FRAMEWORK AGREEMENT SCHEDULE 4

ORDER FORM/
WORK PACKAGE ORDER

FROM

Authority	Secretary of State for Environment, Food and Rural Affairs
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Contact Ref:	[redacted]
Order Number	Ecm_56474
Order Date	

TO

Contractor	University of Gloucestershire
For attention of:	[redacted]
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1. SERVICES REQUIREMENTS

(1.1) Services and deliverables required:

The **Key Objectives** of the project are to assess;

1. how effective Agri-Environment Schemes (AES) have been in terms of protecting the interest features of the current coastal & floodplain grazing marsh in accordance with the existing habitat definition

and

2. if and how AES have been used to contribute towards improving natural floodplain functioning in line with the proposals set out to develop a new definition for this habitat as floodplain wetland mosaic**.**

To be able to undertake the assessment in relation to (1) it is necessary to review the existing coastal & floodplain grazing marsh inventory to clarify to what extent the 'areas of highly important refuges for wetland wildlife' are within, or outside of, the HLS target area and to recommend any changes to the boundary of this.

This is a desk-based assessment and no field work will be required. Task 3 will involve assessments through the use of a series of case studies covering a range of

issues that may affect the way the AES has been used to both protect the existing value and enhance the potential for improving natural functioning of this habitat. These case studies will require consultation with land managers.

Main Outputs:

- **A draft map of highly important refuges for wetland wildlife as a GIS shape file with relevant attributes identifying highly important refuges for wetland wildlife under AES inside and outside of schemes and their relationship to the current HLS target area. A report on the methodology used to prepare the map.**
- **A report outlining the methodology, assessment criteria and results/conclusions of the assessments including all relevant spreadsheets and/or data bases used plus a series of at least 3 short case study reports outlining the issues covered and the results of investigations with any conclusions or recommendations.**

Background

This extensive background to the project ensures that the project is seen within the broader context of work on coastal and floodplain grazing marsh. It covers key species groups found in coastal and floodplain grazing marsh, such a birds, plants, invertebrates and fish. It also reviews approaches to managing coastal and floodplain grazing marsh and the role of AES.

The current *Biodiversity 2020* strategy has inherited all its 'priority habitats' from the UK BAP programme, as enshrined in the NERC Act (2006). This includes *Coastal and floodplain grazing marsh*. Unlike most other priority habitats, coastal & floodplain grazing marsh is defined through a combination of landscape and biological characteristics. These latter are often compartmentalised into 'wet grassland for birds', 'floodplain grassland of botanical interest', and 'ditches with botanical or invertebrate interest'. (See Annex 1 for JNCC habitat definition and section 3 below for more details on the current interest features of this habitat).

By definition coastal and floodplain grazing marsh is also a partially drained version of a more naturally functioning wetland system, freshwater or coastal. It has been interpreted essentially as a cultural landscape, where managed water levels retain one or more features – or at least some of the wildlife – of the pre-existing floodplain. The developing *Biodiversity 2020* programme uses these 'priority habitats', as mapped on NE's Habitat Inventory, as the basis for setting targets for key Outcomes. The priority habitats as mapped on the Inventory are also used by NE in a range of Regulations functions.

There is about 218,180 ha mapped on the latest version of NE's Habitats Inventory (post Single Habitat Layer project). However sites currently identified within the

inventory are based on work undertaken in 1993 to map the extent of wet grassland. This work involved the collation of existing data sets some of which originate from the 1970s. Much of what appears in the inventory do not conform to the JNCC definition. There are extensive areas that, although falling within the floodplain and periodically inundated during periods of flood, do not retain sufficiently high water levels throughout the year. Little of the area within the inventory now supports breeding waders, overwintering wildfowl or ditches of high ecological value. Recent studies suggest that approximately half of the area included within the inventory was of extremely low wildlife value and actually should have been mapped as, or considered for restoration to, another priority habitat such as lowland fen and reedbed[1].

Issues

This has resulted in two key problems for Natural England.

- Due to a combination of the habitat definition and the data sources available, the mapping included on NE's Habitat Inventory includes substantial areas of low lying drained ground, admittedly still under grass, that are currently of low biodiversity value. Currently, it is not possible in many cases to distinguish areas of high biodiversity value from low value areas.
- Within the context of restoring degraded ecosystems, and in particular restoring functionality and resilience to wetlands, coastal & floodplain grazing marsh will often be a constraint.

Given the composite nature of coastal & floodplain grazing marsh as a priority habitat, it also begs the question of what is to be delivered through a coastal & floodplain grazing marsh target for restoration or creation. And it begs the question of what 'favourable condition' of coastal & floodplain grazing marsh looks like.

It is crucial that the problems outlined here are not seen narrowly in agri-environment targeting terms. They cut across a whole range of NE programmes – for example, reconnecting rivers to their floodplains, lowland peatland restoration, and coastal realignment, all of which contribute significantly to ecosystem services and climate change adaptation, mitigation and resilience.

