NATURE IS COUNTING ON US

MAPPING PROGRESS TO IMPLEMENT THE CONVENTION ON BIOLOGICAL DIVERSITY

Authors: Christina Supples, Martin Cadena, Lea Phillips, Scott Atkinson, Jamison Ervin, Andrew Gardner, Marion Marigo, Maria Monakhova, Prudence Raine, Estuardo Solórzano Lemus, Annie Virnig, & Di Zhang.

Design and Layout: Kimberly Koserowski, First Kiss Creative LLC

Suggested citation: UNDP (2022). Nature is Counting on Us: Mapping Progress on Implementing the Convention on Biological Diversity. United Nations Development Programme: New York.

UNDP is the leading United Nations organization fighting to end the injustice of poverty, inequality, and climate change. Working with our broad network of experts and partners in 170 countries, we help nations to build integrated, lasting solutions for people and planet.

Learn more at undp.org or follow at @UNDP.

One United Nations Plaza
New York, NY 10017, USA

TABLE OF CONTENTS

ACRONYMS

2030 Agenda	2030 Agenda for Sustainable Development
5NR	Fifth National Reports
6NR	Sixth National Reports
ABTs	Aichi Biodiversity Targets
CBD	Convention on Biological Diversity
GBF	Global Biodiversity Framework
GEF	Global Environment Facility
GIS	Geographic Information Systems
KBAs	Key Biodiversity Areas
NBSAPs	National Biodiversity Strategies and Action Plans
OECMs	Other effective conservation measures
SCP	Systematic Conservation Planning
SDGs	UN Sustainable Development Goals
UNBL	UN Biodiversity Lab
UNCCD	UN Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
UNFCCC	UN Framework Convention to Combat Climate Change

EXECUTIVE SUMMARY

Nature underpins sustainable development and provides essential ecosystem services, such as carbon storage, food, freshwater, and disaster risk reduction, without which humankind cannot exist. Yet, we are witnessing our planet being pushed to its boundaries. We face a global biodiversity emergency, a climate emergency, and a public health emergency, all stemming from a common thread: the destruction of nature. Despite our best efforts, nations around the world collectively failed to fully meet a single global target to protect nature in the past decade.

At the same time, the proposed post-2020 Global Biodiversity Framework (GBF) of the Convention on Biological Diversity (CBD) outlines an ambitious global plan to bring about a transformation in society's relationship with biodiversity by preserving and protecting nature and its essential services to people. Its 21 targets and 10 milestones aim to put biodiversity on a path to recovery by 2030 at the latest, and towards the full realization of the CBD's 2050 Vision of living in harmony with nature. Following the expected adoption of the post-2020 GBF in December 2022, nations that are Parties to the CBD will need to rapidly ensure alignment between their existing national biodiversity policies and these new global commitments and to determine concrete strategies and actions to achieve them in this decade.

As they embark on this path, policymakers urgently need transformative approaches to reconcile competing development and conservation priorities. Spatial data and tools can play a transformative role in guiding policymakers to make data-driven decisions when identifying, planning, and implementing nature-based solutions. However, despite the potential for spatial data and tools to support national policymaking on biodiversity, previous United Nations Development Programme (UNDP) analyses suggest that they are not being used in practice by many nations.

In this paper, we seek to better understand trends in the use of spatial data and tools for biodiversity policymaking among developing countries, countries with economies in transition, and small island nations; and to evaluate the impact that their use may have on policy outcomes. We analyzed the extent to which Parties to the CBD, and that received funding from the Global Environment Facility (GEF) for enabling activities during implementation of the 2011-2020 Strategic Plan for Biodiversity, incorporated spatial data in the form of maps during the development of three policy documents: post-2010 National Biodiversity Strategies and Action Plans (NBSAPs), and the Fifth and Sixth National Reports (5NR, 6NR) to the CBD. We conducted this analysis to help determine which types of action could help nations bridge the gap between the potential for spatial data to accelerate action on nature, climate and sustainable development, and the capacity of policymakers to use it. We consider the presence and complexity of maps in these three policy documents as a reasonable proxy for this potential. We hypothesized that reduced barriers to accessing spatial data and tools during the 6NR period would result in their increased inclusion in these policy documents, as compared to during the 5NR and post-2010 NBSAP periods. We did not distinguish between spatial data for the terrestrial, freshwater, and marine environments.

Photo credit: UNDP Peru

Key findings

Trends in spatial data frequency

- There are 2,273 occurrences of maps across the 161 6NRs submitted to the CBD Secretariat by June 2020, as compared to 1,254 occurrences in 189 5NRs, and 683 occurrences in 188 post-2010 NBSAPs. This represents an 81 percent increase in the frequency of map usage from the 5NR period to the 6NR period, and a 233 percent increase from the post-2010 NBSAP to the 6NR period.
- The average number of maps used across all nations increased 114 percent, from seven maps per 5NR to 14 maps per 6NR. Nations that received GEF funding contributed most significantly to this increase, including an average of 17 maps per 6NR, and having 164 percent more occurrences of maps compared to the 5NR average. Those that did not receive GEF funds included only an average of four maps per 6NR.
- Prior to the 6NR period, most nations typically included four or fewer maps in their 5NR (56 percent) or NBSAP (78 percent). During the 6NR period, the number of countries that included four or fewer maps decreased to 35 percent, with those receiving GEF funding also contributing most significantly to improving this trend. Only 22 percent of this subset of nations included four or fewer maps. The percentage of GEF recipient nations including 20 or more maps in a national report increased to 33 percent during the 6NR period, from eight percent during the 5NR period, and six percent during the NBSAP period.

Trends in the use of spatial data for advanced decision-making

- During the 6NR period, across GEF-funded countries, in addition to the increasing occurrence of maps, nations also relied on more complex types of spatial analyses to help determine trends in national progress to meet the CBD's objectives, and the effectiveness of actions to do so.
- Seventy-seven nations included at least one actionable map in their 6NR, with 97 percent of those nations having received GEF-funds. Additionally, 139 nations included at least one potentially actionable map in their 6NR, with 79 percent of those nations having received GEF funds.
- Over 350 actionable maps were included across all 6NRs, an increase from 155 actionable maps across all 5NRs, and 73 actionable maps across all NBSAPs, indicating that progress is being made to use more complex spatial analyses to develop data-driven biodiversity plans and reports.
- There is a near doubling of the occurrence of both the actionable and potentially actionable map types, as well as the number of countries using them for national reporting from the 5NR period to the 6NR period, and then again from the NBSAP period. This trend is most pronounced among GEF-funded nations, who included 99 percent of all actionable maps in the 6NRs.
- Actionable maps in the 6NRs most frequently focused on the intersection between protected areas and biodiversity (218 maps), a 1,047 percent increase compared to their usage during the 5NR period (19 maps) and 5,350 percent increase from the NBSAP period (four maps). The occurrence of spatial analyses on proposed protected areas almost doubled from the 5NR period to the 6NR period.
- The most frequent potentially actionable maps in the 6NRs focus on key biodiversity areas (387), protected areas (313), land cover and land cover change (192), ecosystem services (159), policy and management (156), and habitat type and intactness (151).
- The inclusion of maps on ecosystem services tripled during the 6NR period, and the occurrence on maps of key biodiversity areas increased 66 percent.

Use of spatial data to measure progress to achieve the Aichi Biodiversity Targets

- During the 6NR period, nations also increased the frequency with which they used spatial analyses to report on progress to achieve the Aichi Biodiversity Targets (ABTs).

Photo credit: UNDP Kazakhstan

- Two-thirds of the maps used in 6NRs supported assessments of progress to achieve seven ABTs: 21 percent of all maps used across the 6NRs addressed protected areas (ABT 11), 12 percent addressed habitat fragmentation and degradation (ABT 5), 10 percent addressed species and extinctions (ABT 12), 8 percent addressed ecosystem services (ABT 14), 8 percent addressed climate resilience (ABT 15), 6 percent of the spatial data used addressed sustainable resource management (ABT 7), and 5 percent of it addressed pollution (ABT 8).
- UNDP and United Nations Environment Programme (UNEP) provided spatial data to support data driven assessments of progress towards the first five of these ABTs.

Use of the UN Biodiversity Lab to support biodiversity policymaking

- GEF recipient nations used the UN Biodiversity Lab (UNBL) to produce 20 percent (458 maps) of the 6NR spatial analyses. This means that they were published using a UNBL provided template or that the UNBL was cited as a source for the map.
- Of the 123 nations that received GEF funds for the 6NR project, 55 of them created at least one map using UNBL support. Only nations that received GEF funding included UNBL maps in their 6NR. Of those nations that used the UNBL to help prepare their 6NR, each incorporated an average of eight UNBL maps.
- Thirteen GEF recipients relied on the UNBL to produce 70 percent or more of the maps they included in their 6NR: Botswana, Cameroon, Comoros, Côte d'Ivoire, Equatorial Guinea, Ghana, Guinea-Bissau, Mauritania, South Sudan, Timor-Leste, Tunisia, Yemen, and Zambia. These countries presented 167 UNBL maps, all classified as actionable and potentially actionable.
- Six countries relied on the UNBL for 100 percent of their 6NR maps: Botswana, Cameroon, Côte d'Ivoire, Ghana, Yemen, and Zambia. These countries presented 55 maps in total, all classified as actionable or potentially actionable.
- The most common maps focused on the intersection of species richness and protected area networks, degradation within ecoregions, and species richness.

Key policy implications

Nations around the world are increasing their ambition for nature by making bold commitments to address the planetary emergencies of biodiversity loss and climate change. At the same time, the milestone decade 2020-2030 dedicated to achieving transformative international commitments is fast slipping away. The urgent need for action is compounded by the interrelatedness of these crises, as well as global dependence on nature to achieve half of the UN Sustainable Development Goals (SDGs). With limited resources and many competing land uses, governments do not always know how and where to prioritize actions on the ground. The lack of consistent spatially explicit frameworks for monitoring, reporting, and adaptively managing progress towards global and national commitments to nature is also contributing to their partial achievement. Yet, as this analysis demonstrates, increasing access to spatial data and tools, and improving capacity to use them, does help support nations to make more informed decisions on how and where to halt or reverse biodiversity loss around the world, while also addressing climate and development issues.

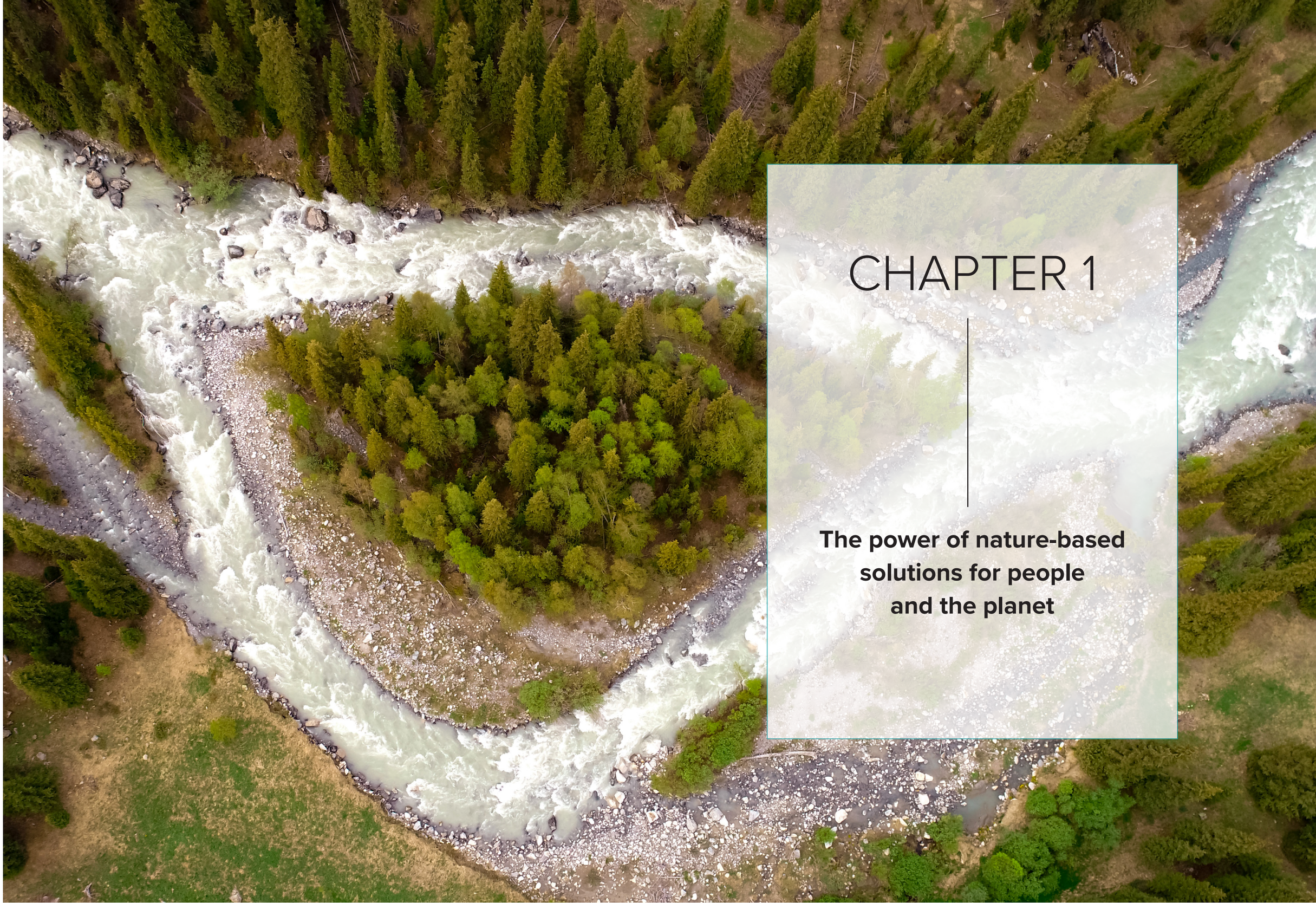
We find that when barriers to accessing spatial data and tools are reduced, policymakers will more frequently use them to develop data-driven biodiversity policies. Assessments of the status of nature, and efforts to monitor the effectiveness of national strategies to protect, manage, and restore it, also become more data-driven. The capacity to identify nature-based solutions that address climate change and sustainable development needs also increases. Providing nations ecumenical access to spatial data and tools has the potential to substantially improve policy impacts for people and the planet. To help achieve this outcome, decision makers need access to reliable and timely spatial data on biodiversity, its benefits to humankind, and the pressures affecting its decline. There is also a common global need for continued technical support so that policymakers without advanced technical training can access, view, and analyze spatial data, as well as communicate decisions and act using spatial analyses and maps.

Building on these findings, we recommend several technical support needs that must be addressed in this decade to ensure the effective implementation of the CBD's post-2020 GBF. Providing resources to do so will lead to improved policy outcomes for people and the planet. These include:

- Continuing to provide free virtual and in-person access to GEF-funded training and capacity strengthening activities, and those funded by other donors.
- Working with global data providers to incorporate accurate and validated national data sources into their datasets.
- Working with governments to validate and officially recognize relevant global datasets that fill national data gaps.
- Developing national baselines of biodiversity that are spatially explicit and replicable for each country around the world. Refining biodiversity indicators to track measurable changes in the status of nature, the impact of threats, and the achievement of solutions, measured in a consistent way across terrestrial, freshwater, and marine environments.
- Building national data management mechanisms and spatially explicit monitoring systems that allow Parties to systematize the collection, sharing, and analysis of data across relevant ministries during national reporting and NBSAP development and implementation.
- Obtaining political support to access, share, and use spatial data for better decision-making across the Rio Conventions and the 2030 Agenda for Sustainable Development.
- Better capturing important biodiversity data from Indigenous peoples and local communities, and to understand the different gender roles associated with biodiversity conservation.
- Raising awareness of globally available marine spatial datasets that can be analyzed for policymaking, using tools such as the UNBL.

In this decade, as we unite to halt the current catastrophic losses of biodiversity, limit global warming to 1.5 degrees, and leave no one behind as we continue to develop the planet, spatial data must become accessible, accurate, analyzed, and applied in the nations that currently lack these capacities. This analysis indicates that systematically and equitably taking steps to do so around the world leads to increased data-driven policymaking with improved outcomes for biodiversity, climate, and people. Using spatial data to guide these discussions is an important step in improving national efforts to address the coupled biodiversity, climate, and sustainable development crises. The time to act is now.

Photo credit: UNDP Burkina Faso



CHAPTER 1

The power of nature-based solutions for people and the planet

Photo credit: UNDP Kazakhstan

THE POWER OF NATURE-BASED SOLUTIONS FOR PEOPLE AND THE PLANET

We are witnessing our planet being pushed to its boundaries (IPCC 2021). We face a global biodiversity emergency, a climate emergency, and a public health emergency, all stemming from a common thread: the destruction of nature (UNEP 2021). Despite our best efforts, nations around the world collectively failed to fully meet a single global target to protect nature in the past decade (CBD 2020). The impact of this failure is undeniable and permeates our daily lives.

Nature underpins sustainable development and provides essential ecosystem services such as carbon storage, food, freshwater, and disaster risk reduction, without which humankind cannot exist (CBD 2016). However, nature's capacity to regulate environmental processes is declining globally (IPBES 2019). Human-induced climate change is contributing to heatwaves, heavy precipitation, and droughts across the globe, which are predicted to increase in frequency and intensity as global warming patterns continue to accelerate (IPCC 2021, 2018). Both the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) are impressing the importance of taking immediate action to combat climate change and the decline of nature, with data demonstrating that humanity has less than 10 years – until 2030 – to prevent planetary warming from exceeding 1.5° Celsius.

