International Climate Finance Evidence Project

Work Package 2 Methods

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Project overview

The Defra-JNCC ICF Evidence Project ran from October 2020 to May 2021 and aimed to address the overarching question:

Can Nature-based Solutions (NbS) effectively and efficiently contribute to simultaneously achieving the UK Government's biodiversity, climate, and poverty-reduction policies for Overseas Development Assistance (ODA) spending?

To address this overarching question, the question was split in two separate work packages:

- **Work Package 1 (WP1):** How can the contribution of a Nature-based Solutions ODA project to biodiversity conservation be effectively and efficiently measured at both the project and programme scale?

- **Work Package 2 (WP2):** What are the underlying principles of a Nature-based Solutions ODA project that successfully (i.e. effectively and efficiently) simultaneously contributes to biodiversity, climate, and poverty-alleviation policies?

For each of these work packages, there were several tasks under each:

WP1 - Biodiversity indicators
Task 1 – Biodiversity Indicator Frameworks Review
Task 2 – Biodiversity Indicator Identification
Task 3 – Biodiversity Indicator and tool creation and support
Task 4 – National biodiversity metrics feasibility assessment
WP2 - Principles of NbS
Task 1 – Evidence Base
Task 2 – Cost-effectiveness
Task 3 – Guiding principles
Task 4 – Implementation Guidance and Checklist
Task 5 – Financial models
Task 6 – Gaps in evidence base and conclusion

The approach and methodology for Work Package 1 is provided within the Biodiversity Indicators Review and Biodiversity Indicator Framework Review Reports. For Work Package 2, the approach and methodology are provided below.

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Work Package 2 Methods

1   Task 1 methods – Evidence Base

1.1   Review scope

The Case Study Analysis was undertaken to (i) identify case studies of projects implementing Nature-based Solutions (NbS) in ODA-eligible countries and of those projects, and (ii) identify which had achieved or were aiming to achieve the 'triple win' of biodiversity enhancement, climate change mitigation and adaptation, and poverty reduction. Developing this part of the evidence base was limited to a two-month timeframe and was carried out by a sub-project team of four researchers.

During this time, 27 databases were analysed with 2934 projects reviewed. To identify relevant case studies, all 2934 projects were first screened for those that did not meet the definition of NbS (see Box 1). Those projects that did meet this definition (792 projects) were then reviewed further using JNCC's selection criteria (see Section 1.3). Those projects which met both the definition of an NbS and the selection criteria (378 projects) were then subject to a detailed review.

This review contributed towards the evidence base for the Work Package, and produced three main deliverables:

- **Library of Projects**: This database contains all 2934 projects assessed for the Defra-JNCC ICF Evidence Project. The project title, the database it is hosted in and a link are provided, as well as whether the project incorporated a clearly defined NbS.

- **Database of NbS Case Studies:** This database contains information on the projects (378) that met both the definition of an NbS and passed the JNCC selection criteria. This database provides a range of information on each case study, including the geographic location, the NbS intervention type and an assessment of whether the project delivers the triple win (i.e. provides benefits for biodiversity loss, climate change and poverty).

- **12 Exemplar NbS Case Studies:** These provide a summarised write-up of the information publicly available on 12 NbS projects in ODA-eligible countries and demonstrate how they provide the 'triple win'. These were selected from the Database of NbS Case Studies through a shortlisting process (see Section 1.5).

The methods below describe the process by which these outputs were developed. Some basic analysis is also included in the document, identifying high level trends in the data and noting were caveats should be made.

1.2   Databases

Table 1 presents the databases which were selected through internet scanning. The databases selection was non-exhaustive and focused on those prioritised by expert JNCC knowledge. Database prioritisation was based on those which may contain examples of NbS projects, with a focus of those in ODA-eligible countries and a spread of focal areas (i.e. to ensure that projects were found for terrestrial, marine and urban realms). As urban examples

were difficult to locate in the databases focussed on ODA-eligible countries, the scope was expanded to those databases providing urban examples in countries not eligible for ODA (e.g. Oppla).

