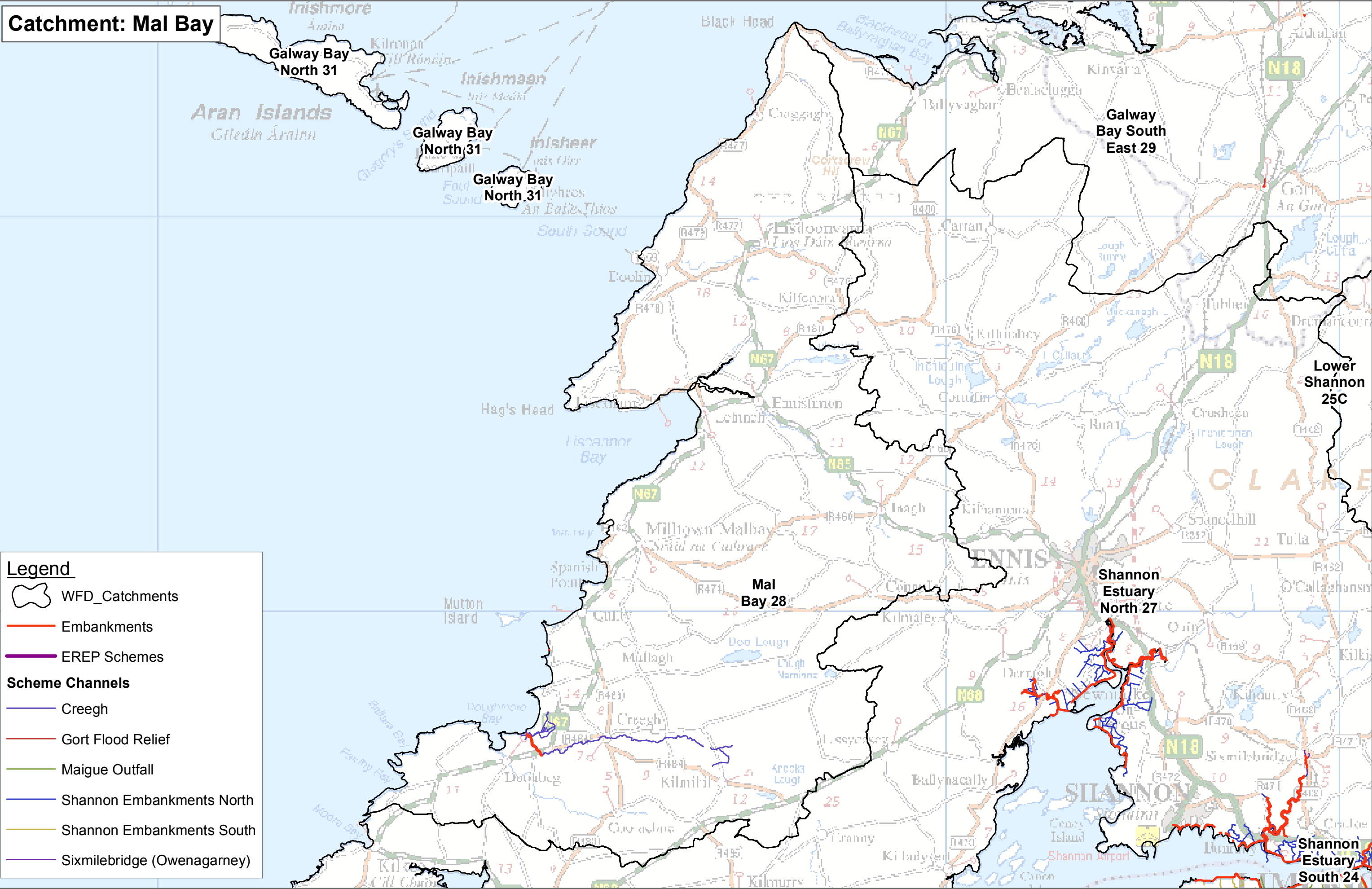
Catchment: Galway Bay South East

Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Corrib
 - Gort Flood Relief
 - Killimor
 - Woodford



Catchment: Mal Bay



Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Creegh
 - Gort Flood Relief
 - Maigue Outfall
 - Shannon Embankments North
 - Shannon Embankments South
 - Sixmilebridge (Owenagarney)

Catchment: Shannon Estuary North

way
ay

North 31 North 31

Galway Bay
North 31

Galway
Bay South
East 29

Lower
Shannon
25C

Lower
Shannon
25C

Shannon
Estuary
North 27

Mal
Bay 28

Lower
Shannon
25D

Shannon
Estuary
South 24

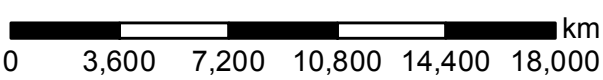
Shannon
Estuary
North 27

Tralee
Bay-Feale 23

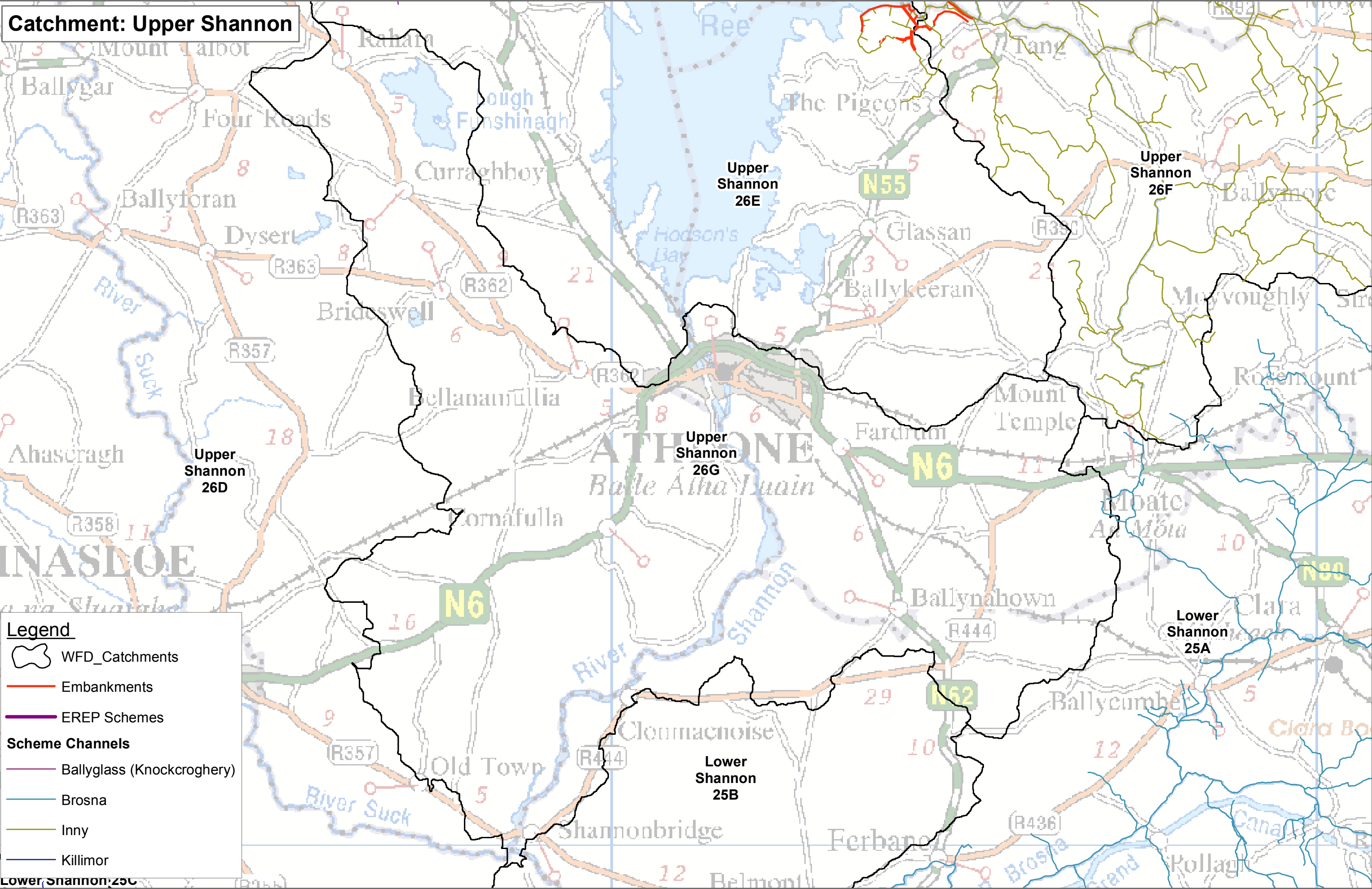
Tralee
Bay-Feale 23

Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels
 - Creegh
 - Deel
 - Feale
 - Gort Flood Relief
 - Groody
 - Killimor
 - Maigue
 - Maigue Outfall
 - Mulkear Ballymackeogh
 - Shannon Embankments North
 - Shannon Embankments South
 - Sixmilebridge (Owenagarney)



Catchment: Upper Shannon

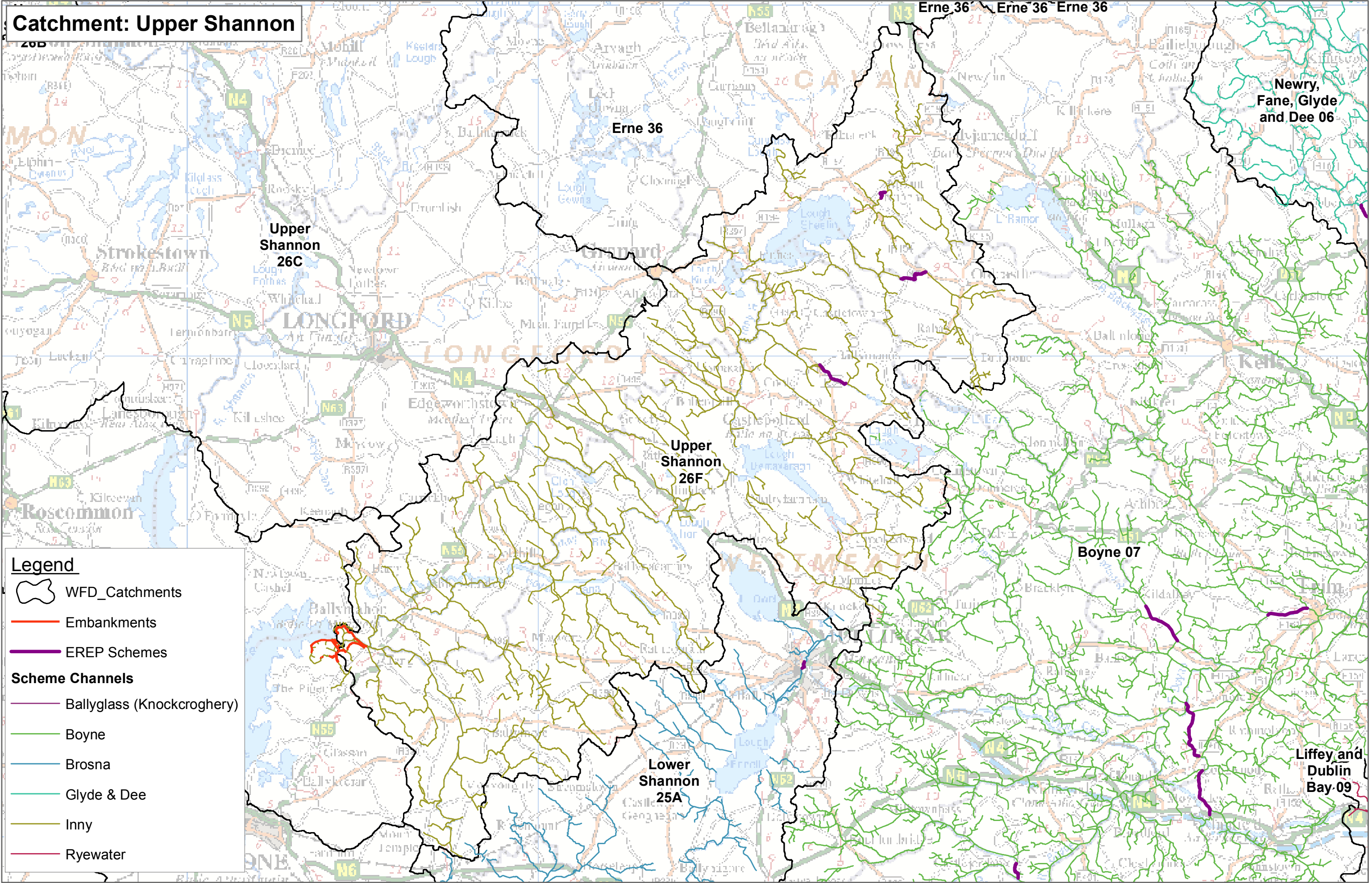


Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Ballyglass (Knockcroghery)
 - Brosna
 - Inny
 - Killimor