The resulting global biodiversity and climate crises are jeopardizing the livelihoods of over three billion people who depend on healthy soils, forests, and fisheries for their well-being (Griscom et al. 2017). This trend is visible as we watch health systems unravel around the world, faced with crushing caseloads from a virus that infected humans due to increasing ecological destruction (IPBES 2020), and that our immune systems are not equipped to fight (WHO 2021). It is palpable as we watch our planet's iconic animals face extinction, with many species declining by almost 70 percent since 1970 (WWF 2020), and the average global extinction rate accelerating faster than at any time over the past 10 million years (IPBES 2019). It is written on the faces of the over 600 million people living less than 10 meters above sea level (UNFCCC 2020, UN 2017), and the two billion people living within 100 km of a coastline (UN 2017), who are witnessing sea levels rise at a rate of 3 mm per year (NASA's Goddard Space Flight Center 2021). It is undeniable to those living adjacent to natural ecosystems whose livelihoods are increasingly threatened by fires, floods, and drought (IPBES 2019); or those who struggle to make a living from severely diminished forests (IUCN Nature 2021), and increasingly degraded soils (UNCCD 2017).

The UN 2030 Agenda for Sustainable Development (2030 Agenda) and the three Rio Conventions each address the interrelated needs of nature, climate, and people (Table 1). Yet, policymakers often face competing development and conservation priorities when trying to implement these agreements. This conflict is evidenced by United Nations Development Programme (UNDP)'s 2020

Photo credit: Monica Suarez Galindo, UNDP Peru

Human Development Report, which finds that high levels of human development are typically dependent on negative environmental impacts (UNDP 2020). The report also suggests that adopting a nature-based development model can help us overcome this challenge by working to stabilize income and the planet at the same time. Given that three out of every four people on earth directly depend on nature for their livelihoods (Steiner 2018), nature-based solutions provide a powerful pathway towards a more sustainable world.

Table 1. Overview of key international multilateral environmental agreements related to nature, climate change, and sustainable development.

International Policy Instrument	Description
2030 Agenda for Sustainable Development (2030 Agenda)	Nations agreed to the 2030 Agenda and a related set of 17 Sustainable Development Goals (SDGs) during the 70th Session of the UN General Assembly in 2015. The 2030 Agenda creates a plan of action to eradicate poverty through sustainable development. At least half of the SDGs are dependent on nature (United Nations n.d.). It is not a legally binding UN treaty.
Convention on Biological Diversity (CBD)	The CBD, established in 1993, is a legally binding global agreement that plays a key role in facilitating biodiversity conservation and sustainable development at the global level. It has three pillars: biodiversity conservation, its sustainable use, and the fair and equitable sharing of the benefits arising from its use. Work on the 2011-2020 Strategic Plan for Biodiversity concluded at the end of the decade. A new post-2020 global biodiversity framework (GBF) is expected to be adopted during the fifteenth Conference of the Parties. National Biodiversity Strategies and Action Plans (NBSAPs) are the principal implementation mechanism at the national level, with periodic national reports also required, with the Fifth and Sixth National Reports (5NRs and 6NRs) submitted under the last Strategic Plan (CBD n.d.).
UN Framework Convention to Combat Climate Change (UNFCCC)	The UNFCCC intends to prevent dangerous human interference with climate systems. The Paris Agreement, ratified by 197 countries in 2015, is implemented in five year cycles with the aim to hold warming ideally to 1.5 degrees Celsius, below pre-industrial levels. Countries submit nationally determined contributions (NDCs), which outline their actions to achieve the Paris Agreement. New NDCs will be communicated in 2025 and 2030, with the ambition to reach net-zero emissions and climate resilience by 2050. The Kyoto Protocol operationalizes the UNFCCC by requiring industrialized and emerging economies to limit and reduce greenhouse gas emissions (UNFCCC n.d.). Both the Paris Agreement and the Kyoto Protocol are legally binding UN treaties.
UN Convention to Combat Desertification (UNCCD)	The UNCCD, established in 1994, is a legally binding UN treaty that intends to address dryland ecosystem conservation, development, and sustainable land management. Some of the most vulnerable ecosystems and peoples can be found in these landscapes. Five regions – Africa, Asia, Latin America and the Caribbean, Northern Mediterranean, Central and Eastern Europe – determine how the Convention will be achieved in their region. Action programs at the national, regional, and sub-regional level serve as implementation mechanisms. Every four years, Parties to the UNCCD are required to report to the Conference of Parties. They provide data on progress towards the five strategic objectives, resource mobilization, and case studies related to the implementation of the Convention (UNCCD n.d.).

National Biodiversity Strategies and Action Plans (NBSAPs) are the principal policy instrument for implementing the Convention on Biological Diversity (CBD) at the national level. This framework Convention on nature addresses not only the conservation of biodiversity, but also its sustainable use, and the fair and equitable sharing of the benefits arising from its use (CBD n.d.). Nations use NBSAPs to prescribe concrete strategies and actions to take to achieve these objectives. NBSAPs have the potential to spur action on nature-based solutions across multiple biodiversity, climate, and sustainable development policies. Parties are also required to make periodic national reports to the CBD on their progress to meet the Convention's objectives, the effectiveness of their actions to do so, and the status of biodiversity in their country. These reports also provide an important assessment of global progress and challenges in meeting the commitments to biodiversity expressed in NBSAPs.

The proposed post-2020 Global Biodiversity Framework (GBF) of the CBD outlines an ambitious global plan to bring about a transformation in society's relationship with biodiversity by preserving and protecting nature and its essential services to people. Its 21 targets and 10 milestones put biodiversity on a path to recovery by 2030 at the latest, and towards the full realization of CBD's 2050 Vision of living in harmony with nature (CBD 2021). Following the expected adoption of the post-2020 GBF in December 2022, nations that are Party to the CBD will need to rapidly ensure alignment between the existing national biodiversity policies in their NBSAPs and these new global commitments and determine concrete strategies and actions to achieve them in this decade.

Spatial data and tools can play a transformative role in guiding policymakers to make data-driven decisions when identifying, planning, and implementing biodiversity policy (Levin et al. 2019, Hansen et al. 2013). Decision makers can use spatial data to visualize the most effective strategies to achieve national targets, and to explore the additional positive benefits for other policy commitments. Analyzing spatial data using Geographic Information Systems (GIS) and Systematic Conservation Planning (SCP) can also guide policymakers to determine the most effective locations to protect, manage, and restore nature, and the scale of action needed. These types of analyses can also help countries to identify a suite of nature-based solutions that best address their diverse national commitments to complementary multilateral environmental agreements related to biodiversity, climate change, and sustainable development. Monitoring trends from remotely sensed Earth Observations allows policymakers to assess the outcomes, impacts, and effectiveness of policy decisions over time. Many of the types of spatial datasets required to develop and implement data-driven NBSAPs, and to monitor their implementation and impact through periodic national reporting, already exist nationally or can be developed from existing global spatial datasets (Table 2).

Table 2. A brief list of essential spatial data layers for policymaking on biodiversity, climate, and sustainable development.

Data Layer Type	Example
Climate vulnerability	Distribution and intensity of vulnerability of ecosystems and species to climate change
Ecoregion	Global ecoregion classifications, national ecoregion maps
Habitat and habitat intactness	Distribution and degree of intactness and degradation of forests, wetlands, grasslands, drylands, coastal habitats, e.g., seagrass beds, coral reefs, dunes, mangroves
Human footprint	Aggregate layer of human impact, habitat conversion, roads, infrastructure; concessions map of mining, forestry, oil exploration; planned road networks; infrastructure; energy and mineral deposits
Hydrology, water quality, volume	Distribution of water quality and volume/availability
Invasive alien species	Distribution of density, key pathways for spread
Land use and land cover	Vegetation maps, forest cover, land use
Land tenure and rights	Distribution of land tenure, land use rights, land rights disputes
Marine features	Coral reefs, fish stocks, hydrosphere, marine regions, essential fish habitats, seagrasses, marine protected areas
Natural resource management	Cattle density per hectare, agricultural intensity
Natural resource productivity	Soil productivity, water availability, fisheries productivity
Pollution point sources	Landfills, discharge pipes, sewage treatment plants, large farming operations, tanneries, refineries
Protected areas	Protected areas (individual), protected area networks, protected area expansion plans, management effectiveness, other effective conservation measures (OECMs), marine protected areas
Population, poverty	Distribution of population densities, types of population groups, including Indigenous peoples and local communities, distribution of poverty levels, income, electrification, roads
Sustainable management	Certified sustainable agriculture and forestry operations, certified sustainable aquaculture operations
Water use and demand	Distribution of groundwater withdrawal, municipal water use, agricultural water use, industrial water use

In 2017, the United Nations Development Programme (UNDP) began surveying nations that are recipients of Global Environment Facility funding (GEF-eligible) to better understand the extent to which they have the capacity to use spatial data to develop and implement biodiversity policy. A review of spatial data used in the post-2010 National Biodiversity Strategies and Action Plans (NBSAPs) and Fifth National Reports (5NRs) revealed that despite the potential for spatial data and tools to support data-driven biodiversity policymaking, it was not being used in practice by many nations (Ervin et al. 2017). For example, for the subset of NBSAPs and 5NRs reviewed in that analysis, which had a different sample size than we use in this paper, CBD Parties included an average of four and five maps, respectively, with one of these maps representing the nation's political boundaries, and a second representing its protected area boundaries. Only four NBSAPs and six 5NRs included 20 or more maps, and 32 NBSAPs and 20 5NRs included none.

In a follow-up UNDP user needs assessment (UNDP 2017) to determine the reasons for this gap, 60 GEF-eligible Parties to the CBD identified four common barriers. First, available spatial data are often inaccessible because they are scattered among multiple ministries and data providers that require complicated sharing agreements. Second, accessible spatial data are often in unusable formats. They may be inconsistent, inaccurate, of low spatial resolution, incompatible in format, at the wrong timescale, or too out-of-date. Third, accessible, usable data, are often not nationally validated, as is the case for most global spatial data sources, which must be nationally validated through collaborations between data providers and governments before they can be used for policymaking. Fourth, government ministries also often lack access and training to use GIS to process, analyze, and apply the results of spatial analyses.

Runting et al. (2020) concluded similar findings, also recognizing that while many of the national and global spatial data layers need to implement and monitor progress on the CBD's Aichi Biodiversity Targets (ABTs) are available, they are not frequently used in national reporting. The Task Force on Nature-related Financial Disclosures (2022) confirmed that the lack of understanding of how to use data can be more challenging than the shortage of data. Unreliable baseline information additionally complicates efforts to measure the impact of conservation strategies and actions (Grantham et al. 2020, Waldron et al. 2017), which limits the prospect of effectively safeguarding biodiversity and ecosystem services (Meyer et al. 2015). It is essential that barriers for accessing and utilizing spatial data are removed, especially for less-developed countries (Runting et al. 2020).

During implementation of the CBD's 2011-2020 Strategic Plan for Biodiversity, over 140 Parties received GEF-funding and a technical support package to develop three policy documents: post-2020 NBSAPs, and the 5NR and Sixth National Reports (6NR). UNDP worked in partnership with the United Nations Environment Programme (UNEP), the United Nations Environment World Conservation Monitoring Centre (UNEP-WCMC), and the CBD Secretariat to provide this support. The 6NR development technical support package was oriented towards promoting data-driven national reporting, and included spatial data, tools, and trainings in English, French, and Spanish to help strengthen the capacity of policymakers to access and use spatial data and tools for decision-making. The UNDP Innovation Facility, funded by the Government of Denmark, also supported this process.

In an additional effort to reduce the barriers to accessing and using spatial data for decision-making, UNDP, UNEP, and the CBD Secretariat jointly launched the UN Biodiversity Lab (UNBL) in 2018. During the 6NR period, Parties could freely use this online platform to visualize over 130 global terrestrial and marine spatial datasets on biodiversity and sustainable development, upload national spatial data into secure private national projects, and perform basic spatial analyses. For each GEF recipient nation, UNDP also provided 18 spatial analyses of biodiversity status to support the development of data-driven progress assessments towards five ABTs for which spatial data are readily available around the globe.

CHAPTER 2

Measuring progress to map nature-based policy

Photo credit: UNDP Guatemala

MEASURING PROGRESS TO MAP NATURE-BASED POLICY

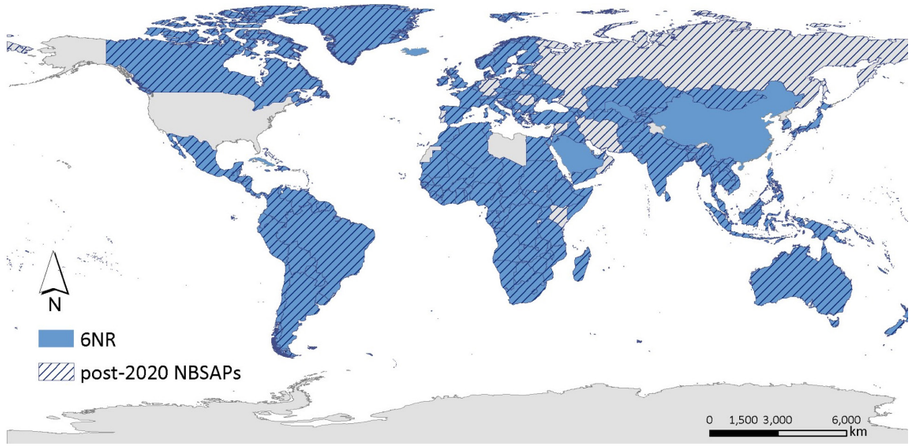
Setting a baseline

In this analysis, we seek to better understand trends in the use of spatial data and tools for biodiversity policymaking among developing countries, countries with economies in transition, and small island nations; and to evaluate the impact that their use may have on policy outcomes. We evaluated the extent to which nations that are Parties to CBD, and that received funding from the GEF for enabling activities during implementation of the 2011-2020 Strategic Plan for Biodiversity, incorporated spatial data during the development of three policy documents: post-2010 NBSAPs, and 5NR and 6NR. We conducted this analysis to help determine which types of action could help nations bridge the gap between the potential for spatial data to accelerate action on nature, climate and sustainable development, and the capacity of policymakers to use it (Ervin et al. 2017, UNDP 2021). We consider the presence of maps in these three policy documents as a reasonable proxy for this potential. We hypothesized that reduced barriers to accessing spatial data and tools during the 6NR period would result in their increased inclusion in policymaking documents, as compared to during the 5NR and post-2010 NBSAP periods. We did not distinguish between spatial data for the terrestrial, freshwater, and marine environments.

To determine how and with what frequency Parties used spatial data during different periods of policymaking, we analyzed the types of spatial data included in all the officially validated 6NR, 5NR, and post-2010 NBSAPs submitted to the CBD by June 2020 (Figure 1, Annex 3). To do so, we evaluated the maps directly inserted into these documents. We also analyzed maps that could be directly accessed from the primary submission using an embedded weblink. This included links to files stored on an external server, such as on a OneDrive or Dropbox file, and links to maps published in an external document or on an external website. We excluded references to maps in external documents that were not directly linked from the primary submission; those that had no identifiable information, such as a legend or title; and those that were illegible.

Of the policy documents formally submitted to the CBD in the last decade, we analyzed trends in spatial data from 161 6NRs, and compared these results from 189 5NRs and 188 post-2010 NBSAPs (Figure 1). Of the policy documents that are included in this analysis, 123 received GEF funds for the 6NR period, 123 received GEF funds for the 5NR period, and 126 received GEF funds for the NBSAP period. For each map, we recorded the map title in the original language, and translated it to English, if necessary, as well as the platform used to generate the map, such as UNBL or a national platform. We also listed the types of ABTs that the spatial data supported an assessment towards. Where a map was related to more than one ABT, each was listed. We also parsed the results by those countries that received financial support from the GEF to produce each document versus those that did not receive this funding (GEF n.d.).

Figure 1. Nations whose CBD policy documents are analyzed in this assessment[1].



To understand the likelihood that policymakers could use spatial data to develop biodiversity policy, we also classified each map as non-actionable, potentially actionable, or actionable using the categories proposed in the UNDP analysis Are We Counting on Nature (UNDP 2017) (Table 3, Figure 2):

- **Non-actionable spatial data:** maps that are unlikely to be useful in isolation, or combined with other data layers, to answer key questions associated with the ABTs, those proposed in the post-2020 GBF or other policy targets. Examples included national boundary, political maps, and basic variables and geographic features.
- **Potentially actionable spatial data:** maps that have the potential to be useful to decision makers, but only when the data layers within them are combined with other data layers to yield new information. Examples of potentially actionable maps include forest cover, existing protected areas, Key Biodiversity Areas (KBAs), habitat intactness, and population density.
- **Actionable spatial data:** maps that allow decision makers to develop priorities and act. Examples included a single-layer map, such as proposed new protected areas or coastal vulnerability, and composite maps, such as the intersection of KBAs and unprotected lands.

1 The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the UN Secretariat or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

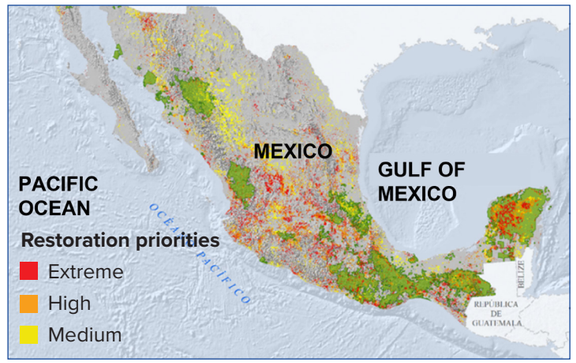
Table 3. Taxonomy used to characterize the likelihood of spatial data to guide policymakers to develop data-driven biodiversity policy. In this analysis, to understand the likelihood that policymakers could use spatial data to develop biodiversity policy, we classified each map as non-actionable, potentially actionable, or actionable.

