



CAMBRIDGE WATER WATER RESOURCES MANAGEMENT PLAN 2024

Biodiversity Net Gain and Natural Capital
Method Statement

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1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE OF REPORT

Like all water companies in England and Wales, Cambridge Water is required ^[1] to prepare, maintain and publish a Water Resource Management Plan (WRMP). A WRMP sets out the strategy for water resource and demand management to ensure supplies of safe, clean drinking water are maintained to customers throughout the relevant company's region in a way that is economically, socially, and environmentally sustainable. WRMPs are reviewed on a rolling five-year basis; Cambridge Water published their most recent WRMP (WRMP19) in December 2019. The next cycle of WRMPs (WRMP24) cover the period 2025 to 2050 and beyond. Cambridge Water is now reviewing and updating their draft WRMP24 for submission in autumn 2022.

Cambridge Water forms part of the Water Resources East (WRE)¹ regional group and is one of five regional water resources groups in England and Wales working under the National Framework for Water Resources (the 'National Framework')². Each regional group brings together the water companies operating in that region with key water users, stakeholders and environmental regulators including the Environment Agency. This enables greater co-ordination and alignment of water resources planning for WRMP and regional plan development. The other water companies that form WRE alongside Cambridge Water are Affinity Water, Anglian Water, Essex & Suffolk Water and Severn Trent Water.

In addition, Cambridge Water are merged with South Staffs Water. South Staffs Water are one of five water companies³ that make up the Water Resource West (WRW) regional group. As such, there is also the requirement for the Cambridge Water WRMP to align with that of South Staffs Water and WRW regional plan.

Biodiversity Net Gain (BNG) and Natural Capital Accounting (NCA) assessment is required by regulators to provide a comprehensive understanding of the benefits and costs to the natural environment of plan proposals. This report sets out the consistent methodology to follow when undertaking the BNG and NCA assessment. Through this approach, the EA expectations for consideration of environment and society in WRMP overall decision making will be satisfied for both the components and the cumulative programme of the Regional Water Resources Plan.

This report draws on the Water Resource Planning Guideline (WRPG) produced by the regulatory bodies⁴ (Ofwat, the EA and NRW) along with guidance from UK Water Industry Research (UKWIR, 2021)⁵ on the application of the NCA and BNG to WRMPs. The methodology also draws on the principles of the Natural Capital Register and Account Tool (EA, 2021)⁶ and the approach outlined in Defra's Enabling a Natural Capital Approach (ENCA) (Defra, 2020)⁷. Table 1 outlines the different policy drivers and regulator expectations and how these are considered within the NCA and BNG approach.

Table 1 Relevant policy drivers and guidance that are considered within the NCA / BNG approach

Country	Legislation / Guidance	Approach
England	WRMP24 Supplementary Guidance: Environment and society in decision-making (England)	Natural Capital approach to include assessment of five minimum ecosystem services
England	Environment Bill and 25 Year Environment Plan ⁸	BNG assessment using Defra metric 3.0

¹ <https://wre.org.uk/>

² <https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources>

³ Along with Severn Trent Water, United Utilities Water, Dŵr Cymru Welsh Water and Hafren Dyfrdwy

⁴ Ofwat, NRW & EA (2021), Water Resources Planning Guideline – v9 for Publishing February 2021

⁵ Andrews R, Ashmole R, Fredenham E, Mant JM, Pitcher C, Sanders J, Twigg W, Wade TI and Westbrook M (2021) Environmental Assessments for Water Resources Planning. UK Water Industry Research Ltd Report 21/WR/02/15.

⁶ EA (2021) The Environment Agency Natural Capital Register and Account Tool, Version 1. Technical Report. Published January 2021.

⁷ Defra (2020) Enabling a Natural Capital Approach Guidance, updated August 2021

⁸ Defra (2018) A Green Future: Our 25 Year Plan to Improve the Environment. www.gov.uk/government/publications.

1.2 NATURAL CAPITAL, ECOSYSTEM RESILIENCE AND BIODIVERSITY GAIN

Although there is currently no legislative requirement for NCA, the WRPG states that water companies should use NCA in their decision-making which can be used to include an assessment of ecosystem resilience. The EA have published separate supplementary guidance on Environment and Society in Decision-making^{9,10} which provides more detail about the expectation for NCA, and how NCA can support decision-making. The purpose of this is to allow water companies and Regional Groups to “make decisions that do not devalue, and look to enhance the value of the natural world for society benefit” (WRPG Supplementary Guidance⁹) together with supporting water companies to promote plans that have the potential to deliver wider environmental and social benefits.

