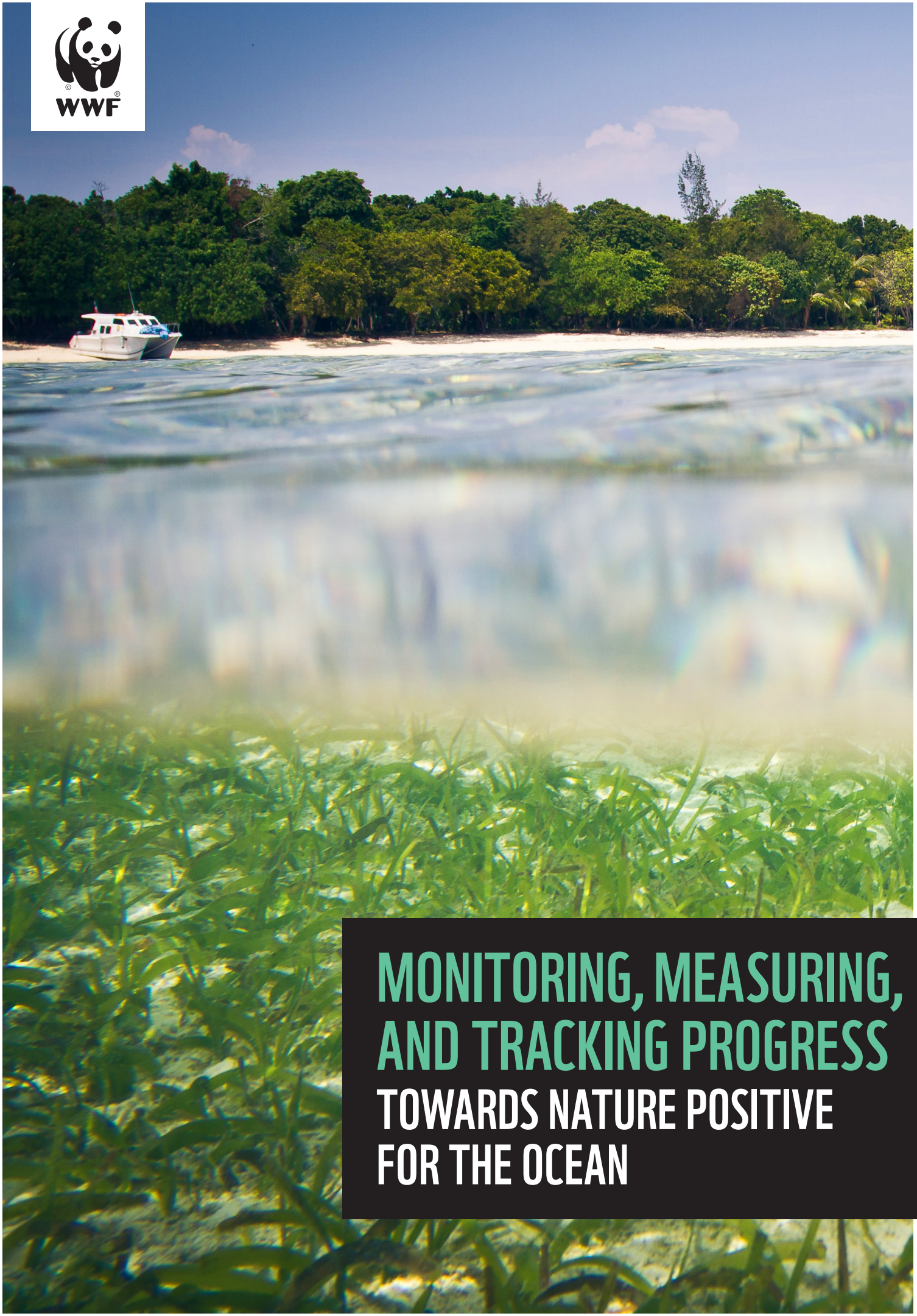


MONITORING, MEASURING, AND TRACKING PROGRESS

TOWARDS NATURE POSITIVE FOR THE OCEAN

ACKNOWLEDGEMENTS

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Private sector consultations: We gathered feedback in written form and through bilateral consultations with eight sector-relevant companies to obtain industry perspectives on the ecological indicators

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About WWF

World Wildlife Fund (WWF) is one of the world's largest and most respected independent conservation organizations. WWF's mission is to stop the degradation of the earth's natural environment and to build a future in which humans live in harmony with nature. Our WWF-US Oceans team takes a science-based approach to encourage credible contributions to a nature-positive future for the ocean. We develop, recommend, and assess tools, frameworks, and recommendations for companies, financial institutions, and policymakers, and collaborate across disciplines and sectors. For more information, see our website: https://www.worldwildlife.org/pages/science-for-a-nature-positive-future-for-the-ocean?p=c4b0b0&v=1&hours=10000000

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LIST OF ACRONYMS

AI	Artificial Intelligence
AR3T	Avoid, Reduce, Restore & Regenerate, and Transform
ASC	Aquaculture Stewardship Council
AUV	Autonomous Underwater Vehicle
BACI	Before-After-Control-Impact
CDP	Carbon Disclosure Project
CSRD	Corporate Sustainability Reporting Directive
ESRS	Environmental and Social Reporting Standard
ESIA	Environmental and Social Impact Assessment
ETP	Endangered, Threatened, and Protected
GDST	Global Dialogue on Seafood Traceability
GRI	Global Reporting Initiative
ICZM	Integrated Coastal Zone Management
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IUU	Illegal, Unreported and Unregulated
MPA	Marine Protected Area
MEL	Monitoring, Evaluation, and Learning
MSC	Marine Stewardship Council
MSP	Marine Spatial Planning
OSW	Offshore Wind
PCAs	Protected and Conserved Areas
ROV	Remotely Operated Vehicle
SBTi	Science Based Targets initiative
SBTN	Science Based Targets Network
SoN	State of Nature
TNFD	Taskforce on Nature-related Financial Disclosures



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EXECUTIVE SUMMARY

In June 2025, WWF published *Towards nature positive for the ocean: pathways for corporate contributions* to provide guidance for blue economy sectors, including offshore wind (OSW), coastal and marine tourism, shipping, and seafood (wild-capture fisheries and aquaculture), on actions they can take to credibly contribute to nature positive—the global goal to halt and reverse biodiversity loss. This follow-on report offers **guidance for companies** on how those **recommended nature-positive ocean pathways can be measured, monitored and adapted over time.**



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Monitoring actions taken along nature-positive ocean pathways is a **critical step to ensuring credible contributions by the private sector towards the nature-positive global goal.** This report **provides practical guidance to companies in different ocean sectors on best practices for monitoring, measuring and adapting; along with a set of recommended ecological indicators**, synthesized from scientific literature and practitioner knowledge. Importantly, the report responds to interest from the private sector on assessing progress towards nature positive, and **demonstrates the connections and alignment between the recommended indicators and other key initiatives such as the Taskforce on Nature-related Financial Disclosures (TNFD)**, and the **Science Based Targets Network (SBTN), among others** (e.g., CSRD, MSC, ASC, GDST).

This report is divided into two parts—the main report, and a companion set of Excel tables. **The main report** outlines the rationale for monitoring, provides sector-based examples, and highlights key considerations for monitoring, evaluation, and learning—including where, how, when, and who should monitor. It also offers perspectives on monitoring social dimensions, and key considerations for monitoring and measuring cumulative impacts as well as taking a seascape approach.

The Excel tables provide a synthesis of sector-relevant, science-based, ecological indicators that companies can consider using to measure and monitor their nature-positive actions. The tables also provide other relevant guidance for companies, including explanations of how the indicators can demonstrate directional change toward nature positive, examples of how to monitor the indicators, and mapping of each indicator to existing standards and frameworks. The list of indicators is not exhaustive but provides a useful entry point for companies to understand how to determine a change in pressures on nature and biodiversity, as well as the state of nature following implementation of actions.

KEY MESSAGES:
MONITOR, MEASURE, AND ADAPT

- This report provides recommended indicators, based on science and practicality, allowing companies to understand progress towards the nature-positive goal.

- Monitoring is critical to understand whether implemented nature-positive action pathways are having intended beneficial results in ocean and coastal areas, and informs whether these approaches need to be adapted.

- Monitoring allows companies to confidently avoid and reduce operational and supply chain risks and design targeted, evidence-based interventions. Continuous measurement can help companies demonstrate credible progress toward nature-positive results—to executive leadership and boards of directors—thereby building confidence in and maintaining high-ambition strategies that contribute to nature, climate, and societal goals.

- Financial institutions (FIs) are increasingly demanding data on nature-related impacts and dependencies, risks and opportunities, while ocean-related issues continue to emerge as a priority topic in portfolio risk management, engagement and stewardship. Maintaining up-to-date monitoring can help companies ensure they are better prepared for agile, favorable engagement with investors, including maintaining or unlocking access to funding and lowering the cost of capital.

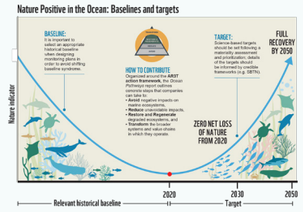
- The indicators presented in the report and supplemental materials are aligned with relevant emergent voluntary and mandatory frameworks, standards, and reporting initiatives (e.g., TNFD, SBTN, ESRS).

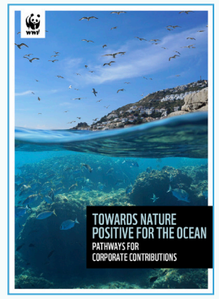
- Where science-based, credible external third-party verified frameworks for monitoring already exist, companies should utilize these tools as a first option for monitoring impact. The development of credible frameworks for additional sectors will be crucial as this field matures.

- Regardless of where a company is on its nature journey, there are multiple entry points available to get started with taking action and tracking progress. The recommendations in this report can be used by any company, no matter how nascent or advanced their data collection and monitoring capabilities. We also recommend that companies partner with expert collaborators to ensure their specific monitoring plans are appropriately tailored to the local context.

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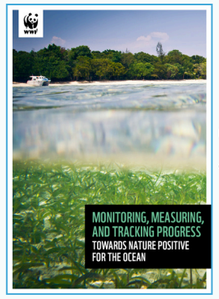
HOW TO USE THIS RESOURCE



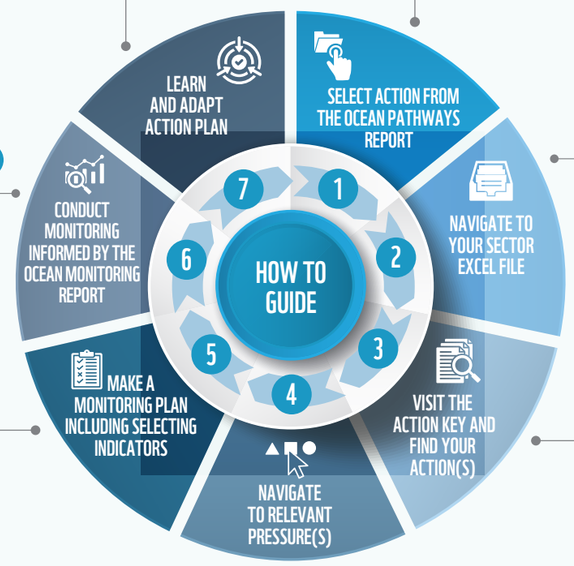


1 Select actions based on understanding of material impacts, following the five step journey to contribute to nature positive.

7 How you adapt will depend on monitoring results and the company's nature journey maturity. If results show that the intervention is not working as intended, select a new action or adjust the existing action. Ensure that the AR3T hierarchy is used, beginning with avoidance steps, then reduction, followed by restoration and regeneration–while concurrently implementing transformative actions.

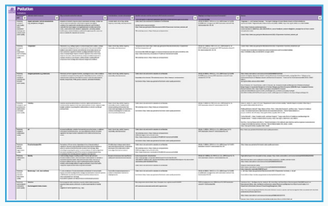


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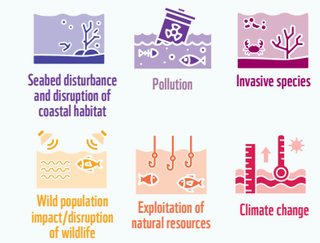


2 Choose the Excel file relevant to your sector:

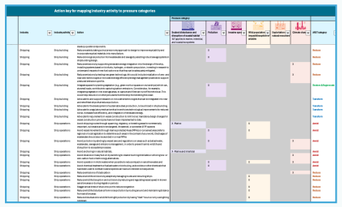




5 Multiple indicators should be selected based on the company's pressures, ecosystem type, actions, and measurement goal.



4 There is one Excel tab available for each pressure category which includes the relevant ecological indicators for that pressure.



3 In the Excel file, actions can be filtered by Industry activity and/or step along the AR3T.

I. INTRODUCTION

The concept of "nature positive"[1] is a unifying goal on which companies, investors, policymakers, and civil society are increasingly relying to help them communicate how actions they take can support biodiversity, climate, social responsibility, and equity goals. Companies in particular are beginning to implement actions for nature to reduce risks to their business and unlock opportunities. The report *Towards nature positive for the ocean: Pathways for corporate contributions*, published in 2025 (hereafter referred to as the "*Ocean Pathways* report"), recommends science-based actions that blue economy sectors can take to credibly contribute to the nature-positive global societal goal; these sectors include offshore wind (OSW), coastal tourism, shipping, and seafood. Actions are detailed along the AR3T action hierarchy (avoid, reduce, restore and regenerate, and transform), based on scientific and practitioner knowledge, and grounded in feasibility.

The recommended actions are both illustrative and qualitative, helping companies understand where to begin to take action, contributing towards a nature-positive economy.

Building on that foundation, this **report and its accompanying Excel tables are intended as a companion guide for those same companies operating in the blue economy who have started to take steps towards** implementing nature-positive action pathways, including those drawn from the *Ocean Pathways* report. Specifically, it gives practical advice on how the actions from the *Ocean Pathways* report and progress toward nature positive can be monitored,[2] measured, and tracked over time. It focuses on ecological indicators that will help companies to develop, implement, report on, and iteratively improve their activities in their journey towards a nature-positive future. The report also provides high-level recommendations on the social dimensions related to nature-positive actions. We recommend that companies engage with expert collaborators (researchers, consultants, civil society organizations, etc.) to ensure robust approaches and to support monitoring and measuring changes to ecological indicators after implementation of nature-positive action pathways.

Companies may utilize this resource to inform their efforts under existing initiatives. For instance, this resource can help to inform disclosures, for example through the Taskforce on Nature-related Financial Disclosures (TNFD), and target-setting, for example through the Science Based Targets Network (SBTN). Critically, it can also be used to inform nature-related strategies or transition plans[3] associated with nature-related dependencies, impacts, risks, and opportunities.[4] In addition, this report can be used as a reference by financial institutions, NGOs, nature-related standards and initiatives, and policymakers to support the selection of ecological indicators in the ocean, in addition to high-level recommendations around monitoring and measuring progress towards nature positive.

1 The nature positive global societal goal seeks to halt and reverse nature loss by 2030 on a 2020 baseline and achieve full recovery by 2050. The Definition of Nature Positive_v12.pdf

2 Monitoring is an ongoing function that systematically collects data on specified indicators. It is a systematic process for collecting and reviewing data and information across the life of a project Commonalities and complementarities among approaches to conservation monitoring and evaluation - ScienceDirect

3 Nature transition plans: https://wwfeu.awsassets.panda.org/downloads/wwf_ntp_2024_v04_compressed.pdf

4 For example in the prepare phase of TNFD's LEAP approach (P1: strategy and resource allocation plans and P2: target setting and performance management) or in developing action plans to deliver against one or more science-based targets for nature. https://tnfd.global/wp-content/uploads/2025/11/Guidance-on-nature-in-transition-plans_DIGITAL-1.pdf?v=1762260405


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This report aims:

- To underscore the importance of monitoring as a critical component of the implementation of nature-positive ocean pathways, and enable companies to adapt action plans based on robust data, leading them towards lower-cost and higher-quality outcomes for nature and people, while also reducing exposure to business risks and impacts.
- To provide a synthesis of science-based ecological indicators for companies to measure progress toward the nature-positive goal, with a primary focus on reducing pressures on nature, while also including state-of-nature indicators where relevant.[5]

  Note: *While we focus on indicators in this report, we also signpost and cross-reference these indicators to existing metrics within relevant frameworks, standards, and initiatives (see Key definitions).*
- To help companies navigate the landscape of emerging resources related to nature measurement in the ocean, and demonstrate alignment to existing frameworks, standards, and reporting initiatives (e.g., TNFD, SBTN, CSRD, MSC, ASC, GDST).
- To provide reference information for all relevant actors—companies, financial institutions, civil society, and policymakers—about monitoring and measurement of nature-positive approaches in the ocean. This information can be used, for example, to inform investor portfolio engagement and stewardship, performance measures for innovative financing (like blue bonds), NGO partnerships, policy design, etc.[i]
- To address the lack of nature-positive indicators in current certification schemes for the OSW, coastal tourism, and shipping sectors that can be consistently applied across these sectors. This report bridges that gap by synthesizing scientific indicators to measure nature-positive approaches across the blue economy. In the case of the seafood sector, where indicators are already present in certifications and more closely align with measuring nature-positive progress, this report provides information on and signposts to existing resources that describe these indicators and metrics (e.g., third-party-verified certifications and schemes) that should be utilized to monitor approaches relevant to nature-positive goals.

