European Union
European Regional Development Fund

Jacobs

Preston and South Ribble FRMS

Preston FRMS - Biodiversity Net Gain Report

ENV0000009C-JAC-ZZ-ZZ-RP-BD-0002 | P01.3

November 2020

Environment Agency

In partnership with:

Lancashire County Council

North West Regional Flood & Coastal Committee

Environment Agency

In partnership with:

Preston and South Ribble FRMS

Project No:	B550B008
Document Title:	Preston FRMS - Biodiversity Net Gain Report
Document No.:	ENV0000009C-JAC-ZZ-ZZ-RP-BD-0002
Revision:	P01.2
Document Status:	S3
Date:	12/11/2020
Client Name:	Environment Agency
Client No:	ENV0000009C
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File Name:	ENV0000009C-JAC-ZZ-ZZ-RP-BD-0002

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Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
1	6th November 2020	First draft	Joel Giordano	Nicholas Westerman	Nicholas Westerman	Sean McGahan
2	11th November 2020	Client Review	Joel Giordano	Nicholas Westerman	Nicholas Westerman	Sean McGahan
3	3rd December 2020	Minor Changes	Joel Giordano	Nicholas Westerman	Nicholas Westerman	Sean McGahan

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Contents

Executive Summary

Jacobs was commissioned by the Environment Agency (EA) to undertake a Biodiversity Net Gain (BNG) assessment for Area 1 and Area 2 of the Preston and South Ribble Flood Risk Management Scheme ('the Scheme'). Impacts considered include:

- Replacement and creation of new concrete flood walls resulting in the permanent loss of mudflat in the river, riparian woodland, scrub and tall ruderal habitats along the bank of the river;
- Replacement of flood embankment resulting in the permanent loss of woodland at Ribble Sidings;
- Creation of species rich grassland and wetland habitats at Ribble Sidings. Ribble Sidings is currently an area of species poor amenity grassland; and
- Creation of mudflat through re-grading the river bank at Ribble Sidings foreshore.

The scheme represents a biodiversity net gain of 23.47% (7.24 Biodiversity Units). In Area 1 the main area of habitat loss is a narrow band of riparian woodland and a small area of scrub. There is also a small area of encroachment into the tidal river which will result in the loss of mudflat. There are very limited opportunities for habitat creation or enhancements in Area 1. A small area of landscape planting will be provided at Broadgate Gardens.

In Area 2 the main area of habitat loss is the band of woodland and amenity grassland at Ribble Sidings. The habitats lost at Ribble Sidings will be replaced with new species rich grassland, tree/woodland planting, wetland/pond areas and a small realignment of the river bank to create new mudflat habitat. These will provide important supporting habitat to the River Ribble.

There is an overall loss in tree cover and additional sites are required to compensate for this habitat loss. Two sites (1. Fishwick Bottoms and 2. land adjacent to Golden Way) have been identified in Preston and an agreement in principle has been made between the EA and the local council on new woodland planting in these locations, but the detailed design (size and extent of woodland planting) and management proposals has not been agreed.

At Ribble Sidings, further work is required to confirm what habitats can been achieved and how they will be created and managed in the long term to achieve the best outcomes for nature conservation.

1. Introduction

1.1 Scheme Background

Jacobs was commissioned by the Environment Agency (EA) to undertake a Biodiversity Net Gain (BNG) assessment for the proposed works for Area 1 and Area 2 of the Preston and South Ribble Flood Risk Management Scheme ('the Scheme'). This document should be read in conjunction with the following plans and tools: -

- Area 1 and Area 2 Site Location Plans;
- UK Habitat Classification Sheets 1-5;
- Environmental Master Plan Sheets 1-9; and
- Areas 1 and 2 Biodiversity Metrics Tool (see Appendix A).

The Preston & South Ribble FRMS seeks to reduce the high level of flood risk to approximately 4,778 properties including over 500 businesses along the Rivers Ribble and Darwen. The project consists mainly of replacing existing flood walls and embankments and is split into five Areas. This assessment cover Areas 1 and 2. Similar assessments will be undertaken for Areas 3, 4 and 5 to support the separate planning applications.