The 25-Year Environment Plan speaks of embedding an environmental net gain principle for development, including infrastructure. The Environment Bill received Royal Assent in November 2021 and is now an Act of Parliament. Mandatory biodiversity net gain as set out in the Environment Act applies in England only by amending the Town & Country Planning Act (TCPA) and is likely to become law in 2023. The Act sets out the following key components to mandatory BNG:

- Minimum 10% gain required calculated using Biodiversity Metric & approval of net gain plan
- Habitat secured for at least 30 years via obligations/ conservation covenant
- Habitat can be delivered on-site, off-site or via statutory biodiversity credits
- There will be a national register for net gain delivery sites
- The mitigation hierarchy still applies of avoidance, mitigation and compensation for biodiversity loss
- Will also apply to Nationally Significant Infrastructure Projects (NSIPs)
- Does not apply to marine development
- Does not change existing legal environmental and wildlife protections

The BNG assessment will demonstrate that options and plans will look to maximise biodiversity gain and facilitate the incorporation of BNG into supply option design. This will underpin delivery of wider environmental net gain through provision of improved habitat quality and quantity.

The use of NCA and BNG assessment is an important part of the overall environmental valuation process and can highlight the opportunities for social and environmental gains as well as helping to engage with environmental stakeholders.

The purpose of NCA assessment is to evaluate the benefits and disbenefits to society that arise from changes to natural capital assets. It can work alongside the SEA which, traditionally focusses on environmental impacts, and BNG which is concerned with habitat improvement for the purposes of ecosystem resilience rather than for the associated benefits to society. Therefore NCA, Strategic Environmental Assessment (SEA) and BNG can be seen as complementary and the outputs of all three should be considered in decision-making. The outputs of the BNG and NCA can also be used to demonstrate fulfilment of other requirements of the WRPG, notably the duty to conserve and enhance biodiversity and deliver environmental ambitions. The BNG assessment underpins the NCA assessment and should be noted that the two in this context are intrinsically linked.

⁹ EA (2021) WRPG 2024 supplementary guidance – Environment and society in decision-making. Published 24/03/2021

¹⁰ NRW (2020) WRPG 2024 supplementary guidance – Environment and Society in decision-making (Wales). Draft for consultation published September 2020.

2. BNG ASSESSMENT

A GIS-based system will be used to allow for rapid assessment of multiple elements and the application of **Defra's Biodiversity metric 3.0** as a means of scoring the biodiversity gain or loss of each element. Therefore, the baseline will be developed from spatial data sets of habitat inventories and available habitat survey data of Cambridge Water's assets, scored through the Defra BNG Metric. Subsequently this information will support an assessment of habitat conditions where data exists, and an assessment of diversity.

The following approach will be split into 2 elements.

Firstly, habitats potentially lost for the revised feasible options list will be assessed (related to the construction working width). This will underpin the baseline required for the NCA.

Secondly the calculation of the habitat enhancements/creation required for BNG and assessment of possible locations for these opportunities will be provided for the constrained options.

This will be based on open-source data to provide a high-level assessment of what can be achieved. The outcomes will subsequently need to be discussed with local stakeholders to ensure synergy of opportunities, which is beyond the scope of the methodology.

2.1.1 Achieving Biodiversity Commitments

The approach will assess whether the company and Regional plans meet with the Environment Bill and the 25 Year Environment Plan commitments and statutory environmental duties for biodiversity through taking into account the **biodiversity commitments** (listed below).

The assessment applies the principles of Net Gain, by taking a hierarchical approach to mitigation seeking to avoid loss of key habitats, and therefore species, and strategic identification of opportunities for biodiversity benefits to protect, enhance and provide resilience. Those that apply to Cambridge Water are given below:

1. Conserving and enhancing SSSIs (Wildlife and Countryside Act as amended).
2. Furthering the purposing of the Habitats Directive (and regulations) Conservation of Habitats and Species Regulations 2017 as amended.
3. Achieving the conservation objectives for marine protected areas (marine and Coastal Access Act).
4. Biodiversity net gain for habitats and species of principal importance for the conservation of biodiversity – (Natural Environment and Rural Communities Act).
5. Sites of Importance for Natural Conservation (SINCs).

Key to this is timely identification of the possible requirement for compensation for likely impacts, such as those to 'irreplaceable habitats' and to identify lower impact alternatives.