This report does not:

- Provide a new standard, framework, or certification, nor enable claims.
- Offer an exhaustive list of all possible indicators relevant to nature positive in the ocean, nor a prioritization of indicators.
- Specify or develop new metrics. Metrics are specific measures, including units associated with each indicator; choice of appropriate metrics will vary depending on geography, regional context, regulations, or other requirements. Companies should work with experts to determine the right metrics for the context of the work.
- Provide a detailed synthesis of social indicators.

5 **Pressures** are human activities that directly or indirectly change the state of the environment and ecosystem. **Pressure indicators** monitor and are attributable to company interventions or actions. Following the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), five key pressures (also known as *direct drivers* of biodiversity loss) contribute most to the loss of biodiversity globally: land and sea use change; direct exploitation of organisms (i.e. overfishing); climate change; pollution; and invasion of alien species.
SBTN Glossary of Terms. May 2023. https://sciencebasedtargetsnetwork.org/wp-content/uploads/2023/05/SBTN-Steps-1-3-Glossary_2023.docx-1.pdf
State of Nature (SoN): the condition and extent of ecosystems, species population size, extinction risk, including positive or negative changes. In other words, state of nature is about the status or condition of nature and the function it fulfills. SoN indicators are influenced by many actors and external drivers, and thus attribution in marine systems is very difficult. SoN may refer to different aspects of biodiversity and the natural world, including species (e.g. diversity, abundance), ecosystems (e.g. extent, integrity, connectivity), and ecosystem processes (e.g. species migrations, nutrient cycling, ecosystem services including pollination, nutrient and water cycling).
https://tnfd.global/wp-content/uploads/2023/09/TNFD-Glossary-of-terms-V3.0-January-2025.pdf?v=1738146236

KEY DEFINITIONS



INDICATOR:

A measurable entity related to a specific information need, such as the state of nature, change in a pressure, progress toward a target, or association between two or more variables.[ii]

Examples:

- One indicator of pollution is nutrient concentration. One metric to measure nutrient concentration is mg/L of nitrate.
- One indicator of the state of nature is ecosystem extent. One metric to measure ecosystem extent is hectares of seagrass bed within the study area.



METRIC:

A quantitative measure of data including the unit relevant to what you are trying to measure or analyze.[iii]



MONITORING, EVALUATION, AND LEARNING (MEL):

Monitoring is a systematic process for collecting and reviewing data and information across the life of a project (rather than just at the end). It is designed to track outcomes in a participatory manner that enables learning, informed decision-making, and capacity development of project participants. *Evaluation* assesses the effectiveness or impact of an intervention or activity to identify if the intended results have been achieved.[6] *Learning* is the process of using the evidence gathered from the monitoring and evaluation to adapt and improve future results and performance.

- Successful MEL plans include the following design principles: 1. Baselines, 2. Clear targets, 3. A defined monitoring frequency, 4. Spatial and temporal design, 5. Thresholds for adaptation and change, and 6. Independent scientific oversight.[iv]



USE OF QUANTITATIVE AND QUALITATIVE INDICATORS:

Both quantitative (numbers and measurable variables) and qualitative (descriptive characteristics) indicators are important for monitoring nature-positive ocean pathways. When quantitative data are not available, qualitative information may be able to provide helpful contextual information. Qualitative data can also be used to monitor transformative action pathways (see the *Transformative Actions* chapter).

6 One type of evaluation, called impact evaluation, helps companies determine whether their actions caused the observed ecological outcomes. Commonalities and complementarities among approaches to conservation monitoring and evaluation - ScienceDirect

II. WHY MONITOR NATURE-POSITIVE ACTION PATHWAYS?

It is critical that companies measure and monitor the actions they have implemented in order to understand whether and to what extent actions lead to intended positive changes for nature over time. Without monitoring, the credibility, success, and cost effectiveness of implementation of nature-positive actions can be called into question.

Despite this, companies do not always include a robust monitoring and evaluation plan alongside their implementation or action plan or within a nature strategy. Barriers to monitoring currently exist, including real and/or perceived financial tradeoffs between monitoring and implementation given finite resources; perceived complexity and lack of expertise and guidance; and challenging conditions with data collection and ongoing monitoring, leading in some cases to a tendency for companies to select indicators that are easiest to measure, rather than those that will support robust and adaptive monitoring and evaluation.[v] However, with the right guidance and in collaboration with experts, robust monitoring and evaluation efforts have the ability to provide companies with multiple benefits including:

Reducing risks: Monitoring nature-positive action pathways enables early indication of how successful an intervention is and/or provide early detection of any potential issues, allowing companies to course-correct and adaptively manage. In turn, this facilitates the informed and efficient use of resources, rather than draining budgets on actions that are not delivering positive results for nature and the business. As such, monitoring allows companies to confidently avoid operational and supply chain risks by applying well-informed interventions, for example, ensuring resilience of supply chains for seafood companies or healthy coastal environments for tourism operators. Where certain environmental standards might be required for regulatory compliance, having a robust monitoring and evaluation plan in place can reduce compliance costs as well as potential regulatory and reputational risks, enhancing license to operate.

Unlocking opportunities: Monitoring data can help to demonstrate credible progress and build confidence in nature-positive actions, which help companies to maintain high-ambition strategies to contribute to nature, climate, and societal goals, build positive relationships with key actors like investors, and continue to make the case for change to executive leadership and boards of directors. Such data can also provide a competitive advantage for companies, providing access to new markets and a first-mover advantage as investors, creditors, and regulators increasingly require nature-related data and credible transition plans. Data collection can also reverse data deficiencies, contributing to a deeper understanding of regional and global trends, thereby supporting informed decision-making toward long-term resilience. Further, demonstrating progress toward nature-positive contributions can help companies make decisions about scaling up or replicating appropriate actions across other projects or locations.

Nature-positive actions in the ocean are not guaranteed to result in the same outcomes in each place. Therefore, monitoring is crucial for actions intended to support nature, which is multi-dimensional, complex, and location-specific—meaning that biodiversity and natural processes are different in each location. Concerted monitoring is even more critical in coastal and marine ecosystems, which are vast, dynamic, and interconnected.

MONITORING NATURE-POSITIVE OCEAN PATHWAYS IS CRITICAL TO ENSURE CREDIBLE, EFFECTIVE CONTRIBUTIONS FOR NATURE AND PEOPLE.

HOW MONITORING NATURE CAN REDUCE RISKS FOR BUSINESSES AND BIODIVERSITY

OFFSHORE WIND

A recent study evaluated 19 months of continuous video recordings from wind turbines in Scotland and found—through AI analysis of thousands of monitored bird flights—that there were zero bird collisions. This contrasted significantly with conservative pre-construction estimates of up to 8.54 collisions per turbine per year under high avoidance assumptions for the project.[vi] A similar study in Germany using radar and AI-based cameras evaluated 4 million bird movements over the course of 18 months, and found that 99.8 percent of birds avoided the turbines.[vi] Both studies were conducted by experts in collaboration with companies and illustrate the power of employing robust monitoring and data collection to demonstrate avoided impact to wildlife, **providing scientific evidence to regulators, investors, and other relevant actors on nature-related impacts and risk reduction**. While the positive results of studies like this are encouraging, companies should ensure that they 1) continuously monitor in real time to ensure these types of collision trends hold and inform future projections on numbers of collisions and species types, and 2) continuously implement measures to further avoid and reduce wildlife impacts, ensuring that collisions remain as rare as possible (e.g., planning turbines in areas outside of migratory bird paths, scheduled shutdowns etc.; see the *Ocean Pathways* report for more information).

COASTAL TOURISM

One hotel in the UK utilized information on coastal erosion to adjust construction plans in order to reduce short-term costs. Instead of continuing to build in zones at risk of coastal erosion, the owner adapted plans to build inland to prevent infrastructure loss from coastal retreat.[viii] Coastal erosion and beach loss are a threat to businesses developing and operating coastal properties. Climate change and the movement of sand and other material due to coastal infrastructure placement can disrupt the natural processes that sustain the beaches on which the tourism industry relies as a key piece of its overall product.[ix] By utilizing data and adapting plans, the tourism industry can avoid economic losses, while also preventing further development that will impact the health and function of coastal and marine ecosystems.

AQUACULTURE

At a Chilean salmon farm,[xiii] a new technology is being tested to monitor water quality. Specifically, it will monitor dissolved oxygen levels in the water to provide an early warning of any decreases up to 48 hours in advance. The early detection system will allow the aquaculture operation to respond in a timely fashion, and reduce the risk of fish mortality. The data collected will also be shared with the government to contribute to collaborative action that supports preventative interventions. These types of technologies and data-sharing, if implemented effectively, could help companies in the sector to reduce risks and make informed decisions to support both ocean health and their own commercial interests.

SHIPPING

Vessels alter the natural soundscape of the ocean through underwater noise, which can negatively impact communication, navigation, and other behaviors of marine mammals.[x] The port of Vancouver services heavy shipping traffic that operates in the Salish Sea, which is also home to abundant marine life and diverse coastal ecosystems. To better understand the impacts of whale watch boats and commercial vessels in high traffic areas, the Vancouver Port Authority established an underwater noise monitoring program and found that increased noise levels were negatively impacting Southern Resident killer whales, including their foraging behavior.[xi] The data informed their decision to establish voluntary slowdown speeds for commercial vessels in whale feeding grounds to reduce underwater noise in these sensitive habitats; the reduction in noise and therefore impact has been verified through continuous monitoring, offering companies the confidence that their actions are leading to positive outcomes, as intended.[xii]

NATURE: ECOSYSTEMS AND PEOPLE

This report investigates the ways in which companies can monitor and measure *nature* in the ocean and along the coastlines. We define nature as including the diversity of living organisms (including people) and their interactions, and we consider it through both *ecological* and *social* dimensions. Within the ecological dimensions, we focus on indicators that broadly apply to both *biodiversity*—the variety of living organisms other than people—and *climate*. For the social dimensions, we explore the views, values, and actions of people, as well as how societal and economic systems are organized and operate.



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III. THE FIVE-STEP NATURE-POSITIVE JOURNEY

To emphasize the importance of science-based approaches to monitoring, evaluation, and learning for the purpose of assessing progress towards nature positive goals for the ocean, we provide here the recommended steps companies should take on their journey (as described in the *Ocean Pathways* report). Additional information is included here to highlight where monitoring, measuring, and evaluation are needed, focused on baseline data and target or goal setting.[xiv]

1 **First, identify and prioritize impacts and dependencies on nature.** *For example, both the TNFD LEAP (Locate, Evaluate, Assess, Prepare) approach and SBTN Steps 1 (Assess) and 2 (Interpret and Prioritize) are credible, stepwise processes for conducting such materiality assessments.*

2 **Next, develop an action plan to begin managing impacts and dependencies in order to contribute towards the nature-positive goal.** *Some companies are developing nature transition plans,[7] so this step may occur as a part of that process drawing from the Ocean Pathways report. We recommend that companies work toward setting SBTN targets (SBTN Step 3, in development for some sectors) and then incorporate the actions in this report into SBTN Step 4 action plans where relevant (the "Act" step).*

a. **Collect or collate baseline data for the relevant site(s) before planning or implementing actions.** Baseline data could come from ESIA processes, impact and dependency analyses, internal supply chain data, or be sourced from historical or other relevant databases or records. Baseline data are required to compare relative changes in pressures and the state of nature after implementation of the action. *Note: to identify a causal link between a specific action and outcomes (i.e., attribution), reference sites and robust impact evaluation analysis are needed (see Box, p.17).*

b. **Based on the baseline condition of the relevant site(s), company pressures, relevant state of nature measures, and considering healthy reference sites (e.g., protected areas of a comparable ecosystem), the goal (i.e., the desired condition, with associated ecosystem thresholds and targets) should be defined.** We recommend the use of SBTN to determine the process for defining thresholds and targets. We also recommend following local regulations and thresholds where they exist, incorporating local expertise, and accounting for the unique characteristics of the project site to identify the target condition or goal.

3 **Implement the action plan, and regularly monitor and measure impacts, for a defined period of time (see also the MEL definition).** *Where possible, companies should apply third-party impact verification and assurance tools compliant with ISEAL's Code of Good Practice. Companies might also consider collaboration with a credible thought partner, for example through the SBTN target-setting and validation process or other relevant experts, to ensure robust approaches. Note that this report provides a list of indicators that companies can measure and compare to baseline data to understand if they are directionally moving towards positive outcomes for nature.*

4 **Publicly report on progress, in line with voluntary disclosure frameworks like the TNFD, and/or mandated disclosure frameworks like the European Union's Corporate Sustainability Reporting Directive (CSRD) and Environmental and Social Reporting Standard (ESRS).** *The resources we provide here can also provide supportive guidance on key indicators.*

5 **Finally, over time, adapt the action plan iteratively in response to challenges, gaps, and opportunities identified through monitoring.**

a. **Monitoring, evaluation, and learning are all critical parts of adaptive management of action plans.** Actions will not always yield positive results, for reasons including design issues or factors outside of an individual company's control. Learning from challenges through monitoring is key to adaptive management and continuous improvement. **Monitoring, evaluation, and learning should be used to inform whether progress towards thresholds or targets is being made, or if adaptive management responses are needed to course-correct.**

SETTING BOTH BASELINES AND TARGETS IS KEY TO A COMPANY'S NATURE JOURNEY.

Determine and measure baselines: Baselines are measurements of relevant indicators before any action is taken and serve as references with which to compare measurements over time. Determining the right baseline is an important part of designing an effective monitoring plan. We recommend that companies work with experts to choose a historical baseline year for a given site(s) that precedes ecosystem degradation in order to identify desired ecological conditions. These data can be drawn from historic scientific and ecological records, Indigenous and local knowledge, and/or field observation data from the site(s) or reference ecosystems. For additional context on the importance of baselines, please see Annex 1.

Set targets: After identifying an appropriate baseline, companies should work with experts to set targets informed by baseline data and scientifically defined thresholds. Science-based targets (are measurable, time-bound objectives grounded in the best available science that specify where, how much, and by when companies should act to reduce their material pressures on nature. This report does not define specific ecosystem thresholds, as appropriate thresholds vary by location, pressure, and company context. Instead, we recommend using the SBTN process, which defines science-based thresholds for key pressures on nature that companies can use when setting targets. For additional context on target-setting, please see Annex 2.

