



**Biodiversity Indicator Framework Review
- International Climate Finance Evidence Project**

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Summary

The UK Government's International Climate Finance (ICF) makes use of indicators in their annual publications to set out results of any impacts from their portfolio of investments. These indicators currently cover social and climate metrics well, but do not yet incorporate information on the biodiversity impacts of projects that are funded. To recommend effective biodiversity indicators that could be used by ICF, it is first valuable to understand existing indicator frameworks. Investigating existing indicator frameworks is important in order to identify indicators and/or objectives that are important for biodiversity KPIs to align with. It is also informative to understand more about the characteristics of the existing frameworks – this can help identify approaches that might be adapted for biodiversity KPIs as well as understanding where problems could arise.

A review of 66 existing indicator frameworks was conducted for the Defra-JNCC ICF Evidence Project. This report aims to review those frameworks and:

- Identify key indicator frameworks to align with
- Identify approaches to producing indicators that might be particularly relevant for ICF biodiversity KPIs
- Identify key strengths, weaknesses, and important characteristics of indicator frameworks in relation to monitoring the performance of NbS projects that might be funded by ICF
- Provide a short summary of the most relevant indicator frameworks for ICF biodiversity KPIs

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1 Introduction

Governments are increasingly investing in interventions to mitigate and adapt to climate change. In the UK, the [International Climate Finance](#) (ICF) portfolio of investments is the key mechanism for funding projects designed to address climate change impacts alongside poverty reduction in developing countries. Given the scale of funding and the importance of ICF for achieving UK ambitions on climate change and overseas development, it is essential to ensure that funding is allocated to projects in the most effective way and the impacts made by the funding are then properly evaluated.

ICF uses several Key Performance Indicators (KPIs) for monitoring and evaluation. Each KPI includes standardised methods such that individual projects can report on the indicators in a consistent way. ICF can then aggregate the reported results to document the impacts of funding. At present, the KPIs include measures that reflect economic and societal impacts, as well as carbon sequestration and avoided emissions. However, the KPIs do not yet incorporate the wider environmental impacts of ICF, including in relation to biodiversity, which is an important part of the [Sustainable Development Goals](#) (SDGs). For example, SDG 14 aims to:

‘Conserve and sustainably use the oceans, seas and marine resources for sustainable development’

and SDG 15 aims to:

‘Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss’

To date, addressing biodiversity decline has not been a requirement of ICF, and because biodiversity does not have specific KPIs, the impacts of projects on biodiversity are not captured in ICF reporting. As such, potential biodiversity and wider ecosystem benefits of ICF projects could be overlooked. Furthermore, some climate change mitigation or adaptation actions can be (unintentionally) detrimental to biodiversity – e.g. afforestation of savannah using fast-growing non-native trees could increase carbon sequestration (in the short-term at least) but would negatively impact native flora and fauna.

Incorporating biodiversity into the KPIs and considering the potential for multiple benefits or unintended consequences is particularly relevant given the increasing interest in Nature-based Solutions (NbS) to climate change. NbS involve using nature and natural processes, and emphasise achieving environmental, societal and economic benefits. In principle, the NbS approach to climate change adaptation and mitigation could therefore provide important additional benefits for ICF over interventions that focus more specifically on just one aspect of climate change impacts.

Developing biodiversity KPIs that are applicable to NbS projects and suitable for the ICF portfolio must address two general challenges. The first relates to the complexity of measuring, monitoring and reporting on biodiversity. For example, biodiversity change often occurs over relatively long time periods that may not be easy to detect in typical reporting cycles. Similarly, the biodiversity effects from an individual NbS project could be masked by wider-scale changes or could be dependent on which species are considered. The second challenge relates to the existing biodiversity indicators used to track performance at national and international level – e.g. progress on the UK government’s 25 Year Environment Plan, Sustainable Development Goals, Convention on Biological Diversity (CBD) [Aichi Biodiversity Targets Framework](#) etc. Although these indicators are not specifically designed for

monitoring and evaluating NbS, biodiversity KPIs for ICF need to align with and (ideally) contribute to reporting against the national and international goals and targets.

To address the above challenges, it is important to understand existing indicator frameworks and their relevance to the ICF KPIs. 'Frameworks' are defined here as '*sets of several indicators designed to provide complementary information, or a proposed process by which several related indicators could be defined*'. Examples of frameworks that contain indicators include the Sustainable Development Goals, the Aichi Biodiversity Targets, and the [Organisation for Economic Co-operation and Development \(OECD\) Environment Indicators](#). Resources provided by the [Biodiversity Indicators Partnership](#) include a framework that is a process for developing indicators rather than a list of indicators itself.

Investigating existing indicator frameworks is important in order to identify indicators and/or objectives that are important for biodiversity KPIs to align with. It is also informative to understand more about the characteristics of the existing frameworks – this can help identify approaches that might be adapted for biodiversity KPIs as well as understanding where problems could arise. For example, the applicability of a framework to ICF will depend on factors such as the spatial scale, approach to reporting, and whether the framework is designed to evaluate funding programmes. Other aspects of a framework may be useful more generally in showing the different potential approaches to producing biodiversity KPIs, and strengths and weaknesses of these approaches – e.g. how the framework is constructed and the underlying rationale. A final important consideration is the use of quality control measures to ensure a framework is robust (e.g. establishing appropriate baselines, avoiding double-counting or incentivising unwanted activities) and that the data used for reporting are appropriately validated.

This report aims to review existing indicator frameworks and:

- Identify key indicator frameworks to align with
- Identify approaches to producing indicators that might be particularly relevant for ICF biodiversity KPIs
- Identify key strengths, weaknesses, and important characteristics of indicator frameworks in relation to monitoring the performance of NbS projects that might be funded by ICF
- Provide a short summary of the most relevant indicator frameworks for ICF biodiversity KPIs

Note that the review is intended to be sufficiently comprehensive to address the above questions, but was time-limited and is not intended to be exhaustive. While the focus of this work has specifically been on ICF and NbS, it should be noted that much of the review could be relevant to other funding mechanisms, and to broader biodiversity considerations.

2 Methods

2.1 Review Scope

A review of 66 existing indicator frameworks was conducted for the Defra-JNCC ICF Evidence Project. The review was non-exhaustive and focused on key frameworks recommended by Defra, in addition to those prioritised by expert knowledge at JNCC. The reviewed frameworks spanned marine, terrestrial and freshwater ecosystems, as well as urban environments. The frameworks predominantly focused on biodiversity and nature-based solutions; however, globally important frameworks related to climate change, sustainable development and socioeconomics were also reviewed.