Due to the time-limited nature of the research, databases were filtered to maximise the likelihood of finding case studies relevant to the scope of this Project. Different search criteria and/or filters were applied to each database dependant on (i) the size of the database; (ii) the relevance of the database to the scope of the Project; and (iii) the filtering ability of the individual database. For example, some databases were analysed in full if they were sufficiently small and/or relevant (e.g. Green Climate Fund, Conservation International), whereas filters were applied to other databases which were too large to analyse in the given time-frame and/or a large proportion of the projects did not meet our definition of an NbS (e.g. GEF). Duplicates of individual case studies found on multiple databases were removed from the final database. The way in which each database was filtered and/or searched was recorded and can be found in Table 1.

To standardise the search criteria between databases, a list of search terms was developed for databases with search bars. These terms were selected as those commonly associated with NbS and reviewed by a panel of experts and researchers. Where initial search terms returned a large sample of projects (e.g. CORDIS), the full list of standardised search terms were not used. The standardised search terms are as follows:

- Nature-based Solutions/Nature based Solutions
- Ecosystem-based/Ecosystem based
- Natural Capital
- Natural Climate Solutions
- Disaster Risk Reduction
- Green Infrastructure
- Natural Infrastructure
- Ecosystem approach

- Ecosystem service(s)
- Restoration
- Nature inclusive design
- Blue Carbon
- Bioengineering
- Ecological engineering
- Applied Ecology
- Bioremediation
- Forestation

Table 1. Databases analysed for this Project. The Table provides the filters which were applied to each database to find case studies more relevant to this Project. The total number of case studies, as well as the number assessed for this Project following filtering is provided.

Name of database	Hyperlink	Total case studies	Filter(s) applied to the Database	Case studies after filtering and removing duplicates
BioCarbon Fund	https://www.biocarbonfund-isfl.org/programs	5	N/A	5
Blue Carbon Initiative	https://www.thebluecarboninitiative.org/carbon-projects	7	N/A	7
CGIAR-WLE	https://wle.cgiar.org/research/projects	300	All 'standardised search terms'.	94
Cities4Forests	https://cities4forests.com/stories/	62	Projects in the 'City highlights' category.	25
Conservation International	https://www.conservation.org/priorities/field-projects	7	N/A	7
CORDIS	https://cordis.europa.eu/projects/en	838737	Search terms = "nature"; "based"; "solutions"; and "biodiversity".	142
Darwin Initiative	https://www.darwininitiative.org.uk/project-search/	221	Filter Year Awarded = 2015 – 2020. Filter Funding Scheme = "Main Project", "Partnership", "Challenge Fund", "Post-Project". Search function changed during review; therefore some "Scoping" or "Fellowship" projects were initially included to review.	206
Development Tracker	https://devtracker.fcdo.gov.uk/	Unknown	Search term = "ICF"; Status = 'Active' and 'Closed'; 'Include Completed Projects' ticked.	106
Duke Nicholas Institute	https://nicholasinstitute.duke.edu/issues/climate-resilience-and-adaptation	6	N/A	6
Ecosystem Services for Poverty Alleviation	http://www.espa.ac.uk/projects	135	Excluded proposals which were not taken forward.	108
Equator Initiative	https://www.equatorinitiative.org/knowledge-center/nature-based-solutions-database/	1234	Filter = 'SDG 1' and 'SDG 13'. Search term = "biodiversity".	131
GEF	https://www.thegef.org/projects	5269	All 'standardised search terms'. Those with status "Completed" or "Project approved" were analysed (projects with "Concept proposed", "Concept approved" or "Cancelled" statuses were deemed to have insufficient information).	173