Nature Positive in the Ocean: Baselines and targets

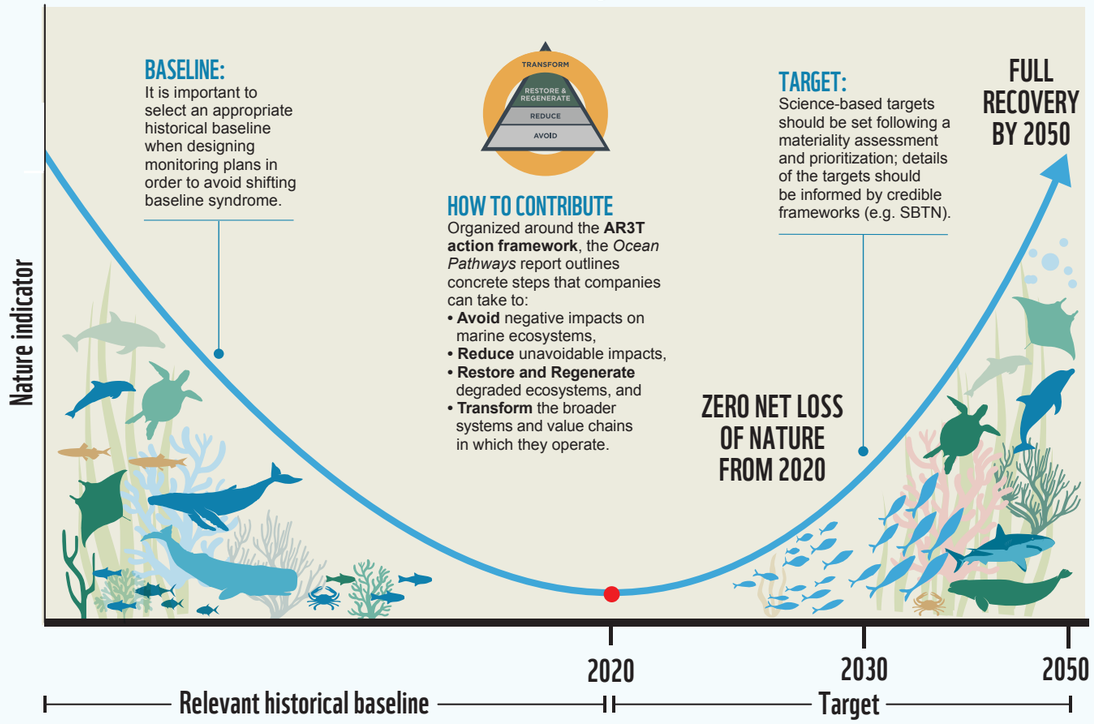


Figure 1: *Shifting baseline syndrome[xvii] refers to a gradual change in the accepted norms for the condition of the natural environment due to a lack of past information or a lack of experience of past conditions. In other words, the state of the environment now or in the recent past may be degraded—yet recent memory or records may suggest that a more recent baseline is desirable when it is not in fact reflective of a robust baseline. Therefore, it is important to consider appropriate historical baselines when designing monitoring plans. In addition, the influence of climate change on the distribution of species and ecosystems is accelerating, and will continue to do so. Therefore, accounting for climate change when considering baselines and targets, including the possibility that historical baseline data should be sourced from beyond the site and/or from a different range of reference values, is also recommended as a part of adaptive management.*

7 A nature transition plan is a set of goals, targets, actions, accountability mechanisms and resources to respond and contribute to the transition implied by the Global Biodiversity Framework where biodiversity loss is halted and reversed by 2030 to put nature on a path to recovery by 2050, while respecting planetary boundaries. The plan should outline how the entity will pivot its business operations and entire business model to ensure that it will meet its objectives and align with local, domestic, and international environmental targets, and the best environmental scientific knowledge. Nature transition plans and nature-positive ocean pathways are complementary and aligned approaches for company action planning. https://wwf.panda.org/discover/our_focus/finance/greening_finance/partner_financial_institutions/nature_in_transition_plans/

IV. WHAT TO MEASURE WHEN MONITORING NATURE-POSITIVE ACTION PATHWAYS

Measuring both pressure[8] and state-of-nature (SoN)[9] indicators can be useful for understanding positive and negative changes to a site and seascape. Therefore, we recommend that a company's MEL plan should always include relevant pressure indicators to provide critical information over time, and should also include SoN indicators but on a less frequent time scale, to understand outcomes holistically both at site and across a seascape.

Pressure indicators are more commonly measured in existing corporate initiatives and frameworks (e.g., SBTN, TNFD), and we recommend including them in MEL plans. Measurable company activities are typically more directly connected to pressures; for instance, companies are able to measure the quantity of pollutants emitted, the amount of fish harvested, or the direct spatial footprint of their hotels or other infrastructure that overlap with habitats. In this way, they can assess their direct contributions to pressures on nature.

State-of-nature indicators are important to understand changes occurring in a site and/or landscape or seascape, and they can also be applied to help understand relevant risks and to prioritize areas for action. Notably, changes in these indicators—like ecosystem extent or species abundance—result not only from an individual company's actions, but also from other factors including weather, climate, and the positive or negative contributions of other activities—by other actors (e.g., governments, other companies, communities). In the ocean, in particular, it is extremely difficult to attribute an individual company's actions to a change in the state of nature due to the diffuse characteristics of the marine realm. We recommend that the use of SoN indicators alone, without further analysis and information about other actions in a land/seascape, should not be used by companies to claim its actions have caused a change in the state of nature (i.e., attribution).

8 **Pressures** are human activities that directly or indirectly change the state of the environment and ecosystem. **Pressure indicators** monitor and are attributable to company interventions or actions. Following the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), five key pressures (also known as *direct drivers* of biodiversity loss) contribute most to the loss of biodiversity globally: land and sea use change; direct exploitation of organisms (i.e. overfishing); climate change; pollution; and invasion of alien species.
SBTN Glossary of Terms. May 2023. https://sciencebasedtargetsnetwork.org/wp-content/uploads/2023/05/SBTN-Steps-1-3-Glossary_2023.docx-1.pdf

9 **State of Nature (SoN):** the condition and extent of ecosystems, species population size, extinction risk, including positive or negative changes. In other words, state of nature is about the status or condition of nature and the function it fulfills. SoN Indicators are influenced by many actors and external drivers, and thus attribution in marine systems is very difficult. State of nature may refer to different aspects of biodiversity and the natural world, including species (e.g., diversity, abundance), ecosystems (e.g., extent, integrity, connectivity), and ecosystem processes (e.g., species migrations, nutrient cycling, ecosystem services including pollination, and water cycling).
https://tnfd.global/wp-content/uploads/2023/09/TNFD-Glossary-of-terms-V3.0-January-2025.pdf?v=1738146236

IMPACT EVALUATION: FURTHER ANALYSIS NEEDED WHEN DETERMINING CAUSAL IMPACT

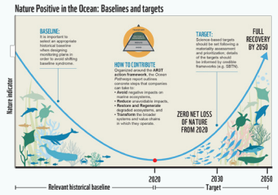
This report focuses on helping companies understand whether their actions for nature are leading to positive results by recommending what to monitor and measure over time and to use the information for adaptive management. There are factors outside of a company's control that can influence monitoring results, especially in the state of nature, but focusing on measuring changes in a company's pressures on nature that are within their control can more closely identify whether interventions have been effective and inform future action.

To go a step further and make causal linkages to say that action *x caused* outcome y, and is therefore attributable to a specific actor and/or action, further analysis is needed. This analysis, called impact evaluation, generally requires a comparison to a control or reference site and a robust evaluation and should be pursued with or by scientific partners. A *control or reference site* is an area to which the area where the action was taken can be compared. Monitoring indicators within the control or reference site and comparing them to the implementation site helps to answer the question: "What would have happened without the action or intervention?" (known as the "counterfactual"). With this approach, the causal impact, including the amount of impact that the action had for nature, can be determined. While there are many types of impact evaluation methods we provide an overview of one that companies can begin to use when assessing nature-positive ocean pathways called Before-After-Control-Impact (BACI, see Annex 3).

We recognize that impact evaluation by companies is typically not feasible in the short term. If a causal analysis is not possible, we recommend that companies avoid making claims that suggest attribution—in other words, claiming that a certain action that they took *caused* a specific change in the state of nature. At the same time, continuous monitoring of pressures can support company decision-making and adaptive management, and be integrated within the ongoing implementation of nature-positive pathways as well as disclosures.



V. HOW TO MONITOR NATURE-POSITIVE ACTION PATHWAYS





1 Select actions based on understanding of material impacts, following the five step journey to contribute to nature positive.

7 How you adapt will depend on monitoring results and the company's nature journey maturity. If results show that the intervention is not working as intended, select a new action or adjust the existing action. Ensure that the AR3T hierarchy is used, beginning with avoidance steps, then reduction, followed by restoration and regeneration–while concurrently implementing transformative actions.

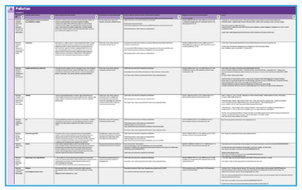


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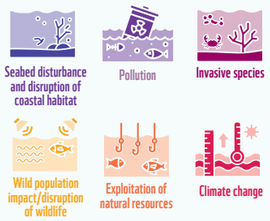


2 Choose the Excel file relevant to your sector:

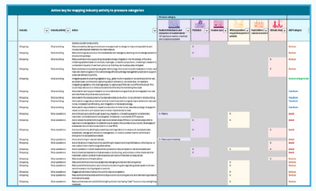




5 Multiple indicators should be selected based on the company's pressures, ecosystem type, actions, and measurement goal.



4 There is one Excel tab available for each pressure category which includes the relevant ecological indicators for that pressure.



3 In the Excel file, actions can be filtered by Industry activity and/or step along the AR3T.

The ecological indicators presented in this synthesis are derived from the scientific literature and informed by practitioner knowledge. These indicators scientifically signal directional change in the marine and coastal environments for biodiversity and ocean health and can be used to demonstrate whether company actions are measurably contributing towards nature positive. The ecological indicators list is applicable to all blue economy sectors, and is organized by the pressure on nature that each action aims to address. We have synthesized indicators for each of the pressure categories below:

1. SEABED DISTURBANCE AND DISRUPTION OF COASTAL HABITAT

(see additional information in the Considerations for where to monitor nature-positive action pathways section below.)

- *Indicators for reefs (coral, shellfish, and rocky), mangroves, seagrass, kelp, dunes, salt marshes/ wetlands. (Note that this list is not exhaustive of all biodiverse marine ecosystems, but is intended to illustrate some of the world's key ecosystem types and how companies can monitor them.)*

2. POLLUTION

- *Indicators for water quality, air quality, and material pollution*

3. INVASIVE SPECIES

- *Indicators for invasive species*

4. WILD POPULATION IMPACT/DISRUPTION OF WILDLIFE

- *Indicators for light, noise, collisions, and entanglements*

5. EXPLOITATION OF NATURAL RESOURCES

- *Indicators for extraction, fishing, use of species-based products, water use*

6. CLIMATE CHANGE

- *Indicators for greenhouse gas emissions*

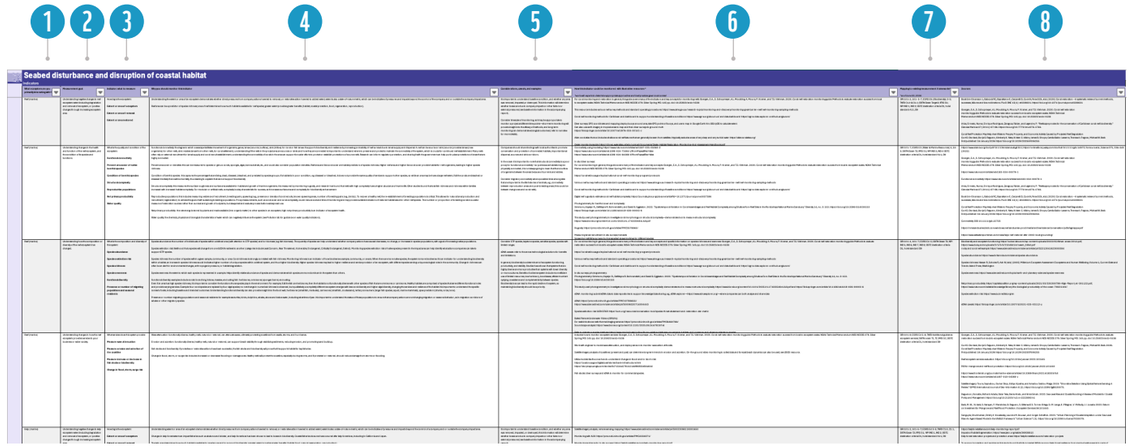
Therefore, a company that has taken action(s) to address its known pressure(s) on nature would measure and monitor the indicators listed within that pressure category. To align actions from the *Ocean Pathways* report to the indicators list, we include an Action Key that links the actions for each sector to the recommended set of indicators that should be measured to monitor directional contributions to nature positive (see the accompanying Excel files for the indicators tables for each sector).

10 In alignment with the *Ocean Pathways* report, we took a pressures-based approach, maintaining the IPBES terminology for pressures.

While the actions that companies take across sectors may vary and the specifics of monitoring approaches may differ, companies should strive to measure and monitor as many of the indicators relevant to their pressures on nature as possible. There is no "silver bullet" or single indicator for nature positive, as nature is complex and multi-dimensional. Robust insights will be gained with every additional indicator monitored to show whether the collective sum of nature-positive actions that a company is taking is contributing to positive progress. As highlighted in the *Ocean Pathways* report, no single action will bend the curve for nature alone, but collective actions from companies across blue economy sectors (along with a whole-of-society approach) are needed.

Recognizing that each project and site will have unique characteristics, companies should prioritize indicators relevant to their materiality assessments. It is also important to note that the list of indicators is not exhaustive, but rather an entry point for companies to begin monitoring and measuring to contribute to greater understanding of directional change from nature-positive interventions.

In the accompanying Excel tables, for each pressure category, we organize the recommended indicators in the following structure:



COLUMN 1: (Seabed Disturbance tab only): Provides the **ecosystem type** most relevant to the indicator selection.

COLUMN 2: Describes the **measurement goal** of monitoring the action so that companies can understand the relative changes to the environment that will be addressed by measuring the indicators.

COLUMN 3: Provides the **list of ecological indicators** the company should monitor to identify whether pressures are being reduced following avoidance, reduction, restoration and/or regeneration actions. *While we do not provide indicators for transformative actions in the Excel tables, we offer a set of questions in Section VIII below.*

COLUMN 4: Provides the scientific underpinning for each indicator. Describes **why** the indicator should be measured and monitored in order to understand the relationship of actions to biodiversity and ocean health. Most relevant for sectors that do not yet have third-party-verified certifications or standards for monitoring and measurement, this column provides decision-useful **information for selecting and monitoring those indicators, what the indicators mean, and what they signal in the ocean health context.**

COLUMN 5: Highlights **considerations, caveats, and examples** for monitoring the indicator, where applicable.

COLUMN 6: Offers guidance on **how the indicator could be monitored with illustrative resources** and **best practices**, including existing tools and methods.

COLUMN 7: **Mapping** of each indicator **to existing frameworks** and initiatives to demonstrate alignment and complementarity. This mapping also connects the indicators to existing **metrics**. The indicators have been mapped to: Global Reporting Initiative (GRI) 101-biodiversity, European Sustainability Reporting Standards (ESRS), Taskforce on Nature Related Financial Disclosures (TNFD) core and sector specific metrics, Science Based Targets Network (SBTN), Ocean targets, land, and freshwater, Science Based Targets initiative (SBTi), International Financial Reporting Standards (IFRS) and drawing connections to Sustainability Accounting Standards Board (SASB) for industry-specific standards, the Nature Positive Initiative (NPI), and the Global Sustainable Tourism Council (GSTC) destination criteria and hotel standards.

COLUMN 8: Provides **sources** from the scientific literature.

Before reviewing the content within the Excel tables, companies should review the sector-specific considerations provided in the next section, which provide examples of applying the indicators in real-world contexts.

CONSIDERATIONS FOR WHERE TO MONITOR NATURE-POSITIVE ACTION PATHWAYS

It is important to determine the geographic boundaries and scope of monitoring before taking action along nature-positive pathways.