The frameworks ranged in scale from international agreements such as the [Convention on Biological Diversity \(CBD\) Post-2020 Global Biodiversity Framework](#) and regional frameworks such as the [Regional Seas Conventions](#), to project scale frameworks such as the [EKLIPSE Impact Evaluation Framework](#) to support planning and evaluation of Nature-Based Solutions projects. Therefore, they include applicability to all nations, and include relevance to ODA eligible countries.

2.2 Search Strategy

The review was conducted predominantly using web-based searches primarily focused on the website for each framework, where available. Additional information was taken from reports found in web-based searches or from informal discussions with individuals involved in the framework, where necessary and appropriate. Where information was not readily available through these means, the framework criteria were noted as absent. This was typical for some frameworks where public information is minimal (either intentionally or through lack of public resources) and contact with the framework challenging or time consuming.

2.3 Data Extraction

Frameworks were reviewed in a matrix with 25 categories aiming to assess the strengths and weaknesses with either free text or closed options depending on the category, which have been summarised below. The topics were chosen in order to capture differences between them, in order to be able to assess the strengths and weaknesses of the different approaches, and ultimately consider how applicable and beneficial these may be for potential ICF KPIs for biodiversity impacts.

The review included ascertaining the numbers of biodiversity indicators present in each framework to inform the subsequent indicator review that will follow as part of this project. Particularly important considerations of the frameworks from an ICF perspective include:

- The spatial scale(s) that the framework is applicable to, e.g. project, national or global scale
- How indicators are nested within the hierarchy of the framework as this can vary between them e.g. is it target and goal driven,
- If frameworks relate to a pressures, state, impact and response model as a way of considering biodiversity impacts
- Whether the framework uses time series data and what baseline is used for calculating trends
- The approach to reporting (e.g. frequency, and type of report)
- Whether frameworks focus on activities (e.g. number of seedlings planted) or outcomes (e.g. amount of carbon sequestered).
- Does the indicator consider net effects i.e. total gains and losses, or just gains. For instance, 'number of trees planted' is not a net indicator, whereas 'total area of forest' is as it will include new areas established and subtract areas cleared.
- Whether the framework can be applied to monitor and evaluate funding

Alignment of the framework to other Multilateral Environmental Agreements was captured to allow links to be drawn between them. Some columns included common closed category assessments to allow for direct comparison between frameworks, including whether they were target driven, had defined baselines, and the temporal scale of assessments. Data requirements of the frameworks were assessed by noting where there is a prescriptive methodology and whether there are practices for ensuring data quality. This review also

noted which frameworks included NbS aspects by specifying the focus of the framework and the system covered.

3 Synthesis

This section summarises the key information recorded about the frameworks and comments on what this could mean for development of an ICF biodiversity KPI. It begins with the varying types of framework reviewed, then discusses aspects of the frameworks of particular relevance from an ICF perspective as listed in the previous section, before exploring structures and rationale around framework construction. To conclude the section, frameworks of particular importance to align with during the development of an ICF biodiversity KPI are described.

3.1 Types of framework

Frameworks investigated in this review could be classified based on their purpose, their approach and their content.

3.1.1 Purpose

Most frameworks were either policy based or designed to evaluate impact (e.g. of funding). One exception to this is the framework for developing indicators, proposed by the Biodiversity Indicators Partnership – this describes a general process rather than containing a list of indicators (Box 1). Policy-based frameworks (such as the CBD's Aichi Targets and Post-2020 Framework) generally relied on indicators that could be produced from global or national scale data. Most were designed to assess the overall performance of countries in relation to agreed goals/targets. Importantly, these describe the net effect of all policies, rather than the specific effect of any individual policy, project, or funding programme. Of the marine frameworks reviewed, policy frameworks were the most common.

On the other hand, impact evaluation frameworks were designed to assess the performance (or potential performance) of individual projects, funding programmes or NGOs, relying on smaller scale indicators. Whilst many of these impact evaluation frameworks focused on assessing a project's progress, some were also used in project selection during the process of applying for funding. Others were designed to measure what works best for biodiversity from an experimental and academic perspective rather than a funding perspective, for example in experiments investigating which interventions would be most beneficial to biodiversity.

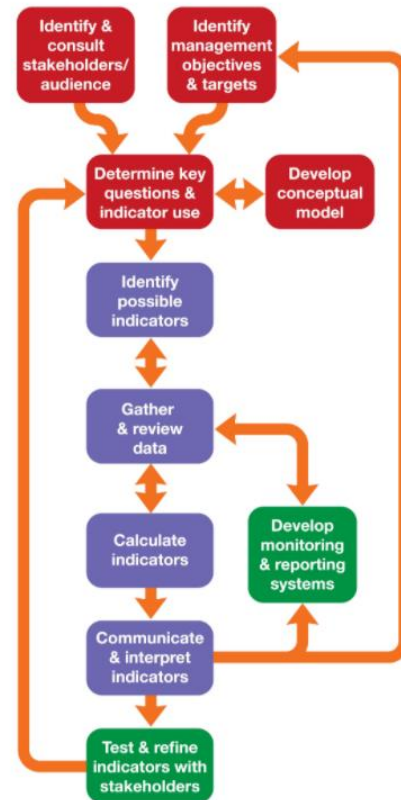
Going forward in the indicator development process, relevant policy-based frameworks will be important to align with, as they represent well established and, in some cases, internationally agreed areas of priority for biodiversity monitoring (discussed further in the 'Alignment' section, below). Meanwhile, impact evaluation frameworks may be more useful as sources of specific indicators suitable for project level measurements that do not rely on coarse global or national datasets.

Box 1: The Biodiversity Indicators Partnership

The Biodiversity Indicators Partnership (BIP) aims to support the development and implementation of indicators to monitor biodiversity at national and international levels. The emphasis is particularly on supporting assessments of progress towards the Aichi Biodiversity Targets and other multilateral environmental agreements such as the Sustainable Development Goals.

BIP have produced a range of valuable guidance documents on developing and using biodiversity indicators. Although these are generally intended to support policy-based indicator frameworks, many of the principles are more widely applicable. The indicator development process identified by BIP (adjacent) and supporting documentation illustrates one approach that might be transferred to develop biodiversity indicators for ICF KPIs (<https://www.bipindicators.net/national-indicator-development/bidf>).