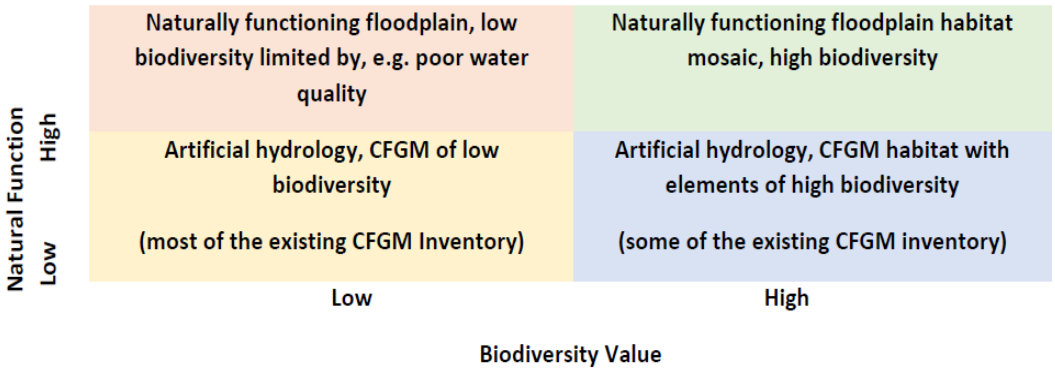
To address this NE is undertaking a range of work to help understand the issues, constraints and opportunities that need to be taken into account when formulating the definition of this habitat and/or developing a new priority habitat that allows for greater natural functioning whilst also retaining the existing biodiversity interest supported within the existing inventory. The approach is outlined in a conceptual fashion below.

More detailed explanation of the biodiversity importance of developing natural ecosystem function can be found in Natural England Research Report 071

[1] The Wetland Potential of Sussex, Sussex WT, 2012 & An assessment of habitat condition of coastal and floodplain grazing marsh within agri-environmental schemes, Philip Dutt, RSPB, November 2004.

'Generating more integrated biodiversity objectives' and in Natural England Research Report 064 'A narrative for conserving freshwater and wetland habitats in England'.

Conceptual Model of Change in Approach



Annex 3 contains the most comprehensive paper presented to the Terrestrial Biodiversity Group in relation to this issue and further information relating to this is also covered in section 2.6. It is important to understand how the identification of important biodiversity refugia (Annex 2) that forms part of this contract fits into the wider picture and overall desire for change to the definition of this habitat.

Current interest features of Coastal & floodplain Grazing Marsh

Wet grassland for birds

The following five breeding waders in England are the most widespread: Lapwing *Vanellus vanellus*, Redshank *Tringa totanus*, Curlew *Numenius arquata,* Snipe *Gallinago gallinago* and Oystercatcher *Haemotopus ostralegus.* Most of which have experienced long term declines and are UK Birds of Conservation Concern. It appears that these species are now breeding on fewer sites than ever before with increased declines across the countryside. The results from a survey of breeding waders on lowland wet grassland suggest that numbers continue to fall and that waders fare better on land under Higher Level Stewardship, in particular where this is deployed on nature reserves and SSSIs. NE/RSPB research in 2009 and 2010 and (Smart, Wotton et al. 2014) found that fields under wader-specific AES management (principally HK9-14) were significantly more likely to support breeding waders than non-AES fields and fields with AES not targeted on waders. This effect was stronger when these fields were on nature reserves or formed part of SSSIs. Most importantly, the survey found that HLS was the best performing of the AE schemes in terms of field occupancy. In addition, fields in nature reserves that had gained AES since 2002 (ie mostly entered into HLS) had significantly better population trends than fields in nature reserves that had no AES or had been in AES since before 2002. It should be noted that these effects were observed against a back-drop of continuing declines in breeding waders on lowland wet grassland, nationally.

Ditches with botanical or invertebrate interest

Stewart J. Clarke's article 'The value, status and management of high quality ditch systems' provides an overview of the current position regarding ditches within coastal & floodplain grazing marshes stating that "*Ditches currently have an important role as refugia for a number of aquatic species which would have previously been more widespread and associated with natural waterbodies. A catchment scale approach to freshwater management and conservation, arguably the freshwater equivalent of a landscape-scale approach, is likely to be the only way in which the coastal and inland challenges for freshwater biodiversity can be reconciled. Such an approach would include: an emphasis on habitat restoration and creation throughout the catchment; the reinstatement of natural processes, which aid species dispersal and create appropriate conditions (Amoros & Bornette, 2002) and coastal management strategies which accommodate any freshwater interest and allow upstream migration*".

The Buglife report 'The ecological status of ditch Systems', 2010 provides a clear account of the importance of the ditch systems of grazing marshes for invertebrates and Plantlife have also identified Important Plant Areas which identify sites that support important plant species that will overlap with areas of coastal & floodplain grazing marsh.

Natural England has prepared a number of reports on catch dykes (http://publications.naturalengland.org.uk/publication/5591497627402240) with some case studies including; Remedial Works for the Catch Dykes at Ebb and Flow Marshes (NECR240) and Remedial Works for the Catch Dykes at Decoy Carr, Acle (NECR239) which may provide some useful information relating to the management of ditches.

The AES has some specific options for the management of ditches of very high environmental value (HB12, HB14, WT3) to help sensitively manage ditches of high environmental value that support target species of plants, birds, mammals and insects, or are essential to the delivery of the wet grassland and wetland options. In addition the CS options for buffering ponds (WT2) has been extended to also include buffering of ditches.

Fish

Naturally functioning freshwater water habitats provide both the physical and chemical conditions required by aquatic species, allowing them to thrive in a water body. The fish community is a result of this interaction between the biotic and abiotic environment. However, fish are also a key element of the freshwater fauna, with the ability to greatly influence habitat structure and function. In addition, the fish assemblage may also have been greatly modified by anthropogenic factors such as

the stocking of both non-native and locally non-native species, together with excessive fish biomass. When these factors are taken into account the guiding principle for Natural England's freshwater fish community vision is "*to support a balanced, self-sustaining, native fish community, representative of a particular type of freshwater habitat*"

Whilst not specifically mentioned within the habitat definition it is recognised that some species of fish will use marshland dykes. ENRR244 suggests that spined loach is a species that may occur within ditches of areas identified as coastal & floodplain grazing marsh and therefore this species also needs to be considered. On the same basis it may be wise to also consider the implications for European eels and Burbot.