In general, several considerations are key, including ecosystem type, local context, multi-actor conceptualizations of relevant scale, and traditional and Indigenous knowledge.[xix] The geographic boundaries of monitoring area(s) should be determined early, ideally before action implementation, in order to ensure appropriate resourcing and planning. As a rule of thumb, the area should be sufficiently large to track changes in the relevant pressures that the action is addressing, and be informed by local experts. The monitoring area will be informed by the unique physical, biological, chemical, and ecological characteristics of the site. Impact areas (sometimes referred to as areas of influence) are often defined in an ESIA phase, or defined as part of the broader regulatory process which determines the extent to which a company is legally responsible for nature. These boundaries can be adopted and adapted to refine the extent of a monitoring program and define the impact area.[11] In general, to define an impact area, companies should understand the context in which they are working and should consider the following dimensions to inform decisions—all of which may be dynamic and thereby require adaptive management:

- **Ecological and functional boundaries:** e.g., ecosystem types, ecosystem services, sensitive habitats, key biodiversity areas, ecologically or biologically significant marine areas, vulnerable marine ecosystems, Particularly Sensitive Sea Areas, migratory routes, blue corridors[12]
- **Company footprint:** areas of development and operation
- **Actors** (including Indigenous Peoples and local communities) and governance characteristics of the region
- **Legal boundaries of the region** (e.g., marine ecoregions, territorial zones)
- **Changing ocean conditions, geopolitics, and human use**[xx]


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In this report, information about monitoring location(s) is provided in terms of ecosystem type, recognizing that local contextual considerations should be examined on a case-by-case basis in collaboration with local experts and communities.

Coastal and marine ecosystems are impacted by blue economy sectors (as noted in the *Ocean Pathways* report), including reefs, seagrass beds, kelp forests, mangroves, salt marshes and wetlands, and dunes. While this list of ecosystems is not exhaustive, it illustrates some of the world's key coastal and marine ecosystem types that are relevant to nature-positive actions taken by companies. **We provide information by ecosystem type because the unique characteristics of each system require distinct indicators to measure their health and service provision.**

11 See definition of area of influence-iucn-esms-manual_0.pdf and TNFD-Glossary-of-terms-V3.0-January-2025.pdf, as well as definition of area of direct/indirect influence: EIA-Manual.pdf to support defining area of impact

12 Sensitive habitats: Habitats unable to recover to at least 80% of their unimpacted structure or function within 20 years if activity and pressures were to cease entirely. https://www.msc.org/standards-and-certification/fisheries-standard/version-3
KBA: Globally significant sites for conservation where unique species and ecosystems occur in important numbers or extent. https://www.keybiodiversityareas.org/
VME: Vulnerable marine ecosystems, defined in CM 22-06, including seamounts, hydrothermal vents, cold water corals and sponge fields. https://www.fao.org/fishery/collection/vme/en
PSSA: defined by IMO as areas recognized for ecological or socio-economic or scientific reasons which may be vulnerable to damage by maritime activities. https://www.imo.org/en/ourwork/environment/pages/pssas.aspx
EBSAs: area of ocean that is ecologically and/or biologically important for example it provides habitat, food sources, or breeding grounds for species. The areas encompass ocean habitats from the coastline to deep ocean. https://www.cbd.int/marine/ebsas


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For each of the coastal and marine ecosystem types, we provide a synthesis of indicators that we recommend companies monitor to understand the system and the impacts their actions have on it. The indicators that we include for the six ecosystems are applicable for monitoring the progress of *avoidance and reduction actions*, as well as *restoration and regeneration actions*. In other words, whether a company is trying to understand ecosystem preservation (avoidance/reduction of impact) or ecosystem restoration and regeneration, the same indicators would apply for both. A company may also be planning to take action to both preserve **and** restore, which are both vitally important to contribute to nature-positive goals. For example, if a company is monitoring a coral reef, the same list of indicators would apply to a *preserved* reef as would apply to a *restored* reef.

The synthesized list of ecosystem-relevant indicators is included under the seabed disturbance and coastal disruption pressure category. The indicators for each ecosystem type are further categorized under the following framing:

- **How big is the ecosystem?**
- **What is the composition/diversity of the ecosystem?**
- **What is the quality/condition of the ecosystem?**
- **What services does the ecosystem provide?**

We used these guiding questions to organize indicators and assist companies in answering specific questions about the areas in which they work.[13] Given that nature and biodiversity are distinct in each place, this is not comprehensive guidance, but rather a helpful starting point which reflects the fact that every ecosystem is unique and requires specific considerations and indicators.

WHEN TO MONITOR: DETERMINING MONITORING TIMESCALE AND FREQUENCY

Monitoring should be conducted continuously over time to capture changes; the appropriate frequency will depend on the indicator type and the rate of change of the response. For example, habitat extent could be measured annually, while water quality could be measured weekly or monthly. In addition, the frequency of monitoring and length of the program will influence the results (i.e., short-term monitoring may inflate success). A long-term approach to monitoring is key in coastal and marine contexts, as ecosystem recovery and responsiveness to nature-positive action are likely to occur slowly—over years, rather than months or week. Therefore, it is critical to understand the goals and intended outcomes of the work in order to define the right monitoring parameters.

13 The data collected to answer each of these questions, along with baseline or reference data and conditions, then can be used to identify ecosystem intactness, which is the degree to which an ecosystem retains its natural structure, composition, and function in response to human pressures. Frontiers | Where Might We Find Ecologically Intact Communities?

Utilizing lessons learned from restoration monitoring, below we provide an illustrative monitoring timeline and explain what the different stages indicate about the results (adapted from Goergen et al., 2020):[xxi]

- **Pre-restoration**: Baseline site monitoring. This phase provides data to understand existing conditions before interventions are deployed.
- **Restoration occurs.**
- **Post-restoration:** Conduct monitoring surveys immediately to document new site conditions following restoration.
- **Initial implementation survey**: Within three months (or sooner, depending on the ecosystem and the intervention type). This step tests the initial success and efficacy of the restoration methods.
- **Short-term monitoring:** After about one year, conduct monitoring to continue to track implementation success.
- **Mid-term monitoring:** Occurs between years one to five following restoration, with data collection every one to two years. This phase of monitoring tests the effectiveness of the restoration efforts and helps to identify where adaptive management may be needed.
- **Long-term monitoring:** Monitor after five years. In general, long term monitoring data provide insights into ecological outcomes (state of nature) and so, with proper evaluation, the data can help determine whether restoration has had an impact on the ecosystem and state of nature. (Note: additional monitoring is always recommended when a major event happens that can impact restoration efforts, such as a hurricane or disease outbreak.)

These fundamentals for determining the timescale and frequency of a monitoring program can be applied for the deployment of any type of intervention to evaluate changes over time.

UNCERTAINTY IN THE MARINE ENVIRONMENT

Marine systems are highly variable and subject to external and global factors including climate change and extreme weather events. Therefore, monitoring results may show no signal, a delayed response, non-linear change, or can be influenced by unexpected external shocks (e.g., *Sargassum* algae blooms covering beaches around the Caribbean). Therefore regional (e.g., hurricanes) or global phenomena (e.g., El Niño) can override or delay potential benefits for nature that companies are trying to achieve through their actions. It may take time for companies to see the results of their actions given that external factors also influence the system, and it is important to remember that despite delayed results, continuous management of local impacts can increase the resilience of marine ecosystems to stressors associated with climate change.[xxii, xxiii]


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CONSIDERATIONS FOR WHO SHOULD MONITOR NATURE-POSITIVE ACTION PATHWAYS

To assign roles and responsibilities for monitoring, companies should consider their in-house capacity and expertise, as well as what is being monitored, external responsibilities (e.g., compliance), and funding available. Companies at a minimum should work with local experts (e.g., scientists, consultants, knowledge-holders, communities, and governments) when identifying and interpreting data and robust global initiatives (e.g., SBTN) with third-party verification, or certifications and standards (e.g., MSC, ASC). Local experts should have scientific backgrounds and be able to demonstrate relevant expertise, including familiarity with local and regional regulations, and relationships with other local experts and government officials. Socioeconomic specialists should conduct robust stakeholder engagement activities and public consultations to engage effectively with the socioeconomic and political landscape, Indigenous Peoples and local communities, and cultural heritage. Areas of specialized expertise that may be helpful to inform monitoring include ecology, engineering, hydrodynamics, and social science.

VI. SECTOR-SPECIFIC CONSIDERATIONS FOR INDICATORS

While the list of indicators is relevant across all sectors, the ways in which the indicators are applied and in what contexts will differ between sectors. Below, we articulate considerations for each sector, including examples of how the ecological indicators can be applied (quantitative data), and also recommend how a company could record progress using qualitative information; both are important to understanding progress. Note that as a precondition of the nature-positive monitoring journey, companies should reference and follow existing policy and regulatory monitoring frameworks and requirements relevant to their industry and/or region.

OFFSHORE WIND



Measurement and monitoring in the offshore wind industry primarily focuses on understanding the marine and coastal systems within and around a project site (refer to the Where section above for guidance on defining impact areas). Avoidance, reduction, restoration, and regeneration actions will be centered around the impacts of fixed assets (e.g., monopiles, cabling) on the ocean and coast, so measurement and monitoring of ecological indicators to understand the results of those actions will take place within the footprint of the wind field and surrounding areas. For the moving assets associated with OSW, including barges that install monopiles and turbines and service vessels that maintain operations, the indicators will signal whether the actions for these assets are having the intended results within the impact area or if adaptive management is needed. Below, we provide high-level examples of how some of the quantitative indicators for the company pressures on nature can be applied, along with examples of qualitative information that should be documented for the OSW sector.



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SEABED DISTURBANCE AND DISRUPTION OF COASTAL HABITATS:

- **Quantitative:** OSW development will impact the seabed and coastlines through the deployment of infrastructure. Therefore, it is important to understand the extent of ecosystems to identify impacts from monopiles and cabling, as well as the extent of restored habitat. It is also equally important to understand the diversity and condition of both existing and restored ecosystems and the ecosystem services they are providing.
- **Qualitative:** Companies should document decision points that avoided conversion of ecosystems or impacts to sensitive areas and species in order to capture how and when pressures on nature were avoided. Companies should also record information about restoration intervention types and processes; whether an intervention is successful can depend on the way in which it is deployed or designed, and documentation can help to facilitate adaptive management.

POLLUTION:

- **Quantitative:** The OSW company should deploy a monitoring program that measures water quality within and around the wind field. Measuring concentrations of key water quality parameters will help the company understand if its interventions are preventing pollution in the water—whether from the monopiles, service vessel discharge, or other pollution sources. Frequent monitoring will allow for early detection of issues and quicker remediation to avoid biodiversity impacts.
- **Qualitative:** Companies should document the specific measures taken to avoid or reduce pollution.

INVASIVE SPECIES:

- **Quantitative:** The OSW company should monitor for invasive species, especially as underwater structures with materials transported from port can promote their establishment. Knowledge of the presence and absence of invasive species will signal whether avoidance and reduction actions have been successful.
- **Qualitative:** Companies should document processes involved in OSW development or operations that can introduce invasive species, and the measures and methods used to manage them.

WILD POPULATION IMPACT/DISRUPTION OF WILDLIFE:

- **Quantitative:** The construction and operation of OSW will produce light and noise, so monitoring those elements will be critical to understand avoided or reduced impact. Similarly, collisions with turbines can affect birds and bats; monitoring the number of wildlife collisions can demonstrate the success of nature-positive actions such as changes to turbine color and height intended to help avoid or reduce these incidents.
- **Qualitative:** Companies should document the measures taken to avoid or reduce impacts to wildlife.

EXPLOITATION OF NATURAL RESOURCES:

- **Quantitative:** Dredging or extraction of sand and sediments is sometimes needed for OSW development. It is important that companies monitor where and how much extraction has occurred in order to understand the impacts as well as the potential restoration needs.
- **Qualitative:** Companies should document when and where choices were made to avoid dredging or using materials derived from destructive practices, as well as where circular economy approaches were deployed.

CLIMATE CHANGE:

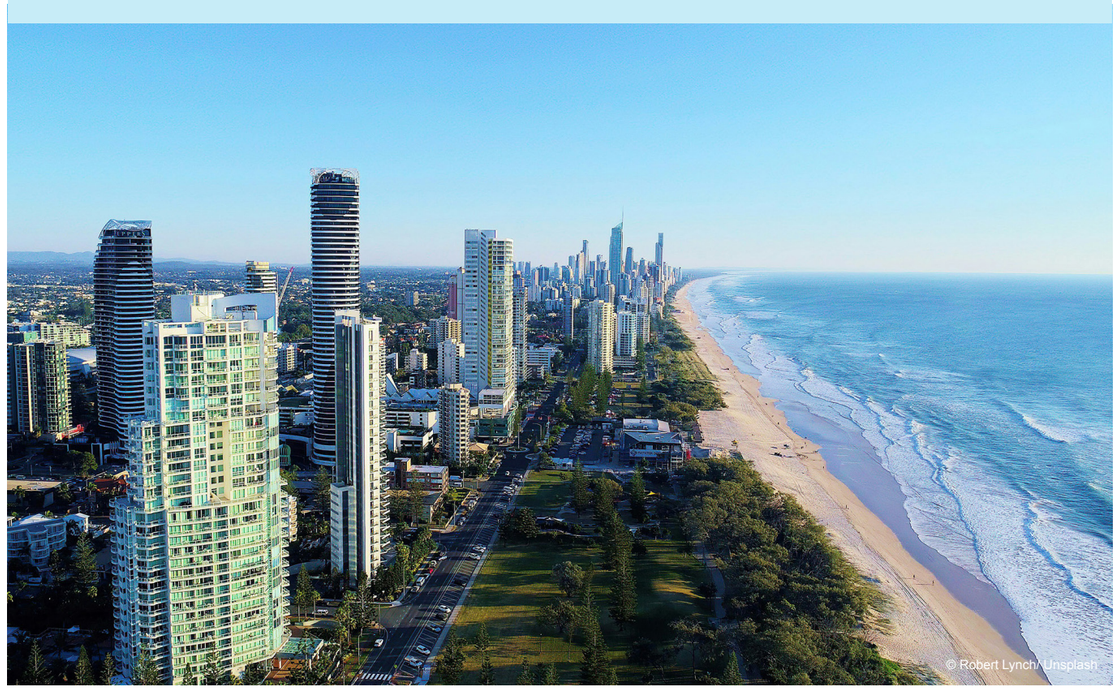
- **Quantitative:** Machinery, equipment, vessels, and materials used to construct or operate the OSW site may contribute to GHG emissions and should be monitored. Companies should align with the Science Based Targets initiative (SBTi) target-setting process, and follow the GHG protocol for measuring.
- **Qualitative:** Companies should document methods adopted to avoid or reduce emissions and/or to integrate renewable energy.

OSW EXCEL

COASTAL TOURISM

Measurement and monitoring in the coastal and marine tourism industry primarily focuses on understanding the marine and coastal systems within and around a destination (refer to the Where section above for guidance on defining impact areas). Avoidance, reduction, restoration, and regeneration actions will be centered around the impacts of fixed assets (e.g., hotels and associated infrastructure) on the ocean and the coast, so measurement and monitoring of ecological indicators to understand the results of those actions will take place within the footprint of the destination and surrounding impacted areas both on the coast and in the ocean. For the moving assets associated with coastal and marine tourism such as vessels for excursions, the indicators will signal whether the actions for these assets are having the intended results or if adaptive management is needed. Nature-positive related certifications are not yet developed for the tourism industry; however, the Global Sustainable Tourism Council (GSTC) has articulated specific actions for the hospitality sector as well as advising on how to measure them. As they are framed through a sustainability lens, the relevant GSTC actions and recommended measurements are mapped to the ecological indicators for the coastal tourism sector in the Excel tables.

Below, we provide high-level examples of how some of the quantitative indicators for the company pressures on nature in the coastal and marine tourism sector can be applied, along with examples of qualitative information that should be documented.



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SEABED DISTURBANCE AND DISRUPTION OF COASTAL HABITATS:

- **Quantitative**: Tourism and destination development will impact the seabed and coastlines through the deployment of infrastructure. Therefore, it is important to understand the extent of ecosystems to identify impacts from tourism activities, as well as to monitor the extent of restored habitat. It is also equally important to understand the diversity and condition of both existing and restored ecosystems, and to monitor the ecosystem services they are providing.
- **Qualitative:** Companies should document decision points that avoided the conversion of ecosystems or impacts to sensitive areas and species in order to capture how and when pressures on nature were avoided. Companies should also record information about restoration intervention types and processes; whether an intervention is successful can depend on the way in which it was deployed or designed, and documentation can help to facilitate adaptive management.