Biodiversity Indicator Development Framework



3.1.2 Approach

Some frameworks take a direct approach, whereby they set a specific list of indicators and objectives. Other frameworks are more indirect, and describe the process and guiding principles and logic within which individual projects then identify indicators that are specific to the project. For example, the CBD's Post-2020 Framework sets an extensive but defined list of indicators for users to choose from and apply. This means comparison between countries or projects can be direct and equivalent, however the methods for the indicators within must be broadly applicable. In contrast, [monitoring and evaluation for the Darwin Initiative](#) focuses more on supporting individual projects to create their own indicators to measure biodiversity through the use of a logic framework, in acknowledgement of the range of differences across countries, projects, habitats, and available resource and data.

Indirect frameworks may provide useful methods, perspectives and lessons learnt that should be considered in subsequent indicator development taking place within this project. The flexibility of presenting a logic framework may make it easier to ensure indicators' relevance to specific Nature Based Solutions as these are likely to cover a wide and diverse array of projects and biodiversity outcomes. However, current ICF KPIs are very direct and so a more direct framework may be desirable for consistency purposes, and emphasis would instead be on methods that would cover priority concepts of biodiversity impacts for a wide-ranging set of NbS. Some projects do still aggregate the more flexible and project specific indicators (for example using indicators such as the number of projects with evidence of biodiversity recovery) which presents another option for ICF biodiversity KPIs, although such indicators are generally quite vague. This may limit how meaningful they can be.

3.1.3 Content

Some of the frameworks reviewed are very high level, consisting of a small set of broadly applicable indicators, whilst others are very detailed with a much more comprehensive list. Many frameworks have a set of high level 'core' indicators that are used by every project or actor, and also a more detailed set of 'optional' indicators that can be flexibly included depending on the applicability to the situation. A core or common indicator is an agreed scientific approach between different countries or projects using a common method and data types for assessing a particular component. These core, or high-level indicators are more commonly used in situations where results are aggregated, for example in programme level funding evaluations that are carried out by aggregating results across all projects within a funding programme or portfolio. High level targets are sometimes calculated combining different types of indicator into a more general set of metrics or indicators for the overall assessments of status of the environment, however depending on the similarity of the combined metrics this has the potential for an additional challenge of comparing like with like. This is not only a statistical challenge, but makes interpretation, comparison and communication problematic.

As aggregating results across all projects within the portfolio of investments is likely to be an essential requirement for ICF, high level approaches that are broadly applicable will be important to consider in the indicator development stage of this project. However, with Nature Based Solutions and their effects on biodiversity being so diverse and context specific, it may be desirable to adopt or include the option for a more flexible approach which would allow for headline indicators similar to the current KPIs, but also a way to capture the more specific biodiversity gains (and therefore not applicable to all projects) resulting from ICF funding. This will require careful consideration throughout this indicator development project.

3.2 Particularly important considerations of the frameworks from an ICF perspective

3.2.1 Spatial Scale

The scales of frameworks investigated within the review ranged from indicators designed to assess a small project to those designed to assess at a global level. NbS based ICF projects could take place at a range of scales from local to national (or potentially cross-border), so it is important that any indicators developed are applicable at a project level for individual reporting, while recognising these will occur at multiple scales. In addition, these should be aggregated to the ICF portfolio level to be able to report on total impacts from ICF funding. While it is not necessary to make indicators applicable at a global scale, it would be necessary to ensure they could be applied at any particular location on the globe with current or future ODA eligibility. Indicators from global scale frameworks could also be of relevance where they use global scale datasets that could be applied at the scale of an ICF project where no local data exist. Whilst this would create trade-offs between data resolution (likely to be coarser for global datasets, finer for data collected by individual projects) and resource requirements (less required when using global datasets, more for data collected by individual projects) associated with data collection that would need careful consideration, this is the approach taken by ICF's KPI 10 (under development).

3.2.2 Trend / time series data

Ongoing monitoring and development of trends and time series from indicator data seems to be a reasonably common approach but was not present in all frameworks. Including trend data is useful in cases where it is important for an indicator to show change over time (e.g.

tracking improvement or progress towards a target). As effects on biodiversity usually take place across fairly long timescales and may increase or decrease at different stages of NbS implementation, this may be an important aspect to consider in indicator development during the current project but relies on updated or additional data being available over time. As ICF is continuing over a number of years, even if trend data are not reported it is worth considering whether ongoing impacts of additional projects should be reported cumulatively, or as progress per time-step (e.g. annual) to allow comparison of progress between years.

3.2.3 Approach to and frequency of reporting

Frameworks were found to have a large variation in their approach to reporting. Many relied on a system of annual reports, although the frequency varied from one-off or sporadic reports to ten-yearly reports. In some cases, these reports (produced by project managers, or countries) are then collated by an overarching funding programme or an international policy body, who then aggregate this information to produce summary indicators. The format of reports varies significantly across frameworks. For the biodiversity KPIs, it may be most appropriate to plan for reporting to take place in the same format as other ICF KPIs or Defra funding programmes (which will need to acknowledge the actions taken only, and not the actual biodiversity impact which may not be apparent for many years), as it appears there is no standard frequency in the reporting process. In some cases, however, there was also variation in reporting within a single framework, making aggregation difficult. This should be avoided, ensuring that a clear and consistent mechanism for reporting on the biodiversity indicators is specified and implemented.

3.2.4 Activities / Outcomes

Most frameworks contained both activity indicators (also known as output indicators) and outcome indicators, covering a broad range of types such as action plans, monitoring programmes, assessments and informing policy. Both types may be of relevance and could be considered in the ICF biodiversity KPIs, with outcome indicators likely giving a more complete picture of effects on biodiversity where data is available, but with activity indicators likely easier to obtain data for in many cases. For example, if a project has an objective of providing biodiversity benefits by restoring habitat, it may be easier to track the area under restoration than to quantify the changes in species populations, although the latter is the intended outcome and a much more accurate assessment of the actual gains.

3.2.5 Baseline

Most frameworks used the project start or the first assessment as a baseline, whilst others used a fixed date (e.g. pre-industrial era) or a modelled 'business as usual' scenario to compare an intervention with what would have happened if the intervention had not taken place. Some frameworks did not specify a baseline, making the ability to track progress or determine whether objectives have been achieved difficult. Defining a baseline or other approaches to set up reference values will therefore be important for the current project to do. Using the first assessment of the project start may be most appropriate as data for this baseline will be available, whereas other baselines may be more difficult to determine. However, the original state of the land on which an NbS is implemented will vary in each location it is performed. Depending on how success of the NbS is being judged, this may be an issue. Careful consideration of the most appropriate baselines to use will therefore be required in subsequent tasks of this project.