0 1,750 3,500 5,250 7,000 8,750 km

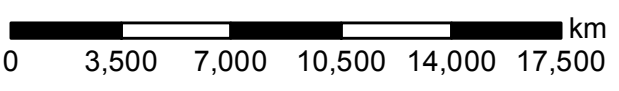




Catchment: Upper Shannon

Legend

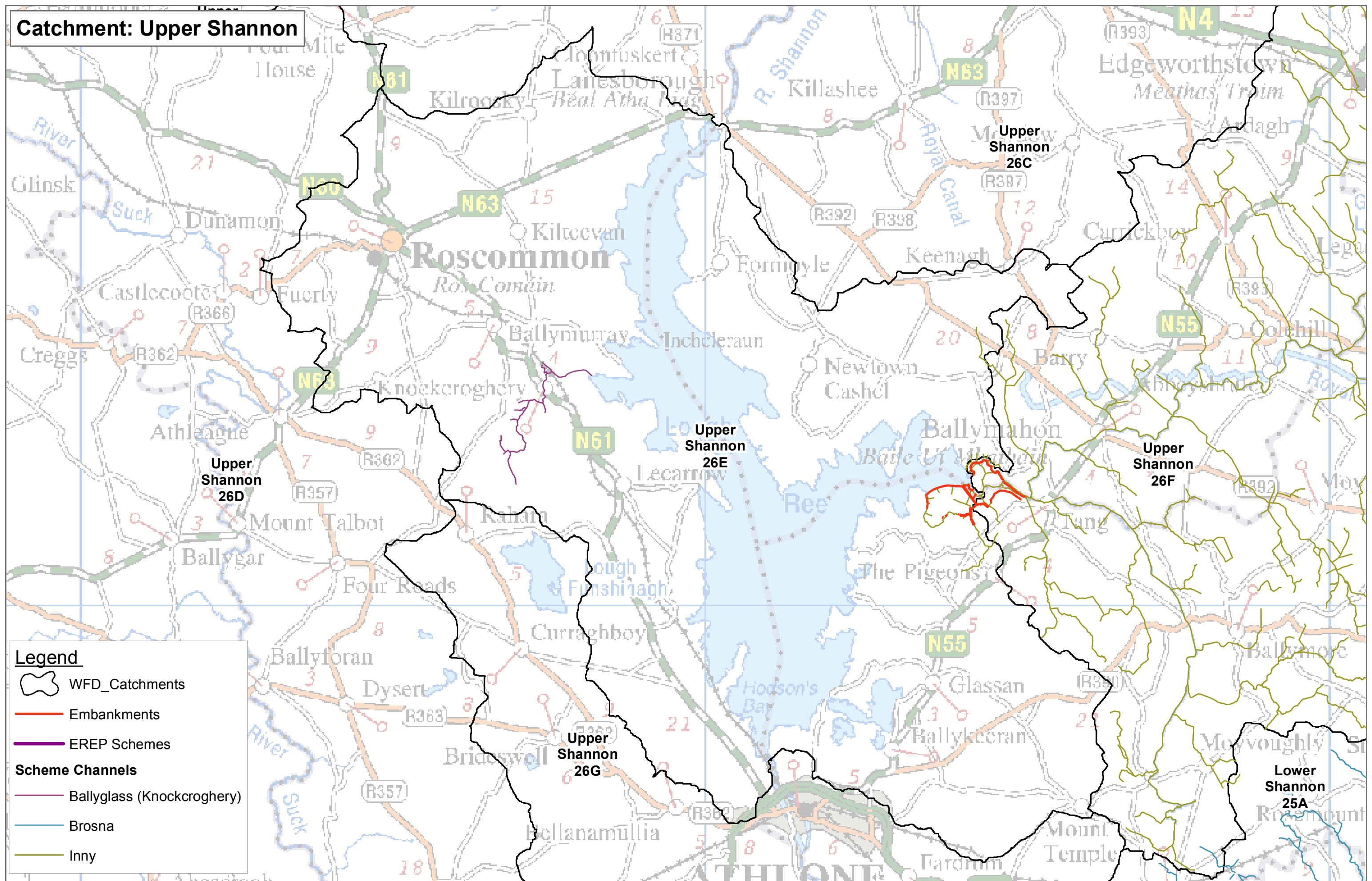
- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Ballyglass (Knockcroghery)
 - Boyne
 - Brosna
 - Glyde & Dee
 - Inny
 - Ryewater




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Catchment: Upper Shannon



Legend

 WFD_Catchments

— Embankments

— EREP Schemes

Scheme Channels

—— Ballyglass (Knockcroghery)

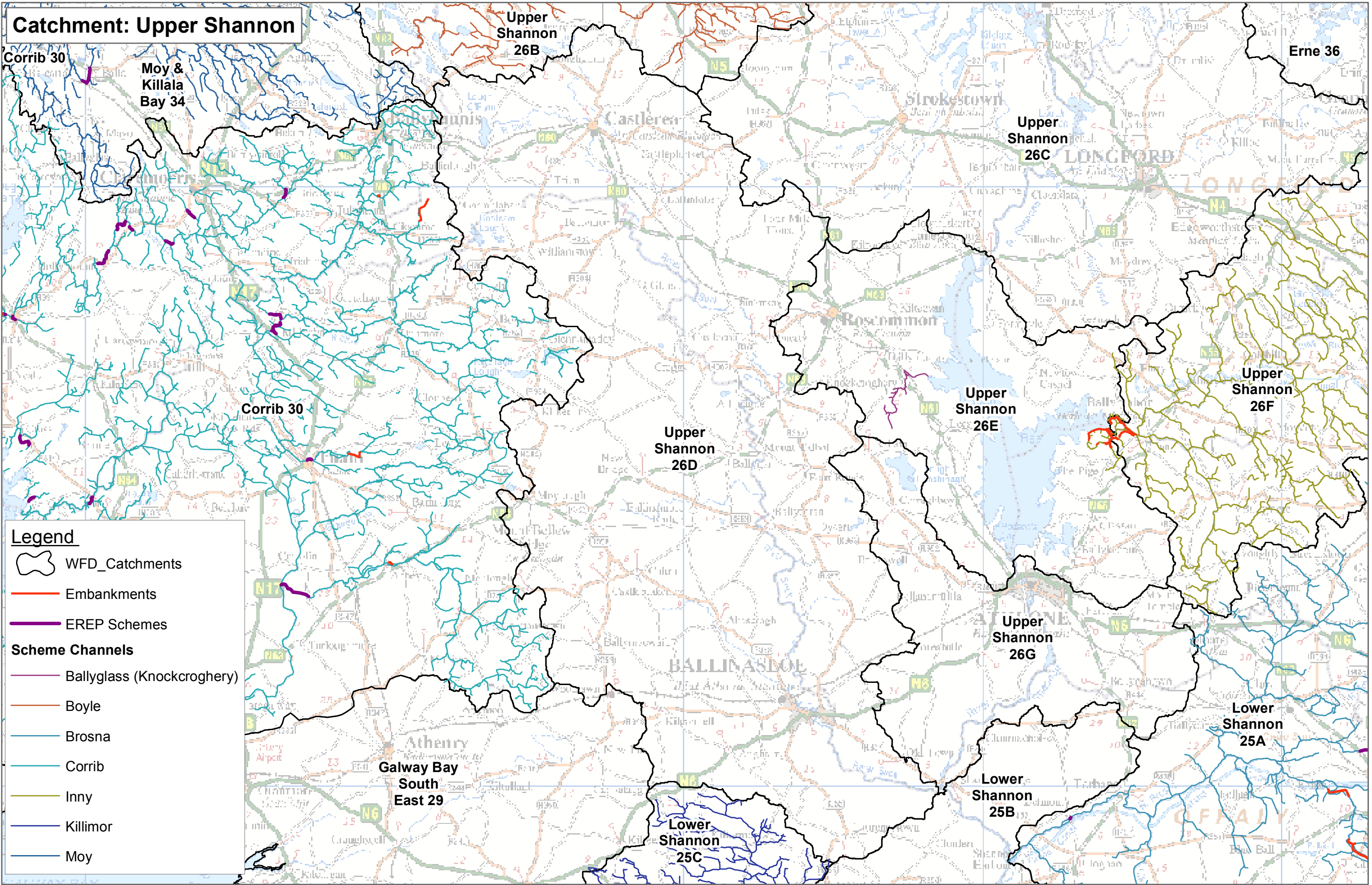
— Brosna

— Inny



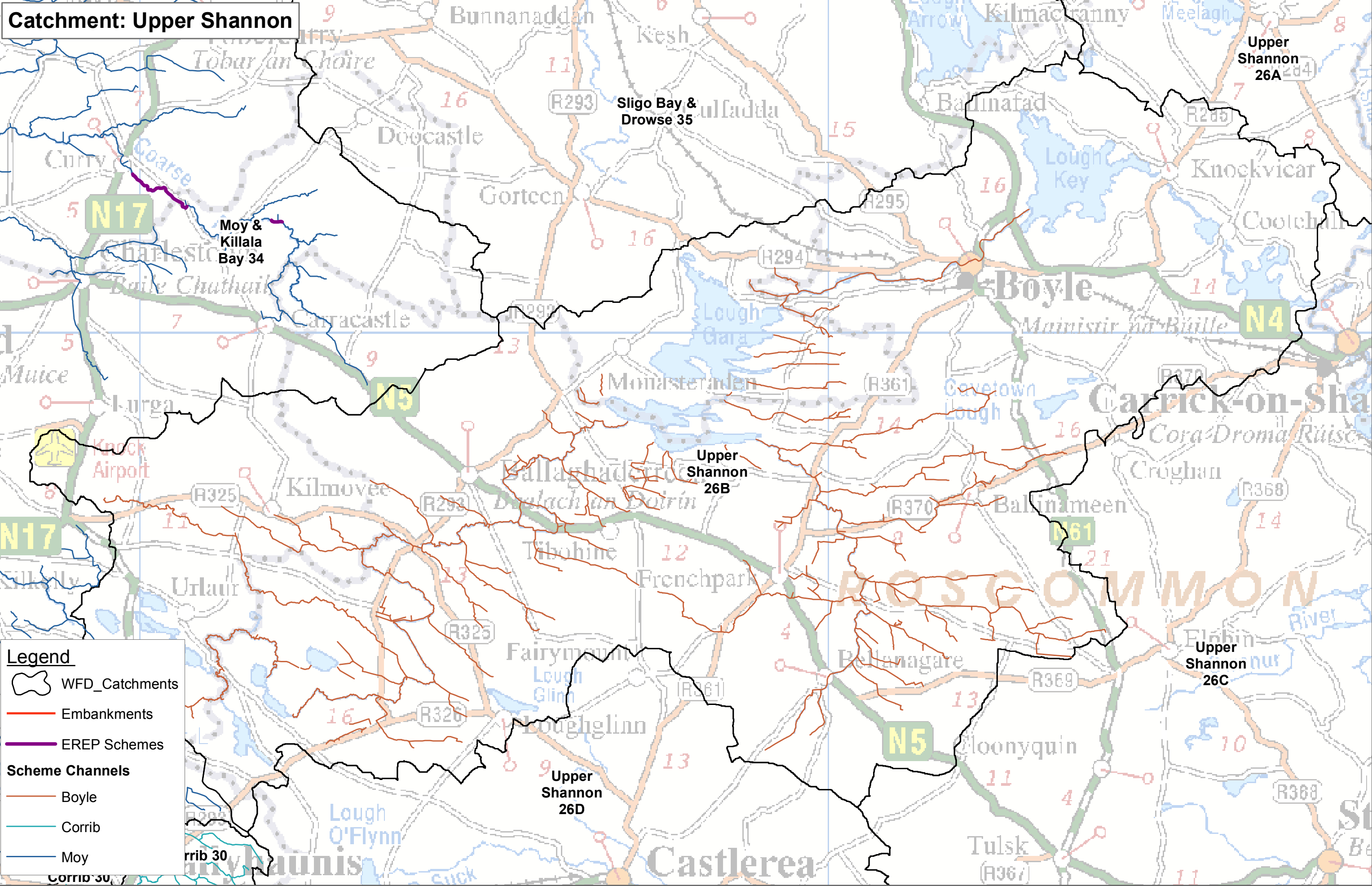
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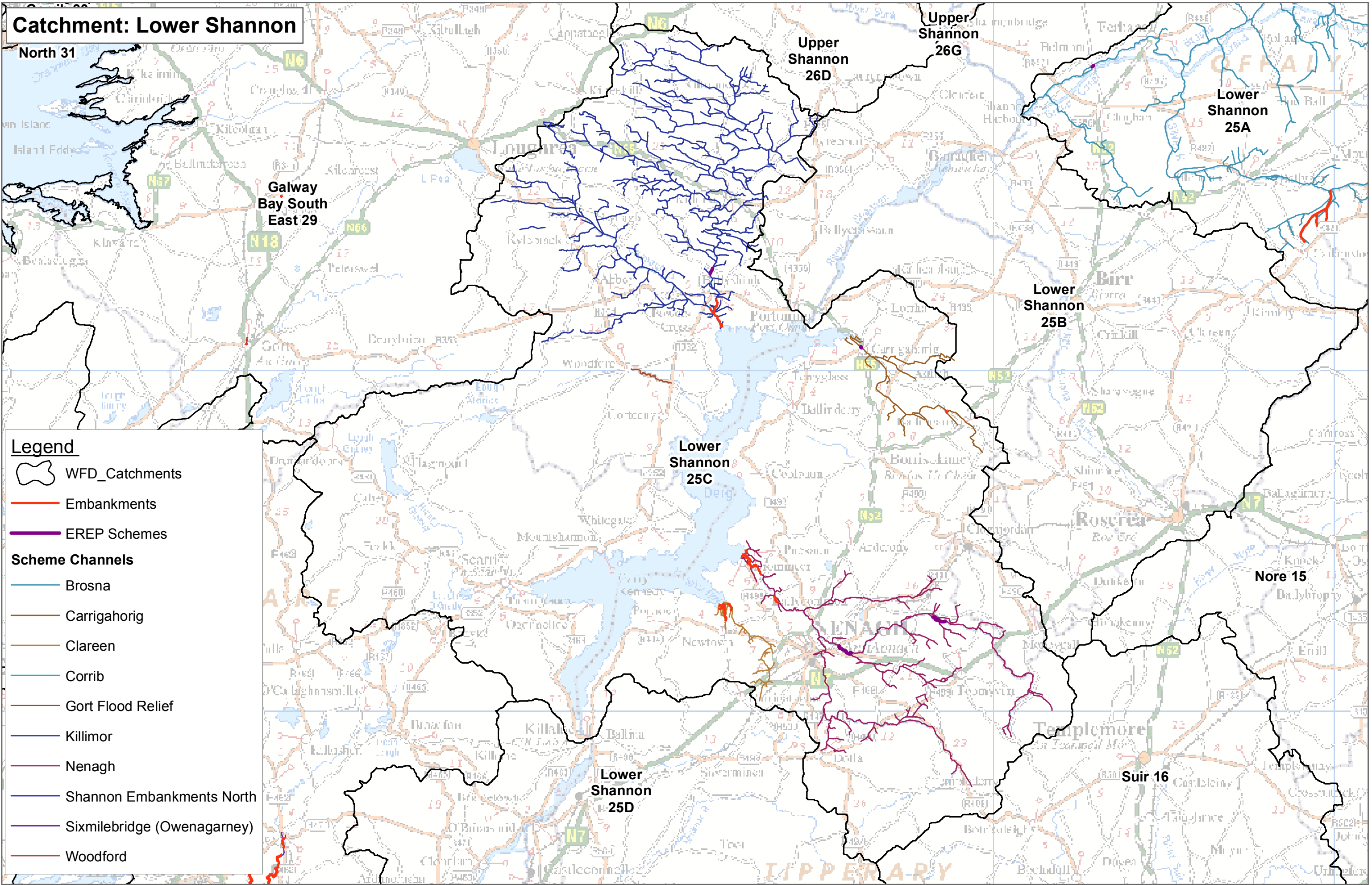