Other priority habitats within the floodplain

The current definition for coastal & floodplain grazing marsh incorporates areas of seasonal water-filled hollows and permanent ponds with emergent swamp communities, but not extensive areas of tall fen species like reeds; although they may abut with fen and reed swamp communities. We recognise that outside of the current inventory, but within the floodplain, there will be a range of other priority habitats such as; fens, wet woodland, reedbeds, saltmarsh and species rich meadows (floodplain meadows). An assessment of the biodiversity value of these areas that are outside the current boundary is beyond the scope of this contract although it would be beneficial to the overall project to identify any sites supporting these habitats that are not currently shown on the PHI if this is possible. In addition, it may be that some areas of the current coastal & floodplain grazing marsh inventory may be identified as supporting floodplain meadow or be under restoration to floodplain meadow and it would be advantageous to check this with the Floodplain Partnership who have a data base of such sites.

Working with Natural Processes (WWNP)

WWNP aims to protect, restore and emulate the natural functions of catchments, floodplains, rivers and the coast. The WWNP Evidence Directory presents flood risk management practitioners and other responsible bodies easy access to information which explains 'what we know' and 'what we don't know' about the effectiveness of a range of different measures from a flood risk and ecosystem services perspective. This includes proposals for floodplains and floodplain wetlands which it suggests can be restored or created to store large volumes of water for flood risk and ecological benefits. Floodplain restoration aims to restore the hydrological connection between rivers and floodplains so that floodwaters inundate the floodplains and store water during times of high flows. This can involve removing flood embankments and other barriers to floodplain connectivity.

For floodplains generally the report considers that overall there is a significant benefit for biodiversity providing a habitat for waders, wildfowl and fish; although river & floodplain restoration may not benefit all species e.g. breeding waders such as snipe (Smart et al. 2008) it is perceived as being generally beneficial for a wide range of biodiversity features in different ways and full river reconnection is likely to offer maximum benefits, providing a range of habitat wetland features and continuity for migration.

With introduction of Countryside Stewardship other options have been introduced that seek to introduce more natural functioning such as 'making space for water' (SW12). It is intended to help water flow in a winding course across floodplains, flooding temporarily to restore river and wetland habitats. This will also reduce the risk of high energy flows and soil erosion, and allow water to drain freely back into the river channel. If successful there will be:

- new areas of river and wetland habitats appearing, such as new channels, temporary ponds in old channels and wet grassland
- gradual erosion and movement of the river bed and river banks
- deposits of gravel, sand and silt appearing in the river channel and on the floodplain after a flood

Taking more of an ecosystem approach

NERR024 'Managing for species: Integrating the needs of England's priority species into habitat management' recommends that for BAP species conservation to be properly integrated into habitat-based approaches we need to place much greater emphasis on creating the component niches and resources required by these species, rather than managing habitats in a generic way. The report provides a detailed assessment of the species requirements for coastal & floodplain and grazing marsh across different taxonomic groups and identifies 47 UK BAP/Section 41 species associated with this habitat. The list of species consists largely of vascular plants, invertebrates and vertebrates and that there are relatively few restricted or very restricted species associated with this habitat. The report concludes that;

- Coastal and Floodplain Grazing Marsh is a land use-rather than a distinct habitat and is therefore difficult to assess due to its highly variable character. The species that are found within the ditches include both those of lowland wetlands (mainly fens) and those of ponds, whereas the infield species are primarily associated with terrestrial grasslands.
- Those species associated with ponds tend to use grazing marsh ditches in early succession (often having been recently dredged). These lack vegetation and, if the fields are grazed, have low-lying shelves which provide shallow water and a drawdown zone very similar to ponds.

- Species associated with fens tend to use ditches with more established, late-successional vegetation (equivalent to linear fens"). The more restricted species are also dependant on high water quality.
- Grazing marsh management should seek to maximise ditches in varying states of succession from completely open to fully vegetated. Some should therefore be on long-rotational management to encourage the development of late successional habitats.

NERR071 sets out the rational, principles and practice around generating more integrated biodiversity objectives and at page 50 considers the issues for coastal & floodplain grazing marshes. It states that;

- Large and heavily developed river and coastal & floodplains are amongst the most difficult areas in which to restore natural function. However, even in these landscapes there are opportunities for limited restoration of some natural processes to the benefit of characteristic habitat mosaics and the species they support.
- In some cases, large-scale change is being increasingly considered on river and coastal & floodplains due to the over-riding difficulties of defending land from flooding in the face of climate change. In these instances restoration of natural ecosystem function can be contemplated on a larger scale.
- Prioritising restoration measures along these lines risks ignoring the importance of more agriculturally developed land that has provided (and still provides) refuge for species whose natural habitats have been eliminated from the landscape. We need to ensure that such habitats continue to fulfil their role as a refuge for displaced species, whilst at the same time ensuring that they do not unduly obstruct the restoration of more naturally functioning habitat mosaics where this is practicable. In larger landscapes it is possible to zonate restoration areas whilst safeguarding some artificial refugia, for instance, part of a grazing marsh system could be restored to natural hydrological function by in-filling ditches, whilst areas of adjacent grazing marsh could be retained to maintain species populations and provide colonists to restored areas.

Assemblages and Niche requirements

Any assessment of biodiversity value cannot be complete without some assessment of the species assemblage. A large number of the invertebrate and plant species on the Section 41 priority species list are associated with open freshwater habitats and related wetlands (See NERR024 for more detail). Buglife's manual for the survey and evaluation of the aquatic plant and invertebrate assemblages of grazing marsh ditch systems provides a guidance on the use of metrics for evaluating the nature conservation value of plant and invertebrate assemblages of grazing marsh ditch systems. Table 2 of their report provides a check list and scoring system for target native aquatic invertebrates of grazing marsh ditches in England and Wales. In addition to this Pantheon is an analytical tool developed by Natural England and the

Centre for Ecology & Hydrology to assist invertebrate nature conservation in England. This database provides details of the habitat preferences of over 2,800 invertebrate species associated with all types of freshwater wetlands. It holds all the latest conservation concern status values for the inverts, as well as the defined assemblage affiliations, and can provide a species quality index score for the whole sample.