3.2.6 Prescriptive methodology

Some frameworks gave users a prescriptive methodology to follow for measurements made against their indicators, while others did not. Some did not provide the prescriptive

methodology themselves but did provide a link or reference to prescriptive methodology defined elsewhere, which has the benefit of standardising methods across frameworks. Provision of a prescriptive methodology ensures consistency and comparability across assessments, whereas allowing assessors flexibility to decide exactly how to measure something themselves may make it applicable across more situations and may be more common where data are more likely to be scarce, such as for some of the marine frameworks. The current ICF KPIs provide significant amounts of detail on the methods used to calculate, although also recognises that "The breadth of programming necessitates not having a prescriptive approach." Going forwards, this project will aim to provide a prescriptive methodology for any indicators developed, to ensure consistency across assessments and to fit with the format of ICF KPIs already in existence. However, it may be worth considering if there is scope for flexibility where necessary, for example through having a prescriptive headline indicator and a set of less prescriptive secondary indicators to cover the diversity of projects and biodiversity impacts possible.

3.2.7 Quality control

It is valuable to understand and learn from quality control measures used by existing frameworks. This relates firstly to ensuring that the indicator framework itself is robust and does not risk unintended consequences – e.g. does the framework capture net effects, what baseline is used, is there potential double-counting etc. Quality control can also be considered in relation to reporting by individual projects – e.g. does the framework contain a clear method that can be used consistently by different projects, is there a mechanism for validating the data reported by each project etc.

In many cases, finding information on data quality within the frameworks reviewed was difficult. Where specified, options included data confidence assessments, peer review of methodology, independent or programme level verification or spot checks, compliance with a standard (e.g. the [International Aid Transparency Initiative Standard](#)), formation of technical committees and provision of training. In several cases, frameworks left data quality as completely the responsibility of the user. Any ICF biodiversity KPIs should aim to ensure that reliable data quality checks and ways to report on uncertainty are included within the indicator methodology and clearly communicated in reporting.

3.2.8 Net effects

Frameworks were varied in whether they included net or gross effects. In many cases, frameworks specified that some indicators were based on net effects but did not do so for other indicators. The project team suggests that accounting for net effects will be important in subsequent indicator development, as gains made by NbS in one part of the project area have little meaning if losses are made elsewhere in parallel. This will be explored in more detail during the indicator review.

3.3 Structure and Rationale for Framework

3.3.1 Construction

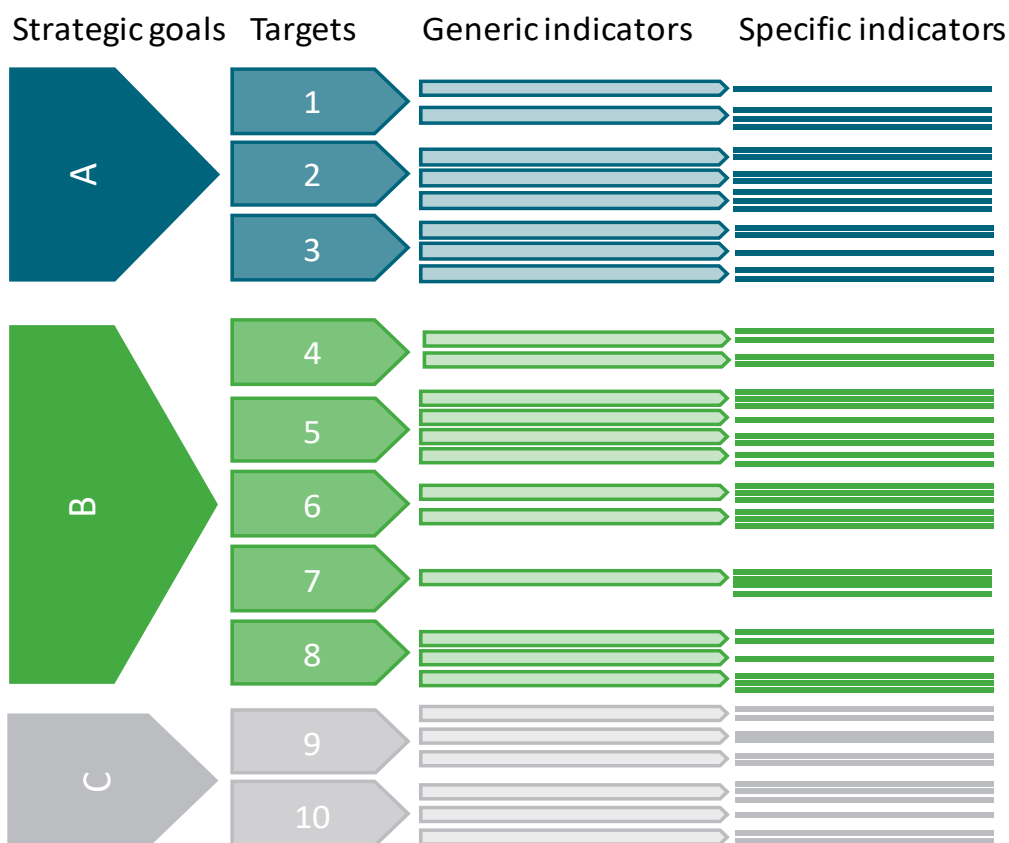
3.3.1.1 Hierarchy

Most frameworks investigated were found to have a hierarchical structure (e.g. theme > goal > indicator > sub-indicator), although the terminology and number of levels used (and to which indicators were applicable) within this hierarchy varied significantly. Such a hierarchy allows for more complex frameworks to be developed, organised and communicated more intuitively, with users easily able to find particular sections of interest (see example in Box 2). Current ICF KPIs are not organised with a hierarchical structure, but this may be a useful

consideration as the suite of indicators expands further. In particular, development of a KPI relating to Nature Based Solutions may particularly lend itself to a hierarchical structure with sub-indicators relating to the overall key performance indicator, due to their diversity and context dependant nature.

