Defining “Critical Biodiversity Areas”

Table of content

Objectives 2

Context 2

Biodiversity is under severe threat: the role of fossil fuels 2

Biodiversity protection is becoming a priority for public decision-makers 2

Financial institutions have a responsibility in biodiversity protection and restoration 3

What areas can be considered critical for biodiversity? 3

List of frameworks included in the definition of “Critical Biodiversity Areas” 4

What other frameworks were not included in this definition? 7

Contact 7

Annex – List of other frameworks excluded from the definition 8

Objectives

This note aims to provide financial institutions (FIs) with an architecture of frameworks for identifying areas most critical to biodiversity preservation globally, and for guiding the adoption of measures to protect these areas from fossil fuel activities.

Given the fragmented and evolving state of biodiversity-related knowledge, this architecture should be understood as a minimum foundation and may evolve over time as new information emerges. FIs should use this architecture to define ‘no-go zones’ in their fossil fuel policies, i.e. commit to refraining from financing any project or company involved in fossil fuel activities within areas corresponding to the listed frameworks.

Context

Biodiversity is under severe threat: the role of fossil fuels

Human activities are destroying, often irreversibly, ecosystems on which societies directly depend. On average, the population size of monitored vertebrate species has shrunk by 70% since 1970,[1] and nearly 50,000 species are now threatened with extinction.[2] Forests and other forms of vegetation are rapidly declining and becoming more vulnerable. The species extinction rate is estimated between 100 and 1,000 extinctions per million species-year.[3] The main causes of biodiversity loss are (i) habitat loss, fragmentation, and degradation, (ii) land use intensification, (iii) pollution (air/water; chemicals, nutrients), (iv) overexploitation/unsustainable use of resources, (v) invasive species (competing with indigenous species), and (vi) climate change.

Fossil fuels, through their direct operational impacts on ecosystems, as well as their indirect impacts as systemic levers of an extractive economy and as the main contributor to climate change, bear a significant responsibility for the erosion of biodiversity.

Biodiversity protection is becoming a priority for public decision-makers

In view of biodiversity loss, the associated risks and necessity for protection are getting increasing attention and becoming more prominent on the agenda of public decision-makers.

At the international level, the Kunming-Montreal Global Biodiversity Framework (GBF) sets a global roadmap to halt and reverse biodiversity loss by 2030 and achieve recovery by 2050. The GBF is structured around 4 long-term goals[4] and 23 action-oriented targets for 2030 that aim to address direct drivers and systemic enablers of biodiversity loss. GBF Targets 1 and 2 aim to reduce biodiversity loss through effective land management and planning, and restore 30% of all degraded ecosystems, respectively. The GBF Target 3 (known as the “30x30” target) aims to protect and conserve at least 30% of land and sea, prioritizing the most important areas for biodiversity.[5]

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[1] WWF 2024 Living Planet Report
[2] Out of more than 170,000 species assessed in the IUCN Red List of Threatened Species (RLTS)
[3] The species extinction rate is defined as the number of species becoming extinct over time. It is compared to a “(natural) background/normal” extinction rate of 1 E/MSY
[4] on ecosystem integrity, species extinction risk, genetic diversity, and benefit-sharing
[5] The target’s indicator is the percentage of the world’s (terrestrial/freshwater and marine/coastal) surface that is covered by IUCN protected areas (categories I to VI), as well as by Other Effective area-based Management (OECMs) areas.

However, global coverage of protected and conserved areas remains low,[6] and a protection status does not guarantee effective protection from human activities or correlate with an area's importance for biodiversity. Therefore, there is a need to characterize the most critical areas for biodiversity to protect them from harmful activities, and to guarantee effective protection, including by strictly restricting financing to companies responsible for these activities.

Financial institutions have a responsibility in biodiversity protection and restoration

FIs have a responsibility to stop financing activities that drive biodiversity degradation, and to contribute to financing the protection and restoration of ecosystems. The GBF Targets 14 and 15 require FIs to monitor, assess, and disclose their dependencies on and impacts on biodiversity, and highlight the imperative to align all financial flows with the GBF objectives. A growing number of studies highlight the importance of ecosystem services to human societies and economic activities, as well as the systemic risks associated with their degradation. Financial supervisors are increasingly focused on investigating these nature-related risks. However, FIs have yet to grasp the magnitude of the stakes and integrate them into their practices, for instance, their sectoral policies. Few FIs have biodiversity-related policies today, and most that do usually include only frameworks for internationally protected areas, often in vague project finance restrictions.