2.1.2 Data collection and review

The first stage is collection of data and review of relevant, available information to identify key BNG opportunities. The following open source data sets are readily available and can be uploaded to a centralised GIS database for viewing:

- Relevant legislation, national and local policies and guidance for England, including:
 - Nature Recovery Networks
 - Priority Habitat and Priority River Habitats
 - Local Plans for specific policies on BNG, such as Biodiversity Opportunity Areas and Local Nature Recovery Strategies, where available
 - River Basin Management Plans
 - Open source data on non-statutory designated sites

2.1.3 Identifying the biodiversity baseline conditions

The Defra BNG metric is a habitats-based assessment. To demonstrate best outcome (% BNG) a **baseline calculation** of current biodiversity value/score is required. This approach quantifies each habitat type into 'units' based on a number of factors, including habitat distinctiveness, area (or linear equivalent), condition, ecological connectivity and strategic significance. The assessment of BNG options will be a high-level assessment based on available data. For this, a range of open source and accessible data will be used to gain a good understanding of habitats present within the zone of influence that can provide a robust baseline. The zone of influence would be identified through buffering the habitats associated with each element according to the construction footprint and associated impact pathways (see also **section 3.2.1** in terms of the use of the zone of influence for NCA).

Firstly, the habitat data will be provided by using a composite layer comprised of existing habitat inventories, such as Corine Land Cover, Priority Habitat Inventory and available habitat survey data of Cambridge Water's assets, and habitat areas measured in GIS. Secondly, the identification of habitat distinctiveness, condition and baseline extent for habitats, including priority habitats and designated and non-designated sites, would be determined through mapping on known data (such as that available within the habitat survey data of Cambridge Water's assets) and open data on designated sites. Wherever possible we will use datasets that have been collected for the SEA and HRA elements of this project. Cambridge Water's GIS data sets on the habitat condition of their assets will be used to refine the data. Where data on habitat quality is not available, 'moderate' condition will be assumed to avoid an over precautionary assessment. All assumptions will be noted in the BNG report.

The baseline scores are adjusted for the associated habitat impacts (temporary/permanent gains or losses) related to the construction of each element as area of habitat loss. This is assessed in the absence of mitigation, following construction and following habitat re-instatement for temporary habitat loss. This part of the assessment identifies high risk areas where the proposals will result in a significant loss of biodiversity and offsetting may identify an 'irreplaceable habitats' that should be avoided, such as certain priority habitats.

The output is the tool spreadsheet, a table of baseline unit scores for each element, and a map of constraint areas and impact areas, to provide early warning of elements with high scores where offsetting would be onerous.

2.1.3.1 Identifying BNG opportunities and calculating the benefit score

The habitat enhancements/creation required (in hectares and habitat type) to provide no net loss and BNG will be calculated through the Defra BNG Metric 3.0. Enhancement measures can include the provision of new habitats, provision of new habitat features and the improved management of existing habitats, which will result in a net benefit to biodiversity, over and above the measures required to mitigate and compensate for the impacts of a proposed scheme. Enhancement opportunities are added to the Metric as a habitat area and the Metric re-calculates the quantity or balance of (units) of BNG provided, which is also given as a % change from the baseline. The aim is to achieve a minimum of 10% net gain for biodiversity and at this stage this will require significant manipulation of habitat restoration/creation options to identify the best outcome.

Opportunities for biodiversity gain will be linked with those within SEA, WFD, HRA mitigation measures where applicable and NC approaches will require working in parallel to identify solutions to provide best outcomes across these assessments. As a result, a diversity of opportunity habitats will be identified that allow for adaptability under climate change scenarios. Where condition is known this will be accounted for with an assessment of opportunities to improve current habitat condition.

The output of this stage is the tool spreadsheet and a table of the habitats and areas required for enhancement/creation to offset the impacts of each element and provide a minimum 10% BNG. Representation of the BNG opportunities, habitat enhancements or creation, would be represented in GIS with areas shown within possible suitable locations based on habitat type only within a buffered area around each constrained option. The purpose is to represent the area of enhancement /creation required for a rapid assessment of achievability and flag any unmitigable impacts.