Type	Example
Non-actionable: Spatial data that are unlikely to be useful in isolation to develop data-driven biodiversity policy (Figure 2A).	
Administrative regions	Political region or district, national boundary, political map
Basic geographic variable or feature	Geological history map, location map of country, mountains, physiographic map, precipitation, slope, temperature, topography, volcano
Potentially actionable: Spatial data that have the potential to guide the development of data-driven biodiversity policy when used in combination with other spatial data to yield new information for decision-making (Figure 2B).	
Corridors, buffers	Biological corridors, buffer zones
Ecosystem services	Hazards, wetland contributions to fisheries, water services
Habitat and habitat intactness	Habitat extent (e.g., coral reefs, mangroves, sea grass beds), phytogeography, vegetation, degradation, overfishing, coral destruction, coral bleaching
Hydrology, water quality	Hydrological map, watershed map
Invasive alien species	Invasive alien species distribution
Key biodiversity areas	Biodiversity hotspots, endemism, important bird areas, important plant areas, species richness, endangered species
Land cover	Biogeographic data, forest cover change, land cover, forest fires, deforestation, fragmentation
Land use/land use change/ intensity	Land use (e.g., forest, agriculture), land use change, cattle distribution, coffee productivity, potential agricultural productivity
Policy and management	Forest management units, conservation units, sustainable development actions
Protected areas	Protect area extent, network, Ramsar sites, World Heritage sites
Regions, zones	Ocean and terrestrial ecoregions, ecosystem map, biosphere reserve
Socio-economic	Population density and distribution
Actionable: Spatial data that can immediately guide policymakers to develop data-driven biodiversity policy or action (Figure 2C).	
Climate change vulnerability	Disaster risk areas, sea level rise
Future footprint	Mining concessions, timber concessions
Proposed buffer zones	Proposed buffer zones
Proposed protected areas	Proposed protected areas and systems
Protected areas and biodiversity	Protected areas (gazette or proposed) and key biodiversity areas, ecoregions, and/or biodiversity

Figure 2. Examples of the non-actionable, potentially actionable, and actionable spatial data classifications used in this assessment.[2]

A. Non-actionable map example: Albania political boundaries. This type of map is commonly found in a national report or NBSAP introduction. Its use in biodiversity policy development is limited.

B. Potentially actionable map example: Belize terrestrial and marine protected areas. This map is used to report on progress to achieve ABT 11. Policymaking on the protected areas network expansion or corridors are limited until other spatial data are considered.



C. Actionable map example: Mexico priority restoration and Biosphere Reserve sites. This map is used to help assess progress to achieve ABT 11 and 15. When spatial data on priority restoration sites is combined with map of the country's Biosphere Reserves, policymakers can use the resulting map identify where restoration actions can increase the resilience of the protected areas system.

2 The designations employed and the presentation of material on these maps do not imply the expression of any opinion whatsoever on the part of the UN Secretariat or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries

CHAPTER 3

What progress are we making to map nature?

Photo credit: Grégoire Dubois

WHAT PROGRESS ARE WE MAKING TO MAP NATURE?

Trends in the use of spatial data for advanced decision-making

There are 2,273 occurrences of maps across the 161 6NRs submitted to the CBD Secretariat by June 2020, as compared to 1,254 occurrences in 189 5NR, and 683 occurrences in 188 post-2010 NBSAPs. Across all nations, this represents an 81 percent increase in the frequency of map usage from the 5NR period to the 6NR period, and a 233 percent increase from the post-2010 NBSAP period to the 6NR period (Table 4).

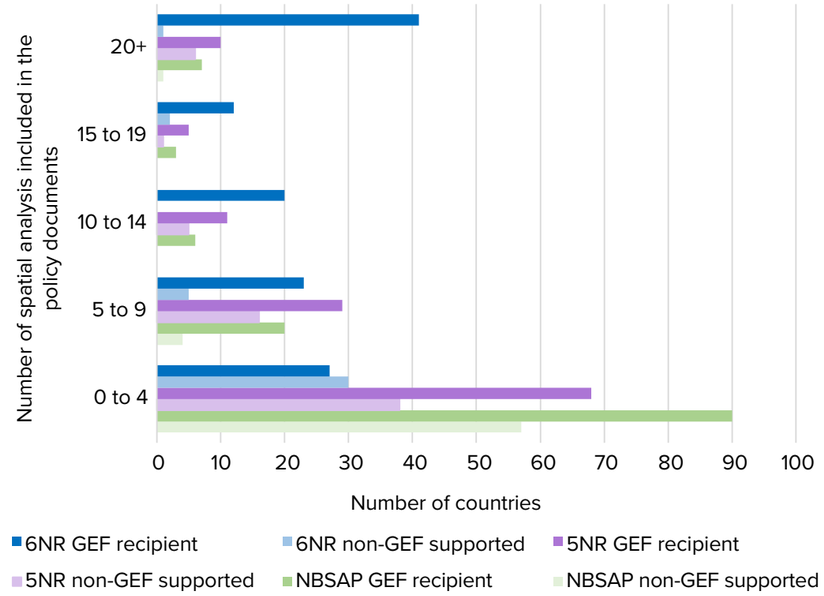
When comparing trends in the use of spatial data between the 5NR and 6NR periods, the average number of maps used across all nations increased by 114 percent, from 7 maps per 5NR to 14 maps per 6NR. Nations that received GEF funding contributed most significantly to this increase, including an average of 17 maps per 6NR, and having 164 percent more occurrences of maps. Those that did not receive GEF funds included only an average of 4 maps per 6NR.

Prior to the 6NR period, most nations typically included four or fewer maps in their 5NR (56 percent) or NBSAP (78 percent). During the 6NR period, the number of countries that included four or fewer maps decreased to 35 percent, with those receiving GEF funding also contributing most significantly to this trend. Only 22 percent of this subset of nations included four or fewer maps. The number of GEF recipient nations including 20 or more maps in a national report increased to 33 percent during the 6NR period, from 8 percent during the 5NR period, and 6 percent during the NBSAP period (Table 4, Figure 3).

Table 4. Trends in the occurrences of maps in post-2010 NBSAPs, 5NRs and 6NRs. The table displays trends for nations that did ("yes") and did not ("no") receive GEF funds, and the combined results ("all"). The total number of maps and the average number of maps are compared across these categories for each policy document type. The percentage of nations with greater than 20 maps, less than five maps, and zero maps is also provided.

Indicator → Policy Document	GEF Support	Countries: Total	Maps: Total	Maps: Average	Countries: > 20 maps (percent)	Countries: < 5 maps (percent)	Countries: 0 maps (percent)
NBSAP	Yes	126	593	4.7	5.6%	71.4%	27.0%
	No	62	90	1.5	1.6%	91.9%	66.7%
	All	188	683	3.6	4.3%	78.2%	40.4%
5NR	Yes	123	820	6.7	8.1%	55.3%	9.8%
	No	66	434	6.6	9.1%	57.6%	12.1%
	All	189	1254	6.6	8.5%	56.1%	10.6%
6NR	Yes	123	2137	17.4	33.3%	22%	8.9%
	No	38	136	3.6	2.6%	78.9%	18.4%
	All	161	2273	14.1	26.1%	35.4%	11.2%

Figure 3. A comparison of the number of maps included in NBSAPs, 5NRs and 6NRs for GEF recipients and other Parties to the CBD.



During the 6NR period, across GEF-funded countries, in addition to the increasing occurrence of spatial data, nations also relied on more complex types of spatial analyses to help determine national progress to meet the CBD's objectives, and the effectiveness of actions to do so (Table 5). Seventy-seven nations included at least one actionable map in their 6NR, with 97.4 percent of those nations having received GEF-funds. Additionally, 139 nations included at least one potentially actionable map in their 6NR, with 79 percent of those nations having received GEF funds. Nations included 357 actionable maps across all 6NRs, an increase from 155 actionable maps across all 5NRs, and 73 actionable maps across all NBSAPs, indicating that some progress is being made to use more complex spatial data and analyses to develop data-driven biodiversity plans and reports. This is a near doubling of the occurrence of both the actionable and potentially actionable map types, as well as the number of countries using them for national reporting from the 5NR period to the 6NR period, and then again from the NBSAP period.

This trend is most pronounced among GEF-funded nations, who included 99 percent of all actionable maps in the 6NRs. Parties provided 1,784 potentially actionable maps in their 6NRs, nearly doubling the 963 potentially actionable maps occurring in the 5NRs and tripling the 513 occurring in the NBSAPs. Most of these maps were also submitted by nations that received GEF funds, who included 93 percent of all potentially actionable maps in the 6NRs. This indicates that the capacity to conduct spatial analyses that are potentially useful to planners is increasing. In addition, many nations could benefit from additional support to combine the data found in their potentially actionable maps with other data layers to yield new information that helps develop strategies and action, and report on their impact.

During the 6NR period, nations submitted a similar number of non-actionable maps. This trend is expected given the need to represent basic information such as a national boundary. However, this map type had the smallest number of occurrences in the 6NR documents (6 percent) when compared to the frequency with which potentially actionable (79 percent) and actionable maps (16 percent) occurred. This strengthens the observation that with support, nations can shift towards applying more complex spatial data for policymaking.

Table 5. The number of map type occurrences (actionable, partially actionable, non-actionable) per policy document type (6NR, 5NR, NBSAP). Information is also provided on the percentage that this map type occurs across all policy document types. We also provide the total number and average number of occurrences per map type per policy document type. These data are also categorized for nations that did and did not receive GEF funds and summarized for all nations.

Document Type	6NR			5NR			NBSAP			Total
GEF Funding	Yes	No	All	Yes	No	All	Yes	No	All	
Actionable maps: total occurrences	355	2	357	107	48	155	58	15	73	585
Actionable maps: percentage of total occurrences	60.7	3	61	18.3	8.2	26.5	9.9	2.6	12.5	100
Actionable map: # of countries including map type	75	2	77	31	12	43	25	4	29	n/a
Actionable maps: Average occurrences	4.7	1.0	4.6	3.5	4.0	3.2	2.3	3.8	2.5	n/a
Potentially actionable map: total occurrences	1,662	122	1,784	621	342	963	444	69	513	3,260
Potentially actionable map: percentage of total occurrences	51	3.7	54.7	19	10.5	29.5	13.6	2.1	15.7	99.9
Potentially actionable map: # of countries including map type	110	29	139	97	57	154	80	18	98	n/a
Non-actionable map: total occurrences	120	12	132	92	44	136	91	6	97	365
Non-actionable map: percentage of total occurrences	32.9	3.3	36.2	25.2	12.1	37.3	24.9	1.6	26.5	100
Non-actionable map: # of countries including map type	50	7	57	54	20	74	50	5	55	n/a
Non-actionable maps: average occurrences	2.4	1.7	2.3	1.7	2.2	1.8	1.9	1.2	1.8	n/a

Actionable maps in the 6NRs most frequently focused on the intersection between protected areas and biodiversity (218 maps), a 1,047 percent increase compared to their usage during the 5NR period (19 maps) and 5,350 percent increase from the NBSAP period (4 maps). The occurrence of spatial analyses related to proposed protected areas almost doubled from NBSAPs and 5NRs to 6NRs (Table 6). The most frequent potentially actionable maps in the 6NRs focus on KBAs (387), protected areas (313), land cover and land cover change (192), ecosystem services (159), policy and management (156), and habitat type and intactness (151). The inclusion of maps on protected areas and ecosystem services tripled during this reporting period. The frequency in which maps of key biodiversity areas appeared in national reports also increased 66 percent.

Photo credit: Natsuki Matsumoto, UNDP Uganda

Table 6. The frequency with which each category of map type occurs in policy documents. The number and percent of actionable, potentially actionable, and non-actionable maps per 6NR, 5NR, and NBSAP are provided. The highlighted values represent the five most frequent types of spatial analysis by policy document type.

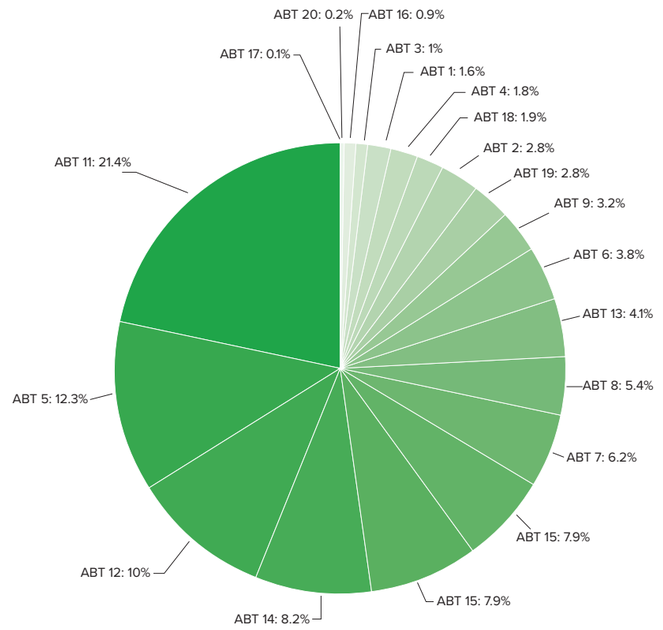
Map Type	Spatial Analysis Type	6NR: total	5NR: total	NBSAP: total	6NR: %	5NR: %	NBSAP: %
Actionable maps	Protected areas and biodiversity	218	19	4	9.60%	1.50%	0.60%
	Climate change vulnerability	63	54	27	2.80%	4.30%	4.00%
	Proposed protected areas	41	23	23	1.80%	1.80%	3.40%
	Future footprint	35	59	18	1.50%	4.70%	2.60%
Potentially actionable maps	Key Biodiversity Areas (KBAs)	387	233	78	17.00%	18.60%	11.40%
	Protected areas	313	147	114	13.80%	11.70%	16.70%
	Land cover/land cover change	192	112	62	8.40%	8.90%	9.10%
	Policy and management	156	554	24	6.90%	4.40%	3.50%
	Habitat and habitat intactness	151	110	38	6.60%	8.80%	5.60%
	Land use/land use change	108	87	46	4.80%	6.90%	6.70%
	Socio-economic data	40	11	13	1.80%	0.90%	1.90%
	Hydrology, water quality	81	67	26	3.60%	5.30%	3.80%
	Invasive alien species	19	21	5	0.80%	1.70%	0.70%
	Corridors, buffers	30	5	8	1.30%	0.40%	1.20%
	Ecosystem services	159	56	36	7.00%	4.50%	5.30%
	Regions, zones	148	59	63	6.50%	4.70%	9.20%
Non-actionable maps	Geographic variable/ feature	121	66	36	5.30%	5.30%	5.30%
	Administrative regions	11	70	61	0.50%	5.60%	8.90%
Non-classified maps		0	0	1	0.00%	0.00%	0.10%
Total		2,273	1,254	683	100%	100%	100%

Use of spatial data to measure progress to achieve the ABTs

During the 6NR period, nations also increased the frequency with which they used spatial analyses to report on progress to achieve the ABTs (Figure 4). Almost two-thirds of the maps used in 6NRs supported assessments of progress to achieve seven ABTs. Approximately 21 percent of all maps used across the 6NRs addressed protected areas (ABT 11); 12 percent addressed habitat fragmentation and degradation (ABT 5); 10 percent addressed species and extinctions (ABT 12); eight percent addressed ecosystem services (ABT 14); and eight percent addressed climate resilience (ABT 15). As part of the 6NR GEF-funded project, UNDP and UNEP provided spatial data to support data driven assessments of progress towards the first five of these ABTs. Additionally, six percent of the maps used addressed sustainable resource management (ABT 7), and five percent of them addressed pollution (ABT 8).

In contrast, nations submitted no or very limited maps for assessments of half of the ABTs: biodiversity awareness (ABT 1), biodiversity mainstreaming (ABT 2), incentives and subsidies (ABT 3), sustainable production and consumption (ABT 4), invasive alien species (ABT 9), access and benefit sharing (ABT 16), developing and implementing NBSAPs (ABT 17), traditional knowledge (ABT 18), science and research (ABT 19), and resource mobilization (ABT 20). Maps for these targets appeared less than three percent of the time. Spatial data is not necessarily useful for reporting on all ABTs and may help explain these results for ABT 17, 18, and 19. However, they are critical to understanding other lesser mapped components of the Convention, such as locations of sustainable production and consumption across sectors (ABT 4) and the extent of invasive alien species (ABT 9), and progress to achieve related targets and commitments over time.

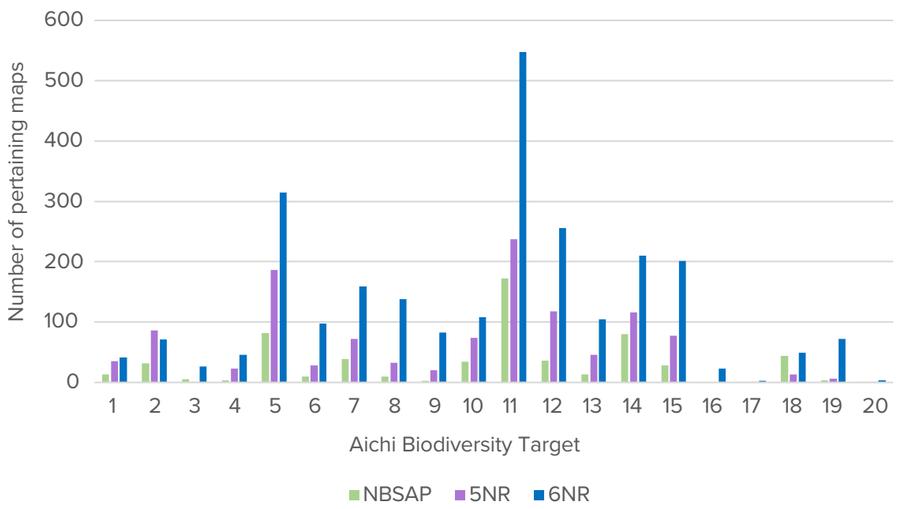
Figure 4. Percentage of occurrence of maps related to each ABT across the 6NRs. Note that maps can be related to more than one ABT at a time.