POLLUTION:

- **Quantitative**: The destination should deploy a monitoring program that measures water quality within coastal waters and water bodies associated with the site (e.g., salt ponds). Measuring key water quality parameters will help to demonstrate if interventions are preventing pollution in the water—whether from wastewater discharge, desalination plants, vessels, machinery, or other sources of pollution. Frequent monitoring will allow for early detection of issues and quicker remediation to avoid biodiversity impacts.
- **Qualitative:** Companies should document the specific measures taken to avoid or reduce pollution.

INVASIVE SPECIES:

- **Quantitative**: Hotels should monitor for invasive marine and coastal plants and animals, as their establishment can disrupt ecosystems and thus nature-based offerings for guests. Knowledge of the presence and absence of invasive species will signal whether avoidance and reduction actions have been successful and allow for early detection and remediation if required.
- **Qualitative:** Companies should record the processes involved in coastal and marine tourism development or operations that can introduce invasive species, and the measures and methods used to manage them.

WILD POPULATION IMPACT/DISRUPTION OF WILDLIFE:

- **Quantitative**: Hotel destinations produce light and noise which can disturb and disorient wildlife. Monitoring local wildlife to ensure that behaviors such as nesting and foraging are undisturbed will help to identify whether interventions to avoid or reduce pressures on wildlife or restore critical habitats have been successful. For example, if interventions to avoid impacts to sea turtle nesting have been successful, monitoring would indicate that the nesting behavior is unchanged or improving.
- **Qualitative:** Companies should note the measures taken to reduce impacts to wildlife, and record where restoration of nesting or foraging grounds has been undertaken.

EXPLOITATION OF NATURAL RESOURCES:

- **Quantitative**: Hotels require large volumes of fresh water during operations. Monitoring how much water is used over time, as well as how much water is reused or recharged into groundwater, will provide insights into the effects of water stewardship actions.
- **Qualitative:** Hotels and destinations should document efforts to promote water recharge and reuse, e.g., through the implementation of bioswales or the use of gray water for irrigation.

CLIMATE CHANGE:

- **Quantitative**: Machinery, equipment, and vessels used to construct the tourism destination and subsequent hotel operations will contribute to GHG emissions and should be monitored, alongside monitoring energy produced from renewable sources such as solar panels. Companies should align with the SBTi target-setting process and follow the GHG protocol for measuring.
- **Qualitative:** Companies should document methods deployed to avoid or reduce emissions and/or to integrate renewable energy.

TOURISM EXCEL

SHIPPING

Monitoring in an industry that is comprised of moving assets that traverse global ocean corridors can be challenging, especially when trying to determine whether interventions are contributing to positive outcomes for nature. Rather than being strictly localized, impact areas are diffused along ocean routes, within different regions, and at numerous ports, so what a shipping company should monitor differs from other industries with fixed assets. The mobile nature of the industry means that there are data gaps on the impacts of shipping on marine environments, further demonstrating the need for companies to fill knowledge gaps through monitoring.[xxiv] Despite the challenges, however, there are indicators that can be monitored on vessels, as well as opportunities to monitor indicators at frequented ports or ports of call to understand progress towards avoiding and reducing impacts and restoring and regenerating nature. Below, we provide high-level examples of how some of the quantitative indicators that can be monitored on vessels or at ports of call can be applied, along with examples of qualitative information that should be documented for the shipping sector.



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CLIMATE CHANGE:

- **Quantitative:** Ships can contribute to GHG emissions reductions in alignment with ambitious target frameworks, such as SBTi. In alignment with the relevant framework, ships should conduct continuous emissions monitoring and be capable of measuring the amount of energy developed and utilized from renewable sources, including wind and solar.
- **Qualitative:** Shipping companies should have an accessible strategy detailing their plan to implement operational and technical measures to meet short-term and mid-term GHG emissions reduction targets. Measures could range from using Just-In-Time Shipping and slowdown measures to adopting alternative fuel and technologies.

POLLUTION:

- **Quantitative:** Shipping companies should monitor water quality and quantity within tanks planned for discharge into the ocean, whether these hold wastewater, gray water, or ballast water, in alignment with the appropriate MARPOL Annex.
- **Qualitative:** Companies should document the measures taken to avoid and reduce water pollution.

INVASIVE SPECIES:

- **Quantitative:** Invasive species can be carried in ballast or bilge water or on the hull of a ship (biofouling), so regular monitoring of those elements of the vessel will allow for early action and mitigation.
- **Qualitative:** Companies should record processes that can introduce invasive species and the measures and methods used to manage them.

WILD POPULATION IMPACT/DISRUPTION OF WILDLIFE:

- **Quantitative:** Monitoring the number of collisions between vessels and marine life can help to determine the success of interventions. Tracking changes in vessel speeds in sensitive areas can also indicate reductions in noise and wildlife disturbance.
- **Qualitative:** Companies should document where navigational routes intersect with sensitive areas, and record changes to routes that avoid sensitive areas or migrating populations, plans for speed reduction areas, and other measures that have been deployed to reduce pressures on wildlife.

SEABED DISTURBANCE AND DISRUPTION OF COASTAL HABITATS:

- **Quantitative:** Shipping may impact the seabed through anchoring, grounding, or by generating waves that disrupt the coastline. In these instances, it is important to measure the extent of ecosystems in a given location to identify the impacted area, as well as to monitor the extent of restored habitats. Companies should also monitor the diversity and condition of both existing and restored ecosystems and the ecosystem services they provide.
- **Qualitative:** Companies should document the decision points that avoided impacts to natural habitats or to sensitive areas and species in order to record avoided pressures on nature. Companies should also record information about restoration intervention types and processes; whether an intervention is successful can depend on the way in which it is deployed or designed, and documentation here can help to facilitate adaptive management.

EXPLOITATION OF NATURAL RESOURCES:

- **Quantitative:** Metals and minerals are sourced for shipbuilding; it is important that companies monitor where materials were sourced from and understand the resulting impacts as well as the potential restoration needs.
- **Qualitative:** Companies should note when and where choices were made to avoid or reduce materials sourced from destructive practices, and where circular economy approaches were deployed.

SHIPPING EXCEL



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SEAFOOD

Existing standards and certification schemes for the seafood sector provide indicators and metrics for wild-capture fisheries and aquaculture that can be used to advance the measurement and monitoring of nature-positive pathways. While the ecological indicators listed in our synthesis for the other sectors broadly apply to the seafood sector, recognized programs such as the Marine Stewardship Council (MSC), Global Dialogue on Seafood Traceability (GDST), and Aquaculture Stewardship Council (ASC) can be referenced for monitoring and measuring approaches, key data elements, and metrics. We mapped the seafood sector actions directly to these existing standards where the relevant indicators and metrics align. This table is not meant to be a prescriptive resource or a guide on how to measure seafood-related actions, but rather demonstrates how actions toward nature positive within the seafood space can be monitored and measured utilizing existing standards and measurement tools. Not all of the nature-positive ocean pathway actions for the seafood sector have an associated MSC, ASC, or GDST indicator or metric, and in these cases we identify other resources for monitoring and measurement.

In the supporting Excel file, we organize the seafood indicator recommendations in the same format as the other sectors, with a few notable additions. Each seafood action is listed with a corresponding recommendation, so the added elements are as follows (see p. 20 for other column explanations):

A B C D E

Seafood

Actions and indicators

Subsector (wild-capture, aquaculture, or both)	Ocean Pathways Action	Seafood Improvement Hierarchy—all	Measurement goal	Indicators	Why you should monitor this indicator	Considerations	How can these indicators be monitored?	Mapping to other existing frameworks* *as of June 30, 2024	Sources and examples	Sources and examples (2)	Sources and examples (3)
				Addressed by MSC, ASC or GDST standards? Due to the significance of these standards to the seafood industry, they are considered core indicators for the seafood improvement hierarchy	Other indicators						
Aquaculture	**Biosparity:** Do not source from, or farm from aquaculture farms known to be operating without legal permits.	AVOID	Recording and monitoring the risk of exposure to unlicensed or	ASC Farm –Full	National registries presence/absence	Exposure to unpermitted aquaculture, especially where this overlaps with protected area designations, carries legal risk.		Monitoring of national farm registries, regular farm audits	GRI 3-27, 13.36, ESRS E3-1, THFO sector guidance Aquaculture; SBTN Ocean T2	Geospatial assessment methods – FAO;		
All	**Habitat destruction:** Do not source from fisheries or farms known to be operating in violation of national habitat protection regulations.	AVOID	Monitoring exposure to production from areas within protected areas.	MSC –Full ASC Farm –Full	Number of farms or vessels sourced from operations that was designated as protected to fish with IUCN protected area category I-II.	Habitat destruction may undermine the conditions required for targeted fish stocks to thrive in, and can therefore undermine the resource base. Where this overlaps with protected area designations that prohibit fishing or farming, this may also carry legal consequences.	In certain jurisdictions, national habitat regulations may not explicitly be aligned with international standards aligned with IUCN designations. Verification is required. In general, this risk is reduced if MSC or ASC certification are present.	Vessel AIS and VMS data correlated with production data, vessel fishing, or Global Fishing Watch; observer coverage, and/or farms regular audits, GPS coordinates	GRI 13.5, 13.4, 101-5, 101-6, ESRS E3-2, E4-5, THFO C1.1, sector guidance Fishing & Aquaculture; SBTN Ocean T2	Global Fishing Watch Map & Data (GFW – website)	ASC GIS Farm Placement tool;	Aquaculture Data Standard Farm Data Standard Data Stewardship
Wild-capture	**Habitat destruction:** Avoid sourcing from fisheries using highly damaging fishing techniques.	AVOID	Monitoring exposure to use of highly damaging fishing techniques including explosives and poisons, as well as bottom-contacting gear in vulnerable habitats.	MSC –Partial	Number of vessels using specific gear types—notably bottom-contact gear such as dredges and trawls.	Destructive fishing is often indiscriminate and may impact on habitats, undermining the conditions required for target species to replenish, and may also harm ETP species, with potential legal consequences.	MSC certification does not allow for destructive fishing practices including cyanide and blast fishing. High-impact bottom-contacting gears such as bottom trawls and dredges may still be certified if impacts remain within MSC's recoverability and structure/function thresholds.	Observer coverage on board	GRI 13.5, 101-6, ESRS E3-1, E3-2, E4-5; THFO C1.1, sector guidance Fishing; SBTN Ocean T2			
Aquaculture	**Habitat destruction:** Do not source from farms that have delineated mangrove or wetland habitat since 1999 (exceptions apply)	AVOID	Monitoring any contributions to mangrove deforestation or conversion.	ASC Farm –Full		Wetlands and mangroves are carbon sinks and play essential roles as nursery grounds for important species of fish that maintain ecosystem resilience and underpin commercial fisheries. Delineating these areas carries significant ecological costs and also makes farms ineligible for sustainability certifications, reducing market potential for produced goods.		Satellite imagery of farm areas, farm GPS location data, regular audits	GRI 13.4, 13.3, 101-6; ESRS E3-2, E4-5; THFO C1.5, C1.1, sector guidance Aquaculture; SBTN Ocean T2 • Land-No-Conversion	ASC GIS Farm Placement tool;	Coastal Habitat Damage, Recovery, and Post-Aquaculture Conversion – Data Standard;	
Wild-capture	**Overfishing:** Avoid sourcing from overfished fisheries that are not making sufficient progress toward improved outcomes within an appropriate time frame.	AVOID	Monitoring fishery health through stock levels and fishing effort.	MSC –Full ASC Feed –Partial	Number of fisheries that are overfished (biomass below biomass at MSY). Number of fisheries experiencing overfishing (fishing effort above fishing effort at MSY).	Overfished fisheries are less productive and at greater risk of collapse than those within sustainable limits, creating material physical and operational risk to seafood companies.	Refer to SBTN Ocean hub step 3 guidance for more information on generational stress and overfishing/overfished status. The ASC feed standard includes a ladder approach to strengthening the sustainability of feed sources over time, starting with basic FIPs, moving through the Marine Trophic Index after three years, and requiring full traceability after five years, with a requirement for MSC certification of whole fish after another three years (nine years total).	Fisheries stock assessment, data-limited assessment methods, (re)certification	GRI 13.5, 101-6; ESRS E3-1, E4-5; THFO sector guidance Fishing, C5.1 high-risk commodities; SBTN Ocean T1	SBTN Ocean hub – step 3 guidance;	GRC Impact of the state of world marine fishery resources (2020)	
All	**Traceability:** Ensure wild and farmed products are traceable from point of capture/production to point of sale. This includes, but is not limited to, adopting a commitment to meet Global Dialogue on Seafood Traceability (GDST) standards for 1,6-chen...dated and retrievable.	IMPROVE	Monitoring the provenance of seafood from source to plate.	MSC Chain of Custody –Partial ASC Chain of Custody –Partial GDST –Full		Effective traceability is a requirement for creating clarity within seafood supply chains regarding sourcing from sustainable fisheries or fish farms. Effective traceability for companies in 1) fish chain, 2) wildfood, and 3) digital and interoperable. Without traceability, product origin—and therefore related exposure to sustainability-related risks—cannot be guaranteed. Both the GDST standard as well as chain of custody certification for certified products are valuable tools for	Traceability is a means to help ensure that seafood product information is carried with the product as it moves through the value chain. Effective traceability provides an indication company with faster, greater visibility into its supply chain that is afforded through seafood certification. However, it is	Effective traceability for all product, but especially non-certified product, means: - Full chain, key data elements (KDEs), the GDST Core KDEs and Supplemental KDEs for Seafood) are collected and exchanged across all critical events in the supply chain, from the event of capture or harvest to the whole...	GRI 13.23; ESRS E4-5; THFO value chain assessment (LEAP Locate), THFO core global metrics C1.1, SBTN Step 1 Assess			

COLUMN A : We list the applicable sub-sector for each action (wild-capture, aquaculture, or both).

COLUMN B : We include the Seafood Improvement Hierarchy categorization for each action (avoid, improve, scale, or transform).

COLUMN C : We include whether the indicators for that action are addressed in leading standards (MSC, ASC, GDST).

COLUMN D : We signpost relevant indicators from other sources when the action is not covered by MSC, ASC, or GDST.

COLUMN E : We provide the rationale for measuring and monitoring, including decision-useful information and the business case for why companies should monitor contributions toward nature positive.

SEAFOOD EXCEL

VII. SOCIAL DIMENSIONS OF NATURE-POSITIVE OCEAN PATHWAYS

People are a part of nature, and nature underpins society and our global economy.[xxv] The pressures on nature and their underlying drivers emerge from humanity's use of resources and approaches to management and governance, including as related to sociocultural, economic, technological, and political dynamics.[xxvi] At the same time, business activities can have significant negative impacts on people, including with respect to human rights (e.g., labor abuses) among others. Therefore, in order to be successful and credible, company approaches to enhance nature-positive outcomes for the ocean must attend to the social dimensions—including the ways in which businesses impact people, and also the ways that businesses affect broader societal systems.[xxvii]



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Nature-positive approaches implemented by companies can potentially enhance societal benefits—through, for example, delivering restoration actions that enhance ecosystem services from which communities benefit; providing new employment opportunities; or unlocking new markets (e.g., through certified products). However, company actions may not adequately address labor rights and other social issues, for instance, in the seafood sector.[xxviii] In addition, nature-positive approaches could have negative impacts on communities, including removing or reducing access to natural resources and key areas (e.g., sacred sites, cultural resources, fishing grounds), as well as displacing pressures from one community or area to another, thereby exacerbating inequities. Processes to implement nature-positive approaches may also be carried out without recognizing or involving Indigenous Peoples, local communities, women, and other marginalized groups, or without obtaining Free, Prior and Informed Consent (FPIC).

In general, attention to the social dimensions—including those related to nature-positive pathways and beyond—involves a focus on a number of key areas including:

- **Well-being and livelihoods** including economic contributions and jobs; access to natural resources and ecosystem services; and health and environmental (i.e., air and water) quality.
- **Impacts on or for Indigenous Peoples and local communities** including rights recognition, FPIC, and inclusion in decision-making processes.
- **Social equity and justice** including changes to the distribution of benefits and harms, perceptions of fairness, and conflict resolution.
- **Workers' rights**, safety, health, and training, including fair wages, and labor rights (e.g., grievance mechanisms, Wi-Fi at sea).
- **Governance** including legal compliance, stakeholder participation and engagement, trust, transparency, and accountability.
- **Systems change** including policy and economic change, as well as ensuring a right to a healthy environment in line with international law.