This assessment is based on the proposals at Areas 1 and 2. Impacts considered include:

- Replacement and creation of new concrete flood walls resulting in the permanent loss of mudflat in the river, riparian woodland, scrub and tall ruderal habitats along the bank of the river;
- Replacement of flood embankment resulting in the permanent loss of woodland at Ribble Sidings;
- Creation of species rich grassland and wetland habitats at Ribble Sidings, which is currently an area of species poor amenity grassland; and
- Creation of mudflat through re-grading the river bank at Ribble Sidings foreshore.

1.2 Opportunities for Habitat Creation & Enhancement.

1.2.1 Ribble Sidings

A project steering group to consider local opportunities for habitat creation was set up in 2018. This consisted of representatives from the EA and the three councils. One of the main opportunities identified within the study area was Ribble Sidings. The local council has aspirations to create a variety of wetland habitats surrounded by a network of paths which were illustrated on a concept plan. This plan was used to engage with local residents during the public consultation events in 2019, which gained good support. The design has been developed by Jacobs based on the concept design. This has been shared with the local community as part of the recent online consultation. The intention is that the EA will deliver the works as part of the FRM scheme for Areas 1&2 and the council will take on the long-term management. The details will be agreed through a habitat and landscape management plan, as detailed in the recommendations section.

1.2.2 Fishwick Bottoms

In 2020, the EA set up a call with estates team at Preston City Council (landowner) to discuss opportunities for habitat creation at Fishwick Bottoms. In principle the council support the proposals for river bank restoration and woodland planting in this location. More detailed plans are required before engaging tenant farmers and detailed agreements can be made for this location.

1.2.3 Golden Way

In 2020, the EA set up a call with the landscape and parks officers at South Ribble Council (landowner) to discuss opportunities for habitat creation at land adjacent to Golden Way. The Council support a proposal for tree planting in the green space next to Golden Way and didn't foresee any issues or objections. More detailed plans are to be drafted and shared with council and other stakeholders to agree a detailed design.

1.3 National Character Area

The scheme is located within National Character Area (NCA): 32 Lancashire and Amounderness. NCA profiles are guidance documents which can help inform decision-making about each NCA. The information they contain will support the planning of conservation initiatives at a landscape scale and encourage broader partnership working through Local Nature Partnerships. The profiles help to inform choices about how land is managed and can change.

The NCA profile details Statements of Environmental Opportunity (SEO) for Lancashire and Amoundness. The SEO which is pertinent to this scheme is SEO 1: "*Conserve, manage and enhance river systems and wetlands – including the Ribble Estuary and the rivers Wyre and Douglas – with their many associated drains, dykes and streams. This will improve water quality and supply, sustainably address flood risk management, and enhance biodiversity and the historic environment through a strategic, landscape-scale approach".* Creation of wetland, species rich-grassland and broadleaved woodland habitat would be examples of achieving this objective.

1.4 Purpose of Report

The National Planning Policy Framework (NPPF) and accompanying National Planning Policy Guidance (NPPG) have identified that developments in England should deliver a net gain for biodiversity. The NPPF, published in February 2019, states (paragraph 170) that: *"Planning Policies and decisions should contribute to and enhance the natural and local environment by… minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures."*

The NPPG for the Natural Environment, updated in July 2019, states (paragraph 020) that: *"Net gain in planning describes an approach to development that leaves the natural environment in a measurably better state than it was beforehand."*

A key element of the net gain policy is that changes should be measurable. As a result, Biodiversity Net Gain Metrics have been developed that allow losses and gains in biodiversity to be measured in an objective and repeatable manner. This report uses the Department for Environment, Food and Rural Affairs (DEFRA) Biodiversity Metric 2.0 Calculation Tool (published July 2019) to determine if the scheme would result in a net gain in biodiversity. Net gains can be achieved by creating new habitats and enhancing existing habitats. The forthcoming Environment Bill will make it mandatory for developments to achieve at least a 10% net gain in value for biodiversity. This means that the development of a site should leave the natural environment in a better state.