2.1.4 Strategic assessment of opportunity areas

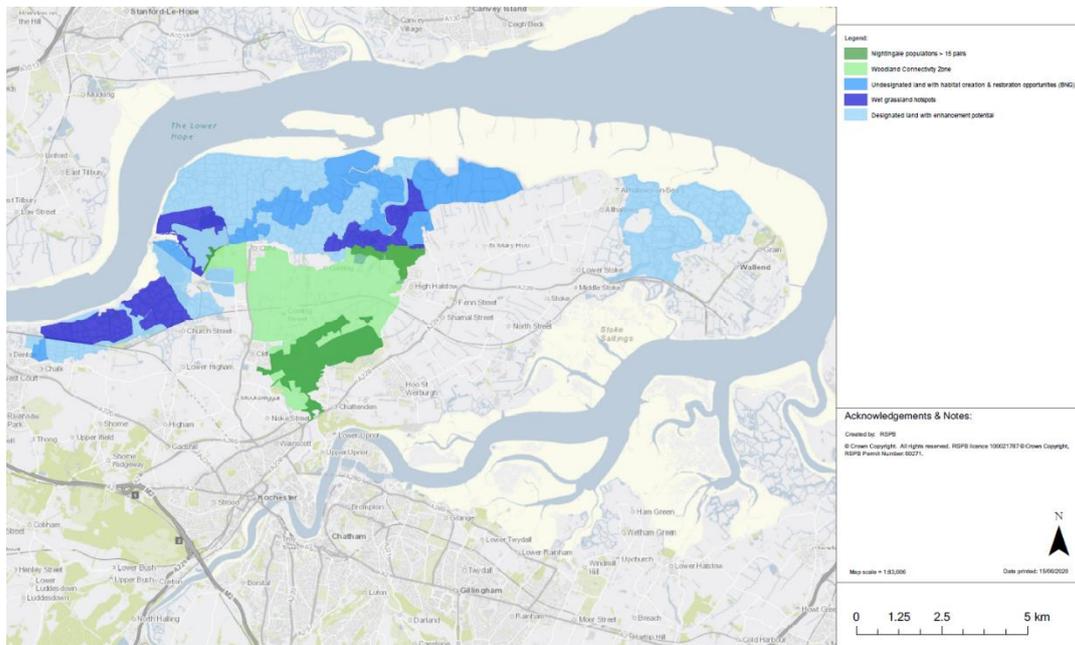
The metric takes into account habitat distinctiveness and risk parameters associated with habitat creation and restoration. This means that a 1:1 replacement will not score 0 in terms of gains and losses but a negative

number of units, as additional enhancements will be required, for example, to take account of time lag of the establishment of created/restored habitat. Therefore, if additional habitat area is required to offset losses and provide BNG, it is possible that insufficient land may be available on site. A strategic assessment of off-site opportunity areas will be undertaken to identify suitable parcels of land where the best biodiversity gain could be achieved. These opportunities will be identified within a buffered area around the constrained options and follow the mitigation hierarchy. These opportunity areas will interface with the NCA to identify where benefits can be achieved and are described further below. Assumption around any uncertainties will be clearly quantified related to compensatory measures presented.

2.1.5 Identifying BNG opportunity areas

The approach follows the mitigation hierarchy of avoiding, minimising and mitigating the habitat lost/deteriorated and local compensation required. Maximum credits can be achieved through identifying opportunities for enhancing the habitat that is lost/degraded rather than replacement. However, where insufficient habitat lies on site to deliver what’s required for net gain, alternative locations will be sought. National and Local plans and policies, such as River Basin Management Plans, will be reviewed to identify any specific objectives for BNG that can be delivered, such as Biodiversity Opportunity Areas, Nature Recovery Networks, the UK Habitat Networks and non-statutory designated sites, for example. An example is given in **Figure 1** of a Nature Recovery Network.

Figure 1 RSPB’s Proposed Nature Recovery Network for example location (zoom in to see detail)



Using the principles of Nature Recovery Networks, core areas for biodiversity within buffered areas associated within each constrained option will be identified. The opportunities will be assessed for their suitability for specific net gain features, connectivity opportunities and achievability.

The output would be a map of biodiversity opportunity areas within these strategic locations.

3. NCA ASSESSMENT APPROACH

The purpose of this methodology report is to set out the approach to be used when assessing the natural capital impacts of WRMPs. **Section 3.1** identifies the approach to qualitative option scoring to be used to initially assess the options¹¹ included in the revised feasible options listings for Cambridge Water. **Section 3.2** describes the detailed assessment approach to be undertaken for options included for the constrained options. This two-stage approach to natural capital allows the National Framework timetable for regional planning to be achieved and also allows best practice approaches to be adopted for the companies WRMPs in an integrated way.

Qualitative scoring of options will support the option-level SEA assessment detailed screening and the multi criteria analysis in initial runs of the decision-making models

The more detailed results will be available to include in subsequent decision-making model runs if the difference is material. They will also be available to support programme level appraisal.

The NCA will include the assessment of baseline environmental assets and their ability to provide ecosystem services, and how these are likely to change as a result of the options.

Natural capital assets are the renewable or non-renewable stocks and benefits that we stand to gain from the ecosystem services, as well as the natural processes behind them. In order to assess the ability of natural capital assets to provide ecosystem services we have to use **ecosystem service metrics**; these are key, measurable benefits that intrinsically link environmental health to the benefits we gain from natural capital assets. There are numerous metrics to choose from so selecting those most relevant to a particular study is an important step to take in the NCA process.

The WRPG Supplementary Guidance states that NCA in England should include as a minimum the following five ecosystem services, we will use all metrics across the Cambridge Water area:

- Biodiversity and habitat (see methodology in section 2)
- Climate regulation
- Natural hazard regulation
- Water purification
- Water regulation

In addition to those services included as a minimum, we will also consider 'Recreation', 'Air quality' and 'Agriculture' as there is the potential for significant impact to this ecosystem service from delivery of WRMP options. As part of the screening exercise, a list of all potential Ecosystem Services will be provided for transparency and completeness and further justification of use of the key metrics used in this assessment (as per those highlighted in the WRPG) guidance. This will provide clarity over how ecosystem services are captured and drives forward an agreed proportional approach. A summary of this approach with key ecosystem services is provided in **Appendix A** (adapted from the UKWIR guidance¹²).