Select trends in using spatial data to map progress to achieve ABTs in 6NRs include (Figure 7):

- **Protected areas (ABT 11):** 548 maps submitted by 111 countries show progress to protect at least 17 percent of terrestrial land and inland waterways and 10 percent of coastal and marine areas by 2020. Of these, 97 GEF supported countries (87 percent) submitted 93 percent (511).
- **Habitat fragmentation and degradation (ABT 5):** 315 maps submitted by 82 countries show progress to reduce the natural habitat loss, degradation, and fragmentation rates by half by 2020. Of these, 78 GEF supported countries (95 percent) submitted 93 percent (294).
- **Species and extinctions (ABT 12)**: 256 maps submitted by 74 countries show progress to prevent the extinction of known threatened species. Of these, 70 GEF supported countries (95 percent) submitted 91 percent (233).
- **Ecosystem services (ABT 14):** 210 maps submitted by 53 counties show progress to restore or safeguard critical ecosystem services. Of these, 48 GEF supported countries (90 percent) submitted 90 percent (188).
- **Climate resilience (ABT 15):** 201 maps submitted by 58 counties show progress to enhance ecosystem resilience and the contribution of biodiversity to carbon stocks. Of these, 53 GEF supported countries (91 percent) submitted 90 percent (181).
- **Sustainable resource management (ABT 7):** 159 maps submitted by 48 counties show progress to reduce pressures on ecosystems vulnerable to the impacts of climate change. Of these, 43 GEF supported countries (90 percent) submitted 89 percent (142).

Figure 5. Number of maps per ABT across the NBSAPs, 5NRs and 6NRs.



Use of UNBL to support biodiversity policymaking

GEF-recipient nations used UNBL to produce 20 percent (458 maps) of the 6NR maps. This means that a map was published using a UNBL provided template or that the UNBL was cited as a source for the map. Of the 123 nations that received GEF funds for the 6NR project, 55 of them created at least one map using UNBL support (Figure 5, Table 7). Only nations that received GEF funding included UNBL maps in their 6NR. Of those nations that used the UNBL to help prepare their 6NR, each incorporated an average of eight UNBL maps.

Thirteen GEF recipients relied on the UNBL to produce 70 percent or more of the spatial maps they included in their 6NR: Botswana, Cameroon, Comoros, Côte d'Ivoire, Equatorial Guinea, Ghana, Guinea-Bissau, Mauritania, South Sudan, Timor-Leste, Tunisia, Yemen, and Zambia. These countries presented 167 UNBL maps in total, all classified as actionable or potentially actionable. The most common maps focused on the intersection of species richness and protected area networks (18), degradation within ecoregions (11) and species richness (10). Six countries relied on the UNBL for 100 percent of their 6NR maps: Botswana, Cameroon, Côte d'Ivoire, Ghana, Yemen, and Zambia. These countries presented 55 maps in total, all classified as actionable or potentially actionable. For this subset, the most common maps focused on ecosystem services (10), KBAs (10), and protected areas (10). Fifty of the 55 countries that used the UNBL to help prepare their 6NR presented an increase in the total number of maps, compared to their 5NR. For some countries, the difference was considerable, such as in the case of with Democratic Republic of Congo and Myanmar, which each have 55 more maps in their 6NRs compared to their previous report.

Figure 6. Frequency of UNBL maps used per country for the 6NR. The nations highlighted in blue used the UNBL data to produce 70 percent or more of the maps they included.

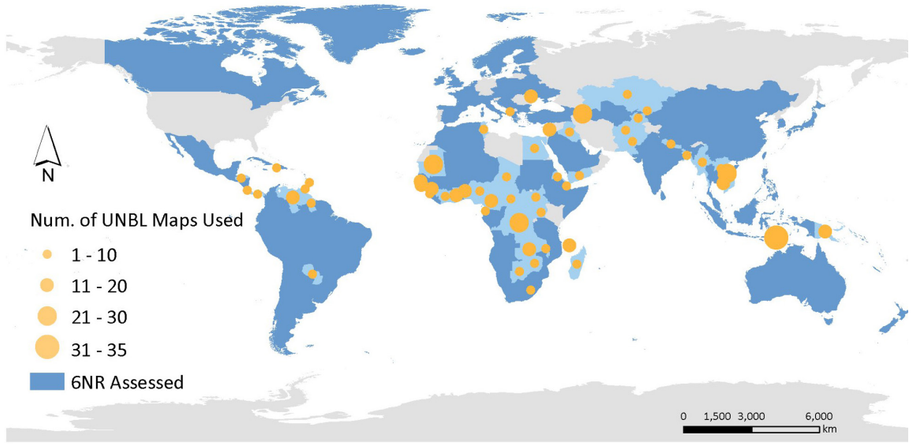


Table 7. Differences in the number of maps included between the 5NR and 6NR period for countries that used the UNBL to develop one or more maps for their 6NR. Highlighted countries are those referenced in the text.

Country	5NR maps: number	6NR maps: number	6NR maps: change in map # from 5NR	UNBL maps in 6NR: number	UNBL maps in 6NR: percent
Afghanistan	4	24	20	6	25.0%
Albania	3	10	7	2	20.0%
Azerbaijan	2	34	32	21	61.8%
Bangladesh	11	37	26	1	2.7%
Barbados	3	33	30	5	15.2%
Benin	8	26	18	17	65.4%
Botswana	5	7	2	7	100.0%
Cambodia	0	33	33	15	45.5%
Cameroon	10	13	3	13	100.0%
Central African Republic	1	3	2	2	66.7%
Chad	1	4	3	1	25.0%
Comoros	0	22	22	20	90.9%
Costa Rica	23	35	12	2	5.7%
Côte d'Ivoire	0	6	6	6	100.0%
Djibouti	8	8	0	1	12.5%
DR Congo	2	57	55	22	38.6%
Egypt	59	29	-30	2	6.9%
Equatorial Guinea	1	7	6	5	71.4%
Eritrea	9	15	6	2	13.3%
Gambia	2	24	22	16	66.7%
Ghana	0	12	12	12	100.0%
Guinea	2	27	25	13	48.1%
Guinea-Bissau	2	22	20	17	77.3%
Guyana	13	24	11	3	12.5%
Haiti	13	28	15	5	17.9%
Honduras	4	8	4	1	12.5%
Iraq	15	33	18	10	30.3%
Kazakhstan	21	30	9	5	16.7%
Kyrgyzstan	1	11	10	4	36.4%
Lao People's Democratic Republic	4	16	12	4	25.0%
Lebanon	4	51	47	11	21.6%
Lesotho	N/A	27	27	4	14.8%
Madagascar	5	18	13	7	38.9%
Malawi	4	15	11	1	6.7%
Mauritania	3	30	27	24	80.0%
Moldova	2	24	22	15	62.5%
Myanmar	3	58	55	9	15.5%
Nepal	7	15	8	4	26.7%
Nigeria	2	9	7	5	55.6%
Pakistan	1	7	6	2	28.6%
Panama	2	25	23	8	32.0%
Papua New Guinea	31	75	44	14	18.7%
Paraguay	11	31	20	8	25.8%
Sierra Leone	0	6	6	1	16.7%
South Sudan	4	10	6	8	80.0%
Tajikistan	1	12	11	1	8.3%
Timor-Leste	7	36	29	35	97.2%
Trinidad and Tobago	52	26	-26	4	15.4%
Tunisia	6	4	-2	3	75.0%
Uganda	10	16	6	2	12.5%
Venezuela	7	23	16	11	47.8%
Viet Nam	1	46	45	22	47.8%
Yemen	8	5	-3	5	100.0%
Zambia	5	12	7	12	100.0%
Zimbabwe	13	15	2	2	13.3%

CHAPTER 4

Nature is counting on us

Photo credit: Monica Suarez Galindo, UNDP Peru

NATURE IS COUNTING ON US

Nations around the world are increasing their ambition for nature by making bold commitments to address the planetary emergencies of biodiversity loss and climate change. At the same time, the milestone decade 2020-2030 dedicated to achieving revolutionary international commitments is fast slipping away. The urgent need for action is compounded by the interrelatedness of these crises, as well as global dependence on nature to achieve half of the SDGs.

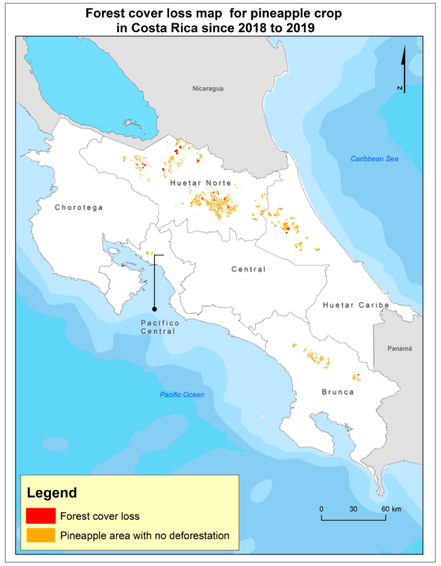
With limited resources and many competing land uses, governments do not always know how and where to prioritize action on the ground. The lack of consistent spatially explicit frameworks for planning monitoring, reporting, and adaptively managing progress towards global and national commitments to nature is also contributing to their partial achievement (Hansen et al. 2021, Maxwell et al. 2020). Yet, as this analysis demonstrates, increasing access to spatial data and tools, and improving capacity to use them, does help support nations to make more informed decisions on how and where to halt or reverse biodiversity loss around the world, while also addressing climate and development issues.

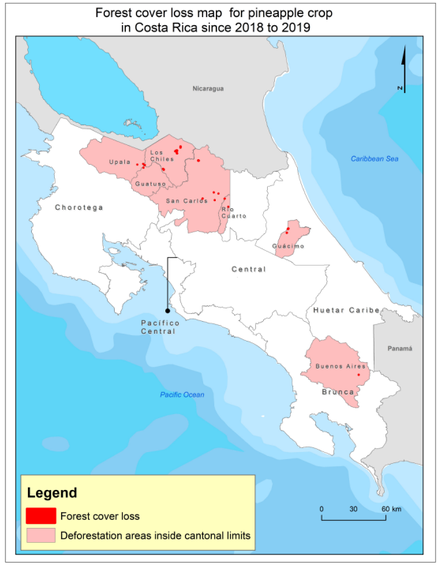
Our findings indicate that when barriers to accessing spatial data and tools are reduced, policymakers will more frequently utilize them to develop data-driven biodiversity policies. Assessments of the status of nature, and efforts to monitor the effectiveness of national strategies to protect, manage, and restore it, also become data-driven. The capacity to identify nature-based actions that also address climate change and sustainable development needs also increases. These findings support those of Hansen et al. (2021) that the spatial data derived from Earth Observations can help nations to better evaluate, report, and adaptively manage actions that contribute towards national and global commitments to nature. Additionally, Runting et al. (2020) emphasize the availability of spatial data on the state and trends of nature, and the importance of using them to take action to mitigate environmental destruction. Fastré et al. further suggest that integrated spatial planning frameworks will be required to meet the global targets for biodiversity in this decade, which are coupled with ensuring global food security (2021).

Providing nations ecumenical access to spatial data and tools has the potential to substantially improve policy impacts for people and the planet. To help achieve this outcome, decision makers need access to reliable and timely spatial data on biodiversity, its benefits to humankind, and the pressures affecting its decline. There is also a common global need for continued technical support so that policymakers without advanced technical training can access, view, and analyze spatial data, as well as communicate decisions and act using maps. Governments around the world are making a strong case about the importance of continuing to increase access to spatial data and tools and to provide technical support to build capacity to use them.

For example, Costa Rica's bold national commitments to decarbonize its economy while maintaining 60 percent of its lands for nature are outlined in an ambitious national policy framework. To determine how to act on these pledges, and harmonize them with sustainable development needs, the country is using a data-driven approach, with maps guiding stakeholder-led decision-making. Spatial data are guiding national plans for ecosystem-based climate adaptation, payments for environmental services programs, and helping to set a baseline for future protection, management, and restoration efforts in the nation's 2021 State of the Environment Report. Decision makers can also use the results to visualize where urban greening can enhance the well-being of urban populations (GEO 2021). Spatial data can additionally be used as a powerful tool for monitoring and accountability. In a nation that accounts for 0.03 percent of the earth's surface but six percent of its biodiversity, pineapple production generates US$1 billion annually. UNDP Costa Rica is also using spatial data to reduce illegal deforestation in the sector. Maps of locations of plantations over time overlaid with forest cover loss over the same period are allowing government, communities, and industry to verify where pineapple is being grown according to sustainable practices and address land uses in direct conflict with actions to develop deforestation free commodities. Spatial data are also helping convene stakeholders from many different sectors to better abide and enforce forestry laws, while also creating the opportunity to identify land areas that should be targeted for conservation and ecosystem service programs (UNBL 2018, Figure 5).

Figure 5a and 5b. Maps illustrating spatial data for decision-making in Costa Rica. Map 5a shows areas of forest cover loss for pineapple crops from 2018 to 2019, overlaid with areas of deforestation. Map 5b shows the same areas of forest cover loss over the same timeframe, overlaid with areas where pineapple crops have no deforestation. These maps and data are being used to reduce illegal deforestation in the sector.[3]

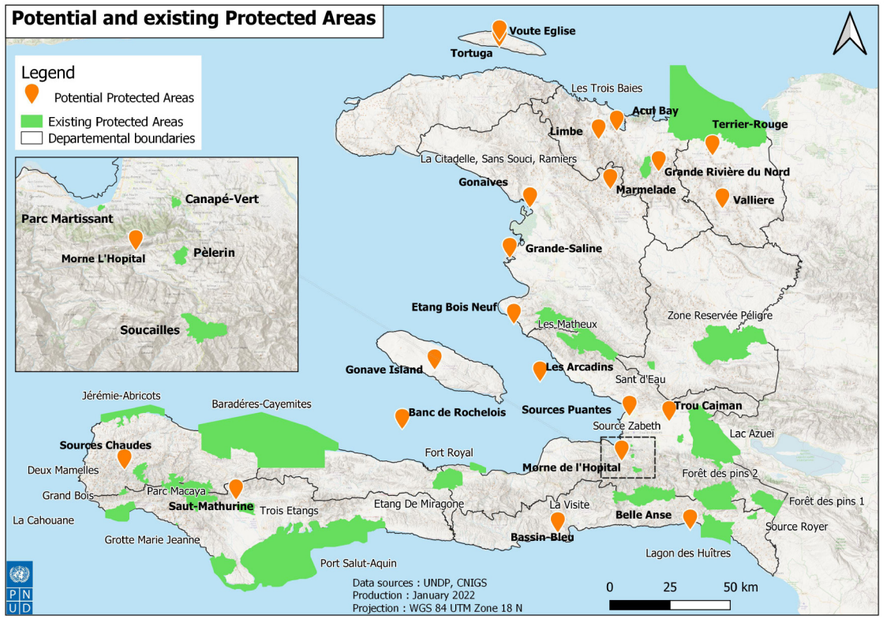




3 The designations employed and the presentation of material on these maps do not imply the expression of any opinion whatsoever on the part of the UN Secretariat or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries

Additionally, when the CBD's Strategic Plan for Biodiversity 2011-2020 was adopted in Haiti, the country had only three protected areas. In 2019, at the time of the validation of the 6NR, Haiti had 25 protected areas, which represent six percent of its marine area and seven percent of its terrestrial area. Since that time, two new protected areas have been declared, increasing the number of protected areas in Haiti to 27 (UNEP-WCMC 2022). Despite this progress, there is a significant gap in achieving ABT 11, which included a national commitment to protect at least 17 percent of inland lands and waterways and 10 percent of coastal and marine areas by 2020. Based on available environmental and spatial data, including UNBL data on biological richness, forest cover, ecosystem integrity, and land cover change, Haitian stakeholders proposed a set of biologically significant sites that could be considered as potential protected areas at the time they developed the 6NR. The government, through the Ministry of Environment, continues to work on declaring new protected areas from this list (RÉPUBLIQUE D"HAÏTI 2019) (Figure 6).