Catchment: Upper Shannon



Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Boyle
 - Corrib
 - Moy



Catchment: Lower Shannon

North 31

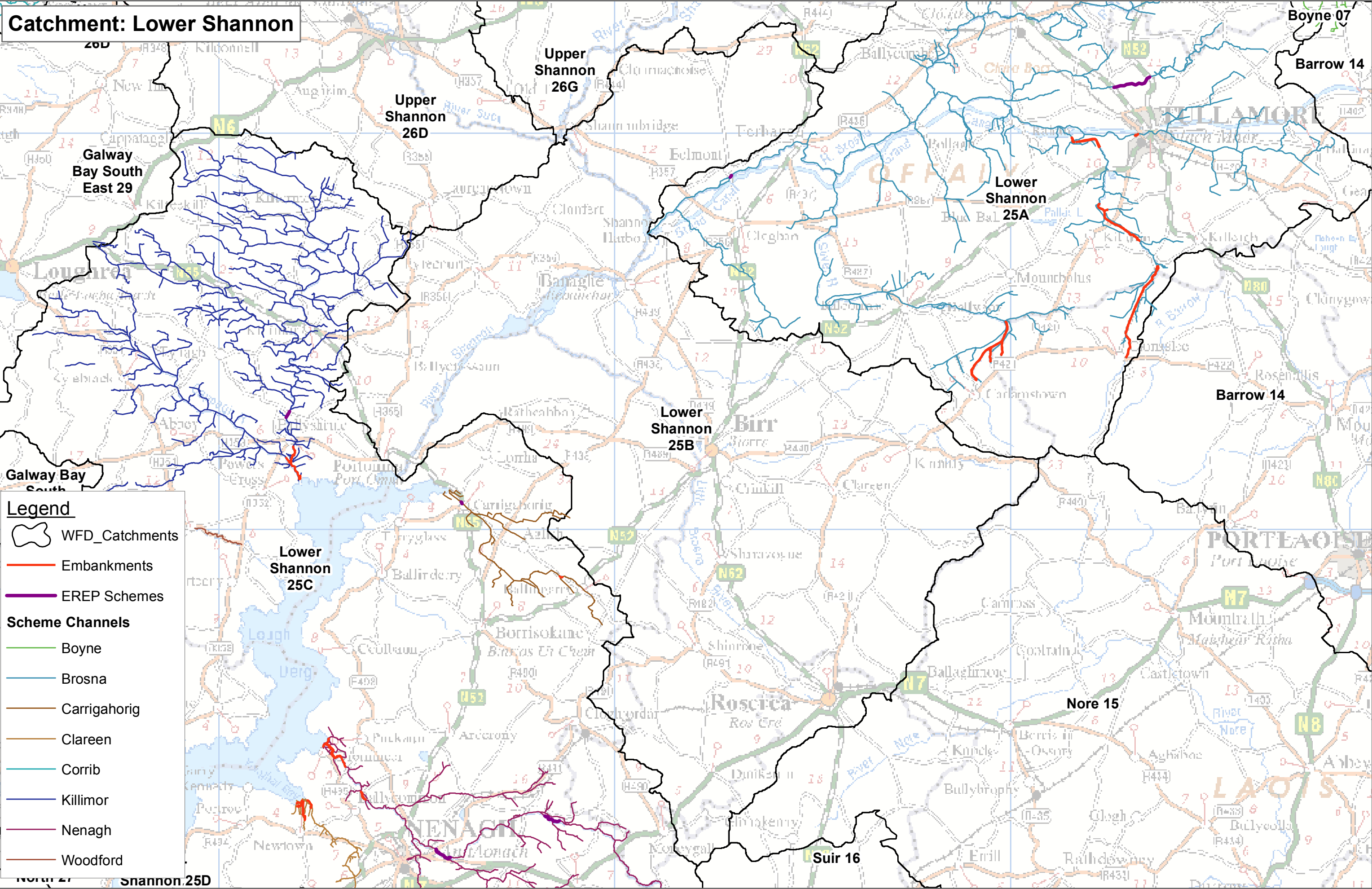
Galway Bay South East 29

- Legend**
- WFD_Catchments
 - Embankments
 - EREP Schemes
 - Scheme Channels**
 - Brosna
 - Carrigahorig
 - Clareen
 - Corrib
 - Gort Flood Relief
 - Killimor
 - Nenagh
 - Shannon Embankments North
 - Sixmilebridge (Owenagarney)
 - Woodford

0 3,600 7,200 10,800 14,400 18,000 km

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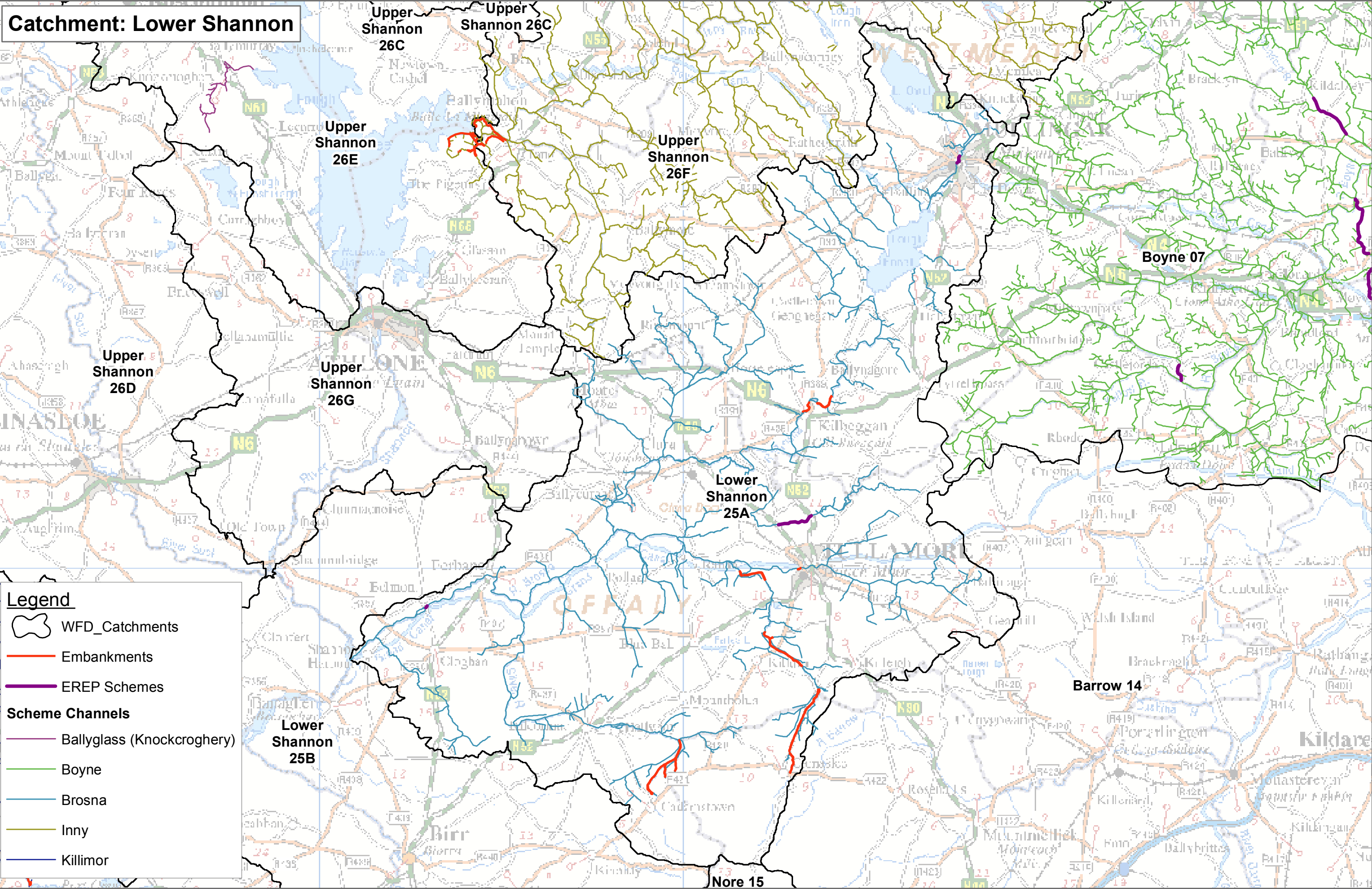
Catchment: Lower Shannon



Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Boyne
 - Brosna
 - Carrigahorig
 - Clareen
 - Corrib
 - Killimor
 - Nenagh
 - Woodford

Catchment: Lower Shannon



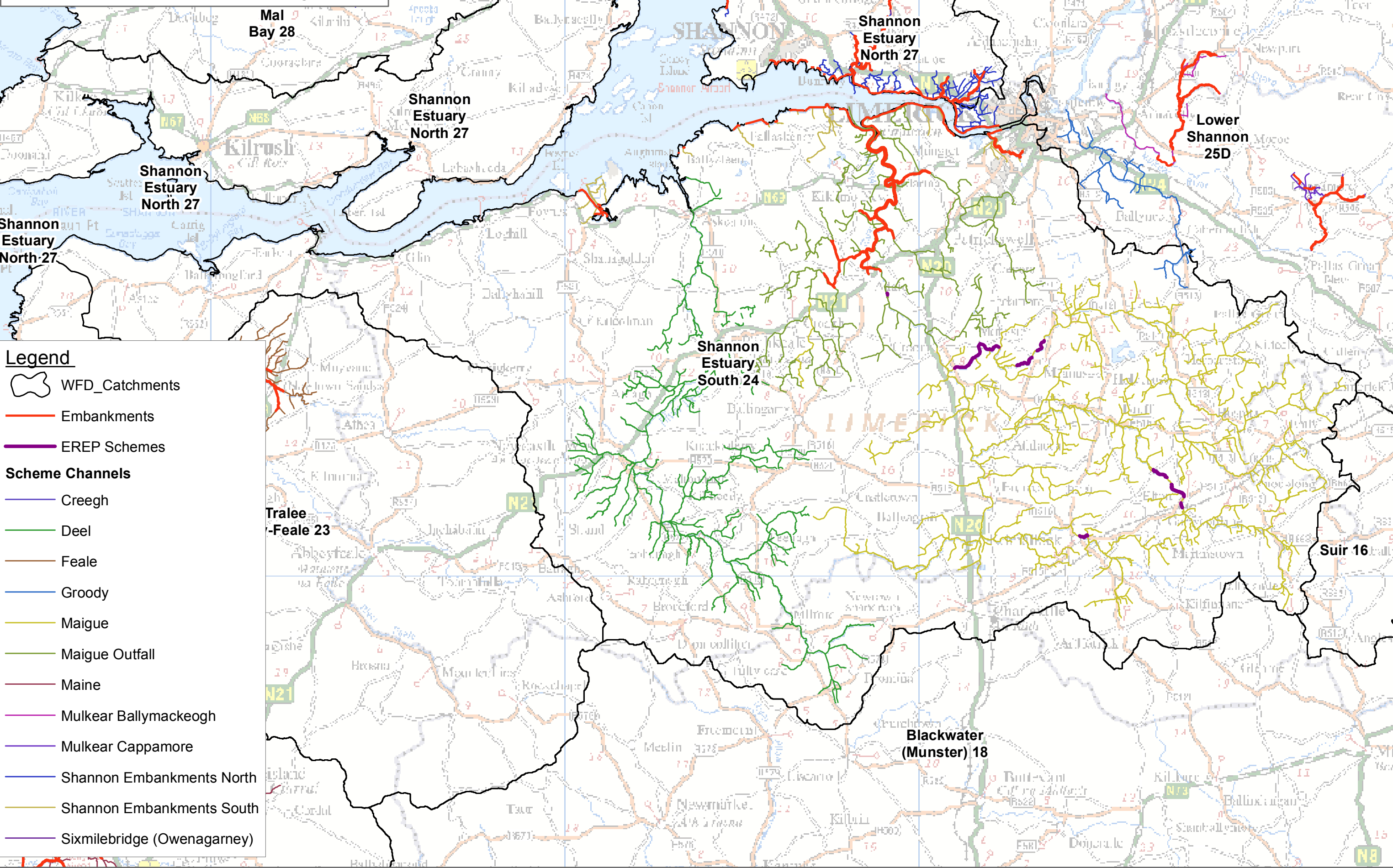
0 3,400 6,800 10,200 13,600 17,000 km



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Catchment: Shannon Estuary South

