

# Gruggies Burn Flood Alleviation Scheme

## Shadow Habitat Regulations Appraisal

March 2024



**Balfour Beatty**



**FAIRHURST**

**West Dunbartonshire Council**

# **Gruggies Burn Flood Alleviation Scheme Shadow Habitat Regulations Appraisal**

**Final report**

Prepared by LUC

March 2024



**West Dunbartonshire Council**

**Gruggies Burn Flood Alleviation Scheme**  
**Shadow Habitat Regulations Appraisal**

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 12449

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# Chapter 1

## Introduction

### Remit

**1.1** LUC was appointed by Fairhurst, on behalf of West Dunbartonshire Council, to provide ecological support during the design and notification stages of the Gruggies Burn Flood Alleviation Scheme (FAS) ('the Scheme') in Dumbarton, West Dunbartonshire.

**1.2** In recognising the Scheme's relationship with the Inner Clyde Special Protection Area (SPA)/Ramsar/Site of Special Scientific Interest (SSSI) designated site complex, this shadow Habitat Regulations Appraisal (sHRA) has been prepared to support the Scottish Ministers in discharging their legal obligations.

**1.3** Wider project context is set out the Scheme's notification documents, while an interpretation of the ecological context is provided in a standalone Ecological Appraisal.

### The Need for HRA

**1.4** The European Habitats Directive (Directive 92/42/EEC) was transposed into UK national legislation via the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) ('the Habitat Regulations').

**1.5** The term 'European Site' is used to refer to what were previously known as 'Natura' sites. These sites were originally designated as part of the 'Natura 2000' network, a Europe-wide system of sites designated for their ecological value. Sites are either designated as Special Areas of Conservation (SACs), the qualifying features for which are normally internationally important habitats or species assemblages, or Special Protection Areas (SPAs), which qualify for their assemblages of birds.

**1.6** Ramsar sites, which support internationally important wetland habitats, are listed under the Convention on Wetlands of International Importance as 'Waterfowl Habitat' (Ramsar Convention, 1971), and form part of the Natura 2000 network in Europe. All Ramsar sites in Scotland are also European sites and are protected under the relevant statutory regimes.

**1.7** SACs and SPAs receive considerable protection through the Habitats Regulations and these protections are normally reflected in national and local planning policy. Where plans or projects have potential to affect SACs or SPAs, an HRA must first be undertaken. The HRA should be undertaken by the 'Competent Authority' - in this case the Scottish Ministers. The

Competent Authority can also request that an Applicant submits a 'shadow' HRA report for consideration as part of a planning application.

**1.8** There is no change to the protection of SACs or SPAs as a result of the United Kingdom's exit from the European Union, and the requirements of the Directives continue to be relevant to the management of European sites.

### Recent Case Law Changes

**1.9** As advised in best practice, this shadow HRA has been prepared in accordance with recent case law findings, including most notably the 'People over Wind' and 'Holohan' rulings from the Court of Justice for the European Union (CJEU).

**1.10** The People over Wind, Peter Sweetman v Coillte Teoranta (April 2018) judgment ruled that Article 6(3) of the Habitats Directive should be interpreted as meaning that mitigation measures should be assessed as part of an Appropriate Assessment and should not be considered at the screening stage. The precise wording of the ruling is as follows:

- "Article 6(3) .....must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of measures intended to avoid or reduce the harmful effects of the plan or project on that site."

**1.11** The HRA report will also fully consider the Holohan v An Bord Pleanala (November 2018) judgement which stated that:

- "Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that an 'appropriate assessment' must, on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.
- Article 6(3) of Directive 92/43 must be interpreted as meaning that the competent authority is permitted to grant to a plan or project consent which leaves the developer free to determine subsequently certain parameters relating to the construction phase, such

as the location of the construction compound and haul routes, only if that authority is certain that the development consent granted establishes conditions that are strict enough to guarantee that those parameters will not adversely affect the integrity of the site.

- Article 6(3) of Directive 92/43 must be interpreted as meaning that, where the competent authority rejects the findings in a scientific expert opinion recommending that additional information be obtained, the 'appropriate assessment' must include an explicit and detailed statement of reasons capable of dispelling all reasonable scientific doubt concerning the effects of the work envisaged on the site concerned."

**1.12** This HRA considers the potential for effects on species and habitats, including those not listed as qualifying features, to result in secondary effects upon the qualifying features of European Sites, including the potential for complex interactions and dependencies. In addition, the potential for offsite impacts, such as through impacts to functionally linked land, and or species and habitats located beyond the boundaries of European site, but which may be important in supporting the ecological processes of the qualifying features, have also been fully considered in this report.