Figure 6. Map illustrating spatial data for decision-making in Haiti – map of potential and existing protected areas in Haiti (2022), which stakeholders determined during the 6NR development process using multiple environmental and social spatial data layers from the UNBL. [4]

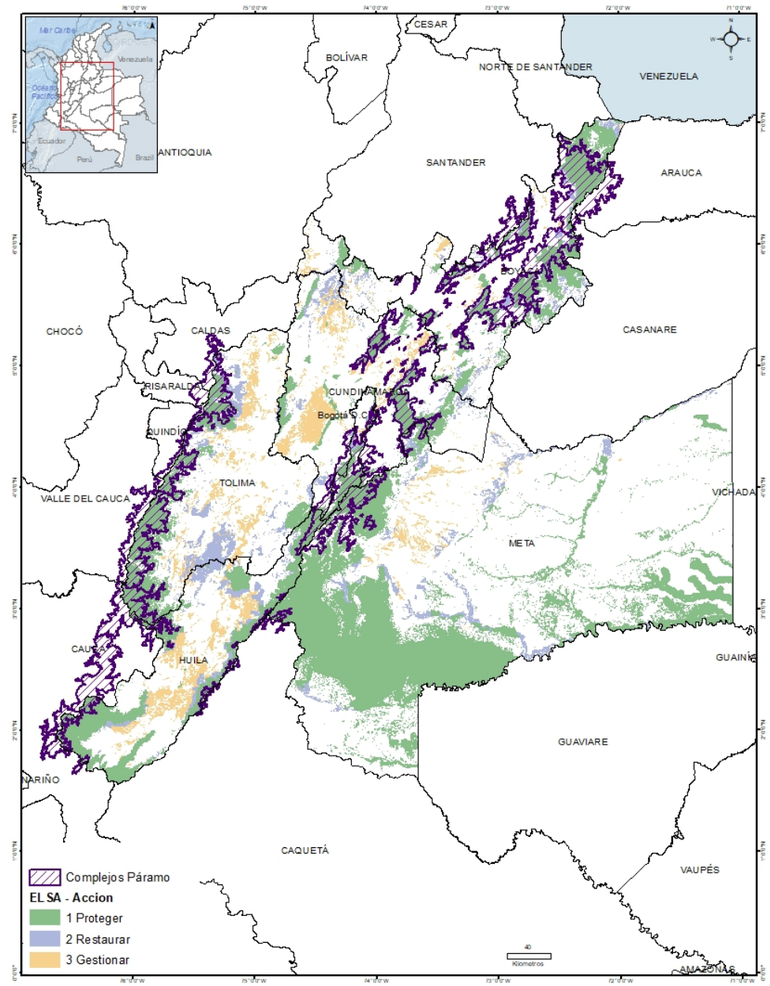


In Colombia, 70 percent of the population is dependent on drinking water that comes from the páramos, a fragile ecosystem high in the Andes. The páramos ecosystem occurs in only two and a half percent of Colombia's continental territory (SIAC 2021) but is fundamental to water regulation in the country.

4 The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the UN Secretariat or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries

Climate change is predicted to reduce the extent of páramos by up to 75 percent. Colombia is using spatial data to build consensus on how and where to safeguard a sustainable urban water supply from these mountainous ecosystems for the nearly 15 million people that are concentrated in this central region of the country. Equipped with maps, national and regional policymakers can visualize the critical role of these páramos areas for water provision to densely populated cities. These data are being used to support the development of the country's post-2020 strategies for nature and integrated development in this biodiversity hotspot (Corzo et al. 2020, Figure 7).

Figure 7. Map illustrating spatial data for decision-making in Colombia.[5]



5 The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the UN Secretariat or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries

These examples illustrate how efforts to increase access to spatial data and tools among GEF-eligible nations, and to build capacity to use them, leads to better outcomes for nature, planet, and people. In each of these unique countries, maps are being used to successfully guide stakeholders to develop nature-based solutions that also enhance livelihoods in the face of limited resources and competing demands.

Together with the nations we supported during the 6NR period, UNDP and UNEP have identified several technical support needs that must be addressed in this decade to ensure the effective implementation of the CBD's post-2020 GBF (CBD 2021). Providing resources to address them will lead to improved policy outcomes for people and the planet. These include:

- Continuing to provide free virtual and in-person access to GEF-funded training and capacity strengthening activities, and those funded by other donors.
- Working with global data providers to incorporate accurate and validated national data sources into their datasets.
- Working with governments to validate and officially recognize relevant global datasets that fill national data gaps.
- Developing national baselines of biodiversity that are spatially explicit and replicable for each country around the world.
- Refining biodiversity indicators to track measurable changes in the status of nature, the impact of threats, and the achievement of solutions, measured in a consistent way across terrestrial, freshwater, and marine environments. Building national data management mechanisms and spatially explicit monitoring systems that allow Parties to systematize the collection, sharing, and analysis of data across relevant ministries during national reporting and NBSAP development and implementation.
- Obtaining political support to access, share, and use spatial data for better decision-making across the Rio Conventions and the Agenda 2030 for Sustainable Development.
- Better capturing important biodiversity data from Indigenous peoples and local communities, and to understand the different gender roles associated with biodiversity conservation.
- Raising awareness of globally available marine spatial datasets that can be analyzed for policymaking, using tools such as the UNBL.

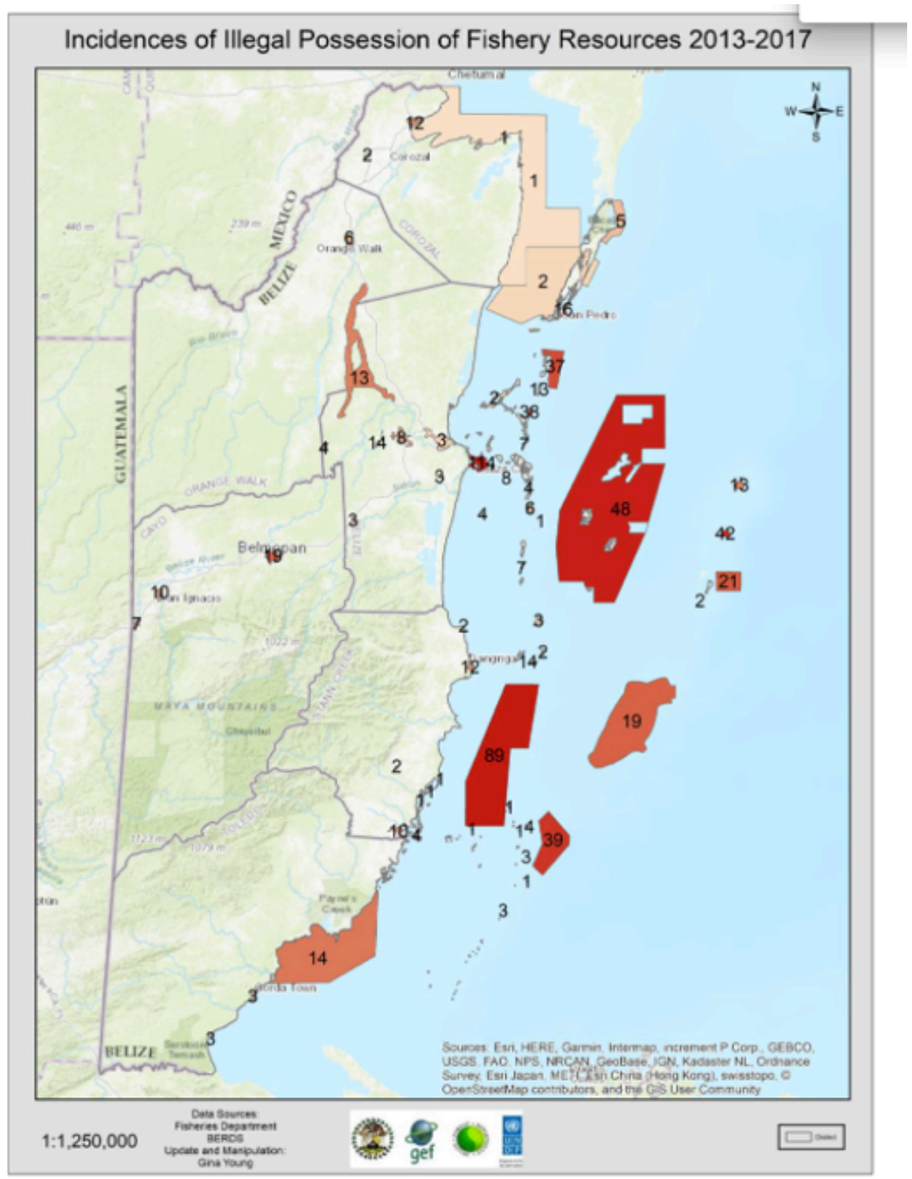
While this analysis does not distinguish between spatial data use among terrestrial, marine, and freshwater environments, it is important to note that, despite their importance, half of the world's coral reefs are lost, and the world's wetlands (Eddy et al. 2021) are disappearing at a rate significantly greater than that of forest ecosystems (Ramsar Convention on Wetlands 2021). As a result, the structure, function, and benefits from marine and freshwater systems are decreasing. Innovative solutions are needed to address these impacts at the scale needed to safeguard the contributions of marine and freshwater ecosystem services to nature, climate, and people (IPCC 2016).

There are several policy frameworks that help address these concerns. First, the United Nations commenced the Decade of Ocean Science for Sustainable Development, which focuses on developing and implementing adaptation strategies and science-informed policy responses to global change (United Nations n.d.). Second, SDG14, Life Below Water, includes ambitious actions to protect, manage, and restore marine ecosystems (United Nations n.d.). Third, the CBD's emerging post-2020 GBF includes bold goals to protect at least 30 percent of the world's marine ecosystems and includes a target on integrated landscape-and seascape planning (CBD 2021).

Policymakers require specific spatial datasets and tools to identify and monitor freshwater and marine resources. For example, the 6NR of Belize explores how spatial monitoring tools and drones are being used in combination to reduce the number of infractions for illegal possession of fishery resources. Mapping the zones with most incidences is helping the country to improve enforcement activities in specific zones, which has led to a one-third reduction in the annual number of infractions. (Gov. of Belize 2019) (Figure 8). In Mexico, spatial data are being used to monitor an early warning system for coral bleaching, which is aiding in management of this vulnerable ecosystem. The 6NR also references the importance of spatial data for a similar monitoring system for Sargassum presence (CONABIO/UNDP 2019).

Photo credit: UNDP Kenya

Figure 8. Map illustrating marine spatial data for decision-making in Belize.[6]



6 The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the UN Secretariat or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries

To help address this need, UNBL also has several important datasets that can help begin to answer these questions including 26 marine-related spatial data layers, and 12 freshwater water-related spatial data layers[7]. For example, the marine pollution index is a global spatial dataset that provides large-scale guidance about where to prioritize management efforts and affirm the importance of addressing terrestrial sources of pollution into marine environments to maintain and improve the condition of marine ecosystems (Halpern et al. 2015). The global surface water transition indicator dataset allows policymakers to identify specific months or years in which freshwater conditions changed, such as the date a new dam is filled, or the month and year in which a lake disappeared (Pekel et al. 2016). Access to, and capacity to use, these types of spatial data and tools will support policymakers to build awareness and consensus of how and where marine and freshwater ecosystems contribute to shared national priorities for nature, climate, and sustainable development.

In this decade, as we unite to halt the current catastrophic losses of biodiversity, limit global warming to 1.5 degrees, and leave no one behind as we continue to develop the planet, spatial data must become accessible, accurate, analyzed, and applied in the nations that currently lack these capacities. This analysis indicates that systematically and equitably taking steps to do so around the world leads to increased data-driven policymaking with improved outcomes for biodiversity, climate, and people. Using spatial data to guide these discussions is an important step in improving national efforts to address the coupled biodiversity, climate, and sustainable development crises. The time to act is now.

7 The full list of UNBL datasets can be accessed here: http://www.unbiodiversitylab.org/data-list .

CHAPTER 5

Concluding recommendations for policymakers and practitioners

Photo credit: UNDP Kazakhstan

CONCLUDING RECOMMENDATIONS FOR POLICYMAKERS AND PRACTITIONERS

The proposed post-2020 GBF of the CBD outlines an ambitious global plan to bring about a transformation in society's relationship with biodiversity by preserving and protecting nature and its essential services to people. Its 21 targets and 10 milestones aim to put biodiversity on a path to recovery by 2030 at the latest, and towards the full realization of the CBD's 2050 Vision of living in harmony with nature (CBD 2021). The framework's theory of change proposes that transformative actions must be taken to deploy solutions to reduce threats to biodiversity, while also ensuring that nature is sustainably used to meet people's needs. Achieving the proposed targets of the post-2020 GBF will require sustained and concerted global, regional, and national action by all nations to transform development, social, and financial models; and reverse trends in biodiversity loss by 2030.

Following the expected adoption of the post-2020 GBF in December 2022, Parties to the CBD will need to rapidly ensure alignment between their existing national biodiversity policies and these new global commitments. As they embark on this work, there is a huge opportunity for governments to use spatial data when determining concrete strategies and actions to achieve their global commitments to nature in this decade. Spatial data and tools are also key to preparing more systematic monitoring and reporting systems on national progress to meet the Convention's objectives, the effectiveness of their actions to do so, and the status of biodiversity in their country.

Spatial data and tools are a necessary component of the technical support that policymakers will require to accurately assess global progress and challenges in meeting the commitments expressed in the post-2020 GBF, particularly as they work to update their NBSAPs. This report demonstrates that when CBD Parties received GEF funding and technical support targeting the incorporation of spatial data into policy documents during implementation of the 2011-2020 Strategic Plan for Biodiversity, occurrences of spatial data use during planning and reporting increased. Nations also relied on more complex types of spatial analyses to help determine trends in national progress to meet the CBD's objectives, and the effectiveness of actions to do so. In particular, reducing barriers to accessing spatial data and tools during the 6NR period resulted in the increased inclusion of maps in policymaking documents, as compared to during the 5NR and post-2010 NBSAP periods.

The achievement of several proposed targets in the post-2020 GBF explicitly rely on spatial data for their achievement (CBD 2022, CBD 2021, WCMC 2022) (Annex 2). These include:

- **Target 1:** land and sea-use planning - ensuring all land and sea areas globally are under integrated biodiversity-inclusive spatial planning addressing land- and sea-use change, retaining existing intact and wilderness areas (CBD 2021).
- **Target 2:** ecosystem restoration - ensuring at least 20 percent of degraded freshwater, marine and terrestrial ecosystems are under restoration, ensuring connectivity among them and focusing on priority ecosystems (CBD 2021).
- **Target 3:** protect and conserve land and sea - ensuring at least 30 percent globally of land areas and of sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved through effectively and equitably managed, ecologically representative, and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.
- **Target 14:** mainstreaming biodiversity - Fully integrating biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts at all levels of government and across all sectors of the economy, ensuring that all activities and financial flows are aligned with biodiversity values.

The dependency of these four targets on spatial data for their planning and implementation necessitates the availability of data and tools that support governments to identify a plausible pathway tow ards the desired outcomes, such as a net gain, or at a minimum no net loss, of ecosystems globally by 2030. In addition, many of the headline indicators put forth in the draft monitoring framework, rely on spatial data for their calculation (CBD 2022, CBD 2021, WCMC 2022).

Despite the central role spatial data and analyses will need to play in development, implementation, and monitoring of the post-2020 GBF and updated NBSAPs, constraints in spatial data access, accuracy, availability, and validation often leave Parties challenged to access and use them. As countries work to update their NBSAPs, it will be critical to identify the spatial and temporal distribution of protection, management, and restoration actions to achieve social, ecological, and economic objectives. There is also a considerable need to strengthen cooperation, collaboration, and alignment across national policies relating to nature, and to coordinate their implementation more effectively to ensure that biodiversity becomes a core consideration during development planning. NBSAPs have the potential to spur action on nature-based solutions across multiple biodiversity, climate, and sustainable development policies, but will only achieve their full potential when spatial data and tools are fully integrated into their planning, monitoring, implementation, and reporting.

The findings presented in this report highlight an urgent need to support CBD Parties to strengthen spatial data on biodiversity at the national, regional, and global level without requiring the use of intensive technical and financial resources. The findings also illustrate the positive impact that investments in capacity building and technical support can have on supporting the governments of developing countries, countries with economies in transition, and small island nations to use spatial data to develop and implement effective biodiversity strategies. These types of investments also lead to more data-driven methods of monitoring and reporting on national progress to achieve biodiversity targets, as well as increased opportunities to use data to identify linkages to similar commitments under other development and multilateral environmental agreements. Without such support, many Parties will remain challenged to effectively plan, implement, and finance the type of bold and effective action required to achieve the targets in the post-2020 GBF.