While engaging with, monitoring, and improving social dimensions while pursuing nature-positive approaches is the right thing for companies to do, it can also reduce risks and enhance opportunities for the business. Risk reduction may include ensuring legal compliance, avoiding reputational risks, and reducing financial risks. Moreover, such engagements can also enhance company reputation, unlock opportunities for new investments aligned with environmental and social responsibility goals, and ensure that the outcomes of nature-positive approaches will be more effective, equitable, and durable. Monitoring these dimensions over time helps ensure that progress is moving in the right direction.

In general, companies should attend to and monitor social dimensions while implementing nature-positive actions including by collaborating with human rights organizations and other experts to prevent and address labor abuses in supply chains,[14] as well as by modifying internal policies, requiring, at a minimum, "do no harm" approaches, while also encouraging positive outcomes for people. Such collaborations can ensure that the most appropriate social dimensions are tracked and assessed, to therefore adapt and improve action plans over time.

14 For example, Bolton has partnered with Oxfam and WWF, with a focus on ocean protection and human rights throughout the seafood supply chain. https://www.bolton.com/our-company/news/bolton-wwf-and-oxfam-join-forces-highlight-transformative-partnerships-aimed

VIII. TRANSFORMATIVE ACTIONS: KEY TO ENHANCING SOCIAL DIMENSIONS

In the *Ocean Pathways* report, we provide a list of transformative actions that companies can take to contribute to nature positive, which are all directly relevant to the social dimensions mentioned in the prior section. It is fundamental that companies, in collaboration with other actors, contribute to transformative actions, as they are required to achieve nature positive. Notably, most transformative actions are process-based, referring to engagements, initiatives, and influencing work. (For reference, the full list of transformative actions can be found in the sector-specific Excel tables within the action key tab.)

As an entry point for companies to ensure that their nature-positive actions are also contributing positively to society, below we offer a synthesis of the *Ocean Pathways* transformative actions into five categories. To accompany these actions, and instead of providing specific indicators, we provide high-level questions for companies to engage with to help them consider and improve the social dimensions of their nature-positive action pathways as they monitor. Companies can apply these as internal, self-reported screening questions.

While this resource offers a first step for companies to engage with transformative actions, we recommend that future work expand on this to provide and/or signpost to frameworks and indicators as well as fill existing gaps, including in collaboration with human rights, labor, and social justice-focused organizations. *The categories and questions below should not be used as prescriptive guidance, as they are not comprehensive for all aspects across sectors relevant to this report.*

CATEGORIES OF TRANSFORMATIVE ACTIONS AND HIGH-LEVEL SCREENING QUESTIONS



1. MAKING POSITIVE CONTRIBUTIONS TO SPATIAL PLANNING AND AREA-BASED CONSERVATION

- Actively participate in processes including ecosystem-based marine spatial planning (MSP) and integrated coastal zone management (ICZM), and advocate for the prioritization of nature.
  - **Question:** Has the company engaged in ecosystem-based MSP, and/or ICZM processes while ensuring the prioritization of nature, and/or have an integrated marine and coastal plan that prioritizes nature?
- Support the expansion of equitable and effective protected and conserved areas (PCAs), as well as their long-term management. This includes avoiding advocating for changes to PCAs that enable industrial-scale and/or unsustainable resource extraction or development (i.e.[xxix]).
  - **Question:** Has the company contributed to or supported the expansion and/or management of effective and equitable protected and conserved areas, for instance, through financial support; policy engagement; technical support; support of community stewardship.
  - **Question:** Has the company avoided political engagement that would encourage damaging PCA downgrading, downsizing, degazettement, and delisting?



2. MOVING GOVERNANCE AND REGULATORY LEVERS TOWARDS NATURE AND PEOPLE POSITIVE

- Engage with policy processes in a way that encourages positive outcomes for nature, including avoiding lobbying for policy changes that encourage negative outcomes for nature.
  - **Question:** Has the company engaged in policy processes to promote nature and people positive outcomes? If yes, note policies and progress towards policy goals including adoption, implementation, and evaluation.
  - **Question:** Has the company avoided political engagement for policy changes that would lead to damaging outcomes for nature?
- Ensure robust processes for public consultation and inclusive actor engagement, including in decisions around siting. This includes meaningful engagement with all relevant actors, including local communities, Indigenous Peoples, small-scale fishers, and others in all processes.
  - **Question:** Has the company led and/or engaged in inclusive public consultation processes in ways that enhance participation of all relevant actors, especially more marginalized groups?
- Engage in collective action that contributes to nature positive in the seascape.
  - **Question:** Has the company worked across other industries with diverse actors from the public and private sectors within the seascape where they operate? If so, who was involved, what were the processes for engagement and results?



3. SUPPORTING AND EMPOWERING COMMUNITIES, ESPECIALLY THOSE MOST DEPENDENT ON NATURE

- Play a role in supporting the social equity (the distribution of benefits and harms) and human rights of communities that can be impacted, including especially those living in nearby areas which are operated in and sourced from. This includes avoiding human rights abuses, ensuring a living wage, and introducing grievance mechanisms and protections for communities.
  - **Question:** What measures (policies, programs, investments) has the company taken to embed social equity and human rights into its development and operations?
- Invest in programs that benefit communities and contribute to social and economic well-being.
  - **Question:** What is the level of financial investment and technical capacity contributed to community, social, and/or educational programs over time?



4. FOSTERING SCIENCE AND TECHNOLOGY FOR BIODIVERSITY

- Play a role in collecting and sharing as much knowledge and data as possible from monitoring programs to work towards shared nature-positive goals.
  - **Question:** Does the company continuously share biodiversity data and its knowledge about monitoring to the maximum extent possible to inform the broader sector and other relevant sectors? If so, what data and what platform(s)?
- Make investments in research programs (for new technology platforms, approaches to climate resilience, mitigation, etc.) that can benefit the broader sector and others working towards nature positive.
  - **Question:** What is the extent of a company's investments in research programs? What programs received investments, and what outcomes did they achieve?
- Invest in and contribute information to scientific monitoring programs, leveraging prior investments in monitoring.
  - **Question:** What is the extent of a company's investments in scientific monitoring programs (including data, financial support, capacity), and what outcomes did it achieve?



5. DRIVING INDUSTRY AND ECONOMIC SYSTEMS CHANGE FOR A NATURE AND PEOPLE-POSITIVE WORLD

- Science-based target setting is a vital part of a company's contributions to nature positive, and can also help to raise the bar for a sector by not only promoting direct company action but also increasing the demand signal for investors and policymakers to incentivize action.
  - **Question:** Has the company set or does it plan to set SBTs? If so, which ones, and which frameworks were used?
- Broader systems change towards a nature-positive economy—an economy in which the net results of all economic activities combined lead to an absolute increase in nature towards full recovery—is necessary to bend the curve for nature. Companies can begin to contribute to this by employing circular economy approaches.
  - **Question:** Has the company employed innovative approaches including circular economy technologies and systems?
- Co-location of industries can benefit multiple sectors by reducing the amount of land and sea required for industry and thus increasing space for nature. (For example, co-locating offshore wind with regenerative aquaculture could have benefits for climate, biodiversity, and local economies.)
  - **Question:** Has the company considered or activated co-location with other industries? If so, which ones, and what have been the results?
- Companies can meaningfully contribute to transforming (historical and/or current) power dynamics that have marginalized certain groups.
  - **Question:** Has the company engaged meaningfully in ways that center the needs of Indigenous Peoples and local communities, including accounting for historical and current disparities in power dynamics?

IX. BEYOND COMPANIES: ROLES OF OTHER ACTORS TO SUPPORT MONITORING NATURE-POSITIVE OUTCOMES

We recognize that companies are not solely responsible for monitoring nature-positive actions, and that certain enabling conditions and actions by others are needed to ensure effective monitoring. Beyond a company's direct investments in monitoring, multiple actors have a role to play, including financiers, policymakers, and civil society.

- **Financiers** can demand high-quality nature-positive actions with outcomes that are verified through monitoring, evaluation, and verification. In the blue economy, as the frameworks and initiatives that would provide such credibility emerge (e.g., SBTN that applies across sectors, complementing initiatives like MSC and ASC), this lever of change will become increasingly relevant.
- **Policymakers** can embed the assessment of credible (e.g., monitored and verified) nature-positive pathways in policy goals,[xxx] including nature risk assessments, transition planning, target-setting, and disclosures. Such approaches would level the playing field for companies who are making credible contributions. Policymakers also have a critical role to play in providing support for data infrastructure, coordination and shared data standards for interoperability (at national and international scales), and in encouraging open data-sharing.
- **Civil society organizations** can work on systems change to increase ambition around nature-positive actions and associated monitoring, and can also collaborate with companies to design or implement aspects of monitoring programs. Such organizations can focus on community-based monitoring, which is an important way to build trust and invest in local leadership and nature stewardship, and may lead to more accurate monitoring outcomes.[xxxi]
- **Various frameworks** (SBTN, TNFD, etc.) can continue to support nature-positive monitoring by providing access to resources and data, encouraging companies to move towards more regular cycles of disclosure, monitoring, and third-party verification.[15]

AN ALL-OF-SOCIETY APPROACH IS NEEDED TO TAKE ACTION AND MONITOR PROGRESS TO ENSURE A NATURE-POSITIVE FUTURE.

15 TNFD recently published a use case on fishing sector metrics in practice and includes investor and company perspectives on the use of metrics and on emerging opportunities: https://tnfd.global/knowledge-bank/applying-tnfd-nature-related-metrics-in-the-fishing-sector-insights-from-investors-and-industry/

X. COLLECTIVE MONITORING THROUGH A SEASCAPE APPROACH

One promising way forward to achieve nature-positive goals in the ocean is a seascape approach—a collective action model for conservation.[xxxii] A seascape approach aligned with the nature-positive goal is a connected coastal and marine region in which communities, governments, civil society, and blue economy sectors work collectively to bend the curve, while coexisting and benefitting from shared ecosystem services.[xxxiii] [16]

A seascape approach emphasizes collective action among all users of a region's marine and coastal areas to address shared challenges and opportunities.[xxxiv] Because ocean systems are highly dynamic and interconnected—through currents, tides, temperature gradients, and mobile species—impacts are rarely confined to a single site and can originate from both land and sea, travel long distances, and accumulate over time.[xxxv] This makes it difficult for companies to measure **cumulative impacts**[17] or contributions using site-level monitoring alone. Large-scale, long-term monitoring across a seascape can enable informed goal-setting and provide a more robust picture of ecosystem health and the progress of actions toward nature-positive outcomes (see Annex 4 for some technological solutions for monitoring). **Collective monitoring with cross-sector data and knowledge-sharing distributes effort, expands understanding, and enables monitoring at an ecologically meaningful scale. In practice, this means that multiple actors collect complementary data across indicators and share their findings, bringing together enough information to enable a seascape-level evaluation of coastal and marine health and biodiversity.** Companies operating in the same region should share knowledge and data to fill data gaps, support evidence-based decision-making, and design robust solutions.[xxxvi]

When it comes to sector-based models for seascape approaches, collective monitoring and action may look different depending on the sector, but all share the same principles of engagement across actors. In addition, multiple sectors listed here may co-exist with one another, emphasizing the importance of taking a holistic seascape approach that involves all relevant actors.

- In the seafood industry, *jurisdictional initiatives* have emerged as a collaborative mechanism through which a diverse set of actors collectively support the management of fisheries or aquaculture in a defined region with the goals of marine ecosystem protection, human well-being, and integration of best practices for sustainability.[xxxvii]
- OSW companies can engage in robust marine spatial planning and related processes to ensure multi-actor contributions for shared decision-making and collaborative data collection to inform actions as well as performance monitoring for the MSP.[xxxviii] Beyond marine spatial planning, the field of collective seascape approaches for the OSW industry is nascent but promising.
- In the coastal and marine tourism sector, stretches of coastline often host different hotels in a seascape; *a destination approach and integrated coastal zone management* can support collective action. Engaging with hotels and other actors that operate and utilize shared coastal and ocean resources can foster collective efforts to address shared challenges or opportunities, including collaboration on monitoring and data collection, as well as shared interventions.[xxxix]
- In the shipping industry, the volume of vessels operating at any one time provides a rare opportunity to collect data in nearly every part of the ocean due to its global operational extent. An industry-wide approach to collecting data could contribute to a global ocean data repository and inform real-time decisions on route management and water quality, and support management or designation of Particularly Sensitive Sea Areas (PSSAs) and blue corridors. In practice, individual ships could passively collect geolocated data on water quality or record migration and sightings of marine organisms, and contribute to a repository of geo-located data to form an extensive and robust database for both shipping and ocean health decisions.[xl]


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16 Scientifically, seascapes can be classified biogeographically as marine ecoregions that include coastal and continental shelf waters grouped by the species composition and the distinct topographic and oceanographic features and ecological processes. Marine Ecoregions of the World: A Bioregionalization of Coastal and Shelf Areas | BioScience | Oxford Academic

17 Cumulative impacts: the sum of exposures to multiple pressures that affect the health and functioning of a system. In the context of the blue economy sectors, cumulative impacts refer to the collective impacts on the coasts and ocean from multiple sectors that develop or operate in a shared region.

Cumulative impact assessment: A process to evaluate the quantitative and qualitative data of impacts from exposure to multiple pressures. The blue economy sectors can contribute by coordinating across shared seascapes to support data collection and knowledge sharing. Such data sharing contributes to assessing the health and functioning of the system based on impacts and interventions of the many actors within the same seascape.

US EPA, OA. 2024. "Cumulative Impacts Explained." Data and Tools. November 13. https://www.epa.gov/cumulative-impacts/cumulative-impacts-explained.

SEASCAPE APPROACH:
COLLECTIVE ACTION AND MONITORING FOR A NATURE-POSITIVE FUTURE

Illustrating collective action and monitoring among all users of a region's marine and coastal areas to address shared challenges and opportunities, contributing to a nature-positive future. All actors collaborate to articulate a shared vision, design plans, take actions, and collect and share data for adaptive management–thereby accelerating action at scale.

A seascape approach aligned with the nature-positive goal is a connected coastal and marine region in which communities, governments, civil society, scientists, and blue economy sectors work collectively for nature while coexisting and benefitting from shared ecosystem services.



OSW companies can collect data within their wind farms, and collaborate with others to collect and share data regionally, informing actions such as ecosystem-based marine spatial planning.

The volume of vessels operating globally provides a unique opportunity for data collection that could inform real-time decisions on route management and water quality, and support conservation of blue corridors or sensitive areas.

Jurisdictional initiatives support the management of fisheries or aquaculture with the goals of marine ecosystem protection, human well-being, and integration of best practices for sustainability.

A Destination Approach and Integrated Coastal Zone Management encourages collaborative monitoring and data collection among hotels and other actors in a region, enabling data-informed decision making and coordinated actions to address shared challenges.



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XI: CONCLUSION

Ultimately, whether we reach a nature-positive future for the ocean will depend on credible, evidence-based actions taken across sectors and scales—including robust monitoring, evaluation, and learning (MEL). While some actions led or implemented by companies and related approaches to MEL are not yet common in the blue economy, the prospect of scaling these approaches holds considerable promise to not only reduce business risk but also unlock opportunities. Success will depend on several factors which require a mindset shift, including (1) a focus on learning; (2) long-term operationalization; and (3) collaborations for a nature-positive economy.

Shifting from a fixed to a learning mindset is critical to our collective ability to reach nature positive for the ocean. Companies can get started by taking action, despite uncertainty— with a focus on MEL to inform continuous improvements for nature and people. By focusing on the approach as a learning journey, companies can continue to innovate, learn from "failures," and pivot quickly towards new innovations. Actions taken collectively (for instance, through a seascape approach), coalitions, and in partnership with experts can help to accelerate the learning process over time as the approaches mature.