## Chapter 2

### Scheme Context

**2.1** Gruggies Burn flows south from its source in the Kilpatrick Hills, discharging to the River Clyde immediately south of Dumbarton. While the burn's catchment is largely rural, its flow through Dumbarton is characterised by canalisation and the land use pressures associated with a heavily urbanised area. The hydrological characteristics of the watercourse are such that it regularly experiences fluvial flooding, creating significant challenges for Dumbarton's communities. This pressure is compounded by coastal flooding during high tides and storm surges at the burn's confluence with the River Clyde.

**2.2** The scheme will achieve flood relief via:

- A **flow diversion culvert**, intercepting high flows, via a flow diversion weir and culvert inlet, north of the A82 and discharging to the River Clyde via an existing culverted watercourse (Hunter's Burn) and a new culvert outfall. Hunter's Burn discharges approximately 800m east of Gruggies Burn. The relief culvert will include new infrastructure at both its inflow and outflow points.
- **Tidal embankments**, extending approximately 470m east from the Gruggies Burn's confluence with the River Clyde.
- A **tidal floodgate** on Castle Road adjacent to its junction with Castlegate Avene immediately south of the entrance to Dumbarton Football Stadium.
- **Flood walls**, comprising sheet pile walls with cladding to reflect local landscape and conservation features between the River Clyde and Glasgow Road in Dumbarton.

**2.3** Further design detail is provided in the Scheme's notification documents and supporting information. Particular reference should be made to the accompanying Ecological Appraisal, which provides an overview of the ecological features associated with each component of the Scheme.

# Chapter 3

## Method

### Stages of HRA

**3.1** HRA is a staged process, with each stage concluding whether the next is required. The stages are summarised in **Table 3.1**.

**3.2** Stage 1, known as ‘Screening Assessment’ or the ‘Significance Test’ seeks to identify whether a plan or project could give rise to ‘Likely Significant Effects’ (LSE) on relevant European Sites. At this stage, a precautionary approach is taken and, crucially, this stage may not consider the application of mitigation.

**3.3** Where LSE are identified, Stage 2 is undertaken. Stage 2, known as ‘Appropriate Assessment’ or the ‘Integrity Test’, builds on Stage 1, relating development detail to the ecological processes underpinning the integrity of relevant European Sites. Integrity is defined as the ability to deliver the European Site’s Conservation Objectives.

**3.4** At this stage, consideration of mitigation measures is central to assessment. Stage 2 seeks to conclude whether a plan or project could cause ‘adverse effects’ on the integrity of the European Sites. It is essential that the Competent Authority consults with NatureScot during Stage 2.

**3.5** Where adverse effects are predicted, Stage 3, ‘Derogation’, is undertaken. Stage 3 seeks to demonstrate that the plan or project is for ‘imperative reasons of over-riding public interest’ (IROPI) and that no alternative exists. Stage 3 requires the identification of appropriate compensatory measures.

**Table 3.1: Stages of HRA**

Stage	Task
<p><b>Stage 1: Screening Assessment (Significance Test)</b></p>	<ul style="list-style-type: none"> <li>■ Describes plan or project.</li> <li>■ Identifies potentially affected European Sites and factors contributing to their integrity.</li> <li>■ Assesses Likely Significant Effects (‘LSEs’) of plan or project alone or in combination with other plans and projects.</li> </ul>



Stage	Task
<p><b>Stage 2: Appropriate Assessment (Integrity Test)</b></p>	<ul style="list-style-type: none"> <li>Further gathering of data (plan or project, and European Sites).</li> <li>Evaluates plan or project impacts, in view of European Sites' conservation objectives.</li> <li>Identifies avoidance or mitigation measures which may reduce the effects of the plan or project.</li> <li>Assesses adverse effects on the integrity of the European Site arising from plan or project.</li> </ul>
<p><b>Stage 3: Derogation</b></p>	<ul style="list-style-type: none"> <li>Identifies 'imperative reasons of overriding public interest' (IROPI).</li> <li>Demonstrates that no alternatives to the plan or project exist.</li> <li>Identify potential compensatory measures.</li> </ul>

**3.6** The remainder of this chapter sets out the approach taken as part of the HRA of the Scheme.

### Guidance and Good Practice

**3.7** This sHRA has been prepared in cognisance of relevant guidance, good practice and verified data sets. Reference has been made to:

- Standard Data Forms for European Sites published on the JNCC website<sup>1</sup>.
- NatureScot's 'Advice to planners and developers on protected areas'<sup>2</sup>.
- NatureScot's HRA Guidance<sup>3</sup>.
- NatureScot's SiteLink website<sup>4</sup>.
- British Trust for Ornithology Wetland Birds Survey (WeBS) data<sup>5</sup>

### Stage 1: Screening Assessment

**3.8** The Screening Assessment stage of the HRA focuses on identifying LSE and seeks to conclude, based on research and analysis, whether Stage 2 Appropriate Assessment is

required. In order to identify LSE, the following information is gathered:

- Relevant European Sites, including citations, boundaries and known threats and pressures.
- Baseline ecological data relating to the Site.
- Proposed development characteristics (including both construction and operational detail).
- Potential pathways to LSEs, based on ecological principals.
- Potential pathways to LSEs are then considered for each European Site, drawing on data collated during Stage 1. Applying the precautionary principle, 'likelihood' is determined.

**3.9** Each task is detailed further below.

### Identification of European Sites

**3.10** European Sites within 500m of the Scheme are identified for consideration within the Screening Assessment. The qualifying features and conservation objectives of relevant European Sites, together with current pressures and potential threats were established using the sources described below.

### Baseline Ecological Data

**3.11** A suite of ecological baseline surveys was undertaken by LUC in relation to the Scheme in June 2023. This included desk study, Phase 1 habitat and protected species surveys. Surveys were undertaken in line with best practice guidelines. A summary of this data is provided in the accompanying Ecological Appraisal.

### Proposed Development Characteristics

**3.12** Drawing on information presented in wider notification documents, relevant aspects of the Scheme's construction and operational parameters are identified. These include design features, such as the location of infrastructure; construction methods and timescales, such as habitat removal or the use of heavy plant; and operational parameters, including maintenance requirements. It is noted that, at this stage of the notification process, full Scheme design details are not available.

<sup>1</sup> Available at <https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9003061.pdf>

<sup>2</sup> NatureScot. Advice to planners and Developers. Available at: <https://www.nature.scot/professional-advice/planning-and-development/natural-heritage-advice-planners-and-developers/planning-and-development-protected-areas> [Accessed March 2024].

<sup>3</sup> NatureScot. Online HRA Guidance. Available at Habitats Regulations Appraisal (HRA) | NatureScot [Accessed March 2024].

<sup>4</sup> NatureScot. SiteLink website. Available at: <https://sitelink.nature.scot/home> [Accessed March 2024].

<sup>5</sup> Data request via BTO website. Data for Clyde Estuary Sector 6 – Dunglass Castle to Dumbarton Rock.

### Potential Pathways to LSEs

**3.13** Generic potential pathways to LSEs have been identified, drawing on generic ecological principals of good management in aquatic environments. It is therefore considered that there is potential for the Scheme to result in LSE via the following effect pathways:

- Physical damage/loss of habitat through
  - direct habitat loss.
  - via run-off/pollution.
- Physical disturbance and/ or mortality of qualifying features.
- Non-physical disturbance (noise, vibration, and light).
- Reduction in water quality (via pollution or sedimentation).

### Identifying Effect Significance

**3.14** Good practice guidance<sup>6</sup> highlights that the identification of LSE should be 'relatively quick and straightforward.' The identification of any pathway or connectivity between a plan or project and a European Site is sufficient to require further investigation through Stage 2 Appropriate Assessment.

**3.15** A risk-based approach involving the application of the precautionary principle is adopted in the Screening Assessment, such that a conclusion of 'no significant effect' will only be reached where it is considered 'obviously' very unlikely, based on current knowledge and the information available, that the Proposed Development would not have a significant effect on the integrity of the European site.

**3.16** Relevant case law helps to interpret when effects should be considered as being likely to result in a significant effect. In the Waddenzee case, the European Court of Justice ruled on the interpretation of Article 6(3) of the Habitats Directive including that:

- An effect should be considered 'likely', "if it cannot be excluded, on the basis of objective information, that it will have a significant effect on the site" (para 44).
- An effect should be considered 'significant', "if it undermines the conservation objectives" (para 48).
- Where a plan or project has an effect on a European Site "but is not likely to undermine its conservation objectives, it cannot be considered likely to have a significant effect on the site concerned" (para 47).