REFERENCES

Convention on Biological Diversity (n.d.). CBD Secretariat.
Retrieved October 2022 from https://www.cbd.int/

Convention on Biological Diversity (n.d.). Protected areas and the CBD.
Retrieved October 2022 from https://www.cbd.int/protected/pacbd/

Convention on Biological Diversity (2022). Development of a monitoring framework for the post-2020 global biodiversity framework.
Retrieved October 2022 from https://www.cbd.int/nbsap/monitoring.shtml

Convention on Biological Diversity (2021). Financial Sector Guide for the Convention on Biological Diversity: Key actions for nature.
https://www.cbd.int/doc/c/8e24/f151/326b69024f014a8fb9684a8d/cbd-financial-sector-guide-f-en.pdf

Convention on Biological Diversity (2021). Global Biodiversity Outlook 5. Montreal.
https://www.cbd.int/gbo/gbo5/publication/gbo-5-en.pdf

Convention on Biological Diversity (2021). Kunming Declaration “Ecological Civilization: Building a shared future for all life on Earth”. Kunming, China.
https://www.cbd.int/doc/c/c2db/972a/fb32e0a277bf1ccfff742be5/cop-15-05-add1-en.pdf

Convention on Biological Diversity (2021). Lessons learned from United Nations Development Programme, UN Environment Programme (UNEP), and UNEP – World Conservation Monitoring Centre Supporting the implementation of the Strategic Plan for Biodiversity 2011-2022 and suggestions for the post-2020 global biodiversity framework. Information Document. 3 May 2021. CBD/SBI3/INF/30.
https://www.cbd.int/doc/c/e4f6/5897/402f27ceb479e4cc0b38a56b/sbi-03-inf-30-en.pdf

Convention on Biological Diversity (2021). One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework.
https://www.cbd.int/article/first-draft-global-biodiversity-framework-one-pagers

Convention on Biological Diversity (2021). 2030 Action Target 1: Land and Sea Use Planning. The Post 2020 Global Biodiversity Framework.
https://www.cbd.int/sites/default/files/2021-08/gbf_one_pager_target_01_0.pdf

Convention on Biological Diversity (2021). 2030 Action Target 2: Ecosystem Restoration. The Post 2020 Global Biodiversity Framework.
https://www.cbd.int/sites/default/files/2021-08/gbf_one_pager_target_02.pdf

Convention on Biological Diversity (2021). 2030 Action Target 3: Protect and conserve land and sea. The Post 2020 Global Biodiversity Framework.
https://www.cbd.int/sites/default/files/2021-08/gbf_one_pager_target_03_0.pdf

Convention on Biological Diversity (2021). 2030 Action Target 14: Mainstreaming Biodiversity. The Post 2020 Global Biodiversity Framework.
https://www.cbd.int/sites/default/files/2021-08/gbf_one_pager_target_14.pdf

Convention on Biological Diversity (2021). Indicators for the Post-2020 Global Biodiversity Framework. CBD/WG2020/3/3/Add.1. 11 July 2021.
https://www.cbd.int/doc/c/a6d3/3108/88518eab9c9d12b1c418398d/sbstta-24-inf-16-en.pdf

Convention on Biological Diversity (2021). Proposed Headline Indicators for the Post-2020 Global Biodiversity Framework. CBD/SBSTTA/24/INF/6. 4 January 2021.
https://www.cbd.int/doc/c/a6d3/3108/88518eab9c9d12b1c418398d/sbstta-24-inf-16-en.pdf

Convention on Biological Diversity (2020). First Draft of the Post-2020 Global Biodiversity Framework. Montreal. 5 July. CBD/WG2020/3/3.
https://www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf

Convention on Biological Diversity (2019). Considerations on ecosystem restoration for the post-2020 global biodiversity framework, including a possible successor to achieve Aichi Biodiversity Target 15. 30 October. CBD/POST2020/WS/2019/11.
https://www.cbd.int/doc/c/fcd6/bfba/38ebc826221543e322173507/post2020-ws-2019-11-03-en.pdf

Convention on Biological Diversity (2018). Decision adopted by the Conference of the Parties to the Convention on Biological Diversity: 14/5. Biodiversity and climate change. 30 November. CBD/COP/DEC/14/5.
https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-05-en.pdf

Convention on Biological Diversity (2016). Biodiversity and the 2030 Agenda for Sustainable Development – Policy Brief.
https://www.cbd.int/development/doc/biodiversity-2030-agenda-policy-brief-en.pdf

Convention on Biological Diversity (2011). Report on how to improve the use of biodiversity in a landscape perspective. 4 August. UNEP/CBD/SBSTTA/15/13.
https://www.cbd.int/doc/meetings/sbstta/sbstta-15/official/sbstta-15-13-en.pdf

Convention on Biological Diversity (2002). Identification, monitoring, indicators, and assessments. COP 6 Decision VI/7.
Retrieved October 2022 from https://www.cbd.int/decision/cop/?id=7181

Corzo, L., Rodríguez-Buriticá, S., Ochoa, D., Batista, M. F., He, S., Virnig A., Fonseca, C., Marigo, M., Virnig, A., Venter, O., Atkinson, S., Ervin, J., & Garcia, H. (2021). Mapping of essential life support areas (ELSA) in Colombia. In: Moreno, L. A., Andrade, G. I., Didier, G., & Hernández-Manrique, O. L. (Eds.). Biodiversity 2020. Status and trends of biodiversity in Colombia, pp 112. Bogotá, D. C., Colombia: Instituto de Investigación de Recursos Biológicos Alexander von Humboldt. http://reporte.humboldt.org.co/biodiversidad/2020/cap4/401/

Dinerstein, E., Joshi, A. R., Vynne, C., Lee, A. T. L., Pharand-Deschênes, F., França, M., Fernando, S., Birch, T., Burkart, K., Asner, G. P., & Olson, D. (2020). A “Global Safety Net” to reverse biodiversity loss and stabilize Earth’s climate. Science Advances, vol. 6, No. 36. https://doi.org/10.1126/sciadv.abb2824

Ervin, J., de Silva, A., Hart, T., Shrestha, D., Supples, C. and Ahmed, H. (2017). Are We Counting on Nature? An Analysis of Spatial Data included in Post-2010 National Biodiversity Strategies and Action Plans and 5th National Reports from 135 Countries. United Nations Development Programme. https://nbsapforum.net/sites/default/files/nbsappercent20spatialpercent20planningpercent20analysispercent20final.pdf

Eddy, T., Lam, V., Reygondeau, G., Ciscneros-Montemayor, A., Greer, K., Palomares, M.L., Bruno, J., Ota, Y., Cheung., W. (2021). Decline in capacity of coral reefs to provide ecosystem services. One Earth, vol 4, No. 9, pp 1278-1285. https://doi.org/10.1016/j.oneear.2021.08.016

Fastré C., van Zeist W., Watson J., Visconti, P. (2021). Integrated spatial planning for biodiversity conservation and food planning. One Earth, vol. 4, pp 1–10. https://doi.org/10.1016/j.oneear.2021.10.014

GEO Secretariat (2021). GEO Highlights 2021. https://earthobservations.org/documents/geoweek2021/GEOpercent20Highlightspercent20Report_reduced.pdf

Global Environment Facility (n.d). GEF Countries (Participants). Retrieved October 2022 from https://www.thegef.org/partners/countries-participants

Government of Belize (2019). The Sixth National Report for the Convention on Biological Diversity. https://chm.cbd.int/pdf/documents/nationalReport6/246148/1

Grantham, H. S., Duncan, A., Evans, T. D., Jones, K. R., Beyer, H. L., Schuster, R. … Watson, J.E.M. (2020). Anthropogenic modification of forests means only 40percent of remaining forests have high ecosystem integrity. Nature Communications, vol. 11, No. 1, pp 1-10. https://doi.org/10.1038/s41467-020-19493-3

Griscom, B. W., Adams, J., Ellis, P. W., Houghton, R. A., Lomax, G., Miteva, D. A., Schlesinger, W. H., Shoch, D., Siikamäki, J. V, Smith, P., Woodbury, P., Zganjar, C., Blackman, A., Campari, J., Conant, R. T., Delgado, C., Elias, P., Gopalakrishna, T., Hamsik, M. R., … Fargione, J. (2017). Natural climate solutions. Proceedings of the National Academy of Sciences, vol. 114, No. 44, pp 11645 – 11650. https://doi.org/10.1073/pnas.1710465114

Halpern, B. S., Frazier, M., Potapenko. J., Casey, K. S., Koenig, K., Longo, C., Lowndes, J. S., Rockwood, R. C., Selig, E. R., Selkoe, K. A., & Walbridge, S. Spatial and temporal changes in cumulative human impacts on the world’s ocean. Nature Communications, vol. 6, No. 7615. https://www.nature.com/articles/ncomms8615.pdf

Hannah, L., Roehrdanz, P., Marquet, P., Enquist. B., Midgley, G., Foden, W., Lovett, C., Corlett, R., Corcoran, D., Butchart, S., Boyle, B., Feng, X., Maitner, B., Fajardo, J., McGill, B., Merow, C., Morueta-Holme, N., Newman, E., Park, D., Raes, N., & Svenning, J. (2020). Thirty percent land conservation and climate action reduces tropical extinction risk by more than fifty percent. Ecography, vol. 43, pp 943-953. https://doi.org/10.1111/ecog.05166

Hansen, A. J., Noble, B. P., Veneros, J., East, A., Goetz, S. J., Supples, C., … Virnig, A. (2021). Toward monitoring forest ecosystem integrity within the post-2020 Global Biodiversity Framework. Conservation Letters, vol. 14, No. 4. https://doi.org/10.1111/conl.12822

Hockings, M., Stolton, S., Leverington, F., Dudley, N., Courrau, J. (2006). Evaluating Effectiveness: A framework for assessing management effectiveness of protected areas. 2nd edition. IUCN, Gland, Switzerland and Cambridge, UK. https://www.iucn.org/content/evaluating-effectiveness-a-framework-assessing-management-protected-areas-2nd-edition

Intergovernmental Panel on Climate Change (2021). Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. Cambridge and New York. https://www.ipcc.ch/report/ar6/wg1/#FullReport

Intergovernmental Panel on Climate Change (2018). Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, & T. Waterfield (eds.)]. Cambridge and New York. https://www.ipcc.ch/sr15/download/

Intergovernmental Panel on Climate Change (2016). Special report on the ocean and cryosphere in a changing climate.
https://www.ipcc.ch/srocc/

Intergovernmental Platform on Biodiversity and Ecosystem Services (n.d.). Models of drivers of biodiversity and ecosystem change.
Retrieved October 2022, from https://ipbes.net/models-drivers-biodiversity-ecosystem-change

Intergovernmental Platform on Biodiversity and Ecosystem Services (2020). Workshop Report on Biodiversity and Pandemics of the Intergovernmental Platform on Biodiversity and Ecosystem Services. IPBES Secretariat, Bonn, Germany. doi:10.5281/zenodo.4147317.
https://ipbes.net/sites/default/files/2020-12/

ANNEXES

Annex 1. List of the Convention on Biological Diversity's (CBD) Aichi Biodiversity Targets (ABTs), which are separated under five separate Strategic Goals

More information about the ABTs can be found on the Convention on Biological Diversity website at https://www.cbd.int/sp/targets/.

Strategic Goal A	Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
Target 1	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
Target 2	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
Target 3	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.
Target 4	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Strategic Goal B	Reduce the direct pressures on biodiversity and promote sustainable use
Target 5	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
Target 6	By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Strategic Goal B	Reduce the direct pressures on biodiversity and promote sustainable use
Target 7	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
Target 8	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.
Target 9	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
Target 10	By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Strategic Goal C	To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
Target 11	By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.
Target 12	By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
Target 13	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Strategic Goal D	Enhance the benefits to all from biodiversity and ecosystem services
Target 14	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
Target 15	By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.
Target 16	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Strategic Goal E	Enhance implementation through participatory planning, knowledge management and capacity building
Target 17	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.
Target 18	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
Target 19	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.
Target 20	By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

Annex 2. Post-2020 Global Biodiversity Framework targets reliant on spatial data

As this report demonstrates, Parties to the Convention on Biological Diversity (CBD) will require technical and financial support to undertake more effective and widespread spatial planning to support the achievement of several targets in the post-2020 Global Biodiversity Framework (GBF), specifically Target 1 (land and sea use planning), Target 2 (ecosystem restoration), Target 3 (protect and conserve land and sea) and Target 14 (mainstream biodiversity), among others. The tables in this annex are adapted from one-page guides produced by the CBD Secretariat on each proposed target in the post-2020 GBF framework (CBD 2021).

GBF Target 1: land and sea-use planning - ensure that all land and sea areas globally are under integrated biodiversity-inclusive spatial planning addressing land- and sea-use change, retaining existing intact and wilderness areas (CBD 2021)

Objective:

Land-use and sea-use change are major direct drivers of biodiversity loss. More effective and widespread spatial planning, which accounts for biodiversity and the objectives of the Convention, will be crucial, both in terms of managed ecosystems (whose biotic composition is the result of deliberate alteration by people) and the conservation of intact ecosystems. A plausible pathway towards this outcome requires a net gain, or at a minimum no net loss, of ecosystems be achieved globally by 2030 through spatial planning and restoration.

Proposed Indicators:

- Percentage of land and seas covered by spatial plans that integrate biodiversity
- Priority retention of intact / wilderness areas
- Sustainable Development Goals:
- Goal 14: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
- Goal 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Key notes on GBF Target 1:

- Integrates biodiversity considerations using spatial data during land use planning exercises.
- Promotes the worldwide application of methods or processes for analyzing and allocating the spatial and temporal distribution of actions to achieve various social, ecological, and economic objectives (Metternicht 2017).
- Encourages the retention of existing intact and wilderness areas to ensure the protection of areas with high integrity and biodiversity value, rare or vulnerable ecosystems, ecosystems that are essential for planetary function, and those which cannot be restored.
- Uses spatial data to identify areas of land and sea that are undisturbed by significant human activity, free of modern infrastructure, and where natural forces and processes predominate.
- Incorporates all terrestrial and aquatic ecosystems, including freshwater biomes.
- Addresses land-use change, including the conversion of land cover (e.g. deforestation or mining), changes in the management of ecosystems or agro-ecosystems (e.g. through the intensification of agricultural management or forest harvesting), and changes in the spatial configuration of landscapes (e.g. fragmentation of habitats) (IPBES n.d.).

GBF Target 2 – ecosystem restoration - ensure that at least 20 percent of degraded freshwater, marine and terrestrial ecosystems are under restoration, ensuring connectivity among them and focusing on priority ecosystems (CBD 2021).

Objective:

Restoring both converted and degraded ecosystems is essential to achieving this target. To reach the 2050 Vision, a significant net increase in the area, connectivity, and integrity of natural ecosystems is needed. A plausible pathway towards such an outcome requires that net gain, or at a minimum no net loss, of ecosystems be achieved globally by 2030 through spatial planning and restoration. Twenty percent is suggested as a feasible target.

Proposed Indicators:

- Percentage of degraded or converted ecosystems that are under restoration
- Maintenance and restoration of connectivity of natural ecosystems
- Sustainable Development Goals:
- Goal 6: Ensure availability and sustainable management of water and sanitation for all
- Goal 14: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
- Goal 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Key notes on GBF Target 2:

- Restoration may include: (a) restoring converted areas back to natural states; (b) improving the ecological integrity of degraded natural areas; and (c) rehabilitating converted and degraded areas, such as agricultural lands, to improve both productivity and integrity.
- CBD COP Decision 14/5 adopted the short-term action plan on ecosystem restoration which could help to inform actions towards the attainment of this proposed target (COP 2018).
- Ecological connectivity helps maintain the integrity of ecosystems, the unimpeded movement of species within and across ecosystems, and the flow of natural processes.
- Ecosystem degradation occurs through a loss of biodiversity, ecosystem functions, or services. Natural ecosystems are often degraded prior to being transformed, such as the degradation of marine ecosystems transforming the soft and hard benthos or artificial reef construction (CBD 2019).
- Ecosystem restoration can be prioritized depending on factors such as biodiversity conservation and climate change mitigation (wetlands and forests) or minimizing costs (arid ecosystems and grasslands). Additional priorities may be converted areas within relatively intact tropical forests and shrublands in South America and Africa (Strassburg et al. 2020).
- If existing yield gaps could be closed by 75 percent, up to 55 percent of converted land could be restored while maintaining current agricultural production. Restoring 15 percent of converted lands in priority areas could avoid over 60 percent of expected extinctions (Strassburg et al. 2020).

GBF Target 3 – protect and conserve land and sea - ensure that at least 30 percent globally of land areas and of sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved through effectively and equitably managed, ecologically representative, and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes (CBD 2021).

Objective:

Protected area and other areas-based conservation measures (OECM) coverage needs to be expanded with appropriate prioritization and improved management to safeguard ecosystem diversity, reduce the rate and risk of extinction, improve species population abundance, and maintain and enhance ecosystem services and nature's contributions to people. The proposed target of 30 percent is supported by scientific studies (Dinerstein et. al. 2020, Hannah et. al. 2020, Jones et. al. 2019, IUCN 2019, Visconti et. al. 2019, Woodley et. al. 2019, O'Leary et. al. 2016). The importance of focusing on biodiversity outcomes and spatial area must be emphasized, since an increase in coverage alone will not be sufficient (Maxwell et al. 2020, Pimm et al. 2018). In addition to the coverage and location of protected areas and OECMs, attention also needs to be given to their management effectiveness.

Proposed Indicators:

- Coverage of Protected areas and OECMS (by effectiveness)
- Protected area coverage of key biodiversity areas (SDG 14.5.1 and 15.1.2)
- Protected Area Management Effectiveness (PAME) (Protected Planet)
- Species Protection Index (GEOBON)
- Sustainable Development Goals:
- Goal 14: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
- Goal 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Key notes:

- To safeguard biodiversity, it is necessary to maintain geographically defined areas that are representative of the various ecosystems found on the planet. This includes:
  - protected or conserved areas that are designated or regulated and managed to achieve specific conservation objectives (CBD n.d.),
  - areas of particular importance for biodiversity protection and conservation, including those contributing significantly to the global persistence of biodiversity (e.g. Key Biodiversity Areas)
  - OECMs, are outside of protected areas, but governed and managed to achieve sustained long-term outcomes for in-situ biodiversity conservation, with associated ecosystem functions and services, and other locally relevant values (e.g., cultural, spiritual, socio-economic) (IUCN n.d).
- These areas be under effective management, which requires adopting appropriate management objectives and governance systems, adequate and appropriate resourcing, and the timely implementation of appropriate management strategies and processes (Hockings et al. 2016).
- The areas must also be under equitable management, which ensures effective participation in decision-making, transparent procedures, access to justice in conflicting situations, and the recognition of the rights and diversity of local people (Zafra-Calvo et al. 2019).
- Ecological connectivity refers to the unimpeded movement of species and the flow of natural processes that sustain life on Earth. Ecological corridors often connect continuous ecosystems.
- Nations should consider wider landscapes and seascapes that combine several ecosystems, and plan at scales that support decision-making regarding trade-offs between sustainability elements while accounting for the effects of activities on adjacent ecosystems (CBD 2011).

GBF Target 14 – mainstreaming biodiversity - fully integrate biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts at all levels of government and across all sectors of the economy, ensuring that all activities and financial flows are aligned with biodiversity values (CBD 2021).