Name of database	Hyperlink	Total case studies	Filter(s) applied to the Database	Case studies after filtering and removing duplicates
GEF Blue Forests	https://gefblueforests.org/project-sites/	5	N/A	5
Green Climate Fund	https://www.greenclimate.fund/projects	159	N/A	159
Green Growth Knowledge Platform	https://www.greengrowthknowledge.org/projects/browse	258	All 'standardised search terms'. Additionally, under 'theme', the following were selected: 'Development'; 'Poverty and Equity'; 'Natural Capital'; and 'Risk and Resilience'.	190
GRID-Arendal	https://www.grida.no/activities/37	81	Filter = 'Completed' or 'In Progress', not 'Comms & Outreach'.	70
ICLEI Africa	https://africa.iclei.org/resource/?fwp_resource_types=case_studies	15	Projects under the 'nature-based development theme' and 'case studies' under the resources tab.	13
ICLEI South Asia	http://southasia.iclei.org/nc/our-activities/our-projects.html	85	Publications and project reports under the headers 'biodiverse city', 'resilient city' or 'nature-based development' that contain an intervention type key word e.g. disaster risk reduction, ecosystem-based adaptation.	23
ID-RECCO	http://www.reddprojectsdatabase.org/	467	Project Status = 'on-going', 'planned', or 'ended'. Objective 1: 'biodiversity conservation', 'biodiversity conservation;conservation/restoration', 'climate', 'development;participatory forest management/social development', 'development;social development', or 'social development'. Objective 2: 'biodiversity conservation', 'climate', or 'social development'. Objective 3: 'biodiversity conservation', 'climate', or 'social development'.	146
IW:LEARN	https://www.iwlearn.net/iw-projects/list	488	Filter = 'biodiversity'	49
Natural Infrastructure for Business	https://www.naturalinfrastructureforbusiness.org/case-studies/	16	N/A	15
Naturally Resilient Communities	http://nrcsolutions.org/strategies/#solutions	53	Filter = 'case studies'.	27

Name of database	Hyperlink	Total case studies	Filter(s) applied to the Database	Case studies after filtering and removing duplicates
Nature Serve	https://www.natureserve.org/conservation-tools/projects	45	N/A	45
Nature4Climate	https://nature4climate.org/nbs-case-studies/	16	N/A	16
Nature-based Solutions Initiative	https://www.naturebasedsolutionsevidence.info/evidence-tool/	195	Following a preliminary analysis of 30 case studies, it was concluded that the database did not provide information relevant to the scope of this analysis. The database is a collection of scientific papers, rather than examples of on-the-ground project implementation.	N/A
Naturvation	https://naturvation.eu/atlas	1000	Search term = "nature based solutions". Filters = 'SDG 3', 'SDG 13', 'SDG 15', and 'monitoring in place'.	149
Oppla	https://oppla.eu/case-study-finder	301	Map = Non-European Countries; Filter = 'NBS Project Case Studies'.	154
Panorama	https://panorama.solutions/en/explorer	724	Filter by Full Solution; Filter by Region: Africa; Asia; Oceania; America EXCEPT North America // Filter by Theme: Biodiversity; Climate Change; Ecosystem conservation; Gender mainstreaming; Human development; Local communities; Management Planning = 418	403
PEDRR	https://pedrr.org/casestudy/	5	N/A	5
Resilient Landscapes	https://resilient-landscapes.org/client-stories/	3	N/A	3
weADAPT	https://www.weadapt.org/case-studies	774	All 'standardised search terms'.	379
Wetlands International	https://www.wetlands.org/?s=&pt%5B%5D=casestudy	33	N/A	33
World Agroforestry	https://www.worldagroforestry.org/projects	197	Search terms = "biodiversity" OR "climate change". Filter = "Resilient livelihood systems" thematic area.	40
World Resources Institute	https://www.wri.org/projects	157	Following a preliminary analysis of 40 case studies, it was concluded that the database did not provide relevant examples of NbS.	N/A

1.3   Case study analysis

Filtering of the selected databases and removing duplicates between databases returned 2934 projects, all of which are available in the Library of Projects spreadsheet. Projects were first screened as to whether they incorporated a clearly defined NbS (see Box 1 for the definition of an NbS used in this Project). For those which did (792 projects), the case studies were the subject to JNCC's selection criteria (see below) and the economic and financial analysis key word search (see Task 2 and 5 Methods).