### Stage 2: Appropriate Assessment

**3.17** Where LSE are identified, they are further assessed via detailed scientific interpretation through an Appropriate Assessment. At this stage, an effect likely to adversely affect the integrity of relevant European Sites is considered. An effect may be adverse to the integrity when it has potential to:

- Cause delays to achieving the conservation objectives of the European Site.
- Interrupt progress towards achieving the conservation objectives of the European Site.
- Disrupt those factors that help to maintain favourable condition of the European Site.
- Interfere with the balance, distribution and density of key species that are the indicators of favourable condition of the European Site.
- Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the European Site functions as a habitat or ecosystem.
- Change the dynamics of relationships that define the structure or function of the European Site (e.g. relationships between soil and water, or animals and plants).
- Interfere with anticipated natural changes to the European Site.
- Reduce the extent of key habitats or the population of key species.
- Reduce the diversity of the European Site.
- Result in disturbance that could affect the population, density, or balance between key species.
- Result in fragmentation.
- Results in the loss of key features.

**3.18** In the Appropriate Assessment baseline is interrogated alongside pathways, within the context of each European Site's Conservation Objectives, ultimately concluding whether effects may be adverse to each site's integrity.

<sup>6</sup> NatureScot. Online HRA Guidance. Available at Habitats Regulations Appraisal (HRA) | NatureScot [Accessed March 2024].

# Chapter 4

## Stage 1: Screening Assessment

### Identification of European Sites

**4.1** Two European Sites were identified within 500m of the Scheme. They share broadly similar boundaries with each other, and with the Inner Clyde Estuary SSSI. Given their overlapping boundaries and almost identical qualifying features, the sites are treated as a 'complex.' **Table 4.1** provides key features of the complex while **Figure 1, Appendix A** shows their spatial arrangement in relation to the Scheme.

**Table 4.1: Designated Sites within 1km of the Site**

Site Name	Designation	Approximate Distance and Orientation from the Scheme	Qualifying Feature(s)
Inner Clyde Estuary	SPA Ramsar SSSI	The proposed Coastal Embankment in its entirety is less than 50m from the northern edge of the designation complex. At its eastern edge, the Coastal Embankment impinges approximately 30m into the designated area.  The proposed outlet of the proposed food relief culvert is similarly located within the designation complex.	Non-breeding (wintering) populations of: <ul style="list-style-type: none"> <li>■ Redshank (<i>Tringa totanus</i>)</li> <li>■ Cormorant (<i>Phalacrocorax carbo</i>)</li> <li>■ Eider (<i>Somateria mollissima</i>)</li> <li>■ Goldeneye (<i>Bucephala clangula</i>)</li> <li>■ Oystercatcher (<i>Haematopus ostralegus</i>)</li> <li>■ Red-breasted merganser (<i>Mergus serrator</i>)</li> <li>■ Red-throated diver (<i>Gavia stellata</i>)</li> </ul> Other features <ul style="list-style-type: none"> <li>■ Saltmarsh habitat</li> </ul>

### Scheme Characteristics

**4.2** In considering the components of the Scheme as they relate to the Inner Clyde Estuary SPA/Ramsar/SSSI complex (the Inner Clyde), it is important to note that:

- While the notification boundary associated with the Site is large, the physical footprint of the Scheme within Gruggies Burn is limited.
- Detailed design, including the requirements for vegetation removal, construction methods and construction timescales are yet to be determined.
- The Scheme seeks to reduce the severity of flood events along Gruggies Burn. In doing so, it is anticipated that

Gruggies Burn will become a more stable environment, with associated benefits for the ecosystem's structure and function. This is relevant as improved ecosystem stability will reduce catastrophic flooding events and the associated discharge of mobile sediment and, potentially, pollutants, to the Inner Clyde.

- Hydraulic and Hydrological modelling, described in the notification documents, demonstrates that current coastal processes will not be significantly affected by the implementation of the Scheme.

**4.3** Within this context, there are two important elements of the Scheme:

- The tidal embankments will require development immediately adjacent to the Inner Clyde for much of its length. A small section of the tidal embankment will fall within the northern edge of the designated area.
- The flow diversion culvert outfall will be constructed within the northern edge of the Inner Clyde, albeit that its footprint is likely to generally replace existing culvert infrastructure at this location with a localised embankment to the existing rail bridge to remove a flood route northwards.