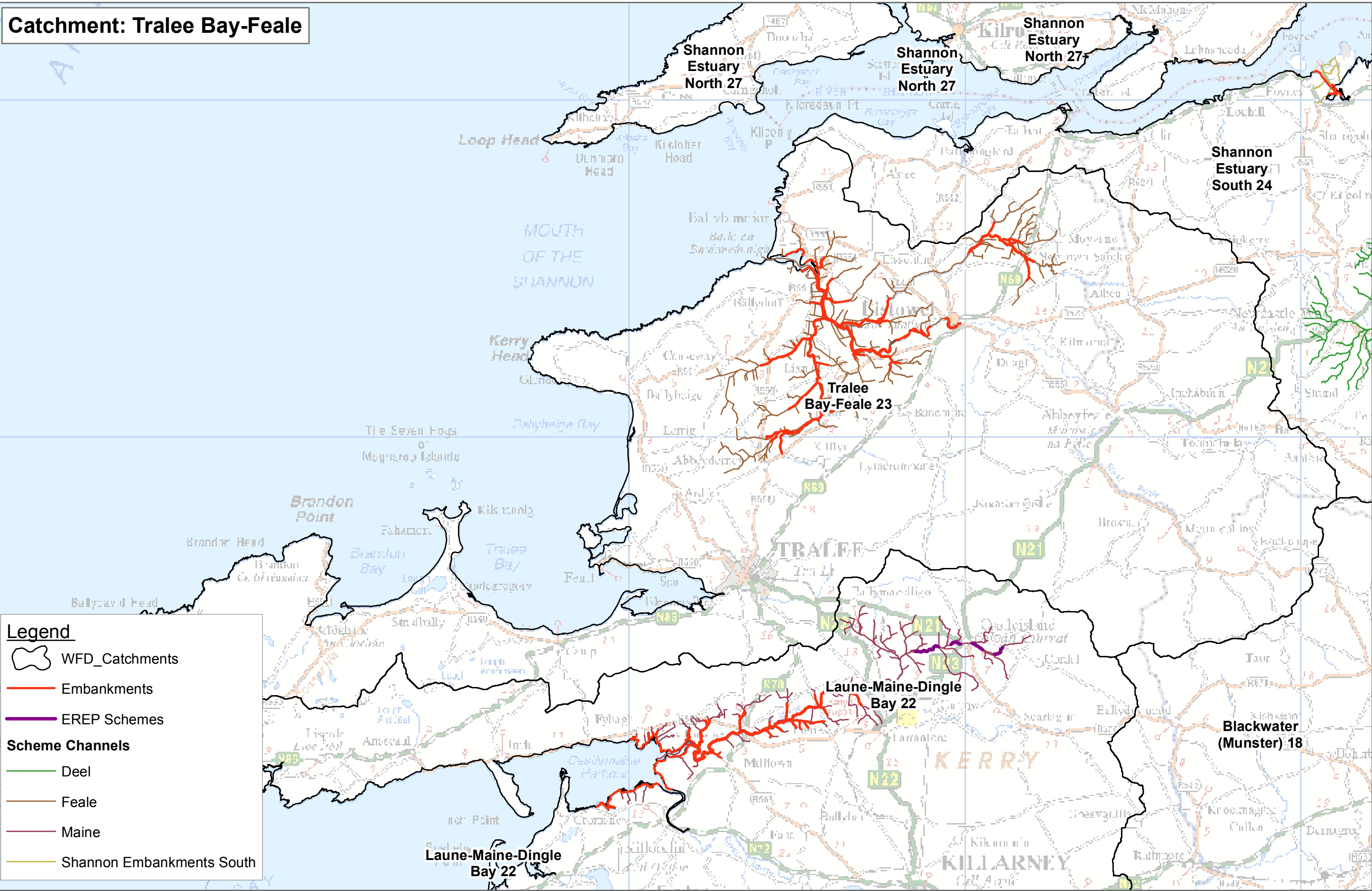


0 3,500 7,000 10,500 14,000 17,500 km



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Catchment: Tralee Bay-Feale

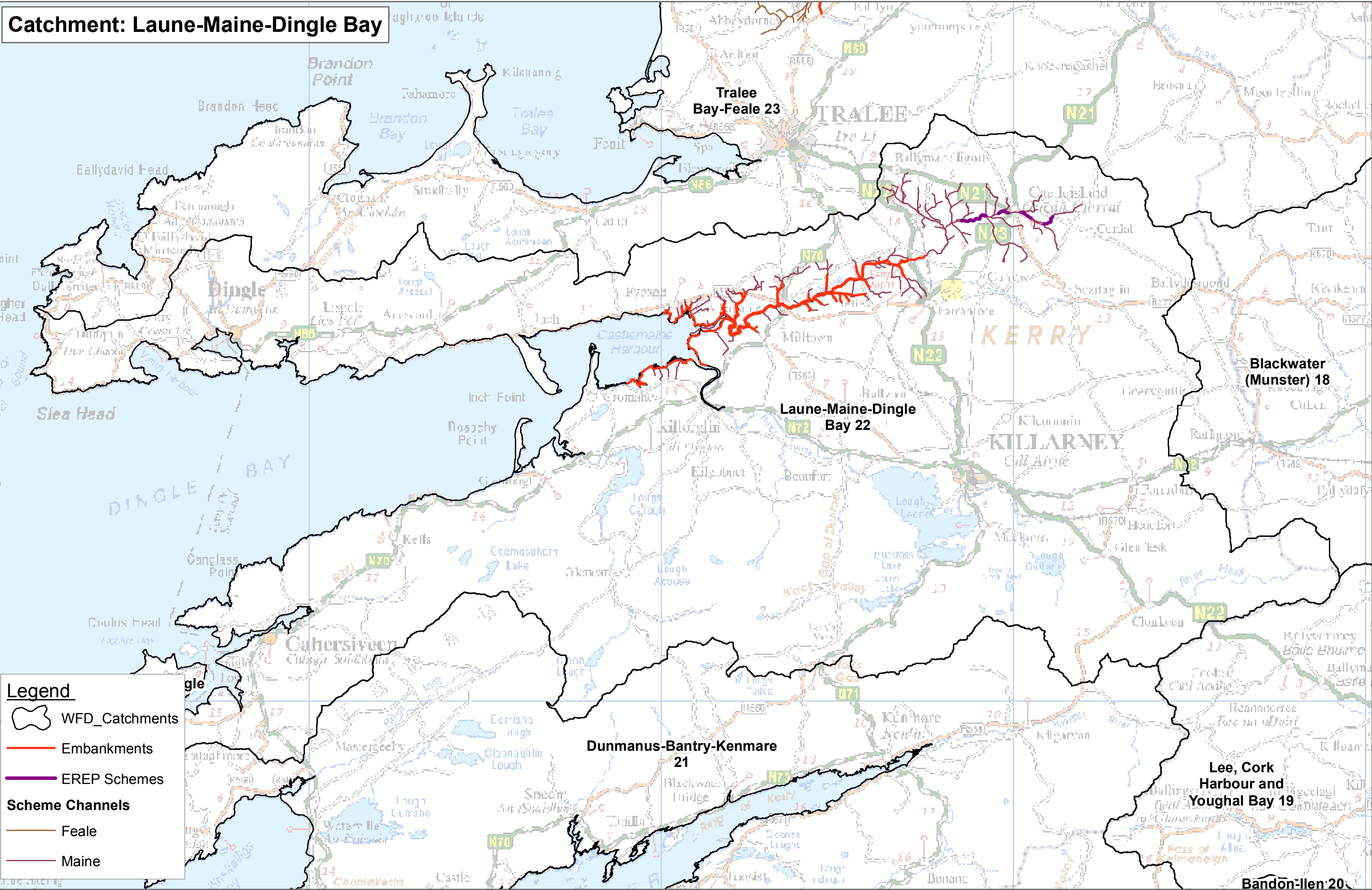


0 3,600 7,200 10,800 14,400 18,000 km



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Catchment: Laune-Maine-Dingle Bay



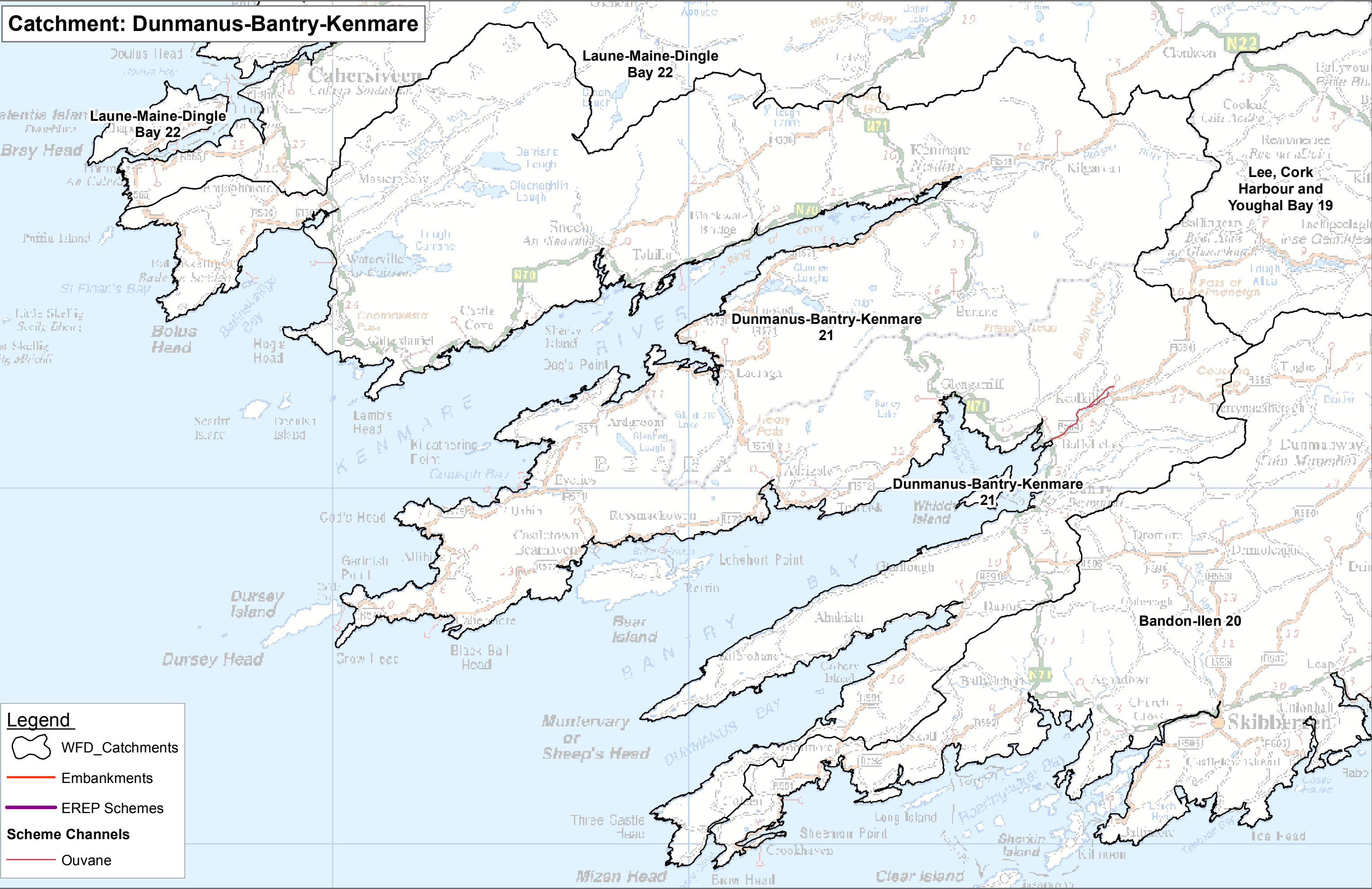
Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Feale
 - Maine