1.5 Aims and Objectives

This report will calculate the losses and gains in biodiversity units as a result of the scheme. The report will detail the assumptions that have been made to inform the calculations. The calculations are based on the detailed design plans.

This report will be in accordance with both legislative and the best practice guidelines for BNG. The report describes the survey methods employed, presents the results of the surveys and makes recommendations for further work that will be required to inform the detailed assessment.

It will set out a principle agreement in terms of what habitat will be created and the target condition. Further work will be required to explain how the habitats will be created, managed and monitored in the long term, in order to achieve the target condition.

1.6 Study Area

The Study Area is defined by the planning boundaries presented in Area 1 and Area 2 Site Location Plans. It was not deemed necessary to assess the River Ribble on the following principles:

- Linear features for watercourses will not be accounted for in the metric. All associated habitats relating the River Ribble such as mudflat habitats will be accounted for separately and individual habitat parcels. As such the River Ribble has been excluded from the BNG assessment.

1.7 Assumptions and Limitations

The metric uses habitat categories as a proxy for biodiversity. While the scoring of habitats is informed by ecological reasoning and the available evidence, the outputs of biodiversity unit calculations are not scientifically precise or absolute values. The generated biodiversity unit scores are proxies for the relative biodiversity worth for the state of a place. The metric and its outputs should therefore be interpreted, alongside ecological expertise and common sense, as an element of the evidence that informs plans and decisions. The metric is not a total solution to biodiversity decisions. The metric, for example, helps work out how much new or restored habitat is needed to compensate for a loss of habitat, but it does not tell you the management requirement to achieve the desired habitat.

2. Methodology

This report has been produced in accordance with the methodology set out in the following guidance documents:

- The Biodiversity Metric 2.0 – User Guide – Beta Test (Crosher *et al.*, 2019a); and
- The Biodiversity Metric 2.0 – Technical Supplement – Beta Test (Crosher *et al.,* 2019b*).*

2.1 Habitat Metrics

A Biodiversity Metric generates a value measured in units for a site before development commences and after development is completed, allowing the difference (positive or negative) to be measured. The calculation is based on habitats, and for each habitat parcel, a biodiversity value is generated based on five factors that are multiplied together. These are:

- the area of the habitat or length of hedgerow;
- the value (or distinctiveness) of the habitat;
- the condition (poor, moderate or good) of the habitat;
- the ecological connectivity of the habitat; and
- the strategic significance of the habitat.

Where habitat creation or enhancement is proposed to compensate for loss of biodiversity value, multipliers are used to reflect the time it will take for the required condition of the target habitat to be achieved and the difficulty of creating the target habitat in the first place. Whilst these are called multipliers, the effect they have on the number of biodiversity units that proposed new or enhanced habitats will deliver is to reduce them. This reflects uncertainties around the effectiveness of habitat creation and enhancement.

To calculate the change in biodiversity unit value, firstly the baseline (or pre-intervention) 'biodiversity unit' value of each habitat parcel was calculated. Next, using the proposed design the biodiversity unit value for the habitats that were expected to be retained, plus the values for any enhanced or newly created habitats, were calculated. The change in biodiversity was worked out by subtracting the site's baseline biodiversity unit value from the sum of post-intervention values for retained, created and enhanced parcels of the same habitat type. This gave the final biodiversity unit value from which net gain or loss for the scheme was assessed.

2.1.1 Hedgerow Metrics

In the biodiversity metric 2.0, hedgerows and lines of tress are measured by the hedgerow biodiversity unit. This uses length (kilometres), height and condition to calculate the units. The loss and gain in hedgerow biodiversity units needs to be assessed separately to other biodiversity unit measures. As such, it is only possible to compensate for the loss of hedgerow through the creation or enhancement of hedgerows elsewhere.