Important Areas

We are aware that a number of organisations are identifying important areas for their specific taxa, e.g. Important Bird Areas, and are preparing maps of 'Important Areas' relevant to their taxonomic interest, this includes Plantlife Important Plant Areas, Buglife Important Invertebrate Areas, and work by the Freshwater Habitats Trust to identify Important Freshwater Areas. Apart from the use of the Plantlife's work on stoneworts, the value of these assessments in terms of identifying areas of importance for coastal & floodplain grazing marsh remains untested. However the methodology used in the assessments may provide some guidance to the scale and details of the data required to provide a nationally comprehensive picture.

Managing change at the coast

For coastal locations that support floodplain grazing marsh it is important to bear in mind that a series of broad principles concerning the management of change at the coast, agreed by English Nature in 2006 (Annex 6), included advice about flood risk management options affecting designated features currently landward of defence structures. This seeks '*To improve the quality of environmental land and sea management through the development and adoption of sustainable practices, taking account of the impact of climate change'.* The principles includes taking account of the impacts of relative sea level rise and more frequent extreme storm events which are predicted to affect the coastal flood plain, including intertidal, brackish and freshwater habitats and associated species assemblages.

There is a need for coastal management strategies to enable longer-term adaptation to coastal change over the next 50 to 100 years. This is more likely where these features are behind man-made sea defence structures near the end of their operational life or technical limitations meant that the current standard of defence cannot be maintained. In some circumstances increasing tidal inundation of such features is acceptable as a form of 'natural change'; in others adapting to coastal change means that it may not always be possible to conserve the same mosaic of habitats and species in the same places. Where this is the case, the aim should be to develop and sustain diverse coastal and wetland ecosystems of comparable wildlife value through habitat replacement programmes.

Agri-environment Scheme (AES)

Unlike many of the priority habitats there is no specific AES option to manage this particular habitat. It is however recognised as a feature within the BETHA[2] handbook as 'G15', termed as 'periodically flooded pastures or meadows, with ditches that maintain the water levels, containing brackish or fresh water', also stating that the ditches are often especially rich in plants and invertebrates and that almost all areas are grazed but some are cut for hay or silage. It recognises that other features, such as grassland for breeding and wintering birds (G12 and G13 respectively) are also likely to be present (see BEHTA handbook pages 91 & 92) and that wet ditches (feature F01) should also be recorded where they are present (see BEHTA handbook page 50) should be recorded if present. The main grassland is often not very species-rich, but some areas may support other priority Habitats such as G06 - Lowland Meadows, G07, Purple moor-grass and rush pastures and W04, Fens (see BEHTA handbook keys 2a and 2b). In addition it states that land currently under arable in the flood plain, but with potential to be restored to G15, should be identified as A01 on the pre-populated BEHTA map, but with its potential recorded in the notes column (see BEHTA handbook Section 1.5.10).

Because this habitat lacks a specific option there are a wide range of options used to manage the variety of features associated with the habitat, the main options are HK9, HK10, HK11, HK12, HK13, HK14 but others such as HK6, HK7, HK8, , HK15, HK16, HK17, HB14, HQ6, HQ7 may also be used. Of note is the fact that Natural England Commissioned Report NECR114 'Monitoring the outcomes of Higher Level Stewardship: provides the results of a 3-year agreement monitoring programme', which includes areas of coastal & floodplain grazing marsh, identified that HJ6 (Preventing erosion or run-off from intensively managed improved grassland) had also be widely used on this habitat stating that the targeting of priority habitats by resource protection options is largely a consequence of the Coastal & floodplain and Grazing Marsh Priority Habitat being defined as a landscape type rather than on the basis of the vegetation communities present. Hence, improved grassland, as here, is found on Coastal and Floodplain Grazing Marsh and is appropriately managed under option HJ6, preventing erosion or run-off to the incorporated network of watercourses. A range of other capital items will also be used on this habitat such as WN2 (Creation of scrapes and gutters), WN3 (Ditch, dyke and rhine restoration), WN4 (Ditch, dyke and rhine creation), SP2 (Raised water level supplement) and SP9 (Threatened species supplement).

[2] Baseline Evaluation All Higher Tier agreements on agricultural land will require a survey of their starting condition against which progress towards achieving environmental outcomes, via changes in condition or feature extent, can be measured in later years. This is known as a Baseline Evaluation of Higher Tier Agreements (BEHTA). Access to all the internal guidance for the CS and ES scheme will be provided to the successful consultants.

Targeting AES Intervention

Targeting areas for the restoration and recreation of coastal and floodplain grazing marsh English Nature Research Reports No. 332 and Methods for targeting the restoration of grazing marsh and wet grassland communities at a national, regional and local scale provides some historical background to the provides some of the background to the development of the original coastal & floodplain grazing marsh inventory and early BAP targeting for this habitat. More recently under the Biodiversity 2020 Strategy targets were set for this habitat including bringing 90% of the existing habitat into favourable management and the creation or restoration of an additional 15,000ha to be established outside the current inventory.

Objectives

The **Key Objectives** of the project are to assess;

1. how effective Agri-Environment Schemes (AES) have been in terms of protecting the interest features of the current coastal & floodplain grazing marsh in accordance with the existing habitat definition

and

2. if and how AES have been used to contribute towards improving natural floodplain functioning in line with the proposals set out to develop a new definition for this habitat as floodplain wetland mosaic**.**

To be able to undertake the assessment in relation to (1) it is necessary to review the existing coastal & floodplain grazing marsh inventory to clarify what extent the 'areas of highly important refuges for wetland wildlife' (Annex 2) are within, or outside of, the HLS target area and to recommend any changes to the boundary of this.