0 3,500 7,000 10,500 14,000 17,500 km

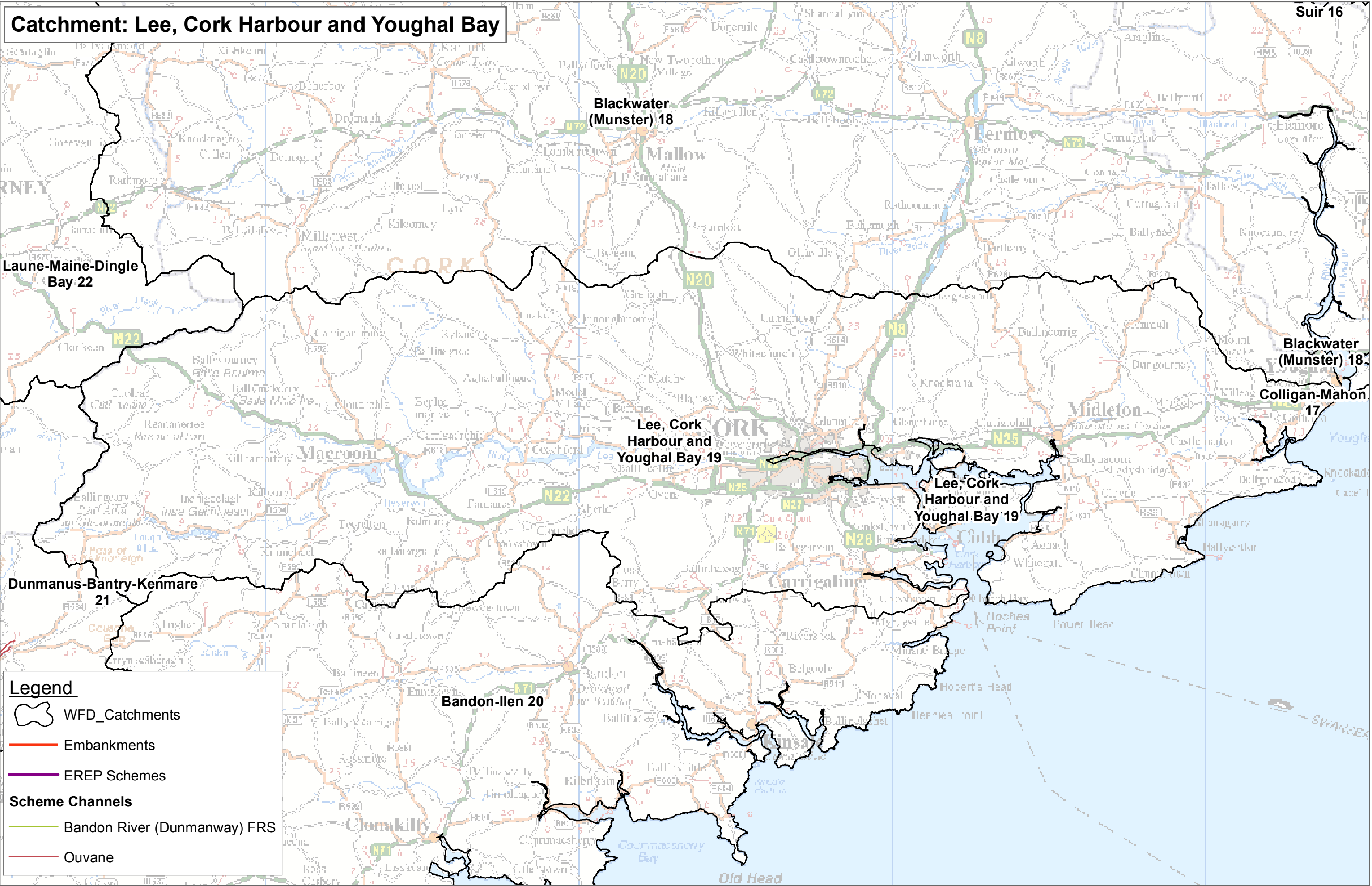


Catchment: Dunmanus-Bantry-Kenmare



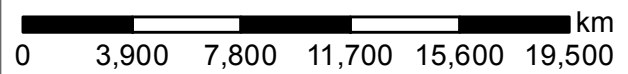
[illegible]

Catchment: Lee, Cork Harbour and Youghal Bay

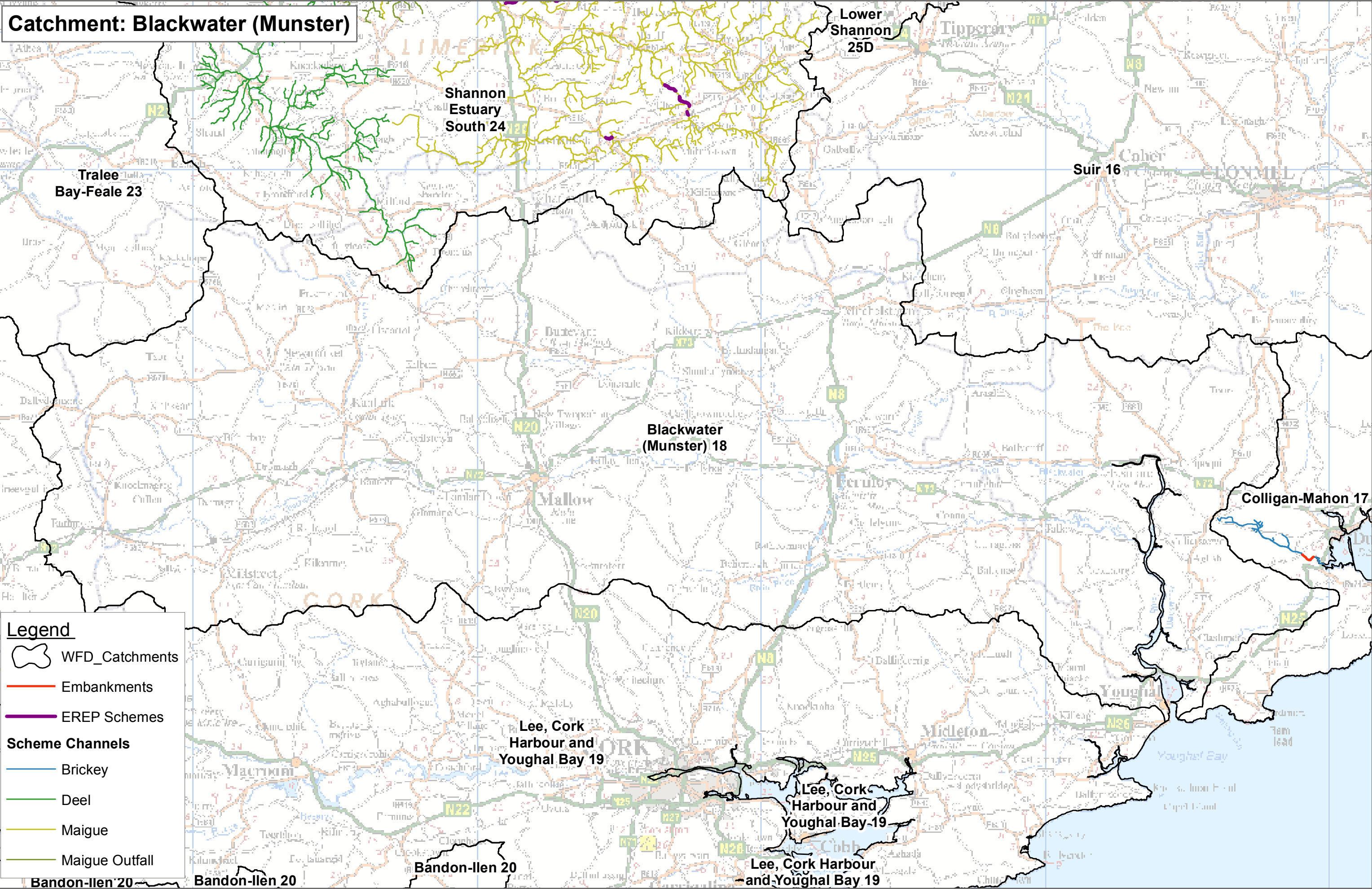


Legend

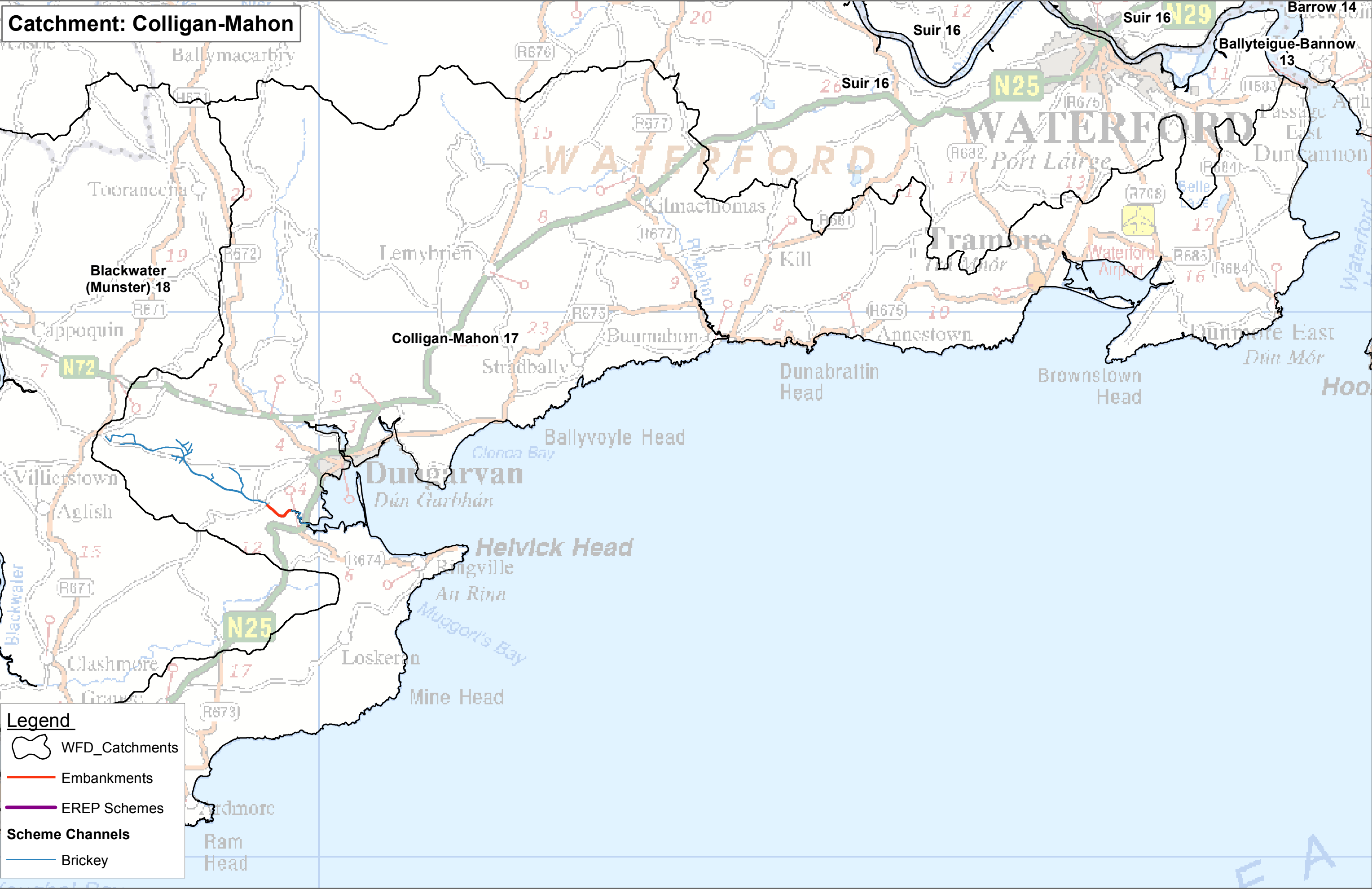
- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
- Bandon River (Dunmanway) FRS
- Ouvane



Catchment: Blackwater (Munster)