Moving nature-positive approaches and their associated MEL systems from pilot phases into standard business practice will require a deliberate shift toward long-term thinking and operationalization. Embedding these approaches within companies will depend on sustained, forward-looking strategies that integrate MEL into core decision-making processes rather than treating them as an add-on. At scale, this involves shaping sector-wide approaches to MEL, including the development of standardized operating procedures that can be applied consistently across functions and actors. Clear roles and responsibilities across functions will be essential—across ownership, development, and day-to-day operation of these systems. Practical tools, including technical manuals, targeted capacity-building efforts, and ongoing support mechanisms, must be developed to underpin this transition, reinforced by enabling incentives, policies and funding structures that make long-term adoption both feasible and attractive.

Finally, ensuring the success of nature-positive approaches will depend on fundamentally new ways of working for blue economy companies, grounded in collaboration across sectors and geographies. Operating a seascape approach, with grounded and coordinated action among finance, policy, civil society, and communities, offers a promising pathway to achieve the Global Biodiversity Framework's 2050 vision of living in harmony with nature. This means collectively shifting from our current, extractive economy—[xli] one that erodes the natural capital that businesses depend on—to a regenerative, nature-positive economy that supports societal resilience and shared prosperity. While this transformation may appear generational in scale, the momentum is building—and with aligned action, this rising tide has the potential to lift all boats.

ANNEXES

ANNEX 1: BASELINES

Baseline data can be drawn from historical records, if available. If such records are not available, then it can be sourced through surveys or modeled (known as back-casting).[xlii] Baselines are critical to understanding relative progress towards nature positive following action implementation.[xliii]

Choosing the right baseline is an important part of designing a monitoring plan. While the global nature-positive goal specifies a "2020 baseline," this is a global reference point based on the policy goals embedded in the Kunming-Montreal Global Biodiversity Framework; it does not refer to ecological baselines and it is always appropriate to downscale it to individual monitoring plans. The status of nature (species abundance, ecosystem condition, etc.) in 2020 in a given location may not represent a desirable baseline. In fact, global biodiversity as measured by the Living Planet Index showed a 68% decline in wild vertebrate populations from 1970 to 2020.[xliv] We recommend that, rather than focusing on a 2020 baseline, a desirable historical baseline should be chosen for a given site—especially when the condition of the site(s) in 2020 was degraded. This will involve investigating which habitats and ecosystems existed before degradation occurred, through historical scientific records, as well as Indigenous and local knowledge.[xlv] (See McClenachan et al. (2012) for approaches to identifying historical baselines in marine systems.)[xlvi]

To gather baseline data, data from ESIAs can be used, and can be enhanced by additional data gathered by companies and expert collaborators, through:

- Site visits and direct field observations (e.g., of ecosystems, species).
- Environmental documents required by regulatory agencies, including historical records. These documents should be publicly available from the relevant jurisdiction, and may include both physical and online records.
- Early conversations with relevant agencies and departments to provide site-level information and considerations.

ANNEX 2: TARGETS

Science-based targets for nature are based on thresholds—biophysical values that indicate attainment of a desired state of nature, such as ecosystem condition or species population levels—and are generally aligned with planetary boundaries that define a "safe operating space" for humanity based on natural processes that regulate the stability and resilience of Earth's systems.[xlvii] In the ocean, relevant planetary boundaries include ocean acidification and biosphere integrity.

This report does not define specific ecosystem thresholds, as appropriate thresholds vary by location, pressure, and company context. Instead, we recommend using the SBTN process, which defines science-based thresholds for key pressures on nature that companies can use when setting targets. For the ocean, SBTN guidance is currently available for wild-capture fisheries, covering overexploitation, sea-use change (e.g., habitat loss and degradation), and wildlife impacts (including on endangered, threatened, and protected species), with additional guidance forthcoming for other ocean sectors including OSW, coastal tourism, and shipping.

Besides articulating specific indicators, our report also describes the intended outcomes for different ecosystem types (for example, what generally characterizes a healthy coral reef or kelp forest system) to help companies identify what conditions they should be working towards in their nature action plans, which ideally are founded on science-based targets. In addition, the report can serve as a reference and input to possible follow-up analyses, described in the Annex below ("Impact evaluation: determining causal impact"). In order to *attribute* change and ultimately identify the causal impacts of a nature-positive action pathway, a rigorous analysis called impact evaluation is required. One type of impact evaluation—referred to as Before-After-Control-Impact, or BACI—requires a reference or "control" site to assess whether observed changes in pressures or in state-of-nature outcomes result from a company's actions or from other factors.

In addition, climate change will influence ecosystem thresholds and targets, and therefore should be taken into account as part of adaptive management.

ANNEX 3: BEFORE-AFTER-CONTROL-IMPACT

BACI analysis requires measurement of indicators at four points:

1. **Before** the intervention in the Control or reference site
2. **Before** the intervention in the Impact site (the location where the action is being implemented)
3. **After** the intervention in the Control or reference site
4. **After** the intervention in the Impact site

Then, calculations can be carried out to assess whether and to what extent a certain action led to a change in the state of nature.

Companies can use experimental approaches to trial BACI analyses, including the application of certain innovations compared to a reference—for example, painting wind turbine blades black only in certain sites and assessing whether this has affected bird collisions, assuming that the control and intervention sites have a similar presence of birds.

ANNEX 4: TECHNOLOGICAL SOLUTIONS AND ADVANCEMENTS TO SUPPORT MONITORING

New technological solutions are being developed at a rapid rate, providing opportunities for the blue economy sectors to utilize existing and emerging tools.[xlviii] These tools can address the challenges of collecting data in hazardous environments, reduce costs of monitoring, and provide consistent and continuous monitoring. Below we highlight a selection of technologies and monitoring techniques that could be considered by the private sector for various monitoring needs:

- **Environmental DNA (eDNA):** eDNA is the genetic material left behind by organisms that can be found in environmental samples of soil or water.
  - **Benefits:** Collecting eDNA is a non-invasive, easy, and efficient way to monitor biodiversity in both terrestrial and marine systems. It is especially useful for detecting rare, ETP, transient, or invasive species or organisms that are challenging to monitor, like camouflaged (cryptic) species or microorganisms impossible to see with the naked eye. eDNA results can serve as a useful first step to understand the biodiversity of a site, but they should be used to complement other biodiversity monitoring efforts and not as the sole method.
  - **Limitations:** Results are dependent on the library of DNA markers available or on file for analysis, so the results will capture only the organisms for which the DNA has been recorded in a reference database. It is also important to note that the data are from one time point (time of sample collection) and only capture eDNA within a certain radius that is dependent on the tides, currents, and unique characteristics of the monitoring site. eDNA also cannot calculate population density, but rather only provide information about the presence of a species.[xlix]
- **Underwater video monitoring:** Deploying underwater video cameras is a technique used to monitor species diversity over a continuous time period.
  - **Benefits:** This method could be especially useful in conditions that are too hazardous for divers, or as a way to minimize diving needs. Baited remote underwater videos (BRUVs) are often used to monitor sharks, fish, or other marine organisms. Underwater cameras have also been designed with AI to monitor and identify species that swim within frame to capture the biodiversity of reefs or a particular marine habitat. These technologies can be deployed in the same location for repeated surveys.
  - **Limitations:** There is a species bias towards organisms attracted to bait when using BRUVs; low or poor visibility conditions can degrade video quality and make identification challenging; benthic or cryptic species are not always captured; video processing can be time-consuming in the absence of trained AI models to identify species.[l]
- **Photogrammetry:** Photogrammetry is a tool that creates detailed, high resolution, 3D models of benthic habitats from underwater photographic images. It has been most widely applied in tropical systems to model coral reefs, but it can also be deployed in temperate and polar regions to model the seafloor.
  - **Benefits:** The models can provide information on seafloor topography, habitat complexity, and benthic composition. It is an efficient method for monitoring and analyzing large areas of seafloor.

- **Limitations:** Photogrammetry requires in-situ data collection of imagery with the right equipment, programs to analyze data, and time for processing the imagery.[li]

- **Autonomous underwater vehicles (AUVs) or Remotely operated vehicles (ROVs):** These are submersibles operated from a ship or from shore that can capture video, gather data with sensors (including water quality, seafloor mapping), and collect samples.
  - **Benefits:** This is an efficient and effective way to gather data on several different parameters on one mission. AUVs and ROVs can collect data in areas that are too deep for humans, and they can remain submerged for longer periods of time than divers.
  - **Limitations:** Costs and maintenance can be expensive and limited by power supply; system failures can lead to aborted missions.[lii]
- **Moored buoys:** Buoys equipped with sensors and gauges can be affixed to the seafloor to capture data.
  - **Benefits:** Buoys can continuously monitor site conditions, including precipitation, wind, waves, water quality, currents, and atmospheric pressure. Some buoy designs allow for data transmission in real time for immediate results analysis.
  - **Limitations:** Data coverage applies only in the location where the buoy is deployed; maintenance and sensors can be costly, and the latter are vulnerable to damage if conditions are severe.[liii]
- **Remote sensing:** This measures radiation reflected or emitted from the surface of the Earth, and can be used to measure ecosystem extent, condition, and surface characteristics for nearshore and coastal habitats.
  - **Benefits:** Data can be analyzed from satellite imagery (passive remote sensing), or it can be collected through radar or lidar (active remote sensing), which allows for coverage and analysis of large sites or areas. Remote sensing enables the collection of data in areas that may be challenging to reach; it is not intrusive, and it could be cost-effective for monitoring a large area. Given that it collects data on multiple wavelengths, both terrestrial and marine habitats can be analyzed.
  - **Limitations:** Remote sensing can be costly if actively collecting data through radar or lidar, and requires specialized skills in both collection and analysis. Differences in resolution or quality of imaging can impact analysis, as can meteorological conditions.[liv]
- **Electronic monitoring systems:** Video sensor technology collects data for the fishing industry including on numbers of fish caught, fishing effort, and bycatch.
  - **Benefits:** The data informs stock assessments and can ensure that catch limits will support the long-term sustainability of a fishery. The systems provide real-time, accurate data as well as transparency and can enable coverage across a large fleet. Other benefits include geo-located data and reduced on-board observer programs (which reduces costs), plus compliance is incentivized.
  - **Limitations:** If cameras are blocked, not cleaned/maintained, and/or technology malfunctions, data will be lost or not captured accurately. Implementing EMS systems on a large fleet could be costly in the short term.[lv]

Where it may not be possible to have sophisticated technological systems to collect data, for example in the case of remote communities or small-scale fisheries, capturing and recording data on mobile phones could be an effective workaround.

ANNEX 5: METHODOLOGY

We synthesized evidence from a variety of robust, science-based sources and expert inputs to inform the recommendations and guidance we provide for companies in the blue economy sector.

This approach mirrors those used in qualitative evidence syntheses (e.g., by IPBES assessments), especially in data-poor scenarios, where we drew from the best available evidence and knowledge. We also considered the evidence hierarchy as a guide, ensuring that we prioritized the most reliable sources while recognizing the value of different types of inputs (e.g., case studies, empirical studies, expert knowledge). We included diverse and wide-ranging inputs. We reviewed scientific literature from the natural and social sciences (e.g., ecology, geography, economics), and focused on specific topics such as monitoring and measurement in the ocean[lvi] to identify the added value and appropriate positioning of this report.

Technical development

The drafting process was led by scientists, who synthesized the above sources, and gathered inputs from a working group of 61 academics and practitioners with relevant expertise (see Acknowledgements). The development process included initial ideation, three virtual workshops, and two rounds of review.

We began the development of the recommendations by investigating the existing relevant frameworks and standards that outline indicators and metrics for marine monitoring (and in some cases terrestrial, where relevant) and collated them into a repository. This exercise allowed us to understand the indicators and metrics that are currently being used by various organizations, taking stock of those that are repeatedly referenced and those that are less common. This provided a robust overview of the existing landscape of indicators and metrics, ensuring that we avoid duplication of effort and instead complement other bodies of work.

As a next step, we listed every action from the *Ocean Pathways* report in an Excel file and disaggregated any clustered actions so that each row held a single action. Through this refining, we reviewed all actions across all sectors and synthesized them to identify common themes (e.g., actions around water quality, noise and light, habitat quality/condition, ecosystems, biodiversity, nature's contributions to people, social processes). This exercise revealed that organizing the actions (avoid, reduce, restore and regenerate) by pressure category would allow us to provide synthesized indicators and measurement recommendations to inform how companies can address their relevant pressures on nature. Given that the transformative actions include recommendations for enabling conditions as well as socioeconomic approaches, those actions were addressed separately as part of our social dimensions analysis and guidance, through which we categorized the transformative actions into thematic groups and identified high-level questions for companies to assess and consider.

Once we had decided to categorize all actions across sectors by pressures and recommend a synthesis of indicators, we explored several logic models through which to organize the full suite of recommendations. Based on the information we provided in the *Ocean Pathways* report, we found that the most logical framing was to organize in this order, drawing terms from Mascia et al. (2014):[lvii] Inputs -> Actions -> What to measure -> Outputs -> Outcomes -> Impacts (see Glossary for definitions).

We identified:

(1) Which elements were covered in the *Ocean Pathways* report.

- **Inputs:** resources needed and enabling conditions (some details also included in this report)
- **Actions:** nature-positive action pathways taken to address pressures on nature
- **Outputs:** qualitative guidance on what would be expected following taking action, including risk reduction and unlocking opportunities

(2) What components would be covered in this report.

- **What to measure:** indicators (see Excel)
- **Outputs:** reduction of pressures on nature
- **Outcomes:** the directional or relative change of that pressure or state of nature

(3) And which were out of scope.

- **Impact:** We provide general guidance in this report about attribution of impacts, which requires further analysis (i.e., impact evaluation) to determine.

After this logic model was defined, we populated the information, which culminated in the Excel files accompanying this report. These identify indicators that companies should monitor and the necessary supporting information to guide them.

Note: We only synthesized indicators and not metrics, because many standards and frameworks have already defined specific metrics. Instead, we map the existing metrics to the list of indicators that we have curated to demonstrate their alignment and complementarity with other initiatives.

Private sector engagement

We also sought feedback from the private sector via a series of engagements:

- Between March and May 2026, WWF gathered detailed feedback in written form and through bilateral consultations with eight sector-relevant companies. This included feedback on the structure and content of the recommended ecological indicators for monitoring nature-positive pathways and helped to ground-truth the document's useability by the private sector. We incorporated select feedback received via these consultations into the final version of the report where relevant; alignment with the ambition of the nature-positive goal, scientific literature, and goals of this report was maintained.

Key themes covered in these consultations included:

- Orienting the nature-positive concept with how companies are currently monitoring and measuring nature, in terms of business impacts, dependencies, risks and opportunities, discussing internal and external factors.
- Perceived challenges to operationalizing the recommended indicators to support monitoring progress toward nature positive in both the short and long term, and opportunities to contribute to solutions.
- Technical feedback on terminology used and clarity of linkages to other relevant frameworks including TNFD, SBTN, CSRD, GBF, SDGs, etc.
- We also noted companies' perspectives regarding the practicality and ambition levels of the recommended indicators; we did not adjust the level of ambition in the content, but will use the feedback to contextualize application of the recommendations and provide the appropriate entry points for company engagement.
- Practical next steps regarding how to most impactfully take this work forward to support companies in monitoring and measuring their nature-positive action pathways.

WWF authors made the final decisions about the content of this document.

ANNEX 6: GLOSSARY

Activity: Actions taken or work performed through which inputs are mobilized to produce specific outputs.[lviii]

Baseline: Measurements of relevant indicators before any action is taken and serve as references with which to compare measurements over time.[lix]

Cumulative impacts: The sum of exposures to multiple pressures that affect the health and functioning of a system. In the context of the blue economy sectors, cumulative impacts refer to the collective impacts on the coasts and ocean from multiple sectors that develop or operate in a shared region.[lx]

Cumulative impact assessment: A process to evaluate the quantitative and qualitative data of impacts from exposure to multiple pressures. The blue economy sectors can contribute by coordinating across shared seascapes to support data collection and knowledge sharing. Such data sharing contributes to assessing the health and functioning of the system based on impacts and interventions of the many actors within the same seascape.[lxi]

Data: Factual information (such as measurements or statistics) used as a basis for reasoning, discussion, or calculation.

Database: A usually large collection of data organized especially for rapid search and retrieval. Organized collection of data stored to store, retrieve, and manage information. Can include text, numbers, images, and videos.