'JNCC's selection criteria' for further analysis of the projects which had met the definition of an NbS was projects which met all the following:

1. The case study demonstrated objectives which directly address two or more (or address two indirectly and one directly) of Her Majesty's Government's (i) climate change; (ii) biodiversity loss; and (iii) poverty reduction policies.

2. The project aims or objectives were clearly defined and indicative of positive future impacts.

3. There is sufficient data/information about the case study to complete the information required for the database.

4. The project has not been cancelled.

Box 1. Definition of a Nature-based Solution

The definition of an NbS used for this project is 'actions which enlist elements of nature or natural processes to address a particular problem, or suite of problems, faced by society and which deliver multiple benefits in the form of public goods.' The umbrella term of NbS includes interventions to adapt, enhance, or create ecosystems, which along with continued sustainable management or protection, enable society to respond to global pressures and change. They may be implemented alone or in tandem with hard, or grey, engineered solutions.

The IUCN defines NbS as 'actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human wellbeing and biodiversity benefits. Our definition recognises that NbS can provide benefits for human wellbeing and biodiversity as well as a broad range of other co-benefits, such as climate change adaptation and mitigation. Our definition does not otherwise depart from the widely adopted and accepted IUCN definition. This frames our definition and treatment of NbS as specifically within the context of a 'triple win' for biodiversity, climate, and people. However, it tailors our approach to NbS in order to address the specific question, *Can Nature-based Solutions (NbS) effectively and efficiently contribute to simultaneously achieving Her Majesty's Government **biodiversity, climate, and poverty-reduction** policies for Overseas Development Assistance (ODA) spending?*

Additionally, in our discussion of NbS we wish to make clear distinctions in the delivery of benefits, especially in our consideration of sustainable management or protected area management. NbS may deliver private goods in addition to public goods; however, a key aspect is the provision of benefits for the wider ecological and social community rather than the simple commercial return on private sector investment. For this reason, this work does not consider the straight-forward sustainable management of natural resources for basic goods and services (e.g., timber, fish, recreation, wildlife habitat) an NbS on their own, whilst it is a necessary component for most NbS interventions. Similarly, a natural capital approach is not considered an NbS by its own right, though the approach may be applied alongside NbS activities. Protected area establishment or management is another such intervention that can be an important tool but may not be considered an NbS if the intention is not the provision of public goods, or if principles such as an ecosystem-based approach are not applied. Protected areas may be established for many reasons, not only grounded in ecological rationale, and have varied levels of restriction or access to natural resources. Therefore, they may not enlist nature or natural processes to address a particular problem and may displace harm to biodiversity or have negative impacts on human well-being.

In order to address the task at hand, the project investigated interventions that aimed to address biodiversity loss, climate change, and poverty reduction. The ability of NbS to deliver effectively and efficiently for this 'triple win' was assessed through this project.

For those which met the definition of an NbS and passed the 'JNCC selection criteria', data for the columns outlined in Table 2 was collected.

Table 2. Descriptions and/or rules of data validation for spreadsheet categories.