2.1.2 River Metrics

In the biodiversity metric 2.0 rivers and streams are defined as those classified either as a "Main River", or as an "Ordinary Watercourse". The riparian zone, defined as a 10m zone from the top of a riverbank that would naturally be periodically flooded and which influences river processes, is not considered as a separate habitat type but as a linear feature within the rivers and streams metric. Rivers and streams are measured by the river biodiversity unit. Offsetting can only be used on the same river type to ensure condition scores and mitigation/compensation are consistent.

The River Ribble is over 30m wide, as such the River Metrics cannot be applied to this site. In this case, the habitat metrics are used along the riparian and mudflat areas as an alternative to the river metrics. The river itself has not been included in the calculations, for the reasons stated in Section 1.6.

2.2 Biodiversity Value

2.2.1 Habitat Parcels (Habitat Area)

A Preliminary Ecological Appraisal (PEA) was carried out in November 2018 (Mott Macdonald, 2019). All habitats were recorded following the methodology outlined in the Phase 1 Habitat Survey handbook: A technique for environmental audit (JNCC, 2010). Habitats were converted to UK habitat classification following UK Habitat Classification system found in The UK Habitat Classification User Manual (UK Habitat Classification Working Group, 2018). The map resulting from this classification is provided as UK Habitat Classification Sheets 1-5. The extent, type, value and condition of each habitat was recorded during this survey, and these factors are discussed in greater detail below.

Where there was change in habitat condition across a habitat type, the habitat area was divided into parcels of each habitat type. Each parcel was recorded on the map and calculated separately using the metric. Habitat types were only separated into parcels either when they were not geographically connected and there was difference in condition or where there was a change in condition in a single location and it was possible to clearly illustrate the different areas on a map.

2.2.2 Habitat Distinctiveness

Habitat distinctiveness is a standard score based on the type of habitat present. The PEA recorded the habitat type and a review of the Section 41: Habitats of Principal Importance in England was then carried out to confirm the category for each habitat. Detailed tables for the habitat distinctiveness score for each habitat are provided in the technical supplement (Crosher *et al.* 2019b); however, the overall distinctiveness categories used for habitat areas is reproduced from the user guide (Crosher *et al.*, 2019a) in Table 2.1 below.

Table 2.1 - Distinctiveness categories used for Area Habitats (taken from Biodiversity Metric 2.0 – User Guide)

Category	Scores	Multiplier
Very High	8	Priority habitats as defined in Section 41 of the Natural Environment and Rural Communities (NERC) Act that are highly threatened, internationally scarce and require conservation action.
High	6	Priority habitats as defined in Section 41 of the NERC Act requiring conservation action.
Medium	4	Semi-natural habitats not classed as a Priority Habitat
Low	2	Habitat of low biodiversity value. Temporary grass and clover ley; intensive orchard; rhododendron scrub
Very Low	0	Little or no biodiversity value e.g. hard standing

A separate table is provided in the user guide (Crosher *et al.* 2019a) for the distinctiveness categories and weightings (scores) for different hedgerow types. The categories are based on the physical structure and the species composition of the woody element of the hedgerow, and their association with physical features (ditches

and banks) that may enhance their ecological value by providing additional niches or enhanced capacity to provide habitat connectivity.

2.2.3 Habitat Condition

Habitat condition is a score based on the quality of the habitat, judged against the perceived ecological optimum state for that particular habitat. The process of assessing habitat condition considers how many of the key physical characteristics and typical species of a particular habitat type are present in a habitat patch. This is determined by condition criteria. Table TS1-1 in the technical supplement (Crosher *et al*. 2019b) lists the habitat condition sheets that are available and indicates which sheet should be used for each Area Habitat type.

Some habitats have a pre-defined condition score and no assessment is required. These tend to be habitats that are intensively managed i.e. croplands or are artificial e.g. green roof and have a narrow biodiversity niche.

Habitat condition is divided into one of three categories: Good, Moderate and Poor. These three main categories will be used but the metric and calculation tool does allow for half scores, if for example, it is not possible to separate two main categories.