The biodiversity assessment underpins the habitats assessment related to the NCA. The BNG screening assessment provides the habitat areas within the zones of influence related to the construction area. The data feeds directly into the NCA.

3.1 QUALITATIVE SCORING ASSESSMENT/LINKS TO MULTI CRITERIA DECISION ANALYSIS

As highlighted previously, this high-level qualitative scoring is necessary to assist with the development of the SEA and support screening of options (and associated ecosystems).

¹¹ In this document, though not synonyms, the term 'options' covers both components (the components that make up options) and options.

¹² Environmental assessment guidance for water resources management plans and drought plans (2020) UKWIR

This scoring will also feed into the *Multi Criteria Decision Analysis (MCDA)* and help support decision making related in the initial decision-making model runs. Scoring system will be developed that is commensurate with that developed for South Staffordshire where each ecosystem service metric is a reflection of the potential level of benefit or disbenefit provided towards that metric based on defined scoring criteria for each ecosystem service. Disbenefits will be recorded separately to highlight any trade-offs between metrics. A brief commentary will also be included to describe the benefits or disbenefits. This pragmatic qualitative-based approach is aimed at highlighting key potential benefits and disbenefits at this stage.

Options with a score of 0 for a particular ecosystem service will not require additional assessment at the next stage.

Option scores will be calculated based on the magnitude, scale and duration of expected impacts, with each category scored between 0 and 3. Benefits will be given a positive score whilst disbenefits will be given a negative score, and these will be presented as two separate scores so that each option will have a benefit and disbenefit score for each ecosystem service (this is relevant, for example, so that construction impacts and long-term habitat enhancements can both be recognised without cancelling each other out). These scores will be multiplied to provide the total score required for the multi-criteria decision assessment to be undertaken on the constrained list of options.

Examples of the scoring criteria are presented in detail in **Appendix B**. The biodiversity and habitats ecosystem service will provide a high-level view of likely biodiversity improvements or losses.

3.2 DETAILED ASSESSMENT

Detailed assessment will be undertaken through four key steps:

1. Baseline assessment of zone of influence
2. Qualitative assessment
3. Quantitative assessment
4. Monetised assessment (only where appropriate and following further discussion)

3.2.1 Step 1 - Baseline assessment of zone of influence

The zone of influence for each option will be defined using GIS. This will include the spatial area impacted by option construction and operation. The zone of influence of each option may vary depending on the ecosystem service being assessed. For example, the zone of influence for water-related impacts of an option can extend all the way downstream of a river, across an entire groundwater body (where relevant, these would be selected to be consistent with the WFD assessment) or upstream (e.g. if related to regulation impacts). However, the zone of influence for climate regulation benefits may only extend to the option footprint itself.

The zone of influence will be defined based on how far benefits are likely to extend, the pathways for benefits and any indirect benefits further afield (for example, reduced abstraction from other sources). Relevant spatial units will be used for each ecosystem service based on the most appropriate available data, for example WFD catchments or designated sites boundaries, although a bespoke zone of influence will be used where possible.

The footprint of the option will be taken from the central project GIS. Where this comprises only lines or points, assumptions will be made about the land-take and construction working area (unless more detailed data is available. Standard assumptions will be agreed for different types of infrastructure e.g., a 30m working area around a pipe.

For some Ecosystem Services, a wider zone of influence will be relevant than others, to ensure that all benefits and disbenefits are captured. These will be applied systematically for different types of options, but with each site individually reviewed. The approach will be refined when the list of options is known, but some key points include:

- The water regulation ecosystem service may require the downstream length of a river, or a groundwater body, to be considered. This would be agreed in conjunction with the WFD assessment.
- Recreational benefits will depend on factors including footpath networks, public open spaces and population in the surrounding area. A buffer will be applied to the option footprint.
- Biodiversity benefits should consider ecological connectivity with surrounding areas and proximity to any designated sites as outlined in **Section 2**.