Box 2. Example of a Framework Hierarchy

The CBD Aichi framework is led by five ‘strategic goals’ which set out the high-level aims of what the framework is hoping to achieve. Within each of these sit a different number ‘targets,’ which provide specific and directed objectives that should be reached in order to achieve the goals. Under each of these sit a list of ‘generic indicators’ which could be used to monitor specific actions or processes to help evaluate how well individual nations are progressing with each of the targets. Each ‘generic’ indicator has a list of suggested ‘specific’ indicators, which refer to detailed and repeatable methods or datasets that can be used to measure the ‘generic indicator’. The indicator suite is non-binding and nations choose which ones are most applicable to their own monitoring needs and resources. By structuring it in this way it is transparent how each indicator sits within a broad breadth of objectives to measure how specific actions chosen by nations aggregate to achieve high-level biodiversity impact worldwide. The figure below is a graphical illustration of how the hierarchical structure of the CBD Aichi Framework works, but note that it does not accurately reflect the correct number of categories in each section.



More detail available on the CBD webpages at <https://www.cbd.int/sp/targets/>

3.3.1.2 Number of (biodiversity) indicators

The number of indicators, and of biodiversity indicators included within each framework varied substantially. Some were found to have as few as six, whilst others had a choice of well over 100. The proportion within the framework of relevance to biodiversity also varied substantially depending on the frameworks' aims, focus and geographical scale. The fact that some frameworks had over 100 indicators (for example the CBD's draft post-2020 framework had 161 indicators, all of direct relevance to biodiversity) illustrates the complexity associated with measuring biodiversity and highlights the need for a more explicit understanding of the aspects of biodiversity that are highest priority for Defra and the ICF.

3.3.1.3 PSIR

Indicator construction based on pressures, states, impacts and responses (PSIR) is a common approach for their development in UK policy to ensure the effects of all aspects of a policy intervention are monitored but is not ubiquitous to all frameworks. Many of the frameworks did not explicitly specify whether they were based on this or a similar approach. Whether indicators within the frameworks investigated were pressures, states, impacts or responses could normally be inferred however, with most either addressing all four components, or largely focusing on one of the four. Although this does not appear a commonly used approach in developing frameworks more widely, it may still be useful to consider all four aspects within this project, in particular considering which are most important or pragmatic to monitor to assess different biodiversity impacts.

3.3.1.4 Habitats / systems covered and notable differences between Defra's realms of interest (terrestrial, marine, urban)

Some frameworks (such as the CBD Aichi Targets and Post-2020 Framework) covered all habitats and systems. However, most had a slightly more specific focus on either terrestrial or marine habitats. Within terrestrial based frameworks, most covered all terrestrial habitats, although a few had a more specific focus, such as on urban environments. Several of the frameworks with a specific focus on NbS were designed for urban environments, suggesting that monitoring NbS in urban environments may be more well-studied than monitoring NbS elsewhere. Within marine based frameworks, again most covered all marine habitats, but some had a more specific focus such as coral reefs, whilst others had a broader focus that also included freshwater systems. Going forwards, a solution will need to be found that is applicable across all habitats in which ICF could implement an NbS. The fact that most frameworks specialised into at least marine or terrestrial may suggest a challenge in producing biodiversity indicators that are applicable across all systems. Therefore, the project may need to look into the formation of more than one set of indicators, with a different set applied in different systems.

In general, it is more difficult to monitor biodiversity in marine environments than it is in terrestrial environments, mainly due to issues such as the prohibitive costs of monitoring programmes, high resource demand, technical challenges and the complex nature of marine ecosystems. This is reflected in many of the frameworks reviewed. Most frameworks reviewed had either a marine or terrestrial focus, reflecting the large differences in monitoring techniques required across the two realms.

Another key difference between realms of interest is between urban environments and rural environments. Many urban NbS are very localised, likely leading to limited effects on biodiversity. Using the same indicator to measure the effect of an urban NbS may lead to issues in the scaling of results compared to an NbS in a rural area that is likely to cover a larger geographic spread. It is also notable that urban NbS are necessarily less habitat focused than either terrestrial or marine, as actions focus on using and improving the urban

landcover, rather than converting landcover which a lot of the broader habitat indicators consider. The difference across all three realms make globally applicable ICF biodiversity indicators extremely challenging, and there will be a trade-off between how generic the indicator is and how informative it is in assessing biodiversity impacts as a whole.

3.3.2 Alignment

Some indicator frameworks form part of international commitments that the UK has agreed to. It will be important for any biodiversity KPI to at least be consistent with the objectives of these frameworks. Most frameworks in the review mentioned alignment with other frameworks. Alignment with internationally agreed policy frameworks were the most common to come up – in particular the SDGs, but also others such as the CBD and [UNFCCC](#) (United Nations Framework Convention on Climate Change). Moving forwards, it will be important to ensure that any indicator or indicator framework developed within this project aligns strongly with such international conventions, in order to maintain a wide base of policy support and contribute towards global goals.

3.3.2.1 Important frameworks to align with

Alongside the CBD frameworks, the SDGs and the UNFCCC, there are international frameworks with regional implementation, such as the Regional Seas Conventions for marine environments. Aligning with such frameworks in its funding streams makes the UKs commitment to these agreements clear, standardised and may make it easier to report how progress achieved through ICF funding is contributing against these international commitments. The IUCN (International Union for the Conservation of Nature) has also developed a [Global Standard for Nature-based Solutions](#), which provides guidelines around NbS implementation, including ensuring that biodiversity monitoring is included in project planning. Aligning with this where possible will provide informed guidance and internationally peer-reviewed and agreed standards.

Specific UK based policies, such as the [25 Year Environment Plan indicators](#) and the [UK Biodiversity Indicators](#), may also be useful to align with in cases where the indicators used could also be applicable in non-UK habitats and environments.

The [French](#) and [German](#) Governments have previously developed indicators with a very similar aim to the current project (ensuring the biodiversity benefits of Official Development Assistance). There will therefore be some natural alignment with, and potential lessons learned, from these projects due to the matching objectives.

In terms of format of the delivery of the indicators themselves, it will be important to align with the other ICF KPIs to ensure consistency across the assessment suite. It may also be useful to align with other relevant funding portfolios, such as the [Illegal Wildlife Trade \(IWT\) Challenge Fund](#), which has well-formatted 'how to guide' that could be used to inform new ICF KPI guides.

Further details on these frameworks, and a selection of others, can be found in [Appendix 1 Summary of significant frameworks](#).