Catchment: Colligan-Mahon



Catchment: Suir

Shannon
Estuary
North 27

Lower
Shannon
25C

Lower
Shannon
25B

Lower
Shannon
25D

Barrow 14

Slaney
& Wexford
Harbour 12

Nore 15

Suir 16

Ballyteigue-Bannow 13

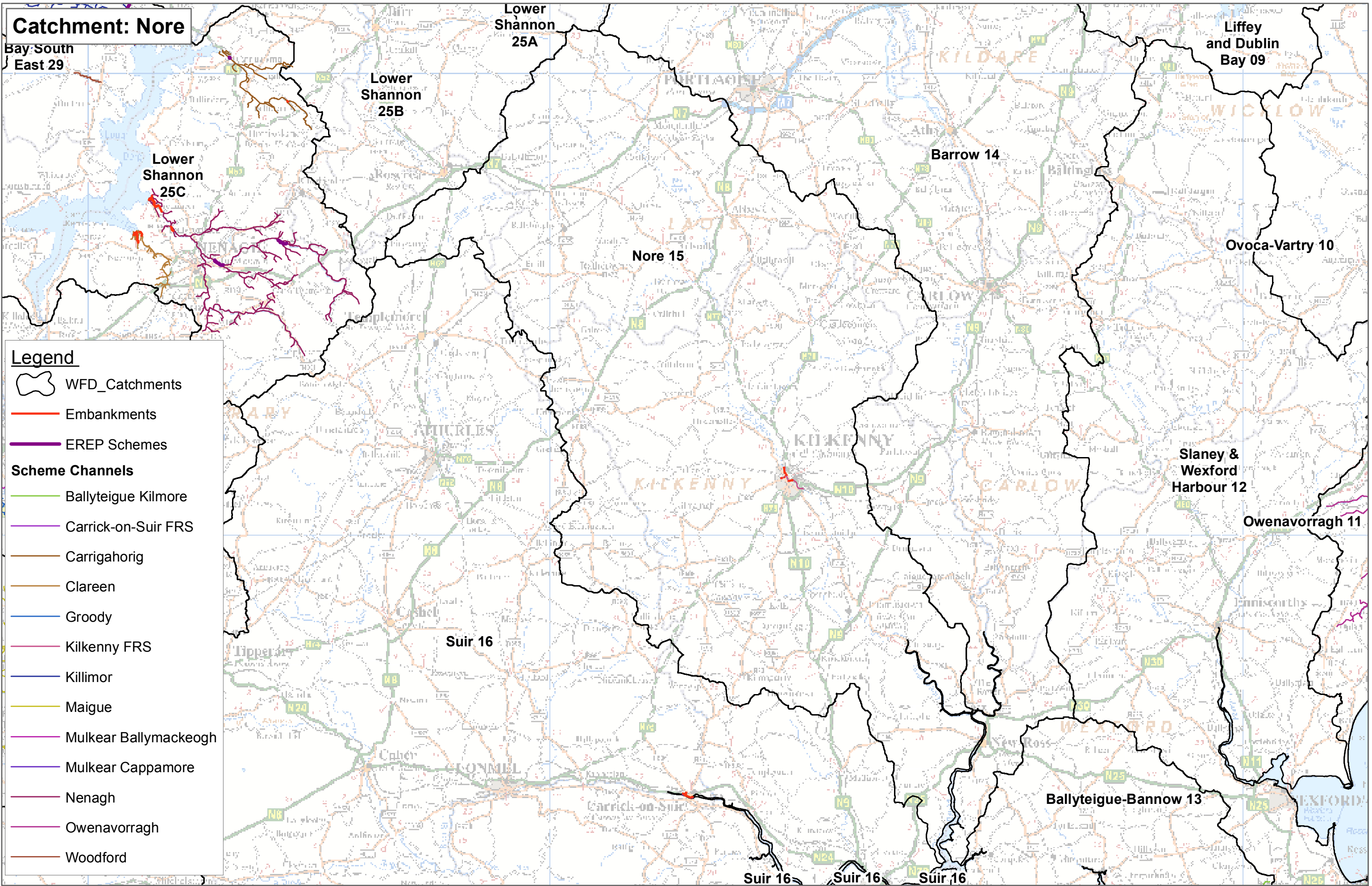
Colligan-Mahon 17

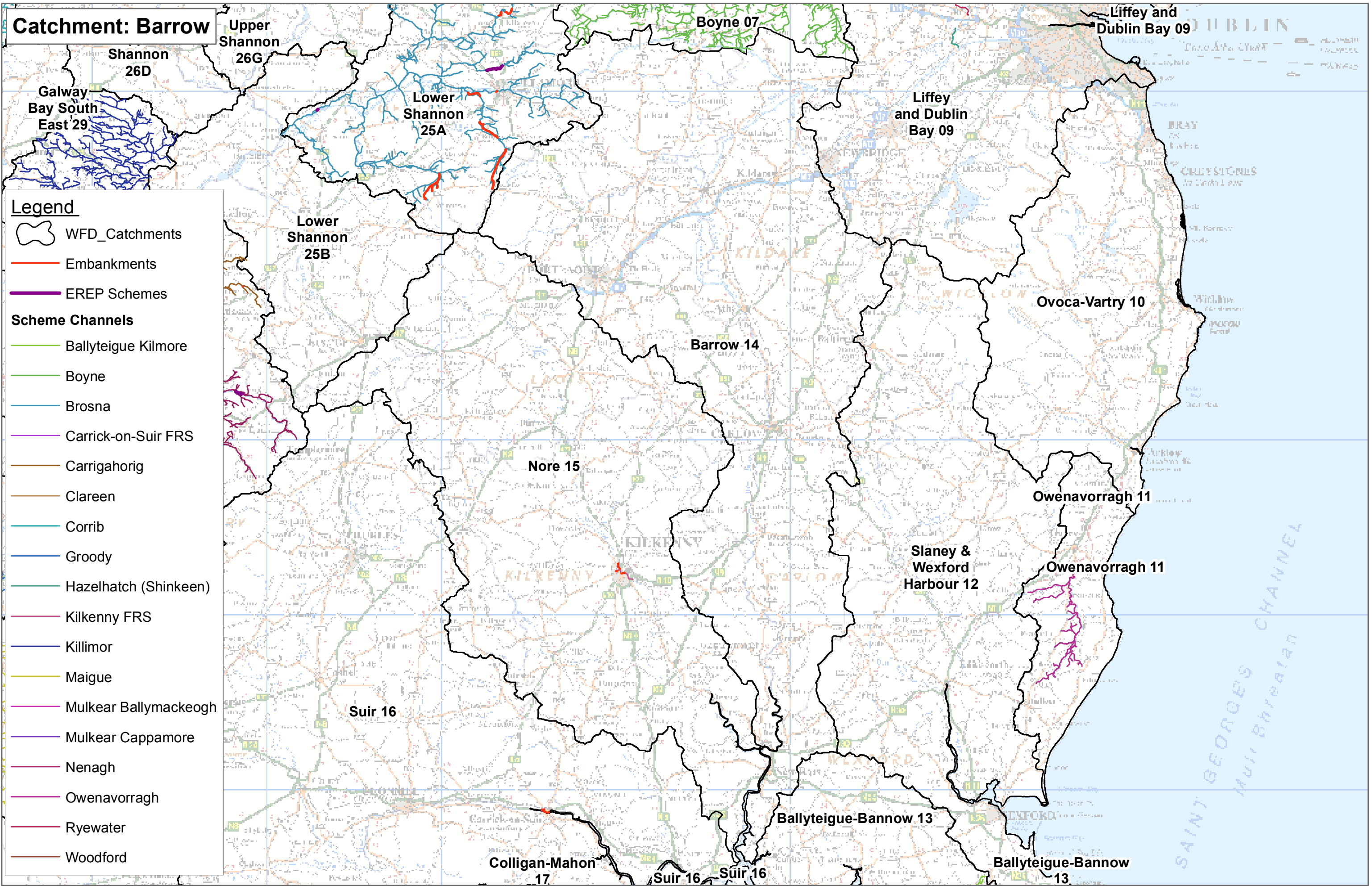
Legend

- WFD_Catchments
- Embankments
- EREP Schemes
- Scheme Channels**
 - Carrick-on-Suir FRS
 - Clareen
 - Groody
 - Kilkenny FRS
 - Maigue
 - Maigue Outfall
 - Mulkear Ballymackeogh
 - Mulkear Cappamore
 - Nenagh