Tasks and Requirements

To achieve these objectives the following tasks are proposed.

Task 1 – The key question to determine within this task is the current extent of biodiversity interest within the current priority inventory. To answer this requires the development of a national map of highly important refuges for wetland wildlife identifying those areas under AES agreements and those not under a scheme and those within and outside the current HLS target area. This will be a desk based exercise using the best available data. No field work is to be undertaken. This may be divided into the following sub-tasks;

- Agree assessment criteria for identifying highly important refuges for wetland wildlife. As part of this task the successful contractor will need to prepare draft criteria for sign-off by the Project Steering Group.

- In agreeing the definition for highly important refuges for wetland wildlife the successful contractor will need to identify a set of important features and species relevant to this habitat. In preparing this list we require, where information is available, to identify which of these features and species may be more easily retained by changes towards a more naturally functioning floodplain and hydrology.
- Agree data sets to be used in the assessment – It is the responsibility of the successful contractors to identify a full list of data that will be used in this assessment following consultation with the Project Steering group. The data used must not restrict the use of the final product/map for use externally and therefore ideally should be open data. A list of some NE data sets is available in Annex 5, this is not to be considered as the definitive list of data to be used and it is anticipated that the consultants will consider the use of additional data sets from other sources.
- Agree boundary for mapping the areas of highly important refuges for wetland wildlife. It is currently proposed that the assessment will be restricted to the existing coastal & floodplain grazing marsh boundary as outlined on the latest version of the PHI. However, if this is agreed then it would be advantageous if additional areas of this habitat identified outside of the inventory could also be included if possible.
- Agree parameters and framework for the assessment including the scale and level of detail required and attributes to be recorded.
- Prepare map identifying highly important refuges for wetland wildlife identifying those areas under AES agreements and those not under a scheme and those within and outside the current HLS target area. It is envisaged that this will be a single layer with multiple attributes that can be selected to provide a range of outputs.

Output: A draft map of highly important refuges for wetland wildlife as a GIS shape file with relevant attributes identifying highly important refuges for wetland wildlife under AES inside and outside of schemes and their relationship to the current HLS target area. A report on the methodology used to prepare the map.

Task 2 – The key question to determine under this task is how effective is the AES in conserving the existing biodiversity value of coastal & floodplain grazing marsh (as currently defined) and how effective has the current HLS target area been in targeting delivery. This may be divided into the following sub-tasks;

- Agree which AES options & capital items to be used in the assessment – some of the main options are outlined in section 2.9.
- Agree evaluation criteria and assessment process to be used – the criteria for evaluation need to take account that this is a desk based exercise. It would be

advantageous to include within the assessment a comparison between designated (SSSI) sites and non-designated sites.

- Use the data and information collated to develop the map prepared in Task 1 to assess how effective AES has actually been in terms of conserving and enhancing the current interest features of coastal & floodplain grazing marsh. It is anticipated that this will be carried out in two parts, the first is a national, desk based assessment using the best available data providing some general conclusions as no field work is to be undertaken. The second part of the assessment will be through the use of case studies as outlined in Task 3 below.

Output: - The output of this assessment will be captured in the output described in Task 3

Task 3 – Drawing on evidence from at least 5 of case studies the key questions for this task is to identify how successful;

(a) the current AES has been used to maintain the existing wildlife value of the coastal & floodplain grazing marsh, as per the existing habitat definition. This is a continuation of the assessment outlined in Task 2 above but is likely to be a more detailed assessment as outlined in the sub-tasks below, and

(b) the current AES has been in terms of helping to restore natural floodplain functioning that could help towards delivering floodplain wetland mosaics.

This may be divided into the following sub-tasks;

- Agree case study sites and issues to be investigated within each of each study area (see below).
- Agree which AES options & capital items to be used in the assessment
- Agree evaluation criteria to be used. It would be advantageous to include within the assessment a comparison between designated (SSSI) sites and non-designated sites.
- Agree assessment process. It is anticipated that as part of the assessment a consultation exercise with land managers and advisers will be beneficial and therefore tenders need to include the proposed methodology and the anticipated scale of the consultation exercise. (Note: the costing for this aspect of the project needs to be identified separately to determine if sufficient funds are available).

Outputs:

- A report outlining the methodology, assessment criteria and results/conclusions of the assessments including all relevant spreadsheets and/or data bases used plus a series of at least 5 short case study reports outlining the issues covered and the results of investigations with any conclusions or recommendations. It would be advantageous to include within

the assessment a comparison between designated (SSSI) sites and non-designated sites.

Selection of case Studies

It is important that the case studies selected are geographically spread across the country and take account of as wide a range of features, species and functional issues as possible. The case study catchments should focus on a range of different hydrological and edaphic parameters and different pressures, e.g. peat versus clay soil dominated catchments, coastal versus inland, rural versus peri-urban, large versus small etc. It would be useful to include within at least one of these case studies a site that has this 'breeding waders of wet grassland on a retreating coastline' situation, perhaps including a specific nature reserve (see section 2.10).

Some examples of possible case study areas are listed below. For each case study we anticipate a short written report identifying the range of issues covered and the results of the investigations. The selection does not need to be limited to these but it is anticipated that the tender document will include some justification on the choice of case study locations.