What areas can be considered critical for biodiversity?

An area can be considered critical for biodiversity if its degradation leads to an irreversible or disproportionate loss of biodiversity (species richness and diversity, ecological functions, or evolutionary potential (genetic diversity)) due to its irreplaceable nature, vulnerability, functional importance (biological functions and ecosystem services) and/or its role in the long-term sustainability (maintenance of ecosystems and species).[7]

To date, several barriers remain to the comprehensive identification of critical areas for biodiversity. This is primarily because **scientific knowledge on biodiversity is still:**

- **Fragmented and biased**:
  - Geographically: knowledge of species and ecosystems is more detailed in certain regions with greater scientific resources (e.g. Europe), and much more scattered in regions with fewer resources and/or weaker governance, or in less accessible areas, particularly outside national jurisdictions (e.g. the high seas and benthic areas).
  - Taxonomically: certain taxa (e.g. terrestrial vertebrates) are considerably more studied, and therefore reflected in the assessments of the IUCN Red Lists of threatened species and ecosystems, than other groups, such as invertebrates, fungi, or plants.

[6] In 2024, the global coverage of protected and conserved areas reached 17.6% of terrestrial and inland waters and 8.4% of marine and coastal areas (incl. IUCN protected areas categories I to VI and OECMs). See IUCN, Protected Planet Report 2024

[7] Plumptre et al. (2024) define areas of particular importance for biodiversity as "sites that harbor significant populations/areas of threatened or geographically restricted species or ecosystems, or that exhibit significant ecological integrity or irreplaceable character, are important for the maintenance of biological processes, or provide significant ecological connectivity enabling the maintenance of species populations."
Watson et al. (2023) build on GBF Target 3 components to define 12 criteria for selecting areas to protect.

- **Evolutive**: research has yet to assess the state of conservation of all known species,[8] continues to discover new ones, and regularly uncovers new critical areas for biodiversity.[9]

However, many frameworks for critical biodiversity areas and ecosystems have been developed by internationally recognized institutions, based on rigorous and precise scientific criteria. FIs can use these frameworks to adopt policies to protect these areas from all fossil fuel activities.

List of frameworks included in the definition of “Critical Biodiversity Areas”

The table below details all the frameworks proposed for the definition of “critical biodiversity areas". These geographical frameworks should therefore be considered as a minimum basis, subject to regular revision as available data improves.

Key Biodiversity Areas (“KBAs”) form the basis of this definition, as they are recognized as the most robust framework currently available, even if not free from bias.[10] The definition also includes a set of frameworks covering marine areas (one of the “blind spots” of KBAs) and ecosystems considered critical due to their global ecological importance, integrity, vulnerability, and for several, their criticality from a carbon sequestration perspective.

All these frameworks are supported by recognized institutions, based on rigorous scientific criteria, and linked to underlying geographic data that is regularly updated and accessible. It should be noted that these areas are not disjoint, and these different classifications partially overlap.

Furthermore, **protecting these areas requires establishing a buffer zone that must also be free from any fossil fuel activity**. For example, buffer zones of 10 km for terrestrial areas and 50 km for marine areas can be suggested, given that the impact radius of potential damage caused by fossil fuel activities is larger at sea than on land.[11]

Framework name	Biodiversity aspects	Justification
KBAs - Key Biodiversity Areas - IUCN	Threatened or geographically restricted species and habitats; biological functions; ecological integrity; irreplaceability	Framework considered the most robust for defining the most important areas for biodiversity