Functional connectivity: Connectivity focused on movement and its outcomes (e.g., self-replenishment, animal movement between reproductive and foraging areas, population growth, population or species persistence).[lxii]

Impact: The intended and unintended consequences (i.e., changes in knowledge and attitudes, behaviors, and/or social and environmental conditions) that are directly or indirectly caused by an intervention.[lxiii]

Input: The financial, human, and material resources used for an intervention.[lxiv]

Intervention: Specific action (project, program, or policy) designed to effect a specific desired change; may be manifestation of broader strategy.[lxv]

Key performance indicators: Quantifiable measure that evaluates how effectively an action/organization/team is achieving objectives. They are defined metrics that allow for comparison of performance against targets, objectives.

Indicator: A measurable entity related to a specific information need, such as the state of nature, change in a pressure, progress toward a target, or association between two or more variables.[lxvi] An indicator is a quantitative or qualitative variable that is closely correlated with, and serves as a proxy for, a characteristic, phenomenon, or change that may be difficult to measure directly. An indicator provides a practical way to monitor conditions or change in meaningful units over time.[lxvii]

Measurement: The process of collecting data for baseline setting, monitoring, and reporting.[lxviii]

Metric: A quantitative measure of data relevant to what you are trying to measure or analyze. Measured value(s) used to assess specific indicators. It defines the units and how the indicator is being measured.[lxix]

Monitoring, evaluation, and learning (MEL): *Monitoring* is a systematic process for collecting and reviewing data and information across the life of a project (rather than just at the end). It is designed to track outcomes in a participatory manner that enables learning, informed decision-making, and capacity development of project participants. *Evaluation* assesses the effectiveness or impact of an intervention or activity to identify if the intended results have been achieved. *Learning* is the process of using the evidence gathered from the monitoring and evaluation to adapt and improve future results and performance. Successful MEL plans include the following design principles: 1. Baselines, 2. Clear targets, 3. A defined monitoring frequency, 4. Spatial and temporal design, 5. Thresholds for adaptation and change, and 6. Independent scientific oversight.[lxx]

Natural habitat: Areas composed of viable assemblages of plant and/or animal species of largely native origin and/or where human activity had not essentially modified an area's primary ecological functions and species composition.[lxxi]

Nature transition plan: A set of goals, targets, actions, accountability mechanisms and intended resources to respond and contribute to the transition implied by the Global Biodiversity Framework where biodiversity loss is halted and reversed by 2030 to put nature on a path to recovery by 2050, while respecting planetary boundaries. The plan should outline how the entity will pivot its business operations and entire business model to ensure that it will meet its objectives and align with local, domestic, and international environmental targets, and the best environmental scientific knowledge.[lxxii]

Net primary productivity: Measures the rate that energy is stored by plants and made available to other species in the ecosystem. It is a core process that occurs for ecosystems to function. It is related to many factors, such as species.[lxxiii]

Open access: Movement that promotes free, unrestricted online access to scholarly research outputs, allowing anyone to read, download, and use them without financial, legal or technical barriers. Open access means free access to information and unrestricted use of electronic resources for everyone. Any kind of digital content can be OA, from texts and data to software, audio, video, and multi-media.[lxxv]

Outcome: The desired ends that intervention outputs are intended to induce (i.e., changes in knowledge and attitudes, behaviors, and/or social and environmental conditions).[lxxvi]

Output: The products, goods, and services that result from an intervention.[lxxvii]

Pressures: Human activities that directly or indirectly change the state of the environment and ecosystem. Following the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), five key pressures contribute most to the loss of nature globally: land and sea use change; direct exploitation of organisms; climate change; pollution; and invasion of alien species.[lxxviii]

Primary data: Data source collected firsthand by scientists, experts.[lxxix]

Program: A suite of projects collectively organized to achieve a specific outcome or set of outcomes, often serving as a tactical means of achieving policy ends.[lxxx]

Project: A discrete set of planned activities collectively trying to achieve a specific outcome or set of outcomes, often as a component of a program and as a manifestation of a policy.[lxxxi]

Quantitative: Numbers and measurable variables.

Qualitative: Descriptive characteristics.

Science-based: Concepts, practices, or claims that are grounded in scientific principles, methods, or knowledge-decisions or policies are made by taking into account scientific research can results, ensuring they are informed by systematic study and experimentation.

Science-based target: Measurable, actionable, and time-bound objectives, based on the best available science, that allow actors to align with Earth's limits and societal sustainability goals.[lxxxii]

Seascape: A socio-ecological system that consists of natural and/or human-modified ecosystems, and which is influenced by distinct ecological, historical, economic, and socio-cultural processes and activities.[lxxxiii]

Seascape approach: Large, multiple-use marine areas, defined scientifically and strategically, in which government authorities, private organizations, and other actors cooperate to conserve the diversity and abundance of marine life and to promote human well-being.[lxxxiv]

Sensitive habitats: Habitats unable to recover to at least 80% of their unimpacted structure or function within 20 years if activity and pressures were to cease entirely.[lxxxv]

Site: Operational locations within a company's value chain/spheres of control and influence (including direct operations). Sites can include operations from any phase of a product's life cycle, from extractive operations (e.g., mines), material processing (e.g., mills), production facilities (e.g., factories), logistics facilities (e.g., warehouses), wholesale and retail (e.g., stores), and recycling/end of life (e.g., material recovery).[lxxxvi]

Species abundance: Typically, the sum total of individuals from a given species within a given area. A species is considered abundant when it has a high population relative to the size of the area it inhabits. It can also include other measures of performance for plants, animals, or other forms of life in a given area, including number of breeding pairs, population density, and even biomass. In ecology, species abundance can serve as a tool to measure biological diversity and inform conservation efforts.[lxxxvii]

Species evenness: Species evenness refers to the extent to which each species is represented in a sample, ranging from dominance by one species (lowest evenness) to equal representation of all species (highest evenness). It is quantified using indices like the Shannon index and is also known as the Pielou evenness index.[lxxxviii]

Species richness: The number of species within a given sample, community or area.[lxxxix]

State of nature metrics: Standardized indicators designed to assess biodiversity and ecosystem health, aiming to provide clarity and consistency in conservation efforts. It refers to the quality of the environment in relation to the function that it fulfills, including three key categories: species (abundance and extinction risk), ecosystems (extent, integrity, connectivity), and nature's contributions to people.[xc]

Structural connectivity: Elements of connectivity are related to physical aspects of habitats or the configuration of a network.[xci]

Thresholds: Level of an environmental indicator representing attainment of the desired state of nature.[xcii]

Vulnerable marine ecosystem: The term "vulnerable marine ecosystems" refers to paragraphs 42 and 43 of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas (FAO, 2009). The vulnerability of an ecosystem is related to the characteristics that it possesses, including uniqueness or rarity, functional significance of the habitat, fragility, life-history traits, and structural complexity.[xciii] These include seamounts, hydrothermal vents, coldwater corals, and sponge fields.[xciv]

ANNEX 7: TOOLS AND RESOURCES

The information in this report provides a starting point for companies to measure progress towards nature-positive contributions. The examples are cited in the narrative and the Excel tables with resources accordingly, but there are many resources that can support this journey, and we have included the following (non-exhaustive) list to assist:

Frameworks:

- **A conceptual framework for assessing comparability between corporate biodiversity impact accounting tools:** https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5318121
- **Accounting for Nature:** https://www.accountingfornature.org/ and https://www.accountingfornature.org/standard
- **Bringing sustainability to life:** A framework to guide biodiversity indicator development for business performance management. *Business Strategy and the Environmen*t, 29(8), 3303–3313. https://doi.org/10.1002/bse.2573

Indicators:

- **A global indicator of species recovery:** https://conbio.onlinelibrary.wiley.com/doi/full/10.1111/cobi.70077
- **Helcom:** Baltic Sea Indicators: https://indicators.helcom.fi/?

Coastal resilience:

- **Nature-Based Solutions Explorer map with reef and mangrove extent and flooding and damage data:** https://nbs-adapts.coastalresilience.ucsc.edu/index.html
- **Demonstration of sea level rise integration into risk mapping:** https://storymaps.arcgis.com/stories/8c715dcc5781421ebff46f35ef34a04d
- **Coastal resilience explorer showing where mangroves provide benefits for flood protection and resulting economic benefits:** https://www.coastalresilienceexplorer.org/index.html
- **Hazard maps for the Philippines:** https://hazardhunter.georisk.gov.ph/map
- **NOAA flood risk maps:** https://coast.noaa.gov/digitalcoast/stories/bank-infrastructure.html

Maps and geospatial tools:

- **Nature-Based Solutions Explorer map with reef and mangrove extent and flooding and damage data:** https://nbs-adapts.coastalresilience.ucsc.edu/index.html
- **Blue corridors map for whales:** https://bluecorridors.org/explore/species
- **Global coral maps:** https://allencoralatlas.org/
- **Ecologically or biologically significant marine areas:** https://www.cbd.int/ebsa/repository and EBSA handbook: https://www.cbd.int/marine/ebsa/ebsa-handbook-en.pdf
- **EU map viewer:** https://emodnet.ec.europa.eu/geoviewer/#!/
- **Global tracking of marine megafauna:** https://www.science.org/doi/10.1126/science.adl0239
- **Important Marine Mammal Areas:** https://www.marinemammalhabitat.org/imma-eatlas/
- **Ocean biodiversity information system Spatial Ecological Analysis of megavertebrate animal populations:** https://seamap.env.duke.edu/
- **Nature-based solutions for infrastructure mapper—Indonesia and the Philippines:** https://sipanbsmapper.org/en
- **Conservation International Resilience Atlas:** https://www.resilienceatlas.org/
- **Critical sites network map for protected areas and avian species data:** https://criticalsites.wetlands.org/en
- **Key biodiversity areas database and map:** https://www.keybiodiversityareas.org/
- **UNEP WCMC data portal for maps:** https://data-gis.unep-wcmc.org/portal/home/
- **WWF-SIGHT global intelligence platform for spatial datasets and satellite imagery:** https://wwf-sight.org/

Supply chains and market-based approaches

- **Applying a jurisdictional approach to support sustainable seafood.** *Conservation Science and Practice*, 3(5). https://doi.org/10.1111/csp2.386
- **Evaluating the role of market-based instruments in protecting marine ecosystem services in wild-caught fisheries.** *Ecosystem Services 51*, 101356. https://doi.org/10.1016/j.ecoser.2021.101356

Databases:

- **Marine biodiversity indicators and online data knowledge systems:** Includes supplementary files with inventory of global and regional online biodiversity knowledge systems
- **Ocean Observatories Initiative real-time data for US territories:** https://oceanobservatories.org/
- **CMS animal migration database:** https://www.cms.int/topics/atlas-animal-migration
- **European Union data:** https://ec.europa.eu/eurostat/data/database and available datasets: https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/search?from=1&to=30
- **World Conservation Monitoring Centre database:** https://resources.unep-wcmc.org/
- **Map of Life database for species and habitats worldwide:** https://mol.org/
- **GEBCO SEABED 2030 global bathymetry data:** https://seabed2030.org/our-product/
- **Ocean Health Index:** https://oceanhealthindex.org/global-scores/
- **Bat data:** https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecy.2007
- **Seabird tracking database:** https://www.seabirdtracking.org/

Fact sheets:

- **Certified wildlife lighting:** https://myfwc.com/conservation/you-conserve/lighting/criteria/certified/
- **Ocean Conservancy sea level rise fact sheets:** https://oceanconservancy.org/ls/sea-level-rise-tampa-florida/
- **EPA spill prevention, control, and countermeasures:** https://www.epa.gov/oil-spills-prevention-and-preparedness-regulations/spill-prevention-control-and-countermeasure-19

SBTN:

- **SBTN targets:** https://sciencebasedtargetsnetwork.org/companies/take-action/set-targets/ocean-targets/
- **SBTN initial guidance for business:** https://sciencebasedtargetsnetwork.org/wp-content/uploads/2020/09/SBTN-initial-guidance-for-business.pdf

Monitoring:

- **Danish Energy Agency playbook for monitoring of environmental impacts from offshore wind:** https://ens.dk/energikilder/havvindmoeller/vindmoellers-miljoepaavirkning
- **South Fork Wind Benthic Monitoring Program:** https://storymaps.arcgis.com/stories/43138bdb3826449bbc4ce2b3eba49bb0
- **Venterra comparison of monitoring methods:** https://venterra-group.com/wp-content/uploads/2025/05/SPI-PV-Table.pdf

Regulations:

- **European Marine Directive:** https://eur-lex.europa.eu/eli/dir/2017/845/oj and https://eur-lex.europa.eu/eli/dir/2008/56/oj
- https://eur-lex.europa.eu/eli/reg/2020/852/oj/eng

Tools:

- **AVISTEP:** Avian sensitivity tool for energy planning: https://avistep.birdlife.org/
- **IBAT:** Integrated biodiversity assessment tool: https://www.ibat-alliance.org/
- **Marine Megafauna Conservation Toolkit:** https://birdlifeinternational.github.io/Marine-Megafauna-Conservation-Toolkit/executive-summary.html
- **OceansMap data-driven decision-making at sea:** https://www.tetratech.com/insights/elevating-data-driven-decision-making-at-sea-with-oceansmap-technology/
- **Marxan conservation planning software:** https://marxansolutions.org/
- **Marine Geospatial Ecology Tools:** https://mgel.env.duke.edu/mget/
- **Capitals Coaition Nature Tools Compass—tools for nature assessment:** https://capitalscoalition.org/sustain-6/
- **World atlas of artificial night sky brightness:** The New World Atlas of Artificial Sky Brightness | CIRES and https://www.science.org/doi/10.1126/sciadv.1600377
- **PRISM toolkit to support small/medium conservation projects to effectively evaluate the outcomes and impacts of their work:** https://www.birdlife.org/wp-content/uploads/2022/04/PRISM-Evaluation-Toolkit-V1.2.pdf
- **TESSA toolkit for ecosystem service site-based assessment:** https://www.birdlife.org/tessa-tools/
- **UN WCMC Mapping Environmentally Sensitive Assets:** https://resources.unep-wcmc.org/products/WCMC_RT171
- **World Business Council for Sustainable Development Nature Action Portal:** https://www.wbcsd.org/nature-action-portal/

Finance:

- **Inter-American Development Bank finance metrics for nature**: https://publications.iadb.org/en/publications/english/viewer/Financing-Nature-A-Practitioners-Guide-Final.pdf

Nature-based solutions:

- **IUCN standard for NBS:** https://inbs.iucn.org/understand/global-standard-for-nature-based-solutions/
- **WWF Nature-Based Solutions Database:** https://experience.arcgis.com/experience/5f7788e99dc94a54be8ccbd5123523c0/page/INITIATIVES?views=View-2

Underwater noise monitoring:

- **IMO and GloNoise partnership for URN:** https://www.imo.org/en/ourwork/partnershipsprojects/pages/glonoise-partnership.aspx

Glossaries:

- **IPBES glossary:** https://www.ipbes.net/glossary
- **Stockholm Resilience Centre:** https://www.stockholmresilience.org/research/resilience-dictionary.html

Protected area resources:

- **IUCN guidebook for evaluating MPA effectiveness:** https://portals.iucn.org/library/efiles/documents/PAPS-012.pdf
- **World Database on Protected Areas:** https://www.protectedplanet.net/en/thematic-areas/wdpa?tab=WDPA
- **Protected area downgrading, downsizing, and degazettement (PADDD) tracker:** https://www.padddtracker.org/

Shipping and ports:

- **Sustainable Shipping Initiative: Marine Biodiversity and Ocean Health Breakthrough Toolkit:** https://www.sustainableshipping.org/wp-content/uploads/2025/11/MBOH-Breakthrough-Toolkit.pdf

Benchmarking:

- **World Benchmarking Alliance:** https://www.worldbenchmarkingalliance.org/benchmark/nature-benchmark

Kelp restoration:

- **Kelp Forest Alliance**: https://kelpforestalliance.com/restoration-projects

Migratory species:

- **CMS State of the World's Migratory Species:** https://www.cms.int/sites/default/files/publication/State%20of%20the%20Worlds%20Migratory%20Species%20report_E.pdf

Impact evaluation:

- **Society for Conservation Biology—A decision framework tool for impact evaluation in conservation:** https://scb-impact.itch.io/interactive-methods-selection

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