4 Concluding remarks

This review has provided many useful lessons to take forward during the indicator development process and paves the way for considering and assessing existing biodiversity indicators. Ultimately developing an indicator or indicator suite to address ICF needs to consider the impact of the ICF portfolio. In addition, it considers key frameworks with which it would be beneficial to align or learn from. Biodiversity impacts, both positive and negative,

are complex and multi-faceted. Actions to improve biodiversity, particularly while incorporating climate and societal benefits, are varied and wide-ranging. The data and resources required to monitor and assess biodiversity components varies not only across habitats, realms and countries, but also between project sites. To tackle these challenges, existing frameworks are numerous and varied, and this is evident in the review carried out here. For instance, a hierarchical approach can be used to consider how multiple indicators are linked to overall biodiversity objectives. Where aspects of biodiversity are not universally applicable to all projects, some frameworks seek to outline guiding principles to steer the development of locally appropriate indicators, while others split the indicators between broadly applicable 'core' indicators and detailed but 'optional' indicators which cover specific aspects that are not relevant to all projects. It is worth noting that these examples, and many others throughout the review, are not consistent with the current ICF KPIs which are comparatively simple but direct and prescriptive. This highlights the trade-off between different approaches, and underlines the need to understand the ICF priorities with regard to biodiversity and the KPI suite as a whole, and to develop indicator options to meet the requirements across programmes and ensure the positive impact of the ICF portfolio.

4.1 Summary of framework review

4.1.1 Key biodiversity frameworks to align with:

- Most important to align with policy-based frameworks as they include internationally agreed areas of priority for biodiversity monitoring (e.g. CBD's Aichi Targets and Post-2020 Framework)
- Aligning with IUCN Global Standard for NbS will provide informed guidance and internationally peer-reviewed and agreed standards.
- Alignment with the other ICF KPI's will ensure consistency across the assessment suite.

4.1.2 Approaches to producing indicators that are relevant to ICF KPI's:












- A direct framework will remain consistent with current ICF KPI's, though a logic framework may make it easier to ensure indicators' relevance to specific NbS – there may be a need a balance between the two.
- To allow results to be combined across projects and funding programmes, a set of 'core' indicators is essential, but an additional set of 'optional' indicators could be used to capture varied and more specific biodiversity gains.

4.1.3 Important characteristics of indicator frameworks to consider:

- Indicators should be applicable at a range of spatial scales and locations, to ensure all potential ODA countries are encompassed.
- Reports could follow the format of other KPI's, acknowledging the actions taken, rather than the actual biodiversity impact. Ongoing monitoring and trend identification would be required to fully capture changes in biodiversity.
- Defining a baseline will depend on how the NbS is being judged, but the first assessment for the project is likely most appropriate as this data will be readily available.
- A hierarchical structure is used in complex frameworks to allow them to be developed, organised and communicated more intuitively.
- The framework should encompass all habitats in which ICF could implement an NbS – this could involve creating indicators which may be uniquely applicable to each type of system (marine, terrestrial, urban).

Appendix 1 Summary of significant frameworks

A selection of frameworks have been summarised here, either due to their relevance to global commitments, to ICF specifically or to NbS indicators. This acts as a high-level reference of the relevance of familiar and lesser-known frameworks that currently exist. The five most note-worthy frameworks are listed first, followed by a collection of some of the most valuable frameworks relevant to the ICF biodiversity KPI development, listed in alphabetical order. Major aspects of elements included in the framework are depicted using the key in Box A1:

	Marine		Terrestrial		Urban
	Habitat based		Species based		Pressure based
	Funding evaluation		Target based		Nature-based solutions
	Key framework				Website link

Box A1. Key design or capture elements of framework

CBD Post-2020 Global Biodiversity Framework

The CBD Post 2020 Global Biodiversity Framework is a draft framework of overarching goals, more detailed targets and proposed associated indicators. It builds on the previous CBD Strategic Plan Indicators, which were designed to track countries' progress relative to the Aichi targets between 2011 and 2020. The framework is designed for Parties of the CBD to select indicators from against each of the targets for national reporting. **IMPORTANT TO ALIGN WITH FOR INTERNATIONAL REPORTING.**

International Climate Finance Key Performance Indicators

This is designed for ICF funded projects to be able to report on what they have achieved, in order for the ICF to report on what it has achieved as a portfolio of investments overall. The focus is on climate change mitigation and adaptation and on poverty alleviation - it is not a biodiversity framework. Each indicator has detailed guidance on how to assess against it. **IMPORTANT TO ALIGN WITH FOR INTERNATIONAL REPORTING.**

EKLIPSE Impact Evaluation Framework

European Commission funded project including the development of a framework for evaluating the impact of NbS for climate resilience in urban areas. The scope encompasses ten broad challenges (e.g. climate change mitigation and adaptation, water management, air quality etc.) and identifies potential indicators for each challenge. 'Biodiversity' is considered within several challenges, but is most prominent in Challenge 4: Green Space Management including enhancing/conserving urban biodiversity. The report suggests potential indicators, the scale these might be measured at, and contains brief information on potential methods for assessing the indicators.

Although the framework is more general than biodiversity and is designed for urban areas, the emphasis on NbS indicators and evaluation makes it potentially relevant to biodiversity

KPIs – particularly given the relatively high profile of EKLIPSE in work on NbS. **VALUABLE EXAMPLE OF BIODIVERSITY INDICATORS FOR MONITORING NBS FUNDING IMPACT.**

Defra 25 Year Environment Plan Indicators



Contains a set of headline indicators grouped into themes and linked to the goals of the 25 Year Environment Plan. Headline Indicator 16: Developing countries better able to protect and improve the environment with UK support relates closely to ICF objectives. This indicator has not yet been developed but will use information reported by ICF, and so alignment is important. **IMPORTANT TO ALIGN WITH FOR INTERNATIONAL REPORTING, AND VALUABLE EXAMPLES AT THE NATIONAL LEVEL OF UK BIODIVERSITY ASSESSMENT PRIORITIES.**

Regional Sea Conventions



The UNEP Regional Seas Programme includes 18 Regional Seas Conventions and are the main legal frameworks for protecting and conserving marine and coastal environment at the regional level. They align with UN SDG 14 and CBD through the Aichi Targets and post 2020 GBF. There is a core indicator set for all regions relating to 22 categories, however regions often have specific indicators relating to their monitoring and assessment programs, particularly in the European regions. More information on individual regions is given below. **IMPORTANT TO ALIGN WITH FOR INTERNATIONAL REPORTING.**

Biodiversity Indicators Partnership (BIP) Indicator Development Framework

- *NB: Process framework, does not explicitly relate to particular systems or indicators*