[8] The IUCN Red List has assessed more than 170,000 species, out of more than 2.2 million described species.
[9] For example, several hundred (~1,200 in 2025) new Key Biodiversity Areas (KBAs) are designated each year.
[10] KBAs build on BirdLife International’s Important Bird and Biodiversity Areas (IBAs) as well as on the IUCN Red List assessments, are identified at the national level, and need quantitative data. Therefore, they suffer from both geographical and taxonomic biases. KBAs’ triggering thresholds are also not always adapted to large-ranged mobile and diluted marine fauna.
[11] These radii are not based on a specific standard, but on precautionary principles derived from a benchmark of scientific literature and national standards. Edge effects on forest ecosystems have been identified up to 2 km from the disturbance for agricultural activities, and much further during road construction and landscape fragmentation. The range radii of many terrestrial mammals are often on the order of 10 km. Catchment areas in watersheds are often extensive, meaning that waterborne pollutants can spread up to 10 km. In marine environments, the ranges of more mobile species are often much larger. Seismic exploration activities can easily disrupt the behavior of marine mammals over a radius of several tens of kilometers. Oil spill trajectories can reach areas far from the source (up to 500 km following the explosion of the Deepwater Horizon platform).

Framework name	Biodiversity aspects	Justification
		conservation at the global level; evolving framework
EBSAs - Ecologically or Biologically Significant Areas - Convention on Biological Diversity (CBD)	Unique, rare, or threatened marine species and habitats; biologically productive; high diversity of marine species; areas important for life-cycle strategies; vulnerable to human impact; natural or relatively intact	Address one of the weaknesses of KBAs, namely their relatively limited coverage of marine areas and species
IMMAs - Important Marine Mammals Areas - IUCN Marine Mammals Protection Areas Taskforce (MMPATF)	Biology, ecology, population structure of marine mammals; Vulnerability, distribution, abundance, specific characteristics, and main stages of their life cycle.	
ISRAs - Important Shark and Ray Areas	Vulnerability, range restriction, key life-history activities, distinctiveness, and diversity.	
Irrecoverable Carbon ecosystems[12]	Ecosystems where more than 90% of the carbon would not be recoverable within 30 years in the event of disturbance; Vulnerability	Essential and sensitive carbon sinks, within a biodiversity-climate nexus perspective
Primary Tropical Forests - Global Forest Watch	Global ecosystem and ecological importance; Carbon sink; Ecological integrity	Forest ecosystems located in tropical zones (sometimes poorly covered by protected areas or KBAs), rich in biodiversity and carbon
Peatlands - Global Peatland Initiative	Global ecosystem and ecological importance; Carbon sink; Vulnerability; Ecological integrity	Unique and rare ecosystems that contain ~⅓ of the carbon present in the planet's soils (2x forest biomass); drained and degraded, ~5% of annual global human-caused emissions

[12] Based on Noon et al. (2021) Mapping the irrecoverable carbon in Earth’s ecosystems, data updated in 2025 and available at: https://zenodo.org/records/17645053

Framework name	Biodiversity aspects	Justification
Mangroves - Global Mangrove Watch	Global ecosystem and ecological importance; Carbon sink; Vulnerability	Coastal ecosystem rich in biodiversity and essential in providing ecosystem services (fishing, flood protection) and maintaining numerous species (habitat, reproduction, food)
Seagrass beds	Global ecosystem and ecological importance; Carbon sink; Vulnerability	Marine ecosystems rich in biodiversity (1 ha ~ 80,000 fish and 100 million small invertebrates), refuges for many threatened species; oceanic carbon sink (~10%), provision of ecosystem services (fishing, erosion protection)
Coral reefs	Global ecosystem and ecological importance; Vulnerability (particularly from climate change)	Marine ecosystems rich in biodiversity, corals = keystone of reef ecosystems, providing ecosystem services (fishing, coastal protection, medicines, water filtration), extremely threatened by rising temperatures
Intact Forest Landscapes (IFL)	High level of ecological integrity	Largely preserved forest ecosystems, often rich in biodiversity
Arctic[13] and Antarctic areas[14]	High level of ecological integrity; Carbon sinks; Vulnerability	Ecosystems that are extremely sensitive to disturbances, on the front line of climate change, and often with irrecoverable carbon
IUCN Protected Areas Categories I to VI (and Other Effective area-based Conservation Measures (OECMs))	These frameworks include sites that have a protection status. Some FIs have already included these in their policies. Protection status may vary (e.g. strict for IUCN Categories I and II, much less for V and VI), and protection enforcement is far from being effective (e.g. over 80%	

[13] Terrestrial and marine areas characterized by a tundra climate, the absence of trees, and seasonal or permanent sea ice ecosystems.
[14] The Antarctic continent and all marine areas south of the Antarctic Convergence, defined by distinct oceanographic and biological systems.