Objective:

Reaching the goals of the post-2020 GBF and the 2050 Vision for Biodiversity requires that biodiversity moves from the periphery of decision-making to become a core consideration in decision and planning processes across government and all sectors of the economy and of society, recognizing the multiple values of biodiversity. There will be a need for greater and more explicit recognition of all biodiversity values in key national strategic policy and planning documents. Progress towards this target will support the attainment of most of the proposed goals and targets of the post-2020 GBF.

Proposed Indicators:

- Extent to which national targets for integrating biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies, and accounts at all levels, support the mainstreaming of biodiversity values across all sectors and integrated into assessments of environmental impacts
- Integration of biodiversity into national accounting and reporting systems, defined as the implementation of the System of Environmental Economic Accounting
- Existing legislation for environmental impact assessment

Sustainable Development Goals:

- Goal 8: Promote inclusive and sustainable economic growth, employment, and decent work for all
- Goal 14: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
- Goal 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels

GBF Target 14 – mainstreaming biodiversity - fully integrate biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts at all levels of government and across all sectors of the economy, ensuring that all activities and financial flows are aligned with biodiversity values (CBD 2021).

Key notes:

- Biodiversity is the foundation of economic productivity, prosperity, sustainable development, and ultimately, poverty eradication. Hence, ecosystem services should be incorporated into national accounting systems to account for their contribution to the economy.
- Biodiversity values include the "*intrinsic value of biological diversity, as well as the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its critical role in maintaining ecosystems that provide essential services, which are critical foundations for sustainable development and human well-being"* (SDG Knowledge Platform n.d.)."
- Assessing environmental impacts includes the process of identifying the future consequences of current or proposed actions. This information can be used to ensure that projects, programs, and policies are economically viable, socially equitable and environmentally sustainable (CBD 2002).
- Aligning financial flows to nature positive outcomes is a critical step. Managing the risks, impacts, and dependencies of the operations invested; and investing in or financing sectors or business models that are nature positive, increase opportunities for positive outcomes on the ground (CBD 2021).
- Greater efforts are necessary to incorporate biodiversity values and considerations into sectoral policies, including policies related to development, forestry, agriculture, fisheries, energy, finance, and other economic sectors; to develop natural capital accounts; to undertake more effective strategic environmental assessments (SEA) and environmental impact, and to further develop tools, guidelines, and methodologies to support institutions in decision-making.
- There is a need for greater and more explicit recognition of all biodiversity values in key national strategic policy and planning documents, including policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts.
- There is a need for further development and more effective use of policy tools for addressing biodiversity and ecosystem services and functions in a comprehensive manner within and across different sectors and policy areas.

Annex 3. List of nations whose CBD policy documents are analyzed in this report

Information on the GEF funding received to complete each project and the implementing agency are listed.

Nation	NBSAPs		5NR		6NR	
	GEF Funded	Analyzed	GEF Funded	Analyzed	GEF Funded	Analyzed
Afghanistan	UNEP	YES	UNEP	YES	UNDP	YES
Albania	No	YES	No	YES	UNEP	YES
Algeria	UNDP	YES	UNDP	YES	UNDP	YES
Andorra	No	YES	No	YES	No	YES
Angola	UNEP	YES	UNEP	YES	UNEP	YES
Antigua and Barbuda	UNEP	YES	UNEP	YES	UNDP	YES
Argentina	UNDP	YES	UNDP	YES	UNDP	YES
Armenia	No	YES	No	YES	UNEP	YES
Australia	No	YES	No	YES	No	YES
Austria	No	YES	No	YES	No	YES
Azerbaijan	UNDP	YES	UNDP	YES	UNEP	YES
Bahamas	UNEP	YES	No	No	UNDP	No
Bahrain	UNEP	YES	UNEP	YES	No	No
Bangladesh	No	YES	No	YES	UNDP	YES
Barbados	UNEP	YES	UNEP	YES	UNDP	YES
Belarus	No	YES	No	YES	UNEP	YES
Belgium	No	YES	No	YES	No	YES
Belize	UNDP	YES	UNDP	YES	UNDP	YES
Benin	UNEP	YES	UNEP	YES	UNEP	YES
Bhutan	UNEP	YES	UNEP	YES	UNDP	YES
Bolivia	No	YES	Direct access	YES	UNDP	YES
Bosnia and Herzegovina	UNEP	YES	UNEP	YES	UNEP	YES
Botswana	UNDP	YES	UNDP	YES	UNEP	YES
Brazil	UNDP	YES	UNDP	YES	UNDP	YES
Brunei	No	YES	No	YES	No	No

Nation	NBSAPs		5NR		6NR	
	GEF Funded	Analyzed	GEF Funded	Analyzed	GEF Funded	Analyzed
Bulgaria	No	YES	No	YES	No	YES
Burkina Faso	UNEP	YES	UNEP	YES	UNEP	YES
Burundi	UNEP	YES	UNEP	YES	UNEP	YES
Cambodia	UNEP	YES	UNEP	YES	UNDP	YES
Cameroon	UNEP	YES	UNEP	YES	UNEP	YES
Canada	No	YES	No	YES	No	YES
Cape Verde	UNEP	YES	UNEP	YES	UNEP	No
Central African Republic	UNEP	YES	UNEP	YES	UNEP	YES
Chad	UNEP	YES	UNEP	YES	UNEP	YES
Chile	UNDP	YES	UNDP	YES	UNDP	YES
China	No	No	No	YES	UNDP	YES
Colombia	UNDP	YES	UNDP	YES	UNDP	YES
Comoros	UNEP	YES	UNEP	YES	UNEP	YES
Congo (Republic of)	UNEP	YES	UNEP	YES	UNEP	YES
DR Congo	UNEP	YES	UNEP	YES	UNEP	YES
Cook Islands	UNDP	YES	UNDP	YES	UNEP	N
Costa Rica	UNDP	YES	UNDP	YES	UNDP	YES
Côte d'Ivoire	UNEP	YES	UNEP	YES	UNEP	YES
Croatia	UNDP	YES	UNDP	YES	No	YES
Cuba	UNDP	No	UNDP	YES	UNDP	YES
Cyprus	No	No	No	YES	No	No
Czech Republic	No	YES	No	YES	No	YES
Denmark	No	YES	No	YES	No	YES
Djibouti	UNEP	YES	UNEP	YES	UNEP	YES
Dominica	UNEP	YES	UNEP	YES	UNDP	YES
Dominican Republic	UNEP	YES	UNEP	No	UNDP	YES
Ecuador	UNDP	YES	UNDP	YES	UNDP	YES
Egypt	UNDP	YES	UNDP	YES	UNDP	YES
El Salvador	UNDP	YES	UNDP	YES	UNDP	YES

Nation	NBSAPs		5NR		6NR	
	GEF Funded	Analyzed	GEF Funded	Analyzed	GEF Funded	Analyzed
Equatorial Guinea	UNEP	YES	UNEP	YES	UNEP	YES
Eritrea	UNEP	YES	UNEP	YES	UNEP	YES
Estonia	No	YES	No	YES	No	YES
Ethiopia	UNEP	YES	UNEP	YES	UNEP	YES
European Union	No	YES	No	YES	No	YES
Fiji	UNDP	YES	UNDP	YES	UNEP	No
Finland	No	YES	No	YES	No	YES
France	No	YES	No	YES	No	YES
Gabon	UNEP	YES	UNEP	No	UNEP	YES
Gambia	UNEP	YES	UNEP	YES	UNEP	YES
Georgia	No	YES	No	YES	UNEP	YES
Germany	No	YES	No	YES	No	No
Ghana	UNEP	YES	UNEP	YES	UNEP	YES
Greece	No	YES	No	YES	No	YES
Grenada	UNEP	YES	UNEP	YES	UNDP	No
Guatemala	UNDP	YES	UNDP	YES	UNDP	YES
Guinea	UNDP	YES	UNDP	YES	UNEP	YES
Guinea-Bissau	UNEP	YES	UNEP	YES	UNEP	YES
Guyana	UNEP	YES	UNEP	YES	UNDP	YES
Haiti	UNEP	YES	UNEP	YES	UNDP	YES
Honduras	UNDP	YES	UNDP	YES	UNDP	YES
Hungary	No	YES	No	YES	No	YES
Iceland	No	No	No	No	No	YES
India	No	YES	No	YES	UNDP	YES
Indonesia	UNDP	YES	UNDP	YES	UNDP	YES
Iran	No	YES	No	YES	No	No
Iraq	UNEP	YES	UNEP	YES	UNDP	YES
Ireland	No	YES	No	YES	No	YES
Israel	No	YES	No	YES	No	No
Italy	No	YES	No	YES	No	YES
Jamaica	UNDP	YES	UNDP	YES	UNDP	YES

Nation	NBSAPs		5NR		6NR	
	GEF Funded	Analyzed	GEF Funded	Analyzed	GEF Funded	Analyzed
Japan	No	YES	No	YES	No	YES
Jordan	No	YES	No	YES	UNDP	YES
Kazakhstan	UNDP	YES	UNDP	YES	UNDP	YES
Kenya	UNEP	YES	UNEP	YES	UNEP	No
Kiribati	UNEP	YES	UNEP	YES	UNEP	No
Korea (Republic of)	No	YES	No	YES	No	YES
Kuwait	No	YES	No	YES	No	YES
Kyrgyzstan	UNEP	YES	UNEP	YES	UNDP	YES
Lao People's Democratic Republic	UNEP	YES	UNEP	YES	UNDP	YES
Latvia	No	YES	No	YES	No	YES
Lebanon	UNEP	YES	UNEP	YES	UNDP	YES
Lesotho	UNEP	YES	UNEP	No	UNEP	YES
Liberia	UNEP	YES	UNEP	YES	UNEP	YES
Liechtenstein	No	YES	No	YES	No	YES
Lithuania	No	YES	No	YES	No	No
Luxembourg	No	YES	No	YES	No	YES
Macedonia	UNEP	YES	UNEP	YES	UNEP	No
Madagascar	UNEP	YES	UNEP	YES	UNEP	YES
Malawi	UNEP	YES	UNEP	YES	UNEP	YES
Malaysia	UNDP	YES	UNDP	YES	UNDP	YES
Maldives	UNEP	YES	UNEP	YES	UNEP	YES
Mali	UNEP	YES	UNEP	YES	UNEP	YES
Malta	No	YES	No	YES	No	No
Marshall Islands	UNEP	YES	UNEP	YES	UNEP	No
Mauritania	UNEP	YES	UNEP	YES	UNDP	YES
Mauritius	UNDP	YES	UNDP	YES	UNEP	No
Mexico	UNEP	YES	No	YES	UNDP	YES
Micronesia	UNDP	YES	UNDP	YES	UNEP	YES
Moldova	UNDP	YES	UNDP	YES	UNEP	YES

Nation	NBSAPs		5NR		6NR	
	GEF Funded	Analyzed	GEF Funded	Analyzed	GEF Funded	Analyzed
Monaco	No	N	No	YES	No	No
Mongolia	UNEP	YES	UNEP	YES	UNEP	YES
Montenegro	UNDP	YES	UNDP	YES	UNEP	YES
Morocco	UNDP	YES	UNDP	YES	UNDP	YES
Mozambique	UNEP	YES	UNEP	YES	UNEP	YES
Myanmar	UNEP	YES	UNEP	YES	UNDP	YES
Namibia	UNEP	YES	UNEP	YES	UNEP	YES
Nauru	UNEP	YES	UNEP	YES	UNEP	YES
Nepal	UNEP	YES	UNEP	YES	UNDP	YES
Netherlands	No	YES	No	YES	No	YES
New Zealand	No	YES	No	YES	No	YES
Nicaragua	UNDP	YES	UNDP	YES	UNEP	YES
Niger	UNEP	YES	UNEP	YES	UNEP	YES
Nigeria	UNEP	YES	UNEP	YES	UNEP	YES
Niue	UNEP	YES	UNEP	YES	UNEP	No
Norway	No	YES	No	YES	No	YES
Oman	No	YES	No	YES	No	No
Pakistan	UNEP	YES	UNEP	YES	UNEP	YES
Palau	UNEP	YES	UNEP	YES	UNEP	YES
Palestine	No	No	No	YES	No	No
Panama	UNDP	YES	UNDP	YES	UNDP	YES
Papua New Guinea	UNEP	YES	No	YES	UNDP	YES
Paraguay	UNDP	YES	UNDP	YES	UNDP	YES
Peru	UNDP	YES	UNDP	YES	UNDP	YES
Philippines	UNDP	YES	UNDP	YES	UNDP	YES
Poland	No	YES	No	YES	No	YES
Portugal	No	YES	No	YES	No	No
Qatar	No	YES	No	YES	No	YES
Romania	No	YES	No	YES	No	No
Russian Federation	UNEP	YES	UNEP	YES	No	No

Nation	NBSAPs		5NR		6NR	
	GEF Funded	Analyzed	GEF Funded	Analyzed	GEF Funded	Analyzed
Rwanda	UNEP	YES	UNEP	YES	UNEP	No
Saint Kitts and Nevis	UNEP	YES	UNEP	YES	UNDP	YES
Saint Lucia	UNEP	YES	UNEP	YES	UNDP	YES
Saint Vincent and Grenadines	UNEP	N	UNEP	YES	UNDP	YES
Samoa	UNEP	YES	UNEP	YES	UNDP	YES
San Marino	No	YES	No	YES	No	No
São Tomé and Principe	UNEP	YES	UNEP	YES	UNEP	YES
Saudi Arabia	No	N	No	YES	No	YES
Senegal	UNEP	YES	UNEP	YES	UNEP	YES
Serbia	UNDP	YES	UNDP	YES	UNEP	YES
Seychelles	UNDP	YES	UNDP	YES	UNEP	No
Sierra Leone	UNEP	YES	UNEP	YES	UNEP	YES
Singapore	No	YES	No	YES	No	No
Slovakia	No	YES	No	YES	No	YES
Slovenia	No	YES	No	YES	No	No
Solomon Islands	UNEP	YES	UNEP	YES	UNEP	YES
Somalia	FAO	YES	FAO	YES	FAO	YES
South Africa	UNDP	YES	UNDP	YES	UNEP	YES
South Sudan	UNEP	YES	UNEP	YES	UNEP	YES
Spain	No	YES	No	YES	No	YES
Sri Lanka	UNDP	YES	UNDP	YES	UNDP	YES
Sudan	UNDP	YES	UNDP	YES	UNEP	YES
Suriname	No	YES	No	YES	UNDP	YES
Swaziland / Eswatini	UNEP	YES	UNEP	YES	UNEP	YES
Sweden	No	YES	No	YES	No	YES
Switzerland	No	YES	No	YES	No	YES
Syrian Arab Republic	No	YES	No	YES	No	No

Nation	NBSAPs		5NR		6NR	
	GEF Funded	Analyzed	GEF Funded	Analyzed	GEF Funded	Analyzed
Tajikistan	UNEP	YES	UNEP	YES	UNDP	YES
Tanzania	UNEP	YES	UNEP	YES	UNEP	YES
Thailand	No	YES	No	YES	UNDP	YES
Timor-Leste	UNEP	YES	UNEP	YES	UNDP	YES
Togo	UNEP	YES	UNEP	YES	UNEP	YES
Tonga	UNEP	YES	UNEP	YES	UNEP	No
Trinidad and Tobago	No	YES	No	YES	UNDP	YES
Tunisia	UNDP	YES	UNDP	YES	UNDP	YES
Turkey	No	YES	No	YES	No	YES
Turkmenistan	UNDP	YES	UNDP	YES	UNDP	YES
Tuvalu	UNEP	YES	UNEP	YES	UNEP	No
Uganda	UNEP	YES	UNEP	YES	UNEP	YES
Ukraine	No	YES	No	YES	No	YES
United Arab Emirates	No	YES	No	YES	No	YES
UK England	No	YES	No	No	No	No
UK Scotland	No	YES	No	No	No	No
UK Northern Ireland	No	YES	No	No	No	No
UK Wales	No	YES	No	No	No	No
United Kingdom and Northern Ireland	No	No	No	YES	No	YES
Uruguay	UNDP	YES	UNDP	YES	UNDP	YES
Uzbekistan	UNDP	No	UNDP	YES	UNDP	YES
Vanuatu	UNEP	YES	UNEP	YES	UNEP	YES
Venezuela	UNEP	YES	No	YES	UNDP	YES
Viet Nam	UNDP	YES	UNDP	YES	UNDP	YES
Yemen	UNDP	YES	UNDP	YES	UNDP	YES
Zambia	UNEP	YES	UNEP	YES	UNEP	YES
Zimbabwe	UNDP	YES	UNDP	YES	UNEP	YES

Annex 4. Summary of key findings

Improved outcomes for GEF-funded countries

Reducing barriers to accessing spatial data and tools during the sixth national reporting (6NR) period resulted in the increased inclusion in policymaking documents, as compared to during the fifth national reporting (5NR) period and post-2010 National Biodiversity Strategies and Action Plans (NBSAP) periods. These trends are seen among developing countries, countries with economies in transition, and small island nations that received funding from the Global Environmental Facility (GEF) for enabling activities during implementation of the Convention on Biological Diversity's (CBD) 2011-2020 Strategic Plan for Biodiversity.

Key findings

Trends in spatial data frequency

There are 2,273 occurrences of maps across the 161 6NRs submitted to the CBD Secretariat by June 2020, as compared to 1,254 occurrences in 189 5NRs, and 683 occurrences in 188 post-2010 NBSAPs. This represents an 81 percent increase in the frequency of map usage from the 5NR period to the 6NR period, and a 233 percent increase from the post-2010 NBSAP to the 6NR period.

The average number of maps used across all nations increased 114 percent, from seven maps per 5NR to 14 maps per 6NR. Nations that received GEF funding contributed most significantly to this increase, including an average of 17 maps per 6NR, and having 164 percent more occurrences of maps, as compared to the 5NR average. Those that did not receive GEF funds included an average of four maps per 6NR.