Column header	Description of the information provided and/or data validation
Name of case study	The project name provided on the database
Name of database	Name of the database hosting the case study
Link	Hyperlink to the case study
Date accessed	Date which the project information was accessed and recorded by the Project team. DD/MM/YYYY format.
Focal area	Focal area of the case study. **Accepted Values:** Marine; Terrestrial; Urban.
Geographic region	UN sub-region which the project is implemented in. Breakdown of countries into regions can be accessed here: https://unstats.un.org/unsd/methodology/m49/
Country (if relevant)	Country/countries which benefit from the project. 'Regional' is provided if the project documentation only states the relevant UN sub-region.
Is the location ODA-eligible?	Whether the country (or countries) which benefit from the project are included in the 'DAC List of ODA Recipients: Effective Reporting on 2020 Flows' (https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-of-ODA-Recipients-for-reporting-2020-flows.pdf). 'Partly' is provided when not all the countries benefiting from the project are ODA-eligible. **Accepted Values:** Yes; No; Partly.
Ecosystem or biome	Primary ecosystem or biome for which the project is implemented in. The categorisation scheme is based on that of the Chausson et al. (2020) paper entitled 'Mapping the effectiveness of nature-based solutions for climate change adaptation'. More information in this scheme can be found in the paper's supplementary materials: https://onlinelibrary.wiley.com/action/downloadSupplement?doi=10.1111%2Fgcb.15310&file=gcb15310-sup-0001-Appendix.docx. **Accepted Values:** Arctic & Subarctic/Subantarctic tundra; Aquatic production/artificial landscapes; Boreal forests and taiga; Coastal (includes shoreline, beaches, and dunes, but not mangroves, deltas/estuaries, or saltmarsh); Coral reefs; Created forest (plantations); Created grass (artificial grasslands, grass strips); Created other; Deserts and xeric shrublands; Estuaries & Wetlands (tidal, semi-submerged) - Multiple; Informal settlements; Kelp Forest; Large Marine Ecosystems - Multiple (includes surface waters, deep-sea, MPAs, and integrated coastal to open ocean but not benthic); Mangrove; Mediterranean shrublands and forests; Montane/alpine (forests, grasslands, steppe, shrublands); Mudflats; Multiple; Oyster reefs; Polar seas; Ponds and lakes (inland); Temperate forests (broad leaf, mixed, coniferous); Terrestrial production/artificial landscapes; Temperate grasslands

Column header	Description of the information provided and/or data validation
	(including savanna, shrubland); Tropical and subtropical grasslands (including savanna, shrublands); Towns and cities; Tropical and subtropical forests (dry forest, moist/rainforest, coniferous); Wetlands (inland, i.e. swamp marsh bogs fens, except inland peatlands); Peatland; Reef Ecosystem - Other (rocky, etc); Saltmarshes; Sea floor (benthic) – includes hydrothermal vents, seamounts, trenches; Seagrass meadows; Streams and rivers; Submerged Aquatic Vegetation - Other; Watershed.
Year of start date	**Accepted Values**: *Year*; Not stated.
Year of end date	**Accepted Values**: *Year*; Not stated; Ongoing.
Project status	The status of the project at the time of 'Date accessed'. **Accepted Values:** Completed; Ongoing; Planned; Unknown.
Primary intervention type	Primary NbS intervention of the case study. The terminology in the project documentation was largely used or a similar such term to those already collected. Definitions of the NbS intervention types are provided in the 'Interventions Definitions' tab in the 'Database of NbS Case Studies'.
Does the intervention provide benefits for the following? [Climate change; Biodiversity loss; Poverty reduction]	Whether the project reported or suggested benefits for each of the three outcomes in the 'triple win'. Based on project documentation, this was either 'unspecified' if they did not specify a benefit for that outcome, 'qualified' if the project specified a benefit without any quantification, 'quantified' if the benefit had a numerical value or 'monetised' if the project financially valued the benefit. For climate change, both benefits for mitigation and adaptation were included. For biodiversity, area-based proxies were accepted for 'quantified' biodiversity benefits. **Accepted Values** (for each climate change, biodiversity loss and poverty reduction): Unspecified; Qualified; Quantified; Monetised.
Does the intervention aim to provide benefits for biodiversity loss, climate change and poverty (triple win)?	Whether the benefits for (i) climate change; (ii) biodiversity loss; and (iii) poverty reduction are all at least specified (i.e. 'qualitised', 'quantified' or 'monetised' in Columns O - Q). **Accepted Values:** Yes; No.
Is information on the funding mechanism provided?	Whether the funding information for the project is available. **Accepted Values:** Yes; No.
Was the project	Whether the project performance was monitored in some capacity (i.e. Annual Report). **Accepted Values:** Yes; No.