Identifying habitat condition requires some ecological knowledge in most circumstances and quantitative information was collected to explain how each habitat meets the assessment criteria in the technical supplement (Crosher *et al*. 2019a).

2.2.4 Ecological Connectivity

Ecological connectivity is a score based on the proximity of the habitat patch to similar or related habitats. In the test version of the tool all High and Very High distinctiveness habitats should be assigned a Medium connectivity multiplier, and other habitats a Low connectivity multiplier. A connectivity assessment is not appropriate for some habitats such as arable crops. In these cases, N/A was selected and the tool automatically applied a neutral value to reflect this. A forthcoming update to the tool will enable a more sophisticated approach to connectivity to be used.

2.2.5 Strategic Significance

Strategic significance utilises published local plans and objectives to identify local priorities for targeting biodiversity and nature improvement. It works at a landscape scale and gives additional unit value to habitats that are located in preferred locations for biodiversity and other environmental objectives.

A review of the Lancashire Ecological Network (Lancashire Local Nature Partnership, 2015) was carried out to identify green corridor or important habitat networks. The Strategy provides district plans which illustrate the greatest need for habitat corridors and habitats for wildlife.

In addition to this a review of Natural England's Habitat Networks Maps (Edwards *et al*, 2020) was carried out. The maps are based on two components: "Existing Habitat" and "Network Enhancement & Expansion". The "Existing Habitat" element has four components: primary habitats, associated habitats, areas suitable for habitat creation/restoration, and restorable habitat areas. The "Network Enhancement & Expansion" element also comprises four elements. These are network zones that identify areas for improvement that will improve habitat networks, join up areas of existing habitat, increase connectivity and reduce habitat fragmentation.

The habitat network maps are intended to be used to help identify areas for future habitat creation and restoration at a landscape scale but need to be considered alongside other local datasets and knowledge.

- Golden Way is identified in Network Enhancement Zone 1 and Lancashire Ecological Network
- Ribble Sidings is identified in Network Enhancement Zone 2 and Lancashire Ecological Network

- Fishwick Bottoms is not identified on Natural England's Habitat Networks Maps but is identified on Lancashire Ecological Network as "Corridor Areas" where new woodland creation should be targeted.

All three habitat creation areas should be categorised as high strategic significance.

Table 2.2 - Strategic significance categories and scores

Category	Score
High Strategic Significance High potential & within area formally identified in local policy	1.15
Moderate Strategic Significance Good potential but not in area defined in local policy	1.1
Low Strategic Significance Low potential and not in area defined in local policy	1

2.3 Risk Multipliers – Habitat Creation and Enhancement

2.3.1 Time to Target Condition

Time to target condition is a standard score based on how long the habitat type takes to establish. The time period to use is the length of time (in years) between the intervention and the point in time the habitat reaches the pre-agreed target quality (i.e. distinctiveness, condition, area). This time will vary between habitat types, between change scenarios (e.g. creation typically takes longer than enhancement) and due to the way the habitat is managed. A summary of the time to target condition multipliers for different time periods adapted from the user guide (Crosher *et al*,. 2019a) is shown in Table 2.3 below. Detailed tables for the time to target condition for each habitat is provided in the technical supplement (Crosher *et al*. 2019b).

Table 2.3 - Time to target condition: multipliers for different time periods using a 3.5% discount rate

Time (years)	Multiplier	Time (years)	Multiplier
0	1.000	15	0.586
1	0.965	20	0.490
2	0.931	25	0.410
5	0.837	30	0.343
10	0.700	>32	0.320

2.3.2 Difficulty of Creation or Restoring a Habitat

Habitat creation carries an associated risk based on the difficulty and uncertainty of successfully creating, restoring or enhancing a habitat. A multiplier is therefore applied to recognise the difficulty of creating different habitats (Table 2.4) (Crosher *et al*., 2019a). Where uncertainties have been identified further work will be required to help give confidence that the habitat creation or restoration will be successful.