Prior to the 6NR period, most nations typically included four or fewer maps in their 5NR (56 percent) or NBSAP (78 percent). During the 6NR period, the number of countries that included four or fewer maps decreased to 35 percent, with those receiving GEF funding also contributing most significantly to improving this trend. Only 22 percent of this subset of nations included four or fewer maps. The percentage of GEF recipient nations including 20 or more mapsin a national report increased to 33 percent during the 6NR period, from eight percent during the 5NR period, and six percent during the NBSAP period.

Trends in the use of spatial data for advanced decision-making

- During the 6NR period, across GEF-funded countries, in addition to the increasing occurrence of maps, nations also relied on more complex types of spatial analyses to help determine trends in national progress to meet the CBD's objectives, and the effectiveness of actions to do so.
- Seventy-seven nations included at least one actionable map in their 6NR, with 97 percent of those nations having received GEF-funds. Additionally, 139 nations included at least one potentially actionable map in their 6NR, with 79 percent of those nations having received GEF funds.
- Over 350 actionable maps were included across all 6NRs, an increase from 155 actionable maps across all 5NRs, and 73 actionable maps across all NBSAPs, indicating that progress is being made to use more complex spatial analyses to develop data-driven biodiversity plans and reports.
- There is a near doubling of the occurrence of both the actionable and potentially actionable map types, as well as the number of countries using them for national reporting from the 5NR period to the 6NR period, and then again from the NBSAP period. This trend is most pronounced among GEF-funded nations, who included 99 percent of all actionable maps in the 6NRs.
- Actionable maps in the 6NRs most frequently focused on the intersection between protected areas and biodiversity (218 maps), a 1,047 percent increase compared to their usage during the 5NR period (19 maps) and 5,350 percent increase from the NBSAP period (four maps). The occurrence of spatial analyses on proposed protected areas almost doubled from the 5NR period to the 6NR period.
- The most frequent potentially actionable maps in the 6NRs focus on key biodiversity areas (387), protected areas (313), land cover and land cover change (192), ecosystem services (159), policy and management (156), and habitat type and intactness (151).
- The inclusion of maps on ecosystem services tripled during the 6NR period, and the occurrence on maps of key biodiversity areas increased 66 percent.

Use of spatial data to measure progress to achieve the Aichi Biodiversity Targets

- During the 6NR period, nations also increased the frequency with which they used spatial analyses to report on progress to achieve the Aichi Biodiversity Targets (ABTs).
- Two-thirds of the maps used in 6NRs supported assessments of progress to achieve seven ABTs: 21 percent of all maps used across the 6NRs addressed protected areas (ABT 11), 12 percent addressed habitat fragmentation and degradation (ABT 5), 10 percent addressed species and extinctions (ABT 12), 8 percent addressed ecosystem services (ABT 14), 8 percent addressed climate resilience (ABT 15), 6 percent of the spatial data used addressed sustainable resource management (ABT 7), and 5 percent of it addressed pollution (ABT 8).
- United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP) provided spatial data to support data driven assessments of progress towards the first five of these ABTs.

Use of the UN Biodiversity Lab to support biodiversity policymaking

- GEF recipient nations used the UN Biodiversity Lab (UNBL) to produce 20 percent (458 maps) of the 6NR spatial analyses. This means that they were published using a UNBL provided template or that the UNBL was cited as a source for the map.

- Of the 123 nations that received GEF funds for the 6NR project, 55 of them created at least one map using UNBL support. Only nations that received GEF funding included UNBL maps in their 6NR. Of those nations that used the UNBL to help prepare their 6NR, each incorporated an average of eight UNBL maps.
- Thirteen GEF recipients relied on the UNBL to produce 70 percent or more of the maps they included in their 6NR: Botswana, Cameroon, Comoros, Côte d'Ivoire, Equatorial Guinea, Ghana, Guinea-Bissau, Mauritania, South Sudan, Timor-Leste, Tunisia, Yemen, and Zambia. These countries presented 167 UNBL maps, all classified as actionable and potentially actionable.
- Six countries relied on the UNBL for 100 percent of their 6NR maps: Botswana, Cameroon, Côte d'Ivoire, Ghana, Yemen, and Zambia. These countries presented 55 maps in total, all classified as actionable or potentially actionable.
- The most common maps focused on the intersection of species richness and protected area networks, degradation within ecoregions, and species richness.

Annex 5. Consolidated policy recommendations

This section of the report provides consolidated policy recommendations based on the findings of the analysis Nature is Counting on Us, which seeks to better understand trends in the use of spatial data and tools for biodiversity policymaking among developing countries, countries with economies in transition, and small island nations; and to evaluate the impact that their use may have on policy outcomes. The analysis seeks to understand the extent to which Parties to the CBD, and that received funding from the Global Environment Facility (GEF) for enabling activities during implementation of the 2011-2020 Strategic Plan for Biodiversity, incorporated spatial data in the form of maps during the development of three policy documents: post-2010 National Biodiversity Strategies and Action Plans (NBSAPs), and the Fifth and Sixth National Reports (5NR, 6NR) to the CBD. Guided by these results, we suggest pathways for action to help nations bridge the gap between the potential for spatial data to accelerate action on nature, climate and sustainable development, and the capacity of policymakers to use it.

The challenge

- Nations around the world are increasing their ambition for nature by making bold commitments to address the planetary emergencies of biodiversity loss and climate change. At the same time, the milestone 2020-2030 decade dedicated to achieving transformative change for nature is quickly slipping away. The urgent need for action is compounded by the interrelatedness of these crises, as well as global dependence on nature to achieve half of the UN Sustainable Development Goals (SDGs). With limited resources and many competing land uses, governments do not always know how and where to prioritize conservation actions on the ground. Policymakers urgently need transformative approaches to reconcile competing development and conservation priorities.
- The 196 Parties to the Convention on Biological Diversity (CBD) collectively failed to fully meet a single global target to protect nature in the past decade (CBD 2020). The lack of consistent spatially explicit frameworks for planning, monitoring, reporting, and adaptively managing progress towards commitments to nature is contributing to their partial achievement (Hansen et al. 2021).
- Despite the potential for spatial data and tools to support national policymaking on biodiversity, United Nations Development Programme (UNDP) analyses suggest that they are not being used in practice by many nations (UNDP 2017). Others have concluded similar findings, recognizing that while many of the national and global spatial data layers need to implement CBD targets are available, they are not frequently used in national reporting (TNFD 2021, Runting et al. 2020, Grantham et al. 2020, UNDP 2017, Waldron et al. 2017, Meyer et al. 2015).
- Following the expected adoption of the post-2020 Global Biodiversity Framework (GBF) at the end of 2022, Parties to the CBD must rapidly ensure alignment among their existing national biodiversity policies and targets with these new global commitments.

- Constraints in spatial data access, accuracy, availability, and validation often leave CBD Parties challenged to identify the spatial and temporal distribution of protection, management, and restoration activities in each environment to achieve social, ecological, and economic objectives (UNDP 2017).
- Spatial data capacity is required to support the achievement of several targets in the post-2020 GBF: Target 1 (land and sea use planning), Target 2 (ecosystem restoration), Target 3 (protect and conserve land and sea), and Target 14 (mainstream biodiversity). The dependency of these four targets on spatial data, analyses, and prioritizations necessitates the availability of data and tools that support governments to identify a plausible pathway towards the desired outcomes, such as a net gain, or at a minimum no net loss, of ecosystems globally by 2030.
- Spatial data is essential for monitoring the proposed post-2020 GBF. Many of the headline indicators put forth in its draft monitoring framework rely on spatial data for their calculation (CBD 2022, CBD 2021, WCMC 2022).

The opportunity

- Spatial data and tools can play a transformative role in guiding policymakers to make data-driven decisions when identifying, planning, and implementing biodiversity policy (Levin et al. 2019, Hansen et al. 2013). Providing nations ecumenical access to spatial data and tools has the potential to substantially improve policy impacts for people and the planet.
- Decision makers can use spatial data to analyze and geolocate the most effective strategies to achieve national targets, and to explore the additional positive benefits for other policy commitments. Analyzing spatial data using Geographic Information Systems (GIS) and Systematic Conservation Planning (SCP) can guide policymakers to determine the most effective locations to protect, manage, and restore nature, and the scale of action needed.
- Monitoring trends from remotely sensed Earth Observations also allows policymakers to assess the outcomes, impacts, and effectiveness of policy decisions over time. These types of analyses can also help countries to identify a suite of nature-based solutions that best address their diverse national commitments to complementary multilateral environmental agreements related to biodiversity, climate change, and sustainable development.
- Increasing access to spatial data and tools and improving capacity to use them, supports nations to make more informed decisions on how and where to halt or reverse biodiversity loss around the world, while also addressing climate and development issues.
- Given the role of National Biodiversity Strategies and Action Plans (NBSAPs) as the principal implementation mechanism of global biodiversity policy at the national level, there is an opportunity for governments to use spatial data to help identify concrete strategies and actions to take to achieve their global commitments to nature in this decade.

Key conclusions

This report:

- Highlights an urgent need to support CBD Parties to strengthen spatial data on biodiversity at the national, regional, and global level without requiring their use of intensive technical and financial resources.
- Illustrates the positive impact that investments in capacity building and technical support can have on supporting the governments of developing countries, countries with economies in transition, and small island nations to use spatial data to develop and implement effective biodiversity strategies.
- Exhibits how these types of investments lead to more data-driven methods of monitoring and reporting on national progress to achieve biodiversity targets, as well as increased opportunities to use data to identify linkages to similar commitments under other development and multilateral environmental agreements.
- Establishes that when nations that are CBD Parties received funding from the Global Environmental Facility (GEF) and technical support targeting the incorporation of spatial data into policy documents during implementation of the 2011-2020 Strategic Plan for Biodiversity:
  - Occurrences of spatial data use during planning and reporting increased.
  - More complex types of spatial analyses helped determine trends in national progress to meet the CBD's objectives, and the effectiveness of actions to do so.
  - Inclusion of quantitative data and maps in policymaking documents increased.
- Validates that many of the types of spatial datasets required to develop and implement data-driven NBSAPs and to monitor their implementation and impact through periodic national reporting already exist nationally or can be developed from existing global spatial datasets.
- Demonstrates that spatial data must become accessible, accurate, analyzed, and applied in the nations that currently lack these capacities.
- Corroborates that the potential for NBSAPs and national reports to spur action on nature-based solutions across multiple biodiversity, climate, and sustainable development policies will require a full integration of spatial data and tools into national planning, monitoring, implementation, and reporting.
- Finds that when barriers to accessing spatial data and tools are reduced:
  - Policymakers will more frequently utilize them to develop data-driven biodiversity policy assessments of the status of nature.

- Efforts to monitor the effectiveness of national strategies to protect, manage, and restore nature also become data-driven.
- The capacity to identify nature-based actions that also address climate and sustainable development needs increases.

- Validates that decisionmakers need:
  - Access to reliable and timely spatial data on biodiversity, its benefits to humankind, and the pressures affecting its decline.
  - Continued technical support so that those without advanced technical training can access, view, and analyze spatial data, as well as act and communicate decisions using maps.
  - Reduced barriers to accessing spatial data and tools, which results in policymakers more frequently using them to develop data-driven biodiversity policies.
  - Assistance to use spatial data to support stakeholders across sectors identify where national policy commitments for biodiversity can also positively impact climate and sustainable development goals.
- Suggests that without such support, many Parties will remain challenged to effectively plan, implement, and finance the type of bold and effective action required to achieve the targets in the post-2020 GBF.

Improved national outcomes: illustrative examples

In each of these GEF-eligible countries, spatial data is being used to successfully guide stakeholders to improve the conservation of biodiversity while also enhancing livelihoods in the face of limited resources and competing demands.

Costa Rica

- Costa Rica's bold national commitments to decarbonize its economy while maintaining 60 percent of its lands for nature are outlined in an ambitious national policy framework. To determine how to act on these pledges, and harmonize them with sustainable development needs, the country is using a data-driven approach, with maps guiding stakeholder-led decision-making.
- Spatial data are:
  - Guiding national plans for ecosystem-based climate adaptation, payments for environmental services programs, and helping to set a baseline for future protection, management, and restoration efforts in the nation's 2021 State of the Environment Report. Decision makers can also use the results to visualize where urban greening can enhance the well-being of urban populations (GEO 2021).
  - Supporting actions to reduce illegal deforestation. Maps of locations of plantations over time overlaid with forest cover loss over the same period are allowing government, communities, and industry to verify where pineapple is being grown according to sustainable practices and address land uses in direct conflict with actions to develop deforestation-free commodities.
  - Helping convene stakeholders from many different sectors to better abide and enforce forestry laws, while also creating the opportunity to identify land areas that should be targeted for conservation and ecosystem service programs (UNBL 2018).

Haiti

- Haiti's protected area network only represented six percent of its marine area and seven percent of its terrestrial area in 2019, at the time of the country's sixth national report (6NR) validation. Since that time, two new protected areas have been declared, increasing the number of protected areas in Haiti to 27 (UNEP-WCMC 2022).
- Spatial data are:
  - Leading to the recognition that despite this progress, there is a significant gap in achieving Aichi Biodiversity Target (ABT) 11, which included a national commitment to protect at least 17 percent of inland lands and waterways and 10 percent of coastal and marine areas by 2020.
  - Supporting Haitian stakeholders to propose a set of biologically significant sites that could be considered as potential protected areas at the time they developed the 6NR, based on available environmental and spatial data, including United Nations Biodiversity Lab (UNBL) data on biological richness, forest cover, ecosystem integrity, and land cover change.
  - Reinforcing government efforts, through the Ministry of Environment, to continue to work on declaring new protected areas from the list of proposed sites.

Colombia

- In Colombia, 70 percent of the population is dependent on drinking water that comes from the páramos, a fragile ecosystem high in the Andes. This ecosystem occurs in only two and a half percent of Colombia's continental territory (SIAC 2021) but is fundamental to water regulation in the country. Climate change is predicted to reduce the extent of the páramos ecosystem by up to 75 percent.
- Spatial data are:
  - Building consensus on how and where to safeguard a sustainable urban water supply from these mountainous ecosystems for the nearly 15 million people that are concentrated in this central region of the country.
  - Equipping national and regional policymakers with maps to help them visualize the critical role of these páramos areas for water provision to densely populated cities.

- Supporting the development of the country's post-2020 strategies for nature and integrated development in this biodiversity hotspot.

Belize

- In Belize, marine and coastal resources are critical to support the country's ecotourism and fishing industries. The fishing industry alone brings in almost US$14 million. Yet these resources are at risk due to the prominence of illegal fishing techniques, such as ocean trawling (OCEANA 2020). Policymakers require specific spatial datasets and tools to identify and monitor freshwater and marine resources.
- Spatial data are:
  - Illustrating in the 6NR how spatial monitoring tools and drones are being used in combination to reduce the number of infractions for illegal possession of fishery resources.
  - Mapping the zones with the most incidences to help the country to improve enforcement activities in specific zones, which has led to a one-third reduction in the annual number of infractions (Gov. of Belize 2019).

Mexico

- In Mexico, an uptick in extreme ocean temperatures is affecting the quantity and distribution of different types of algae. Noxious blooms of sargassum seaweed are polluting pristine shorelines and posing health problems to those left to clean them up (Jolley 2021). Additionally, hot temperatures are leading to coral bleaching where coral expel beneficial algae (Muniz-Castillo et al. 2021). Early warning systems are proving to be a useful tool to address issues like these before it is too late.
- Spatial data are:
  - Informing the development of a monitoring system that acts as an early warning system for coral bleaching, which is aiding in management of this vulnerable ecosystem.
  - Informing a similar monitoring system for the presence of sargassum seaweed, which can be harmful to both tourism and human health when it grows in abundance (CONABIO/UNDP 2019).

Recommended technical support and capacity building

Reducing barriers to accessing spatial data and tools during the sixth national reporting period to the CBD resulted in their increased inclusion in policymaking documents, as compared to during the fifth national reporting period and post-2010 NBSAP periods. This type of intervention could help nations bridge the gap between the potential for spatial data to accelerate action on nature, climate, and sustainable development and the capacity of policymakers to use it. Using spatial data to guide these discussions is an important step to improving national efforts to address the biodiversity, climate, and sustainable development crises.

Building on the findings in this report, we recommend several technical support needs that must be addressed in this decade to ensure the effective implementation of the CBD's post-2020 GBF. Providing resources to do so will lead to improved policy outcomes for people and the planet. These include:

- Continuing to provide free virtual and in-person access to GEF-funded training and capacity strengthening activities, and those funded by other donors.
- Working with global data providers to incorporate accurate and validated national data sources into their datasets.
- Working with governments to validate and officially recognize relevant global datasets.
- Building national data management mechanisms and spatially explicit monitoring systems that allow Parties to systematize the collection, sharing, and analysis of data across relevant ministries during national reporting and NBSAP development and implementation.
- Refining biodiversity indicators to track measurable changes in the status of nature, the impact of threats, and the achievement of solutions, measured in a consistent way across terrestrial, freshwater, and marine environments.
- Developing national baselines of biodiversity that are spatially explicit and replicable for each country around the world.
- Obtaining political support to access, share, and use spatial data for better decision-making across the Rio Conventions and the 2030 Agenda for Sustainable Development (2030 Agenda).
- Better capturing important biodiversity data from Indigenous peoples and local communities, and to understand the different gender roles associated with biodiversity conservation.
- Raising awareness of globally available marine spatial datasets that can be analyzed for policymaking, using tools such as the UN Biodiversity Lab.