BIP is a global partnership of >60 organisations, hosted by the UN World Conservation Monitoring Centre. The emphasis is on supporting the development and implementation of indicators to measure progress against multilateral environmental agreements, in particular the Aichi Biodiversity Targets. Unlike the rest of the frameworks described here, BIP do not propose a set of indicators, but instead a process by which indicators can be developed. This involves a series of stages – e.g. consultation with stakeholders and establishing objectives, understanding how indicators would be used, developing a conceptual model etc. This process is at least partly relevant for developing biodiversity KPIs. **DEFINES A PROCESS FOR INDICATOR DEVELOPMENT THAT IS LIKELY TO BE USEFUL FOR ICF INDICATORS**

Cadre logique de la Cadre d'Intervention Transversal Biodiversité 2013-2016 (Logic

framework of the biodiversity cross-cutting intervention framework)       

The AFD is responsible for implementation of French ODA spend. Since 2013, biodiversity has been one of the criteria in awarding funding for projects. The main headline indicators they use to report on at a portfolio level are the amount of money invested in biodiversity related projects, the number of biodiversity projects and the hectares of natural areas protected or restored thanks to projects they finance. They also have a number of other frameworks and mechanisms at the individual project level. **VALUABLE EXAMPLE OF A NATIONAL PROJECT WITH VERY SIMILAR AIMS TO THE ICF INDICATOR DEVELOPMENT PROJECT FROM WHICH LESSONS COULD BE LEARNT.**

Climate, Community and Biodiversity Standards



The CCB Standards identify and certify projects that simultaneously address climate change, support local communities and smallholders, and conserve biodiversity. Projects must meet 17 of 20 criteria (or 18-20 to receive 'gold level' certification). The framework suggests multiple indicators that could be used to prove compliance with each criteria, or allows projects to develop their own indicators if clear that these also meet the criteria. **VALUABLE EXAMPLE OF BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A PROJECT SCALE, WITH A**

MATCHING FOCUS TO ICF PROJECTS AIMING TO BOTH IMPROVE BIODIVERSITY AND REDUCE CLIMATE CHANGE.

Connecting Nature's Nature-based solution evaluation indicators

Connecting Nature is aiming to provide a comprehensive set of evaluation indicators that users can select and implement. The project created a one-off report detailing indicators that cities could use themselves to assess NbS they implement. Whilst aimed at the city scale, many of the indicators could also be applied in other contexts. **VALUABLE EXAMPLE OF BIODIVERSITY INDICATORS FOR MONITORING IMPACT.**

Critical Ecosystem Partnership Fund monitoring system

The Critical Ecosystem Partnership Fund provides grants to nongovernmental, private sector and academic organizations to carry out projects aiming to conserve biodiversity and biodiversity hotspots. Their monitoring system is based around reporting against indicators within one of four 'pillars', as well as a qualitative report explaining how a project has contributed to global goals such as the CBD targets. **VALUABLE EXAMPLE OF BIODIVERSITY INDICATORS FOR MONITORING FUNDING IMPACT.**

Darwin Initiative

The Darwin Initiative is a UK programme that funds projects to protect biodiversity and support livelihoods in developing countries. The emphasis is particularly on projects that contribute to objectives under the Convention on Biological Diversity (CBD) and other biodiversity agreements (e.g. CITES, Ramsar Convention on Wetlands). Darwin monitoring and evaluation has a general emphasis on SMART indicators and consideration of outcomes, outputs, the need for baseline data and suitable verification of evidence provided in reporting. However, reflecting the wide scope of the initiative and corresponding difficulty in designing suitably broad indicators, reporting is project-specific. This involves each project proposing a set of indicators based on the objectives that the project identifies using approaches such as logical frameworks that describe how activities link through to outputs, outcomes, and impact. This means that each project may report quite different data (e.g. 'joint production of a conservation management plan', 'establishment of seed bank facility for native species'), although the requirement to link the reported outputs with at least one of the 20 Aichi Biodiversity Targets provides some underpinning consistency. Reports from individual projects are peer-reviewed and have been synthesised into a broad ['key lessons' summary](#) but it is not clear if any further aggregation of outputs from individual projects takes place. **INFORMATIVE EXAMPLE OF HOW A PROJECT-SPECIFIC APPROACH TO DEVELOP INDICATORS CAN OPERATE. ALSO RELEVANT IF CONSIDERING CONSISTENCY ACROSS DIFFERENT UK FUNDING PROGRAMMES**

Essential Biodiversity Variables Framework

This framework aims to capture the measurements needed to study and manage biodiversity change. The indicators are designed for national reporting against CBD targets using large global datasets at 1km resolution, and so may be valuable for monitoring where resources are limited. **VALUABLE EXAMPLE OF BIODIVERSITY INDICATORS FOR MONITORING IMPACT.**

European Union Marine Strategy Framework Directive

A European directive aiming to achieve or maintain Good Environmental Status (GES) in European Seas by 2020 using descriptors, criteria, indicators and targets. Contains 34 biodiversity indicators that cover the DPSIR framework that align with the UK MS and four EU regional seas programmes including the OSPAR, Mediterranean, HELCOM and Black Sea regions. Reporting cycle is 6 yearly and member states submit to the European Commission and European Environment Agency. **VALUABLE EXAMPLE OF MARINE BIODIVERSITY INDICATORS.**

Impact Builder



The Impact Builder is an online hub of outcomes, indicators and data collection tools designed to help organisations monitor and evaluate their projects and programmes. These cover a wide range of environmental impacts, including biodiversity. These impacts are grouped into "sectors" (thematic areas) and "strategies" (ways of working). The hub has been developed by more than 100 UK NGOs, coordinated by Bond. They claim that "*not knowing how to formulate outcomes or where to find appropriate measurement tools are significant barriers to measuring outcomes and impact.*" They therefore try to solve this problem by offering a variety of 'tried and tested' options. **VALUABLE EXAMPLE OF BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A PROJECT SCALE.**

International Climate Initiative (IKI)



The IKI is a funding instrument of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) for the international financing of climate change mitigation and biodiversity. It supports partner countries to implement and develop their NDCs for the UNFCCC and to achieve the CBD goals. There are six standard indicators that all projects must report on. All projects are also expected to design their own indicators based on a results framework specified by the IKI and based on the specific goals of the project. **VALUABLE EXAMPLE OF A NATIONAL PROJECT WITH VERY SIMILAR AIMS TO THE ICF INDICATOR DEVELOPMENT PROJECT FROM WHICH LESSONS COULD BE LEARNT.**