Column header	Description of the information provided and/or data validation
performance monitored?	
Is the post-project evaluation available?	Whether a post-project evaluation was available. **Accepted Values:** Yes; No.

The results of this data collection can be found in the Database of NbS Case Studies.

1.4   Quality assurance process for the case study analysis

A process of quality assurance (QA) was undertaken for all of the information collected on the evidence base of the 2934 projects. An alternative researcher to that who had originally collected the information was assigned a randomised selection of the projects from each database. This alternative researcher was selected based on their expertise within the focal area.

This randomised selection was either a sample of ten percent of the projects assessed from each database, or 25 projects – whichever number was lower. The QA reviews were undertaken blind, where the researcher did not view the original data that had been collected. The focus of this QA was (i) whether the project met the definition of an NbS; (ii) whether the project met JNCC's selection criteria and; (iii) the NbS intervention type. This focus was chosen to ensure consensus for the purposes of case study shortlisting.

The results of the QA review were then compared to the original data inputted into the database. A confidence interval of five percent was allowed for each database, where there could be disagreement of the information in one out of 20 entries. For any disagreements over this threshold, the original and QA reviewers discussed the project and came to an agreement over the correct entry. The plan was for any consistent errors to be edited based on agreement with the Work Package Lead, but this was not found to be required. A total of 274 projects went through the QA process, representing 9.3% of the 2934 projects assessed.

1.5   Shortlisting case studies

Following the assessment of 2934 projects, those which (i) incorporated a clearly defined NbS, (ii) had passed 'JNCC's selection criteria' and (iii) were in ODA-eligible countries (at least partly), were selected for further review. This totalled 283 case studies (see Figure 1), of which 179 were in the terrestrial environment, 68 in the marine environment and 36 in the urban environment.

| Total projects assessed: **2934** | → | Clearly defined NbS: **792** | → | Met the JNCC selection criteria: **378** | → | In ODA-eligible countries: **283** |

Figure 1. Initial sifting of the projects assessed, with the number of case studies returned at each stage.

Case studies with any of the following characteristics were then discarded:

- Those which had neither monitoring nor post-project evaluations available.
- Benefits for any of the poverty reduction, biodiversity, or climate change objectives were 'unspecified'.
- Two or more benefits for any of the poverty reduction, biodiversity, or climate change objectives were 'qualitised'.

The remaining case studies then totalled 75, of which 49 were in the terrestrial environment, 24 in the marine environment and two in the urban environment. To allow for more case studies to be considered for the urban environment, the requirement for monitoring and post-project evaluation was removed, leaving eight urban case studies in the shortlist.

The remaining case studies were further evaluated. Case studies were discarded where (i) evaluations did not provide information that the project had achieved, or was on-track to reach, its targets, (ii) the NbS was a small element of the project and/or largely not related to the project outcomes, or (iii) the information available was insufficient to be able to complete the case study pro forma.

Three researchers then each assessed the remaining case studies, voting on which should be included or excluded in the final shortlist. A quality assurance log was recorded to document the rationale behind the case studies that were being either included or excluded from the final selection. This assessment also aimed to get a spread of NbS implementation types and ecosystems. Agreement on 12 case studies was reached which have been summarised into the standardised two-page case study templates.