Table 2.4 - Difficulty category multipliers

Difficulty categories	Category Multiplier
Very High	0.1
High	0.33
Medium	0.67
Low	1

2.3.3 Off-site Risk

An off-site risk multiplier is also applied (Table 2.5) (Crosher *et al.,* 2019a). This is a score based on where the habitat creation or enhancement is undertaken. The offsite multiplier is applied to compensation parcels outside of the relevant Local Planning Authority (LPA) – Preston City Council, South Ribble Council or National Character Area (NCA) – 32 Lancashire and Amounderness (NE512). All habitats will be created on site within the LPA and NCA boundary.

Table 2.5 – Off-site risk multipliers

Category	Score
Compensation inside LPA or NCA of impact site	1.0
Compensation outside of PLA or NCA of impact site but in neighbouring LCA or NCA	0.75
Compensation outside LPA or NCA of impact site and beyond neighbouring LPA or NCA	0.5

3. Results

The results should be read in conjunction with the UK Habitat Classification Sheets 1-5, Environmental Master Plan Sheets 1-9 and the biodiversity metrics calculator spreadsheet (Appendix A).

3.1 Habitat Loss

3.1.1 Habitat Loss Calculation

In Area 1 the majority of habitats to be lost are the riparian habitats located between the existing floodwall and toe of the river banks. This includes broadleaved woodland (0.38 ha) and scrub (0.1ha). A 0.13km section of ornamental non-native hedge will be lost by BAC/EE Social & Sports Association.

There will be a small loss of mudflat (0.17ha) habitat in both Areas 1 and 2, as a result of the redi-rock embankment encroaching into the river. A narrow band of marginal aquatic vegetation (0.07ha) will also be lost near the toe of the river banks in both Areas.

In Area 2 the majority of the habitat loss is at Ribble Sidings. This includes broadleaved woodland (0.46ha) and amenity grassland (2.19ha).

A small area of allotments (0.14ha) will be temporarily lost next to Penwortham Methodist Church to allow for a working area to build the new flood wall. Species poor grassland will be temporally lost at Golden Way (0.26ha) and amenity grassland will be temporally lost at Middleforth Green (0.3ha), to facilitate access and for temporary site storage.

In total these areas equate to the loss of 17.35 biodiversity units.

3.1.2 Distinctiveness and Condition Scores

With the exception of amenity grassland, which has a low distinctness score, most habitats represent moderate or high distinctiveness. Most habitats are associated with the river corridor or in the case of mudflat and reedbed habitats are assessed with the river itself.

3.1.3 Ecological Connectivity and Strategic Significance

Habitats in Area 1 have not been identified in the Lancashire Ecological Network, however the river and associated riparian vegetation is a habitat corridor and as such should be categorised as moderate strategic significance.

Woodland in at Ribble Sidings and Golden Way in Area 2 has been identified as “Stepping Stone” habitat between “Core Areas” of woodland and should be categorised as high strategic significance.

3.2 Retained Habitats

Trees, woodland (0.74ha) and amenity grassland (0.96ha) are retained where possible within the planning boundary across Areas 1 and 2. A 0.52km line of mature trees will be retained in Area 1.

3.3 Enhanced Habitats

No habitat enhancement is proposed.

3.4 Habitat Gain

3.4.1 Habitat Gain Calculation

In Area 1, the proposed habitat creation includes new ornamental shrub planting (0.06ha) and cornfield annuals (0.04ha). A band of tussocky grassland (0.24ha) will also be created above the redi-rock areas. Any areas of amenity grassland will also be re-instated (0.65ha). A 0.05km length of native species rich hedgerow will be planted at Broadgate Gardens.

In Area 2 the proposed habitat creation includes new species rich grassland (1.35ha), tree/woodland planting (0.13ha) and pond creation (0.19ha) at Ribble Sidings. The river bank will also be re-graded in this section to create new mudflat habitat (0.7ha).

The allotments (0.14ha) will be reinstated next to Penwortham Methodist Church, the species poor grassland will be reinstated next to Golden Way (0.26ha) and the amenity grassland will be re-instated at Middleforth Green (0.3ha)

In total these areas equate to a gain of 7.24 biodiversity units.