Examples of Case Study Areas
Halvergate Marshes, The Broads
Avon Valley
Somerset Levels
Severn & Avon Vales
Suffolk Coast
River Eden
Lyth Valley
Poole Harbour
Cayton & Flixton Carrs (North Yorks
Lower Derwent Valley
Dearne Valley, South Yorks
North Kent Marshes/Thames Marshes,

Outputs

The outputs of this contract will be:

1. A comprehensive report pulling together all the individual outputs as listed above, to include an executive summary, drawing on the findings of the assessment and case studies
2. An GIS shape file identifying locations highly important refuges for wetland wildlife with relevant attributes
3. A '2-page summary' report, using format in attached Annex 4 'Summary Template' summarising the aims, outcomes and implications of the project, for use by policy colleagues, and other non-specialists.
4. All data and metadata collected during the survey and associated spreadsheets populated with data will be provided to Natural England/Defra at the completion of the project.
5. The contractor will present a webinar to the steering group and other invitees to present the findings and recommendations.

Reporting and milestones

[redacted]

Natural England requires the opportunity to comment on draft final reports. The appointed contractor will be responsible for ensuring both the quality of the work as well as the presentation of the material (e.g. proof reading, ensuring clear England). The appointed Contractor is also to be aware that Natural England requests acknowledgement in the publication (including oral presentations) of its funded research, and that the project manager is notified at least two weeks prior to publication. All reports should be provided in MS Word and PDF format.

The final report will be externally peer-reviewed (note: the contractor will be responsible for arranging peer-review by two appropriate reviewers, to be agreed with the Natural England project officer) and be suitable for publication as a Defra science

report. Tenderers should be aware that Natural England and Defra will publish final reports. The final report will be structured in a format that, if appropriate, facilitates rapid conversion into one (or more) papers suitable for submission to an appropriate peer-reviewed scientific journal.

Natural England is also happy to encourage widespread publication and welcomes the use of appropriate trade press, peer-reviewed journals, sector-specific journals and appropriate use of social media.

Note: If the findings of the work are deemed suitable, the contractor will aim to submit a manuscript to a peer-reviewed journal as soon as possible after completion of the report, co-authored by staff from the contractor and Natural England, as appropriate. A proposed timetable for submission of manuscript and publication timeline will be agreed with Natural England.

This project will be paid by achievement of milestones. However, not all milestones need to be associated with payment; and it may be appropriate to include additional milestones that are not related to payment but are used to indicate progress within the project. The frequency of milestone payments should be determined by the contractor, however, we request that they are appropriate and not at a frequency greater than every month.

Should a workshop be included in this project proposal; the milestone payments need to take into account of any associated costs to ensure that the successful contractor has sufficient funds to pay for any workshops costs in advance of the workshop. Defra will not be able to pay any venue hire or refreshments costs on behalf of the contractor.

Governance and Timescale

It is anticipated the contract will be awarded during week commencing 16 September 2019, and the data gathering and analysis will take place during the following 4 months. The contract must be completed by the end of March 2020 with the submission of the final report. Tenders should include a project plan detailing the activities required to complete the contract together with proposed milestones linked to invoice points.

Natural England will establish a steering group to oversee the contract. It is anticipated that the steering group will meet at least three times during the course of the contract at key points the project to be decided at the inception meeting. The Steering Group will also establish a reference group consisting of specialists and advisers to provide support and guidance.

Additional meetings via WebEx/Skype or teleconferencing are likely to be required at least monthly during the project.

The contractor will be responsible for writing up the notes from the steering group meetings. The project manager within Natural England will be Jeff Edwards, who will be the first point of contact within Natural England. The successful contractor must also appoint a project leader authorised to act on behalf of the contractor who will be responsible for the management and delivery of the project and will act as the liaison point with the NE project officer. The contract project leader will provide a short (no more than 1 page A4), written monthly progress note and any interim updates as necessary via catch up calls. The form of these updates will be agreed in the inception meeting.
As the project is being funded through the Rural Development Programme for England, there will be particular requirements around the submission of invoices, and the contractor will be required to supply supporting information on time used and expenses incurred with the invoice. This will be clarified at the inception meeting.

IPR and data sharing

All data resulting from this project, project documents, Intellectual Property Rights and other materials will be the property of Natural England.

Natural England will provide a preliminary list of agreement holders and advisors in the case study areas. The contractor will augment the list in the process of the stakeholder surveys to the requisite numbers. Data on AE options, ecological and climatic events are available externally.

All agreement information provided to the contractor for the purposes of this project, shall be kept securely, confidentially and disposed of at the end of the project. It must not be used elsewhere without prior consent. The supplier will be required to follow Natural England's data protection policy and only act on information provided under our instruction.

Any data collected will be made openly and publicly available, as per Natural England's Access to Information statement (http://publications.naturalengland.org.uk/publication/6430783876628480?category=5927398087327744)

Surveys

If a survey is to be undertaken as part of this study, approval will need to be gained from the Survey Control Liaison Unit (SCLU) in Defra. Any structured approach made by or on behalf of the Government in order to obtain aggregated data is classed as a statistical survey and should be referred to Defra's Survey Control Liaison Unit (SCLU). This also applies to customer satisfaction surveys.

Exceptions are:

- surveys addressed to respondents in central Government or its Agencies (e.g. staff surveys);
- surveys where the respondents select themselves without a direct approach from us, e.g. surveys carried out via a website;
- readership surveys where a questionnaire is sent out together with the material concerned;
- consultation exercises where there is an invitation to comment generally rather than a structured list of questions;
- surveys addressed to the general public (as opposed to ones which contact people in their business capacity). However, SCLU need to be advised so that the survey can be registered on the Department's record and included in the Annual Report to Ministers; and
- surveys to fewer than 25 respondents.