### Potential Pathways to Likely Significant Effects

4.4 Potential impacts on the Inner Clyde are expressed in terms of the SPA's Conservation Objectives<sup>1</sup>. For example, where the Conservation Objective states that *the extent and quality of habitat will be retained and protected from loss and protection*, an impact would subsequently arise from the loss or damage. **Table 4.2** identifies these potential impacts, the pathways by which they might be realised, and how these pathways may arise from the Scheme.

Table 4.2: Impact Pathways and Proposed Scheme Activities

Impact on Qualifying Features	Impact Pathway	Scheme Activity
Physical damage/loss of habitat via direct habitat loss and/or run-off/pollution	<ul style="list-style-type: none"> <li>■ Direct habitat loss or damage through construction activity.</li> <li>■ Degradation of habitat quality, connectivity, or diversity as a consequence of pollution event during construction activity.</li> <li>■ Spread of invasive non-native species.</li> </ul>	<ul style="list-style-type: none"> <li>■ Construction of the tidal embankments and flow diversion culvert outfall within the Inner Clyde.</li> <li>■ Potential pollution event arising from construction activity (construction fuels, chemicals etc.).</li> <li>■ Works in areas affected by invasive non-native species.</li> </ul>
Physical disturbance and/ or mortality and non-physical disturbance (noise, vibration, and light)	Physical disturbance and/or mortality: <ul style="list-style-type: none"> <li>■ Change in distribution of species in Inner Clyde as a consequence of construction activity.</li> <li>■ Loss of structure, function and supporting processes of supporting habitats as a consequence of habitat loss and/or degradation.</li> </ul> Non-physical disturbance: <ul style="list-style-type: none"> <li>■ Direct disturbance to species during construction activity.</li> </ul>	<ul style="list-style-type: none"> <li>■ Construction of the tidal embankments and flow diversion outfall within the Inner Clyde.</li> <li>■ Increased human and plant presence within and adjacent to the Inner Clyde during construction of the tidal embankments and flow diversion culvert outfall.</li> </ul>
Changes in water quality (e.g. pollution event or sedimentation)	<ul style="list-style-type: none"> <li>■ Direct loss of habitat</li> <li>■ Habitat fragmentation</li> <li>■ Disturbance of species</li> <li>■ Change in distribution of species and habitats</li> </ul>	<ul style="list-style-type: none"> <li>■ Increased human and plant presence within and adjacent to the Inner Clyde during construction of the tidal embankments and flow diversion culvert outfall.</li> <li>■ Proximity of plant to watercourses and subsequent potential for hydrocarbon and/or chemical spill.</li> </ul>

### Assessment of Likely Significant Effects

**4.5** Each impact type in **Table 4.2** could be experienced by each of the Inner Clyde’s ornithological qualifying features. While there is no saltmarsh habitat within the Scheme’s boundary, and therefore no pathway for physical damage/loss or physical disturbance, saltmarsh in the wider landscape could be affected by changes in water quality.

**4.6** In the absence of mitigation and protective measures, and in recognition of the requirement to apply the precautionary principle during Screening, it is considered that the Scheme activity listed in **Table 4.2** could be considered to represent LSE, requiring further investigation through Stage 2 Appropriate Assessment. **Table 4.3** summarises LSE.

**Table 4.3: European Sites Screening Assessment Summary**

Qualifying Feature	Potential Pathway to Impacts on Qualifying Features		
	Physical damage/loss of habitat	Physical disturbance and/or mortality And non-physical disturbance (noise, vibration, and light)	Changes in water quality (e.g. pollution event, sedimentation) and hydrological regime
River Tweed SAC			
Qualifying non-breeding bird species	LSE	LSE	LSE
Saltmarsh	No LSE	No LSE	LSE

## Chapter 5

### Stage 2: Appropriate Assessment

**5.1** The Screening Assessment considered the Scheme's design parameters, as they related to environmental protection. However, case law<sup>7</sup> dictates that the Screening Assessment cannot consider how LSE may be reduced through the implementation of mitigation.

**5.2** As established in the accompanying Ecological Assessment, embedded mitigation measures are an intrinsic part of the Scheme, while West Dunbartonshire Council has committed to further mitigation measures. In this chapter, mitigation measures, of relevance to the Inner Clyde, are summarised before potential effects identified through Screening are re-assessed against the European Site's Conservation Objectives.

### Mitigation

#### Embedded Mitigation

**5.3** The following mitigation measures embedded in the design process:

- Construction activity within the Inner Clyde will be minimised wherever possible.
- Vegetation removal will be minimised during construction and operational maintenance of the Scheme.
- Construction activity will adhere to a Construction Environmental Management Plan (CEMP). An outline CEMP has been prepared in support of the notification process. The outline CEMP sets out measures to ensure the water environment is protected and that biosecurity, particularly as it relates to invasive non-native species, is considered.