Framework name	Biodiversity aspects	Justification
UNESCO World Heritage Sites et Biosphere Reserves (program “Man and the Biosphere” (MAB))	European Marine Protected Areas only marginally regulate human activities[15])	
Wetlands of international importance under the Ramsar Convention		
Natura 2000 sites, as defined by European directives[16]		

What other frameworks were not included in this definition?

Many other frameworks exist, and not all could be included in the definition for readability and operability reasons. Some do not have a readily available and/or regularly updated geographical layer necessary for systematic project screening. Others have not been retained for methodological reasons, as they do not relate directly to the preservation of biodiversity. For instance, the “Nature’s Contribution to the People” (NCP) was not included in the criteria. Ecosystem services, which are indispensable for human societies and economic activities, correspond to a conservation objective that is linked but distinct, and should be coordinated with biodiversity preservation.

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[15] Aminian-Biquet et al. (2025)
[16] Birds and Habitats Directives

Annex – List of other frameworks excluded from the definition

Framework name	Biodiversity aspects	Justification for not including	To be included further on
ICCAs - Indigenous and Community Conserved Areas	Governance type of conservation areas	Not directly linked to biodiversity preservation; Partially included in Protected Areas; No geographical layer	N
NCPs - Nature’s Contribution to the People[17]	Areas contributing to ecosystem services	Not directly linked to biodiversity preservation	P
AZE sites - Alliance for Zero Extinction	Sites harboring the most threatened species	Already included in KBAs	n/a
IBAs - Important Bird and Biodiversity Areas	“KBAs” for birds	Already included in KBAs	n/a
IPAs - Important Plant Areas	“KBAs” for plants	Partially included in KBAs; Strongly biased toward Europe and still developing (geographically restricted)	Y
IFAs - Important Fungus Area	“KBAs” for fungi	Incipient framework; No geographical layer	Y
Saltmarshes – UNEP-WCMC			Y
Kelp forests – UNEP-WCMC/Kelp Atlas	Essential marine (high sea/deep-sea) ecosystems (keystone species habitats)	Lack of regular updates in the geographical layers	Y
Cold water corals – UNEP-WCMC			Y
Seamounts (GEBCO database)			Y
Hydrothermal vents – InterRidge Hydrothermal Vents Database			Y

[17] For instance, based on Chaplin-Kramer et al. (2022), Mapping the planet’s critical natural assets

Framework name	Biodiversity aspects	Justification for not including	To be included further on
Hydrographic catchment areas - HydroSHEDS	Importance for freshwater ecosystem preservation; Vulnerability	Lack of a methodology to systematize priority area selection in large catchment areas	Y
Biodiversity Hotspots – Conservation International	Biological richness; Vulnerability [>1,500 endemic vascular plant species; <30% primary native vegetation]	Too large areas for policy application; static with no regular update of the geographical layer	N
Global Safety Net	Compilation of several studies, [18] focusing on preventing both biodiversity loss and CO_2 emissions	Encompasses (partially) already included frameworks; Defines too broad areas for policy application; Terrestrial	N
Critical Habitat Layer (UNEP-WCMC, used in IFC PS6)	Compilation of 54 ecological layers (partial inclusion for some)	Encompasses (partially) already included frameworks	N
Rarity-weighted species richness - IUCN RLTS / Species Threat Abatement and Restoration - IBAT	Biodiversity metrics linked to species’ significance and global extinction risks	Already partially included in the KBAs’ triggering thresholds	N

[18] Based especially on Dinerstein et al. (2020), A “Global Safety Net” to reverse biodiversity loss and stabilize Earth’s climate, which assesses that protecting 50% of the terrestrial realm would reverse further biodiversity loss, prevent CO_2 emissions from land conversion, and enhance natural carbon removal.