NE and Defra are strongly committed to minimising the burden they place upon businesses and local authorities. As a result proposals for new surveys must be assessed by the Survey Control Liaison Unit (SCLU). In order to undertake the survey of agreement holders, proposed as part of this project, approval will need to be gained from the SCLU. NE will make the initial application, but, following outline approval the successful contractor(s) will be required to provide a draft questionnaire to be agreed and approved. A period of at least 6 weeks should be built into the project plan to accommodate this survey approval process.

It is the responsibility of the supplier to ensure that the survey is provided in accordance with the time requirements of this project for SLCU approval

(1.2) Commencement Date: 01 October 2019

(1.4) Completion Date: 29 March 2020

2. PERFORMANCE OF THE SERVICES AND DELIVERABLES

(2.1) Key Personnel of the Contractor to be involved in the Supply of the Services

Chris Short will manage the project and will be the contractor's project leader (CPL)
Philip Staddon will act as a deputy project lead, supporting Chris in his role and acting as an alternative point of contact, should Chris be unavailable.
Dr Pete Gaskell will be assigned as the internal Quality Control lead

(2.2) Performance Standards

The report will be peer-reviewed as required in the specification provided as part of the Request for Quotation document.

(2.3) Location(s) at which Services are to be provided:

Project to be delivered nationally with some case study sites which will be selected in liaison with the Project Steering Group

(2.4) Standards:

The outputs of this contract will be:

1. A comprehensive report pulling together all the individual outputs as listed in the RFQ document, to include an executive summary, drawing on the findings of the assessment and case studies
2. A '2-page summary' report, using format in attached Annex 4 'Summary Template' summarising the aims, outcomes and implications of the project, for use by policy colleagues, and other non-specialists.
3. All data and metadata collected during the survey and associated spreadsheets populated with data will be provided to Natural England/Defra at the completion of the project.
4. A GIS shape file identifying locations highly important refuges for wetland wildlife with relevant attributes
    - **Data Format:** GIS data-layers in ESRI Shapefile format compatible with Arc 10.2.2)
    - **Resolution:** The level of detail required in the mapping should be compatible with that used in the PHI which is mapped to MasterMap polygons
    - **Data Structure:** A single data layer with polygons attributed in accordance with the project objectives with a confidence level attached if possible.
    - **Repeatability:** The GIS work needs to be repeatable to allow for update to the datasets e.g. following consultation – this may be done in Arc or FME
    - **Data sharing:** Ideally the outputs should be available as Open Data
    - **Methodology -** All GIS data sets should include a full description of the GIS methodology used to create it along with reference to all metadata and any specific reference to potential licence restrictions.
5. The contractor will present a webinar to the steering group and other invitees to present the findings and recommendations.
6. Any data collected will be made openly and publicly available, as per Natural England's Access to Information statement if at all possible (http://publications.naturalengland.org.uk/publication/6430783876628480?category=5927398087327744)

(2.5) Contract Monitoring Arrangements

For the avoidance of doubt the services required are being provided under Framework Agreement 22707.

3. PRICE AND PAYMENTS
(3.1) Contract Price payable by the Authority excluding VAT, payment profile and method of payment (e.g. Government Procurement Card (GPC) or BACS)) **£64,550.00** **For full pricing schedule, see Appendix 1** **Payable by BACS**
(3.2) Invoicing and Payment This project will be paid by achievement of milestones. However, not all milestones need to be associated with payment; and it may be appropriate to include additional milestones that are not related to payment but are used to indicate progress within the project. The frequency of milestone payments should be determined by the Supplier, however, we request that they are appropriate and not at a frequency greater than every month. The Supplier shall issue electronic invoices in arrears following completion of appropriate milestones.

4. Invoicing Requirements
All invoices should be sent, quoting a valid purchase order number (PO Number), to: Accounts-Payable.neg@sscl.gov.uk or Shared Services Connected Limited, PO Box 790, Phoenix House, Celtic Springs Business Park, Newport, Gwent, NP10 8FZ. Within 10 Working Days of receipt of your acceptance of this letter via Bravo, we will send you a unique PO Number. You must be in receipt of a valid PO Number before submitting an invoice. To avoid delay in payment it is important that the invoice is compliant and that it includes a valid PO Number, PO Number item number (if applicable) and the details (name and telephone number) of your Customer contact (i.e. Contract Manager). Non-compliant invoices will be sent back to you, which may lead to a delay in payment. If you have a query regarding an outstanding payment please contact our Accounts Payable section either by email to Accounts-Payable.neg@sscl.gov.uk or by telephone 0845 603 7262 between 09:00-17:00 Monday to Friday.

BY APPROVING THIS ORDER FORM THE CONTRACTOR AGREES to enter a legally binding contract with the Authority to provide to the Authority and natural England the Services specified in this Order Form, incorporating the rights and obligations in the Call-Off Contract that are set out in the Framework Agreement entered into by the Contractor and Defra on 25 October 2018.

Electronic Signature

Acceptance of the award of this Contract will be made by electronic signature carried out in accordance with the 1999 EU Directive 99/93 (Community framework for electronic signatures) and the UK Electronic Communications Act 2000. Acceptance of the offer comprised in this Contract must be made within 7 days and the Agreement is formed on the date on which the Contractor communicates acceptance on the Customer's electronic contract management system ("Bravo"). No other form of acknowledgement will be accepted.