Each case study summary developed for this Project is based on the project information, which is publicly available, and where possible from discussions with the project manager who was involved in implementing the case study. Each case study is standardised in format and provides the following information:

- Key facts (executing entity, location, dates of implementation, NbS intervention, ecosystem in focus, and headline project achievements for each (i) biodiversity enhancement, (ii) climate change, and (iii) poverty reduction)

- Context

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- Project objects

- Funding

- Project approach

- Project outcomes

- Lessons learnt

- Sustainability and legacy of the project

- Diagram of the NbS interactions, showing how the project contributes towards the 'triple win'

- Hyperlink to further information

2   Task 2 & 5 Methods – Cost-effectiveness and Financial Models

2.1   Case study review

Each project in the Database of NbS Case Studies was subject to a further key word search as follows:

• Cost	• Loan	• Invest
• Financ*	• Efficien*	• Income
• Effective	• Payment	• Fund
• Grant	• Benefit	• Donor
• $ or £ or €	• Credit	• Revenu

Any NbS case studies which met the key word search criteria were subject to further in-depth review. Where sufficient evidence of economic analysis or the funding arrangements was available, additional research was undertaken to extract the information outlined in the following paragraph. The intention of this search was to maximise the possibility of finding evidence of any economic analysis undertaken by the organisation implementing or funding the NbS project (for example, a value for money or cost-effectiveness assessment), or any novel financing or funding models.

Where sufficient evidence was readily available, the following information was considered:

- Any benefit-cost ratios produced.

- Any discount rate used.

- Reference to wider literature cited as evidence to support any economic case made.

- Any benefits which had been monetised as part of the economic analysis of NbS projects conducted by case study owners.

- Any benefits which were discussed in the supporting documentation for NbS projects but not monetised.

- Reference to the type of funding arrangements (e.g. grant, loan, equity).
- Reference to the types of market mechanisms and funding models used to finance NbS projects.

2.2 Literature review

A further desk-based literature review was conducted to extract additional evidence of economic analysis or relevant financial information. Literature was searched via Google and Google Scholar. A review of the published literature was also conducted via SCOPUS using a series of primary and secondary terms (Box 2). This was targeted at both project characteristics (e.g. NbS or REDD) or intervention types (e.g. agroforesty) which would maximise coverage of both marine and terrestrial ecosystems.

Publications which detailed specific techniques of economic analysis or key search terms (e.g. mitigation, adaptation) within the title, keywords or abstract were specifically targeted due to the higher level of relevance. Returned publications were selected via visual inspection of the title and abstract.

Where publications cited or referred to other literature, which was deemed to be of relevance, the cited literature was reviewed using the same filters to check for relevance.

It is important to note that both the data extraction categories for the case studies and the criteria to select articles for further consideration involved subjective judgement. The literature review is not intended to be exhaustive, rather a sufficient but necessary complement to the case study review.

Box 2. Search terms used to review literature in SCOPUS

Primary search terms:
- **Cost-benefit**
- **Cost-effectiveness**

Secondary search terms:
- NbS
- Nature-based solution
- Mangrove
- Peatland
- Agroforestry
- Coral
- REDD
- PES

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3 Task 3 methods – NbS Triple Win Toolkit: Principles

3.1 Review scope and search methods

The development of the Principles was informed by the case study review undertaken as part of this project, as well as a time-limited literature review. Methods for the case study review tasks are previously described. From this review of case studies, high level lessons learned, themes, or apparent gaps were identified. The literature review was primarily focused on analyses and reports of mature NbS programmes (such as REDD+) as well as other published literature found in reference lists or in limited web-based searches. This literature review yielded a comparison of common principles or gaps, which were distilled to those pertinent to the implementation of NbS in ODA contexts for UK Government.

3.2 Case study review

Once the database review was complete, the Database of NbS Case Studies (378 case studies) was analysed for any overarching trends or conclusions. The review of databases was itself time-limited and not necessarily representative of global NbS projects (see Methods for Task 1) so findings cannot be assumed to be universally valid based on an exhaustive review. Any gaps would need to be interrogated and assessed as to whether there are legitimate reasons why there appears to be an absence of information or work – such as local political, economic, or environmental contexts unfavourable to the application of NbS projects. However, overarching trends can be used to support findings from the review of the literature available on NbS and its historical iterations.