3.4.2 Distinctiveness and Condition Scores

The Defra metric calculator automatically defines the distinctiveness scores based on the defined habitat types.

All habitats will be reinstated to the existing condition.

For all habitats at Ribble Sidings, a target condition score of good has been given. The habitats in this area will be managed and monitored to ensure the target condition can be achieved.

The strips of tussoky grassland above the redi-rock are unlikely to achieve a good condition due to difficulties with access and management once the works are complete. As such a moderate condition score has been given, as an achievable target.

3.4.3 Ecological Connectivity and Strategic Significance

As stated in the methodology, the ecological connectivity has been determined based on the value or distinctiveness of the habitats.

The strategic significance is high for all habitats at Ribble Sidings and along the river. The new habitats will provide important network enhancement and supporting habitat to the River Ribble. Ribble Sidings is identified in Network Enhancement Zone 2 and Lancashire Ecological Network.

3.4.4 Difficulty of creation and Time to target condition

The habitats at Ribble Sidings will need to be managed and monitored to ensure a good condition status. The recommendations section of this report details what further work is required to ensure the success of these habitats.

Species rich grassland is proposed on the new embankment and existing areas of amenity grassland. If the site supports suitable soils and an appropriate management and monitoring plan is in place this habitat would be expected to achieve a good condition score after a period of 15 years.

Woodland and tree planting can be readily planted on most soil types. It will take a number of decades (32 years+) to develop and mature and eventually reach the target condition.

The creation of a new ponds/wetland areas, presents few difficulties of creation. There are well documented methods on pond creation. This would be expected to achieve a good condition score in 5 years.

Mudflat is a technically challenging habitat to create as it requires engineering works to re-profile the bank with the correct elevation, slope and topography. Assuming the correct conditions are created, mudflat will naturally develop in this location. This would be expected to achieve a good condition score in 6 years.

Native species rich hedgerow can be readily planted on most soil types. It will take a minimum of 10 years to develop and reach the target condition.

The new habitats in Area 1 are all standard landscape planting or reinstating areas of amenity grassland. Once established these areas will become part of the standard landscape management by the local council or BAC/EE Social & Sports Association. The tussoky grassland above the redi-rock will readily establish on most soil types. Once established this area will require minimal management and over time is likely to naturally succeed into a mosaic of scrub and tall herb vegetation. All these habitat would be expected to reach target condition after 1 year/growing season and the management responsibilities would then be transferred to the landowner.

The allotments next to Penwortham Methodist Church, the species poor grassland at Golden Way and the amenity at Middleforth Green, will be readily reinstated. Once established these areas will become part of the standard landscape management by the local council or allotment holders.

A summary of the results from the Defra Biodiversity Metric 2.0 calculation for the scheme is contained in Table 3.1.

Table 3.1: Summary results of the Defra Biodiversity Metric 2.0 calculation for the scheme

Development Phase	Calculator	Biodiversity Units
Onsite baseline	Habitat units	30.84
	Hedgerow units	4.99
	River units	0
On-site post-construction (including habitat retention, creation and enhancement)	Habitat units	38.07
	Hedgerow units	5.30
	River units	0
Total net unit change	Habitat units	7.24
	Hedgerow units	0.31
	River units	0
Total net % change	Habitat units	23.47%
	Hedgerow units	6.20%
	River units	0

4. Conclusions

The scheme represents a net gain of 7.24 habitat units (23.47%) and 0.31 hedgerow units (6.20%).

The scheme will result in the loss of moderate value riparian vegetation including woodland, scrub and marginal vegetation. Small areas of mudflat habitat will also be lost due to the alignment encroaching in to the tidal river channel. In Area 1 few opportunities have been identified to reinstate these habitats in-situ, so compensatory habitat creation area is required elsewhere. A small area of new hedgerow, shrub and wildflower (cornfield annual) planting is proposed at Broadgate Gardens. In Area 2 the main area of habitat loss is the band of woodland and amenity grassland at Ribble Sidings. The habitats lost at Ribble Sidings will be replaced with new species rich grassland, tree/woodland planting and wetland/pond areas and a small realignment to create new mudflat habitat. Ribble Sidings will provide important supporting habitat to the River Ribble.