#### Further Mitigation

**5.4** In order that the Scheme achieves legislative compliance during construction, the following additional mitigation measures will be implemented.

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<sup>7</sup> NatureScot Guidance, available at The Handling of Mitigation in HRA [Accessed March 2024].

- An advisory Environment Clerk of Works (ECoW) will be appointed to provide ongoing compliance support during construction activity. The terms of the ECoW role will be agreed with West Dunbartonshire Council and their stakeholders in advance.
- Where measures cannot be provided in a manner that mitigates an LSE, as directed by the ECoW, works in, or within 50m, of the Inner Clyde will be completed between March and October (incl.) in any given year. Of particular importance, all piling works which exceed disturbance thresholds for an LSE will be completed within this window. The qualifying ornithological species of the Inner Clyde are unlikely to be present in qualifying numbers during this time.
- A comprehensive invasive non-native species management plan will be prepared prior to works commencing. The management plan will identify all necessary measures to prevent the accidental spread of plant material during the construction process and, where appropriate, seek to manage the further threat from invasive species.
- A pre-construction protected species walkover will be undertaken no more than 3 months prior to the commencement of works. In the event that protected species evidence is recorded, where necessary, the protected species licensing process will be implemented.

## Assessment of Adverse Effects

**5.5** The following assessment considers whether previously identified pathways could result in adverse effects on the integrity of the Inner Clyde, considering the application of mitigation. The assessment is set in the context that the Scheme is adjacent to a small section of the extensive Inner Clyde complex.

### Physical Damage/Loss of Habitat

**5.6** A small section of habitat within the Inner Clyde boundary will be lost to the proposed tidal embankments. The accompanying Ecological Appraisal highlights that, while within the footprint of the Inner Clyde, habitats to be lost comprise woodland/scrub and grassland, all of which is heavily disturbed by recreational use associated with the adjacent core path network. These habitats do not support the foraging requirements of the qualifying species of the Inner Clyde, i.e. no intertidal habitat is present, nor do they support saltmarsh. As such, there will be no reduction in the extent of habitat essential to the integrity of the Inner Clyde. Similarly,

the footprint of the proposed flow diversion culvert outfall is largely located within existing infrastructure.

**5.7** In relation to damage as a consequence of pollution, construction of the Scheme will be subject to the provisions of a CEMP, an outline of which has been provided with the notification documents. Subject to the successful implementation of the CEMP, the risk of pollution events is minimised.

**5.8 Therefore, there is unlikely to be an adverse effect on the integrity of the Inner Clyde as a result of physical damage/loss of habitat.**

### Physical Disturbance and/ or Mortality and Non-Physical Disturbance

**5.9** West Dunbartonshire Council has committed to delivering all works in, and within 50m, of the Inner Clyde that cannot be mitigated to avoid an LSE between March and October (incl.) in any given year. This sensitive timing of works will mean that qualifying species are unlikely to be present in qualifying numbers.

**5.10 As such, there is unlikely to be an adverse effect on the integrity of the Inner Clyde as a result of physical disturbance and/or mortality and non-physical disturbance.**

### Changes in Water Quality

**5.11** Notification documents have identified that coastal processes are unlikely to be affected by the implementation of the Scheme. Further, a comprehensive CEMP will be implemented, ensuring the water environment is protected throughout the construction process. Whilst not a mitigation measure, it is recognised that the Scheme seeks to manage flooding events, and their ability to introduce large volumes of sediment and, potentially, contaminants to the Clyde estuary.

**5.12 Consequently, there is unlikely to be an adverse effect on the integrity of the Inner Clyde as consequence of changes in water quality.**

## Conclusion

**5.13** This Shadow HRA has demonstrated that, in the absence of mitigation, the Scheme may result in Likely Significant Effects (LSEs) on European Sites. However, once mitigation measures are fully considered, as part of an Appropriate Assessment, it has been determined that there will be no adverse effects on the integrity of European Sites.

# Appendix A

## Figures

Figure 1: Inner Clyde Complex Spatial Arrangement



Figure 1: Inner Clyde SPA/Ramsar/SSSI Spatial Arrangement



- Site boundary
- 500m buffer
- Special Protection Area
- Site of Special Scientific Interest
- Ramsar site

0 100 200 m

Map scale 1:9,000 @ A3