IUCN Global Standard for Nature-based Solutions



The IUCN Global standard for nature based solutions aims "to equip users with a robust framework for designing and verifying NbS that yield the outcomes desired, in solving one or several societal challenge(s)." It is designed to be applicable at any scale and in any geography. It is aimed at a wide range of stakeholders, including national and local governments, financial institutions, planner, businesses and producers. **IMPORTANT TO ALIGN WITH AS IT IS A HIGH-PROFILE INTERNATIONAL STANDARD AND PROVIDES VALUABLE ADVICE ON DEVELOPING BIODIVERSITY INDICATORS OF RELEVANCE TO NATURE-BASED SOLUTIONS, ALTHOUGH FOCUSES ON ADVICE AROUND HOW TO DEVELOP INDICATORS FOR A PROJECT, RATHER THAN PROVIDING SPECIFIC INDICATORS THAT COULD BE REUSED.**

LandScale Assessment Framework



This framework provides 'core' and 'optional' landscape scale indicators for environmental, social and economic aspects of sustainability. It aims to help organizations involved in implementing landscape or jurisdictional management initiatives as well as those sourcing commodities from or investing in rural landscapes. It is currently being piloted in a number of different landscapes around the world. Taking a landscape approach allows for consideration of impacts from a project that take place outside the project area and will therefore be an important concept to consider when developing project scale biodiversity indicators. **VALUABLE EXAMPLE OF BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A PROJECT SCALE.**

Nature 2050



Nature 2050 is a French national action programme aiming to improve countries' ability to adapt to climate change by 2050, and to preserve and restore biodiversity through the use of nature-based solutions. It is convened by CDC Biodiversité, but funded largely through donations from private companies. They aim to restore one metre squared of natural habitat for every 5 euros donated. They have an external steering group, technical committee, scientific council and stakeholder group. Funding can go to projects coordinated by charities,

scientists, public bodies in partner countries, companies or other institutions. They have two headline indicators under the heading of biodiversity (soil carbon and N15 content of leaves) which they say can be applicable to projects in all environments. Projects also select further indicators depending on their context. [VALUABLE EXAMPLE OF A NATIONAL PROJECT WITH SIMILAR AIMS TO THE ICF INDICATOR DEVELOPMENT PROJECT FROM WHICH LESSONS COULD BE LEARNT.](#)

Nature 4 Cities



Nature 4 Cities was a Horizon 2020 funded project sharing methods and tools for use in NbS. This included an in-depth review of indicators that can be used to assess the effectiveness of many aspects of urban nature-based solutions, and to also narrow this list down to the most appropriate and robust 'key performance indicators'. A tool for users is under development. [VALUABLE EXAMPLE OF BIODIVERSITY INDICATORS FOR MONITORING IMPACT.](#)

Regional Sea Conventions - Antarctic Region



The Antarctic regional sea is administered by the Commission for the Conservation of Antarctic Living Resources. CCAMLR Ecosystem Monitoring Programmes major function is to monitor the key life-history parameters of selected dependent species to detect changes in the abundance of harvested species. CEMP includes 18 biodiversity state indicators relating to 8 indicator species, as well as 4 environmental indicators. Data is submitted to CCAML secretariat for the annual meeting. [VALUABLE EXAMPLE OF MARINE BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A REGIONAL SCALE.](#)

Regional Sea Conventions - Arctic Region



The Arctic Council is the leading intergovernmental forum promoting cooperation, coordination and interaction among the Arctic States, Arctic Indigenous peoples and other Arctic inhabitants on common Arctic issues, such as sustainable development and environmental protection in the Arctic. 21 biodiversity indicators are reported on in response to targets as part of the Circumpolar Biodiversity Monitoring Program. [VALUABLE EXAMPLE OF MARINE BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A REGIONAL SCALE.](#)

Regional Sea Conventions - Baltic Sea Region



HELCOM is an intergovernmental organization and a regional sea convention in the Baltic Sea area, consisting of ten Contracting Parties. The integrated assessments are carried out using the BEAT tool, separately for the five key ecosystem components benthic habitats, pelagic habitats, fish, mammals, and water birds. Reports for each indicator state if GES is met. [VALUABLE EXAMPLE OF MARINE BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A REGIONAL SCALE.](#)

Regional Sea Conventions - Black Sea Region



The Black Sea region conducts indicator-based monitoring of the region through the Black Sea Integrated Monitoring and Assessment Programme. The primary focus is the protection of the Black Sea against pollution which includes 14 biodiversity indicators that are also used for reporting for the CBD advisory group. Assessments are conducted every five years and published in State of the Black Sea Environment Reports. [VALUABLE EXAMPLE OF MARINE BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A REGIONAL SCALE.](#)

Regional Sea Conventions - Caribbean Sea Region



UNEP established the Caribbean Environment Programme (CEP) in 1981 as one of its Regional Seas Programmes. The Cartagena Convention provides the legal framework for the Caribbean Action Plan which includes three agreements on oil spills, specially protected areas and wildlife and land-based sources of marine pollution. CEP aligns with the International Coral Reef Monitoring Network and the Global Coral Reef Monitoring Network on coral reef bioindicators which are relevant to CBD reporting. **VALUABLE EXAMPLE OF MARINE BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A REGIONAL SCALE.**

Regional Sea Conventions - Mediterranean Sea Region



The Mediterranean Sea region action plan was set up at the Barcelona Regional Sea Convention. Reporting is at the regional scale, but the Integrated Monitoring and Assessment Programme can be conducted at national level in line with EU MSFD and CBD Aichi Targets. The action plan aims to meet MSFD GES targets with ecological objectives using Integrated Monitoring and Assessment Programme indicators. Quality status reports are conducted every six years. **VALUABLE EXAMPLE OF MARINE BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A REGIONAL SCALE.**

Regional Sea Conventions - North-East Atlantic Region



The OSPAR convention is the mechanism by which 15 Governments & the EU cooperate to protect the marine environment of the North-East Atlantic. Joint integrated assessments are conducted by all contracting parties using a variety of indicators. Quality Status Reports and Intermediate Assessments are conducted at regular intervals. **VALUABLE EXAMPLE OF MARINE BIODIVERSITY INDICATORS FOR MONITORING IMPACT AT A REGIONAL SCALE.**

Yale Environmental Performance Index



The Yale Environmental Performance index is a "data-driven summary of the state of sustainability around the world. Using 32 performance indicators across 11 issue categories, the EPI ranks 80 countries on environmental health and ecosystem vitality. These indicators provide a gauge at a national scale of how close countries are to established environmental policy targets." Each indicator can be weighted and aggregated to give an overall country performance index. **VALUABLE EXAMPLE OF BIODIVERSITY INDICATORS FOR MONITORING IMPACT.**