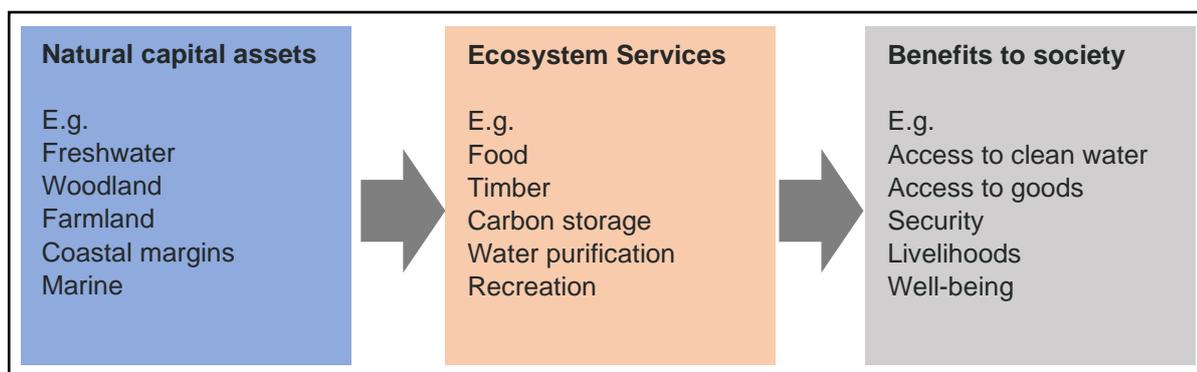
Open-source land cover data detailing the broad habitat types that fall within the zone of influence will be used to provide a natural capital baseline against which potential changes can be measured in subsequent steps. This will provide understanding of the environmental context and the ecosystem services that are currently supported within the option zone of influence. The broad habitat types that support the natural asset baseline (consistent with the ENCA guidance) are as follows:

- Urban
- Enclosed farmland
- Mountains, moors and heath
- Freshwater
- Woodland
- Coastal margins
- Marine
- Semi-natural grassland

3.2.2 Step 2 - Qualitative assessment

A qualitative assessment will be undertaken of the ecosystem services provided by the identified habitat types. We will assess the natural capital assets in the zone of influence as identified in **Step 1**, and map these to the flows of ecosystem services (i.e., the societal benefits they provide). For example, freshwater is a natural asset that has potential to provide biodiversity, water regulation, recreation and tourism, and well-being services, although the provision of these services will depend on local conditions. The conceptual approach for considering relationships between natural capital assets, the environmental services they provide, and societal benefits obtained is denoted in **Figure 2**.

Figure 2 Conceptual approach to considering the relationships between natural capital, ecosystem services and the societal benefits they provide.



These flows of ecosystem services under pre- and post-construction conditions will be assessed, producing a clear written description of the likely change in ecosystem service provision for each option. Qualitative descriptions and maps of how these services benefit or disbenefit the environment will also aid in later decision making and provide insight into opportunities for mitigation. Where feasible, a semi-automated approach will be used to assess the ecosystem services based on broad habitats.

3.2.3 Step 3 – Quantitative assessment

Step 3 will draw on the natural capital asset baseline, as determined in Step 1, to provide ecosystem service values using physical metrics to quantify the ecosystem service provision before and after option construction.

The EA WRPG provides recommended metrics for assessment of the five minimum services which will be used for qualitative assessment. In addition, for the additional ecosystem services included (i.e., recreation and tourism, and agriculture) metrics will be selected from the ENCA Services Databook¹³.

Quantitative assessment using physical metrics is considered to be the “best practice” method as it quantifies the benefit in real terms. This quantification (e.g., area affected/benefited by an intervention such as air

¹³ <https://data.gov.uk/dataset/3930b9ca-26c3-489f-900f-6b9eec2602c6/enabling-a-natural-capital-approach>

pollutant removal in tonnes, or number of 'active' visitors to a site per year as a surrogate of physical health benefits etc) will also be necessary for calculating a monetary value (**Step 4**). In some cases, however, the data required for the quantification of the physical metrics may not be available or of limited accuracy to predict the change to physical metrics resulting from options with sufficient confidence. In this case a decision will need to be made regarding further data collection (if possible) or providing a justification for qualitative assessment only due to high uncertainty surrounding a more detailed quantitative approach.

The outputs of the BNG assessment (Biodiversity Units) will be used as the quantified value for the biodiversity and habitats ecosystem service.

3.2.4 Step 4 – Monetised assessment

In **Step 4**, monetary valuation data will be used to monetise the ecosystem benefits where it is possible. Some of the ecosystem services will be either impossible or challenging to monetise reliably so these may not be included. For example, biodiversity benefits will not be monetised as value transfer approaches tend to undervalue the benefits of biodiversity, as recommended in the WRPG. Only those services which can be monetised with confidence will be included, with an associated confidence scoring included depending on the certainty of monetisation method. The monetised assessment will be presented alongside the metrics from Step 3 for services that have not been monetised, to ensure that they are still represented in the final assessment.