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Annex 1 – Current definition of *Coastal & Floodplain Grassland* priority habitat

From the JNCC website:

> "Grazing marsh is defined as periodically inundated pasture, or meadow with ditches which maintain the water levels, containing standing brackish or fresh water. The ditches are especially rich in plants and invertebrates. Almost all areas are grazed and some are cut for hay or silage. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities, but not extensive areas of tall fen species like reeds; although they may abut with fen and reed swamp communities.
>
> *The exact extent of grazing marsh in the UK* is not known but it is possible that there may be a total of 300,000 ha. England holds the largest proportion with an estimate in 1994 of
>
> 200,000 ha. However, only a small proportion of this grassland is semi-natural supporting a high diversity of native plant species (5,000 ha in England, an estimated 10,000 ha in the UK).
>
> Grazing marshes are particularly important for the number of breeding waders such as snipe *Gallinago gallinago*, lapwing *Vanellus vanellus* and curlew *Numenius arquata* they support. Internationally important populations of wintering wildfowl also occur including Bewick swans *Cygnus bewickii* and whooper swans *Cygnus cygnus."*

Brief commentary

Taking a narrow of view of the hydrological element of this definition, coastal & floodplain grazing marsh requires "periodic flooding" and a sufficiently high and dependable water table to maintain aquatic life in the ditches. It also suggests that good sites will have an undulating topography and a sufficiently high water table to sustain temporary or permanent open water and/or swamp.

By stating that the ditches "maintain water levels" the definition also suggests that water levels are managed to a greater or lesser extent, rather than following natural hydrological functioning.

Taking a narrow view of the biological element of this definition, the definition recognises that high grassland botanical interest is not necessary. High ditch interest does seem necessary though – "The ditches are especially rich in plants and invertebrates." And it strongly suggests that there *will* be bird interest, either with breeding waders or wintering wildfowl.

What can we conclude from this? Conforming to the letter of this definition, to be of priority habitat standard coastal & floodplain grazing marsh should:

- In an average year partially or wholly flood
- Have a network of ditches
- Maintain water levels such that ditches retain aquatic wildlife throughout the year

- Contain rich plant and invertebrate assemblages in the ditches
- Host breeding waders and/or wintering wildfowl

As stated in the main note, a great deal that is currently mapped in NE's Habitat Inventory plainly does not conform to this standard. What is possibly not clear from the definition is whether a coastal & floodplain grazing marsh site that contains only one or some of the biological elements would be 'up to standard' – even then though plenty of sites currently on the Inventory would still fail this standard.

And it does nothing to counter the reality of these coastal & floodplain grazing marsh sites being a partially drained element of a floodplain.

Annex 2 – Proposed draft definition for ‘highly important refuges for wetland wildlife’

The definition of ‘highly important refuges for wetland wildlife’ for areas of coastal & floodplain grazing marsh whose natural habitats have been lost may include, for example land with:

- breeding waders and/or wintering waterbirds
- other terrestrial wetland priority species or assemblages
- species currently dependent on ditches and other seasonal or permanent standing water within, or surrounding the land.”

This Modified floodplain’ criteria (b) is intended to distinguish the “highly important” areas from criteria (a) and the generality of all floodplain habitat, with emphasis on being highly important for wetland wildlife. This is not a definitive list, but such areas may be identified if typically:

- The land has existing SSSI designation or
- would meet the criteria under revised SSSI guidelines even if locally there are already examples of SSSIs
- Areas where recent data indicates the habitat is supporting nationally significant populations or assemblages of wetland species (where it is possible to make this judgement from data).
- Recognised as a ‘hotspot’ for wetland wildlife – as indicated through data such as Freshwater Habitats Trust ‘Important Freshwater Areas’
- Exceptional situations where the habitat may not be of the highest quality but because of surrounding land use (e.g. large scale intensive agriculture with very low biodiversity value), an areas role in supporting wetland species is disproportionately important in the context of that local area.
- For birds, areas that fall under RSPB’s breeding wader strategy may also be indicative.

Priority species are those listed under Section 41 of the NERC Act. However distribution and abundance must be considered. For example, some S41 species may be widespread (e.g. Great Crested Newt) but single occurrences are not necessarily indicative of a highly important area, whereas others e.g. nationally significant populations of a rare wetland plant spp. in a location, may indicate a highly important area.

Annex 3 – Review of the Priority Habitat ‘Coastal and Floodplain Grazing Marsh’ as a component of functional floodplain ecosystems

As attached in the Invitation to Tender

Annex 4 – Summary Template

As attached in the Invitation to Tender

Annex 5 – List of NE data sets

Title
NE data sets
Breeding Wader Hotspots (Curlew, Lapwing,Redshank, Snipe) -
Countryside Stewardship (CSS) Live Option Points
Countryside Stewardship Scheme (CSS) Live Agreements
CS 2016 Scheme Capital Grants Options
Environmental Stewardship Scheme (ESS) Live Agreement boundaries
Environmental Stewardship Scheme (ESS) Live Option Points
Environmental Stewardship Scheme Agreement Based Options points
Environmental Stewardship Scheme Parcel Based Options
Environmentally Sensitive Area Scheme (ESA) Live Agreements
Environmentally Sensitive Area Scheme (ESA) Live Option Points
Environmentally Sensitive Areas (ESA)
ESA Scheme Agreement Tiers 2004
ESA Scheme Agreements 2004
HLS Target Areas
HLS Themes
Land Management Initiatives (LMIs)
Local Nature Reserves (England)
National Character Areas
National Habitat Networks All Habitats Combined
National Habitat Networks Priority Restoration All Habitats Combined
National Nature Reserves (England)
Organic Farming Scheme Holdings 2003 (OFS)
Peaty Soils Location
Priority Habitats Inventory
Priority River Habitat
Ramsar (England)
Severn Estuary High Tide Waterbird Roost Sites
Sites of Special Scientific Interest (England)
Special Areas of Conservation (England)
Special Protection Areas (England)
SSSI Site Units (with condition assessment) (England)
WES Agreements
Joint RSPB/NE data sets
Wet Grassland Waders - Curlew
Wet Grassland Waders - Lapwing
Wet Grassland Waders - Redshank
Wet Grassland Waders - Snipe

Annex 6 - English Nature's interim guidance on impacts on freshwater habitats of coastal realignment

As attached in the Invitation to Tender