3.3 Literature review

A time-limited literature review was conducted while Tasks 1 and 2 were being finalised. This review makes up the majority of the evidence for the nine NbS Principles developed. A diverse range of organisations have developed guidance and defining principles for NbS based on their specific approach – from NGOs (i.e., WWF) to multilateral agencies (i.e., IUCN, The World Bank, CBD) to academics (i.e., Oxford NbS Initiative). The literature review first selected available analyses of the long-term programmes that fall under the umbrella of NbS, such as REDD+ and other development assistance programmes. We also considered a limited review of scientific papers using keyword searches and reviewing the works cited in previously identified key literature. From this review of both grey and scientific literature, key principles and lessons learned were summarised, compared, and reviewed for their applicability to establishing effective, efficient NbS to achieve the triple win. The nine key principles were thus developed which reflect the state of current research into NbS within an ODA context and to maximise the delivery of a triple win.

4 Task 4 methods – NbS Triple Win Toolkit: Implementation Guidance & Checklist

4.1 Implementation Guidance

The Implementation Guidance was developed as an extension of the NbS Principles (see Section 3), providing further information, guidance and useful resources relevant to each principle. The Implementation Guidance provides a framework to support the development of an ODA Nature-based Solution (NbS) project that will effectively and efficiently address the triple win of climate change adaptation/mitigation, poverty reduction and biodiversity enhancement. This was divided into three different components:

1. What do I need to consider?

2. How will this help me achieve the triple win?

3. What resources are available?

4.2 What do I need to consider?

To provide further direction on the actions that should be taken to ensure a project is in line with the Principles and delivers on each aspect of the triple win, a set of key considerations were developed. Key considerations were established for each NbS Principle based on the main processes and procedures that underpin its adherence. Between one and five key considerations were developed for each NbS Principle based on the breadth of components it covered. Each key consideration was framed as a question to encourage the reader to assess the extent to which it has been met, and whether further action is required to adequately address it.

4.3 How will this help me achieve the triple win?

The second section provides further information on the importance of each key consideration to achieving an effective and efficient NbS that delivers on the triple win, and was based on a time-limited review of the NbS literature, as well as expert knowledge from the JNCC Work Package 2 Team. Guidance and evaluations on NbS produced by conservation NGO's, multilateral agencies, academics and long-term NbS programmes were used to identify common barriers and potential pathways to adoption.

4.4 What resources are available?

To provide further guidance on the actions or methods that can be taken to fulfil each key consideration, the final section aimed to provide a list of useful resources. The list was not intended to be exhaustive, but instead a collection of valuable internal and external resources directly accessible from the Implementation Guidance via hyperlinks. External resources were selected based on those mentioned in the NbS literature, as well as from keyword Google Scholar searches, and included relevant academic papers, guidelines, handbooks, reports, and tools. Internal resources relevant to each key consideration were also sign-posted, including guidance on indicators and frameworks produced for Work

Package 1, and both best practice case study overviews and financial models developed for Work Package 2.

4.5   The checklist

The Implementation Guidance was developed around the NbS Principles, taking the form of an interactive radial diagram with no intended order of consideration. A stand-alone checklist was therefore also developed to provide a step-by-step operational framework that could be used when either developing or assessing a project proposal. The aim of the checklist was to take the key considerations in the Implementation Guidance and reorganise them under a 'goals-based' framework, firstly considering project objectives and the local context, then economics and financing mechanisms, and finally institutions and governance. This approach was selected as making project objectives central to an NbS ensures the triple win is effectively addressed from the onset. Additional considerations relevant to the implementation of an NbS were also incorporated within the checklist, either breaking key considerations down into more specific actions, or highlighting them under several stages of project implementation to emphasise their ongoing importance.