Methods for calculating monetary values will be taken from the EA WRPG Supplementary Guidance and the ENCA Services Databook, and are likely to include:

- Benefits/value transfer
- Damage costs avoided
- Productivity losses
- Market prices

Where appropriate, physical metrics will be calculated and monetised using publicly available assessment tools such as Natural Environment Valuation Online (NEVO) (water regulation) or the Outdoor Recreation Valuation (ORVal) Tool (recreation and tourism). The recommended tools or approaches listed in Section A2 of the EA WRPG Supplementary Guidance will be drawn upon.

4. ASSESSMENT REPORTING

A stand-alone BNG and NC report will be prepared for consultation at the same time as the draft WRMP. That document will be for review by the environmental regulator and is not necessarily a wider stakeholder document.

The NCA screening assessment will provide a summary of benefits and disbenefits for the feasible options which will be fed into the MCDA.

An excel register will be provided for the constrained list of options for ecosystem services that are identified to be impacted or provide benefit noting that the NC biodiversity metric is underpinned by the BNG assessment which will provide the necessary quantitative (i.e. area or length) data and the high level identification of net gain and associated ecological resilience opportunity areas.

The BNG will be supported by the Defra BNG 3.0 metric for the constrained and unconstrained list of options.

An updated document will accompany the Final WRMP, that will reflect any changes to options, programmed, or more current information on other company water resources plan.

APPENDICES

Appendix A Summary examples of metrics included for NCA and BNG

The following table provide a summary of why specific ecosystem metrics are included at this stage in the assessment. The assessment and choice of metrics is based on the UKWIR and the All Company Working Group (ACWG) methodologies. More detail regarding rationale of services included are provided in section 2 of the methodology.

Service category	ESS metric – ones in bold are key metrics considered	Example of why metric considered/not include	Comment
Provisioning services	Food (Agriculture)	Recognition that agriculture is a significant activity in the WRW region. Included to account for potential benefit opportunities related to habitat.	Included under agriculture.
	Timber (optional under ACWG method)	Assessment of timber benefits included via other services at this stage (carbon, biodiversity, health and wellbeing). Calculation of timber for economic benefits is not feasible or relevant at this stage in the planning of water resources.	Accounted for under habitats loss/benefit – timber as a ESS not included for the purpose of the water resource management plan.
	Water supply/ regulation	This provides benefit via overall provision of water which can support sustainability reductions to abstraction.	Key provisioning service in the context of this work.
	Fish (optional under ACWG method)	Not feasible to consider in the context of water resource management as dependent on flow and WFD data to determine any impact or benefit. Will be captured qualitatively under biodiversity where known information regarding aquatic habitats is available.	At this level not included as limited knowledge of fisheries related to provision of services.
Abiotic flows	Renewable energy (optional under ACWG method)	Not relevant to account for renewable energy opportunities at this stage in the water resources management planning.	Accounted for as part of the option development and not directly relevant to this assessment at this stage – not sufficient information.
Regulating services	Air pollutant removal (optional under ACWG method)	Air pollutant could be considered via mapping of urban areas and air quality zones. However, there is only likely to be a small overlap between air quality change and habitat loss at this stage. When agreed BNG is identified (areas and type) then benefits for air quality can be considered.	At this stage not accounted for. Will be beneficial following stakeholder engagement as part of the assessment but is beyond the scope of this work.
	Carbon reduction (climate regulation)	Loss of habitats during construction and operation may effect carbon sequestration storage capacity – biodiversity opportunities	Key regulating services to account for related habitat change and opportunities/disbenefits.

		via BNG need to be identified to support over all environmental resilience.	
	Flood regulation (natural hazard regulation)	Loss of flood storage from current land use during construction or may provide benefit dependent on any changes to flow regime in the affected water bodies.	Key regulating services to account for related to habitat change and opportunities/disbenefits.
	Noise reduction (optional under ACWG method)	Not feasible to consider this with the current detail. Noise is considered as part of the SEA related to construction.	See stated regarding why not included.
	Temperature regulation (optional under ACWG method)	Primarily related to shading via habitat creation – at this stage key benefit considered under biodiversity – not feasible to assess until opportunity areas and habitat type identified.	Not accounted for at this stage as will be dependent of project detailed design and the specific habitats related to BNG (spatial scale, location and habitat type).
Cultural services	Recreation and Tourism	It is predicted that there will be impacts on recreation and tourism during construction. It is included to identify the level in impact as this can have wider wellbeing impacts as well as benefits potentially accrued via biodiversity uplift and resilience.	Based on knowledge of use of various recreation open source data sets. Commentary around benefits for physical health including to cover physical health (and wellbeing).
	Physical health (Health and wellbeing) (optional under ACWG method)	See above.	See above.
	Education (optional under ACWG method)	Education benefits are only likely if visitor centres for example are included as part of any options. At this stage it is not feasible to assess any benefit.	Not feasible to assess until more knowledge of opportunities related to water resource options
	Volunteering	Not applicable at this stage.	Not applicable.
Aggregate/bundled services	Amenity (Health and wellbeing) (optional under ACWG method)	See recreation and tourism.	See recreation and tourism above – amenity considered within the context of recreation and wellbeing goals.