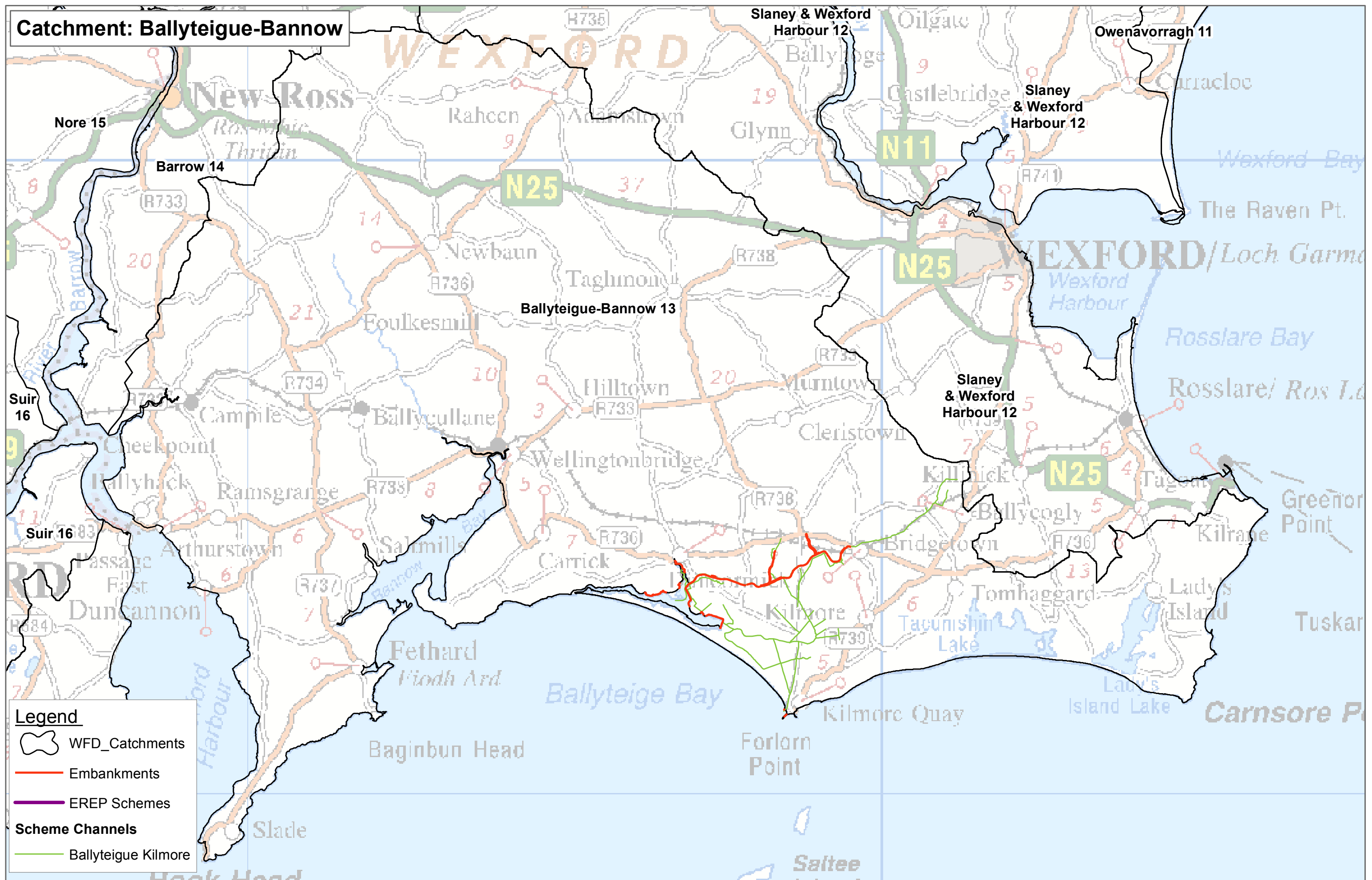
0 4,700 9,400 14,100 18,800 23,500 km







Catchment: Ballyteigue-Bannow



Catchment: Slaney & Wexford Harbour

Shannon
25B

Liffey and
Dublin
Bay 09

Barrow 14

Ovoca-Vartry 10

Nore 15

Slaney &
Wexford
Harbour 12

Owenavorrach 11

Owenavorrach
11

Ballyteigue-Bannow 13

Colligan-Mahon 17

Colligan-Mahon 17

Legend



WFD_Catchments

Embankments

EREP Schemes

Scheme Channels

Ballyteigue Kilmore

Carrick-on-Suir FRS

Kilkenny FRS

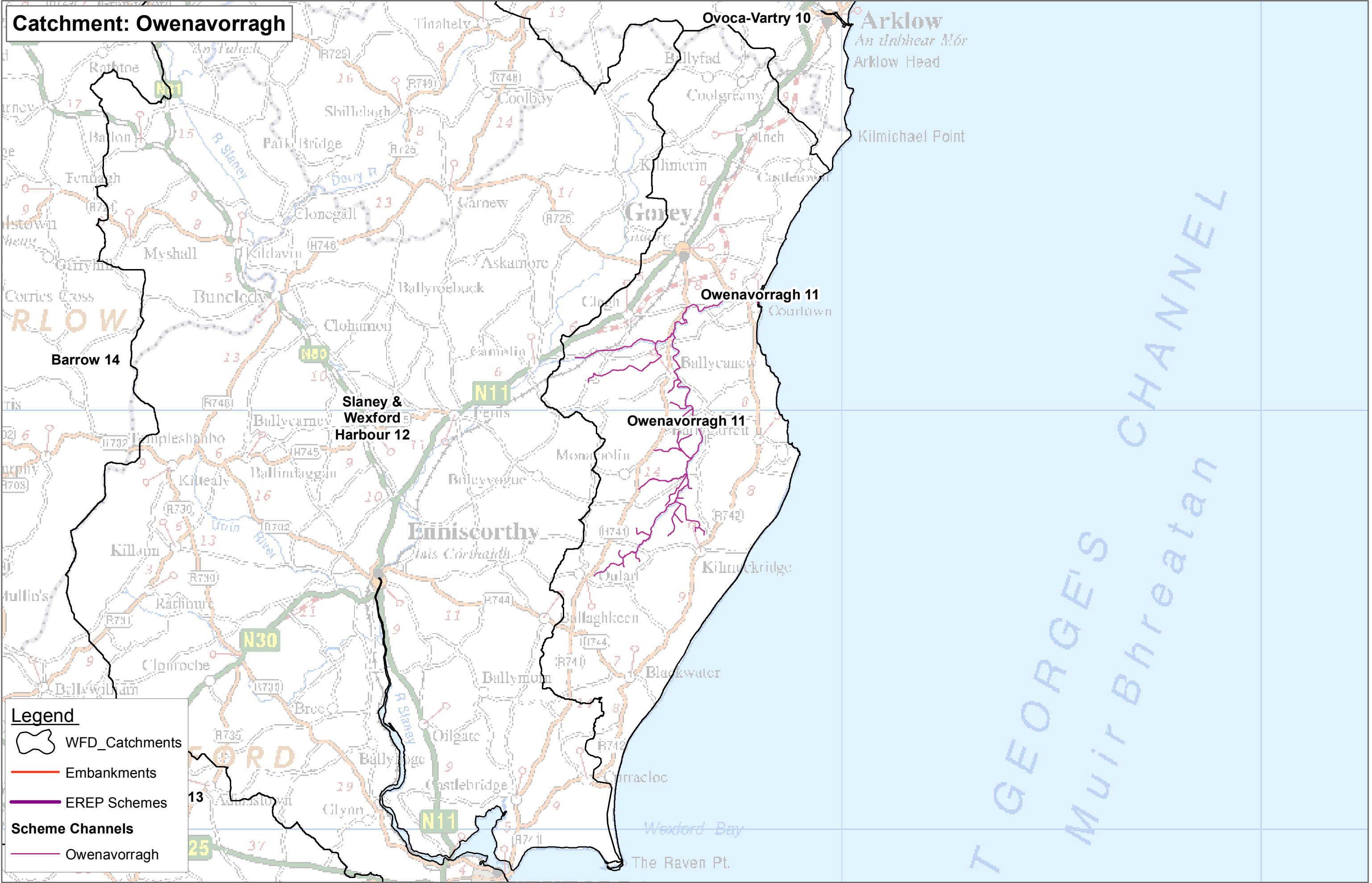
Owenavorrach

0 5,500 11,000 16,500 22,000 27,500 km



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Catchment: Owenavorragh

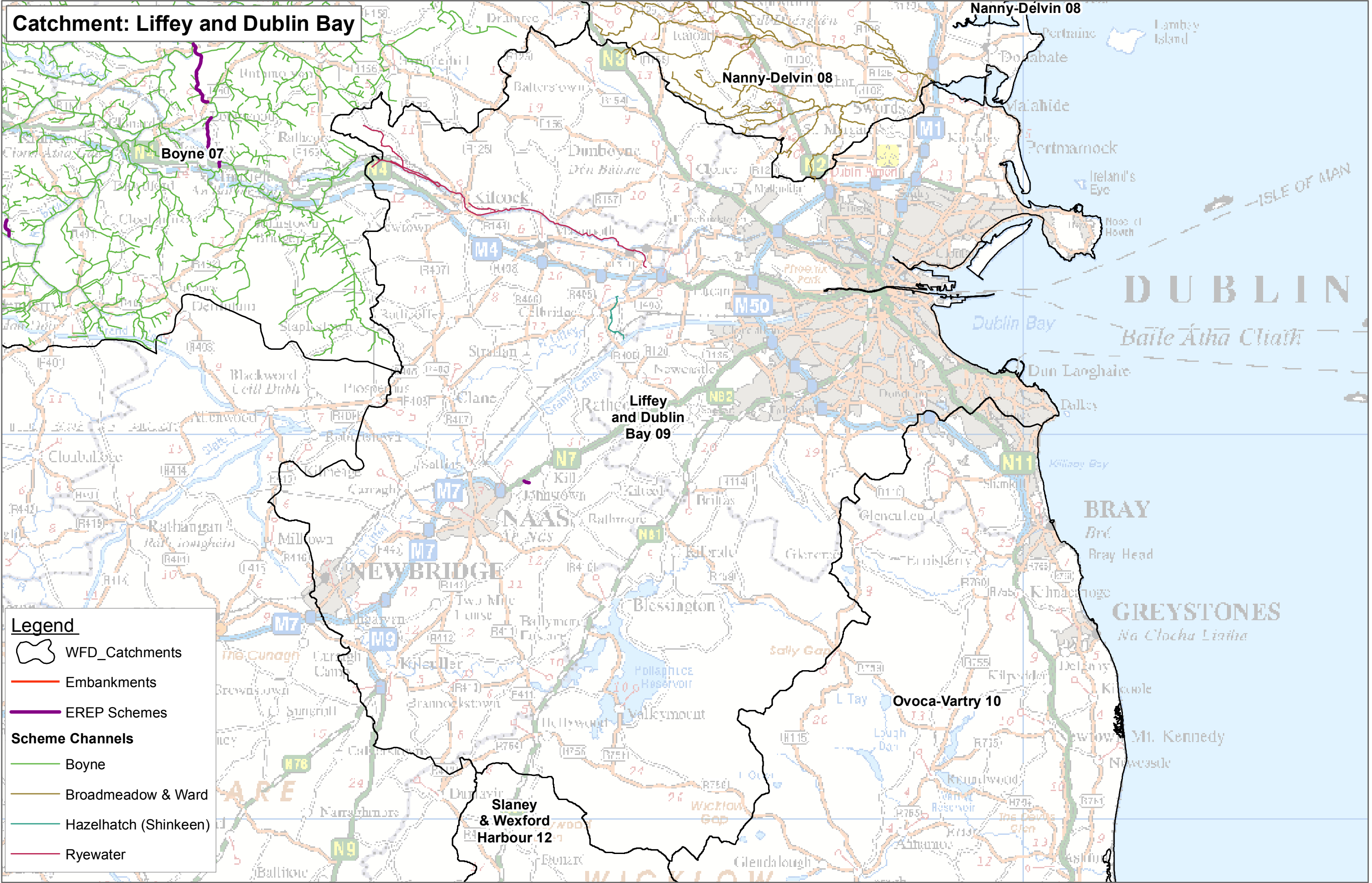


Catchment: Ovoca-Vartry

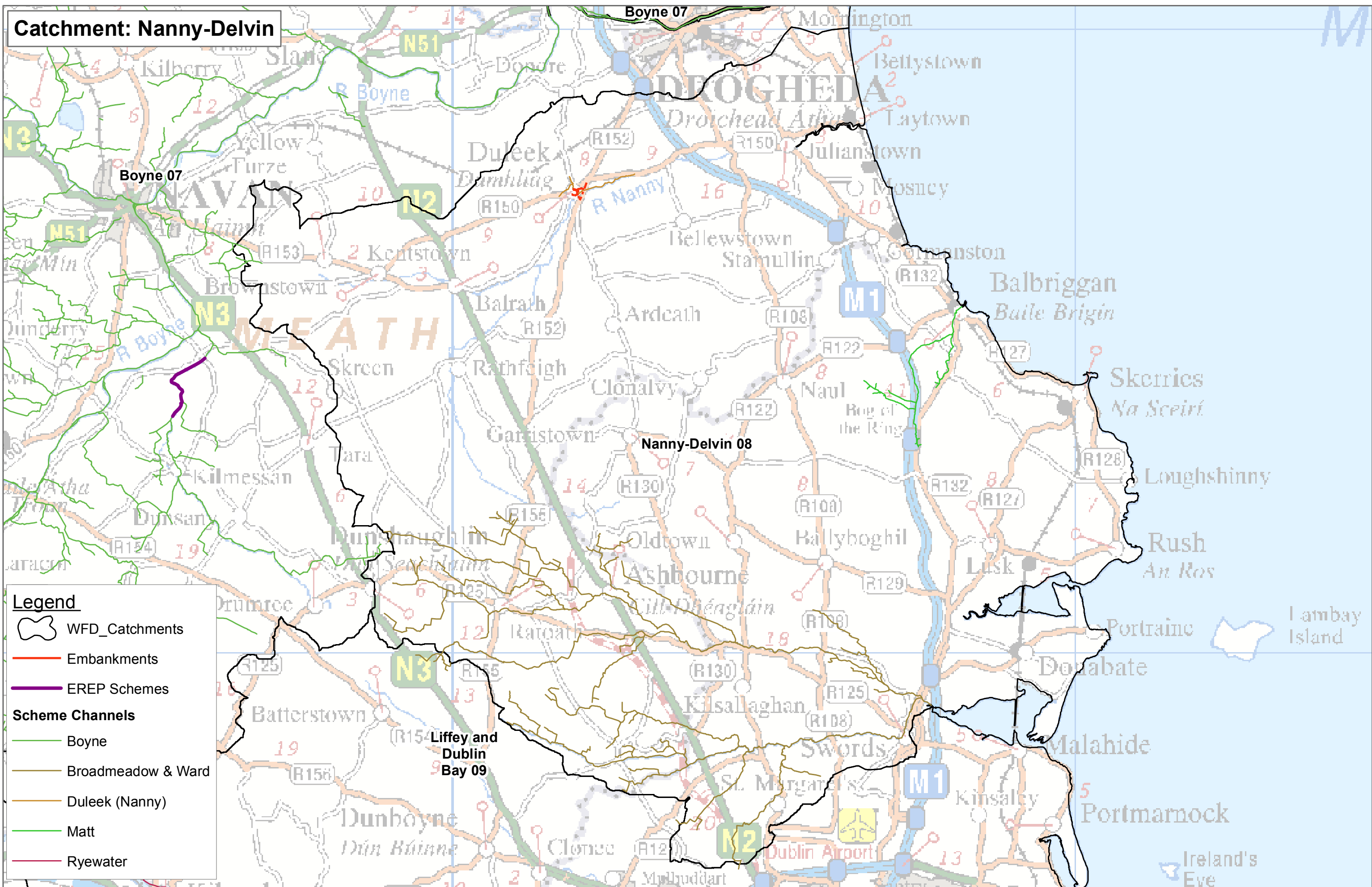


Legend