There is still an overall loss in tree cover and additional sites are required to compensate for this habitat loss. Two sites have been identified in Preston and an agreement in principle has been made between the EA and the local council on new woodland planting in these locations, but the detailed design (size and extent of woodland planting) and management proposals has not been discussed and agreed.

The first site is located at Golden Way. This area is approximately 1.25ha and currently supports a species poor grassland. This will expand an existing area of woodland to the east, providing buffer habitat protecting the existing more mature woodland and improve woodland connectivity. This area is identified in Natural England's Habitat Networks Maps as Network Enhancement Zone 1 and priority for new woodland creation.

The second site is located at Fishwick Bottoms. This is approximately 2.2km of riverbank and currently supports agricultural grasslands. The river bank is currently heavily poached by cattle. This represents an opportunity to restore the river bank potentially benefitting otter, bats and fish populations. All of which are impacted by the current scheme. The new woodland will improve woodland connectivity along the river and at a landscape scale and has been identified on Lancashire Ecological Network as "Corridor Areas" where new woodland creation should be targeted to improve woodland connectivity.

4.1 Recommendations

At Golden Way and Fishwick Bottoms, a detailed agreement for new woodland habitat creation is required with the local council and other key stakeholders. Once an agreement has been reached, the proposals can be updated in this document.

At Ribble Sidings, further work is required to confirm what habitats can been achieved and how they will be created and managed in the long term to achieve the best outcomes for nature conservation.

In order to achieve the desired habitats (distinctiveness and condition), further surveys are required to determine the feasibility of species rich grassland creation. Detailed information on soils is necessary to help determine whether a site is suitable, and, if it is, the most appropriate target community to aim for. Soil analysis provides information on the nutrient status and pH of a soil. Natural England (2008a) gives guidance on sampling methodology. Natural England (2008b) gives advice on soil analysis, assessing site suitability for restoration, methods of re-creation and restoration and details of appropriate species to encourage. For the new embankment a suitable topsoil will need to be sourced to ensure the correct soil chemistry to support a species rich grassland.

If the soil conditions are not suitable other methods will need to be explored to reduce the nutrient status of the soils. Such as a period of regular mowing and haymaking without fertilizer application – these actions may be carried out before soil sampling. Depending on the soil characteristics, nutrient stripping is not always successful and more intensive management techniques may be required on some sites, including turf stripping.

Further assessment maybe required to ensure the ground water conditions are suitable for wetland creation or to inform what additional works will be required to make the site suitable.

Mudflat habitats are typically present on elevations between the lowest astronomical tide and mean high water neap. Saltmarsh and reedbed habitat are likely to establish above the mean high-water neap level. When the embankment is re-graded an assessment will be required to make sure the ground is lowered to the correct elevation. The extent of existing habitats can be taken as a local reference for the correct elevation.

To ensure the success of all habitats at Ribble Sidings, a detailed management and monitoring plan is required to make sure the habitats reach the target condition. This should detail:

1. Identify any potential ground works required to prepare the site (as informed by feasibility study);
2. How the habitats will be created including identifying the seed/planting source of local province;
3. The management options including the timeframes for management;
4. What monitoring is proposed in order to measure success and identify any remedial measures or changes in management.

The success of this scheme will require joint agreements with the key stakeholders. Further discussions are required between the landowner and EA to agree:

1. Roles and responsibilities for creation, management and monitoring tasks;
2. Funding mechanisms which are required to create and manage the habitats in perpetuity; and
3. Legal mechanisms which are required to ensure this site is managed for nature conservation purposes in perpetuity and there is no risk of these habitats being lost in the future due to changes in ownership or land management.

5. References

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Appendix A. Areas 1 and 2 - Biodiversity Metrics Tool