	Biodiversity	Biodiversity is provided as part of the BNG assessment. It provides information around habitat diversity and extent plus condition includes a baseline assessment of habitats present at a site	Underpins all the NCA and strongly related to environmental resilience and mitigation.
	Soil health (optional under ACWG method)	Recognise that there is potential for construction activities to cause for example channel to ground water flows which could affect habitats or loss in agricultural land. Impacts on ground water accounted for via WFD assessment. Agricultural loss accounted for under the specific agriculture ecosystem service.	Not sufficient synergistic data available across the companies that are part of the WRW region. Soil use at this stage is related to habitats and agriculture. Details related to soil impacts/benefit opportunities will need to be considered at a later stage of the water resource planning process.
	Water quality (purification)	Loss of habitats may reduce water purification if close to water bodies. These will be assessments will be related to proximity to water bodies.	High level assessment with information gained primarily from the WFD assessment.

Appendix B High Level scoring criteria

This appendix provides a summary of the assumptions for scoring for both benefit and disbenefit scores for each ecosystem together with scale and duration of impacts. This will support granularity in the assessment matrix to support the MCDA. It should be noted that some metrics will at this stage be incorporated into the SEA (e.g. culture and heritage). Section 2.1 of this report provides details on how this information outlined below is cumulative used.

Biodiversity subcategory score

	0	1	2	3
Habitat importance	No significant habitat	Agricultural, or greenfield	Adjacent to designated areas/ priority habitats	Intersects designated areas / priority habitats or enhancement zones / irreplaceable habitats (Ancient Woodland)
Size of the area directly affected (i.e. within the option Zol)	0	<5km ²	<10km ²	>15km ²
Proximity to option	>1km	1km	<500m	<250m

Scale score

Benefit / disbenefit score	Definition
0	No impact
1	Minor impact (local)
2	Moderate impact (local)
3	High impact (regional)

Duration score

Benefit / disbenefit score	Definition
0	No impact
1	Temporary impact due to construction < 1 year
2	Temporary impacts due to construction >1 year
3	Permanent impact*

*If impacts of construction will have a permanent effect (e.g., loss of irreplaceable habitat) then these should be scored 3.

Magnitude score

Ecosystem service	Benefit / disbenefit score	Definition
Biodiversity and habitat	0	Refer to Biodiversity sub-categories (Below)
	1	
	2	
	3	
Climate regulation	0	No change
	1	Negligible changes
	2	Moderate changes to low sequestering habitats (e.g. farmland, green urban, heath or other grassland/shrub habitats)
	3	Moderate or major changes to high sequestering habitats (e.g. woodland, salt marsh or undamaged peatland)
Natural hazard regulation	0	No land cover change within floodplain where communities downstream are at risk of flooding
	1	Minor land cover change within the floodplain which may result in a minimal change in risk of flooding downstream
	2	Change in land cover (e.g. grassland and heathland) and other regulating habitat within the catchment that impact flood risk (e.g. slow down overland/rapid flows) where communities downstream are at risk of flooding
	3	Change to high values habitats (e.g. woodland, wetland, marsh) within the floodplain which could result in changes related to flood risk to communities downstream
Water purification	0	No change
	1	Change in land cover which will have a minor impact to water quality and/or minor change in dilution which could affect water quality
	2	Change in land cover which will have a moderate impact to water quality and/or moderate change in dilution which could affect water quality
	3	Change in land cover which will have a major impact to water quality and/or major change in dilution which could affect water quality
Water regulation	0	No change/ negligible change
	1	Minor change in catchment water availability (for reference <10% change)
	2	Moderate change in catchment water availability (for reference >10% change)
	3	Major change in catchment water availability (for reference >50% /Significant change)
Health and Wellbeing & Recreation and tourism*	0	No change
	1	Minor change in visitor numbers or access to recreation asset (for reference <10% change) and/or minor impact to health and wellbeing of local community
	2	Moderate change in visitor numbers (for reference >10% change) and/or moderate impact to health and wellbeing of local community or wider population
	3	Major change in visitor numbers (for reference >50% /significant change) and/or major impact to health and wellbeing of local community or wider population
Agriculture	0	No change
	1	Change to Grade 3 or above agricultural land
	2	Change to Grade 2 agricultural land
	3	Change to Grade 1 agricultural land

*recreation/ wellbeing impacts may include changes to access roads, footpaths or recreation assets (parks, nature reserves, golf courses etc.), or changes in amenity value of recreation assets (i.e. visual/ noise impacts, facilities etc.)



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