- WFD_Catchments
- Embankments
- EREP Schemes



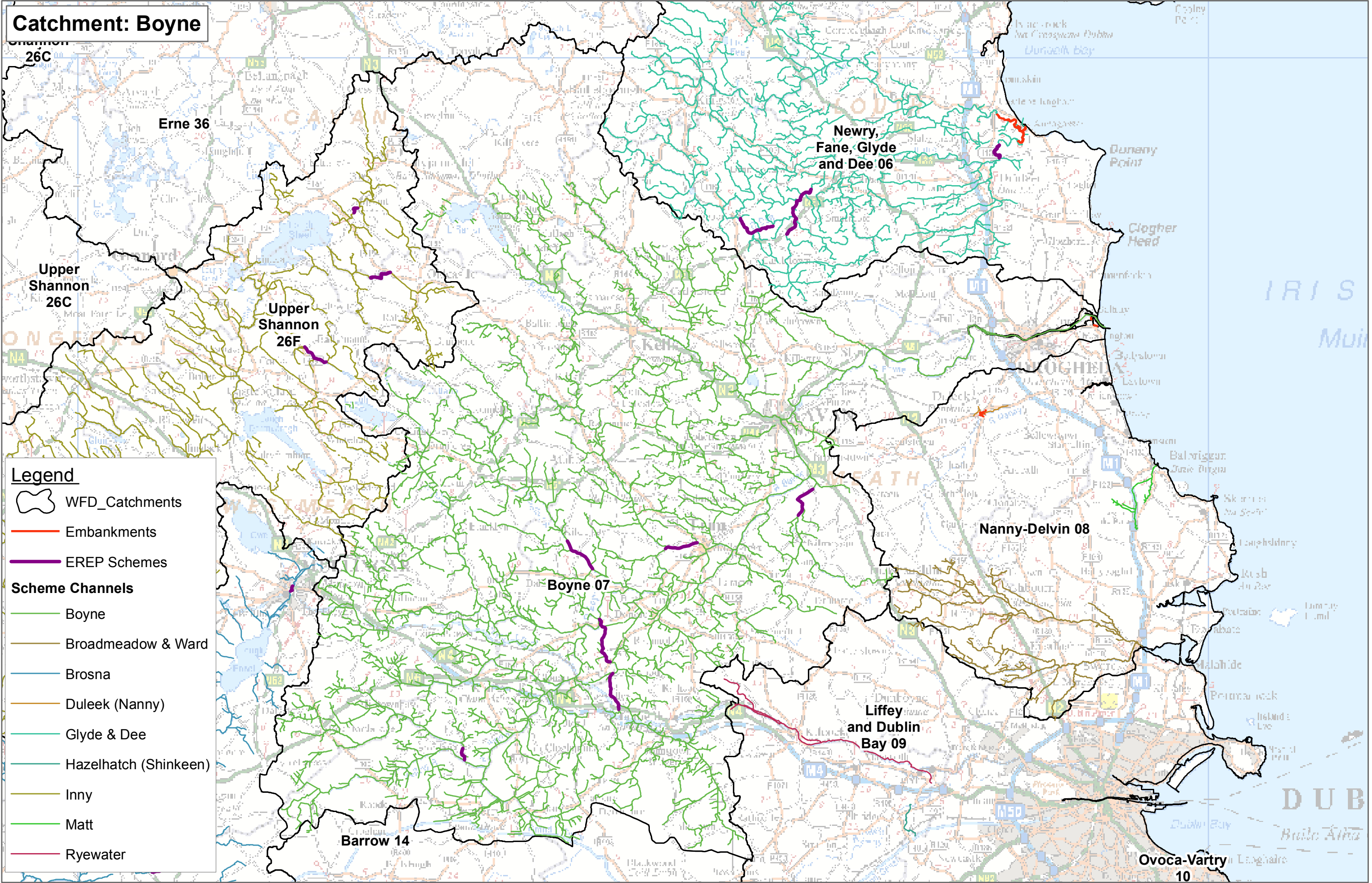
Catchment: Nanny-Delvin



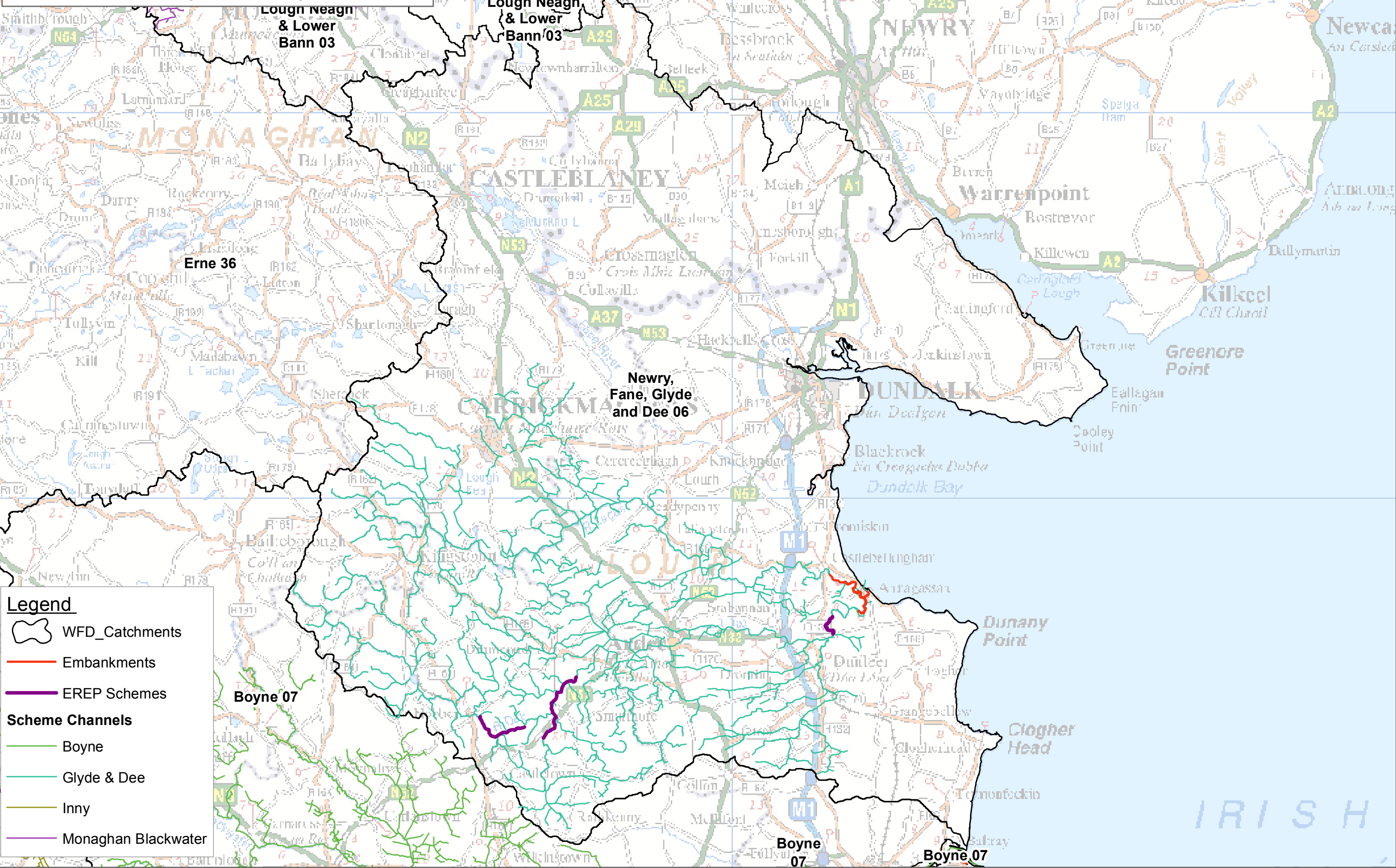
0 2,000 4,000 6,000 8,000 10,000 km

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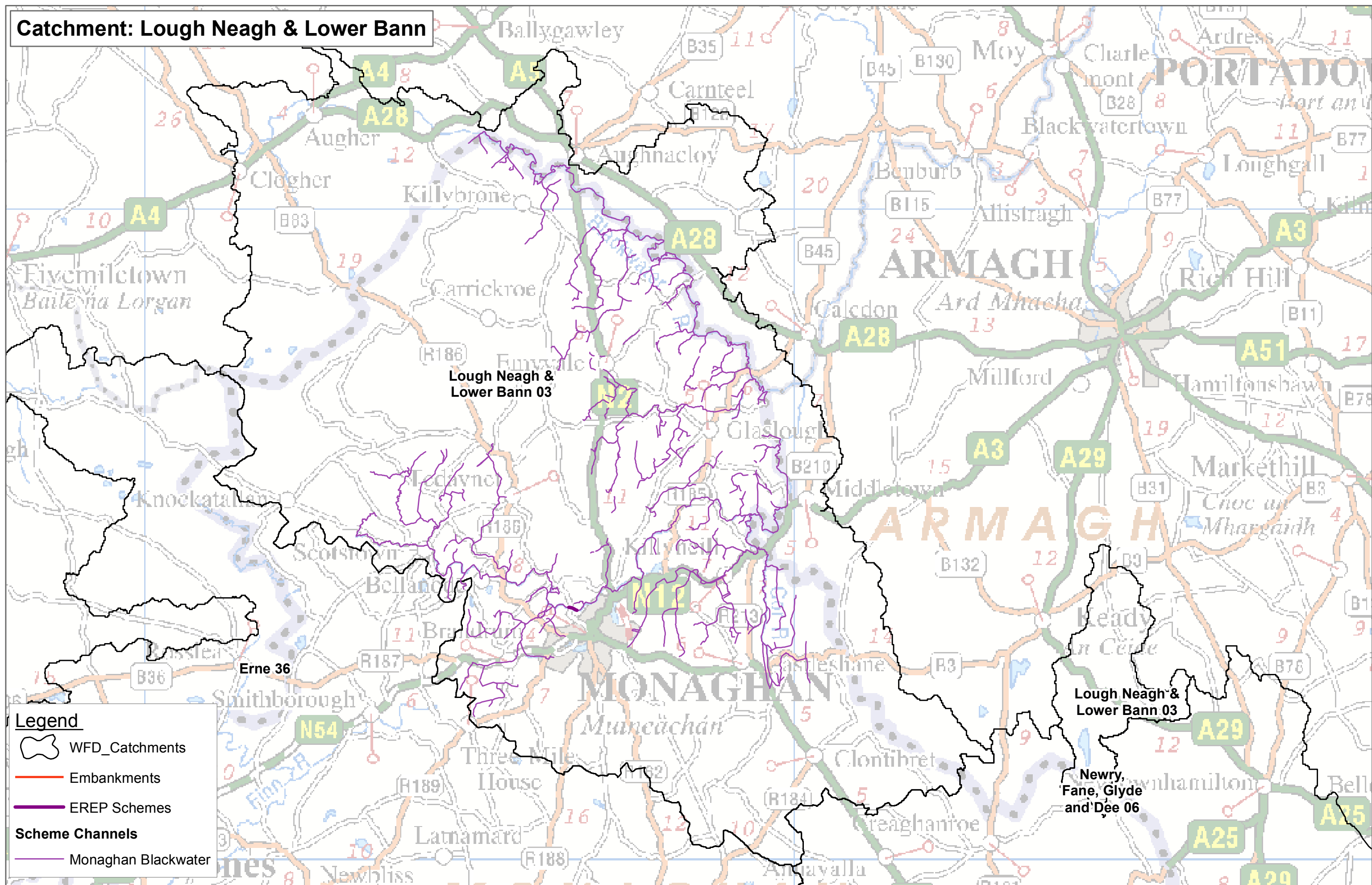




Catchment: Newry, Fane, Glyde and Dee



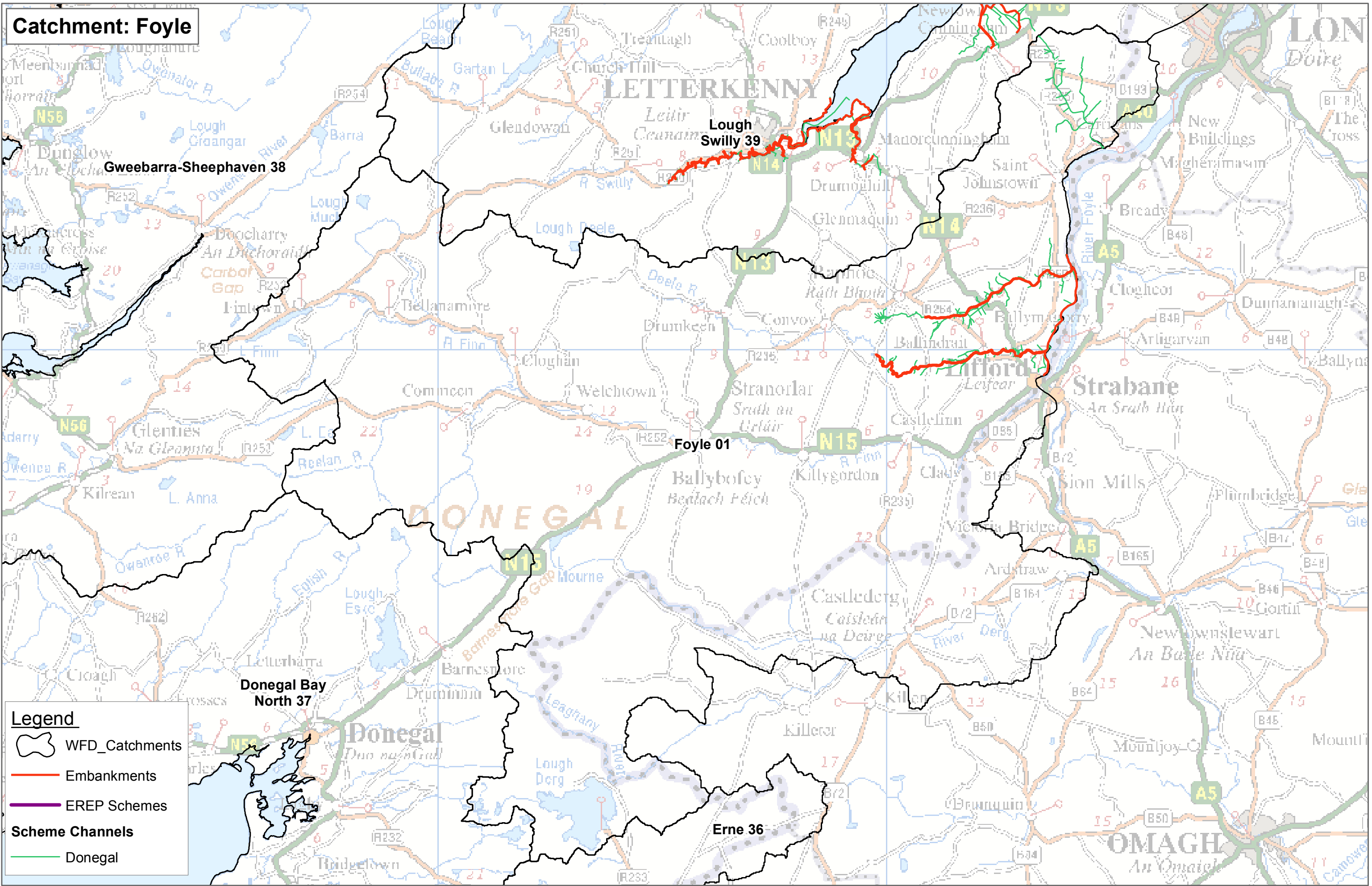
Catchment: Lough Neagh & Lower Bann



0 1,900 3,800 5,700 7,600 9,500 km



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JBA
consulting

Offices at

[Dublin](#)

[Limerick](#)

Registered Office

[24 Grove Island](#)

[Corbally](#)

[Limerick](#)

[Ireland](#)

t: +353 (0) 61 345463

e: info@jbaconsulting.ie

[JBA Consulting Engineers and
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