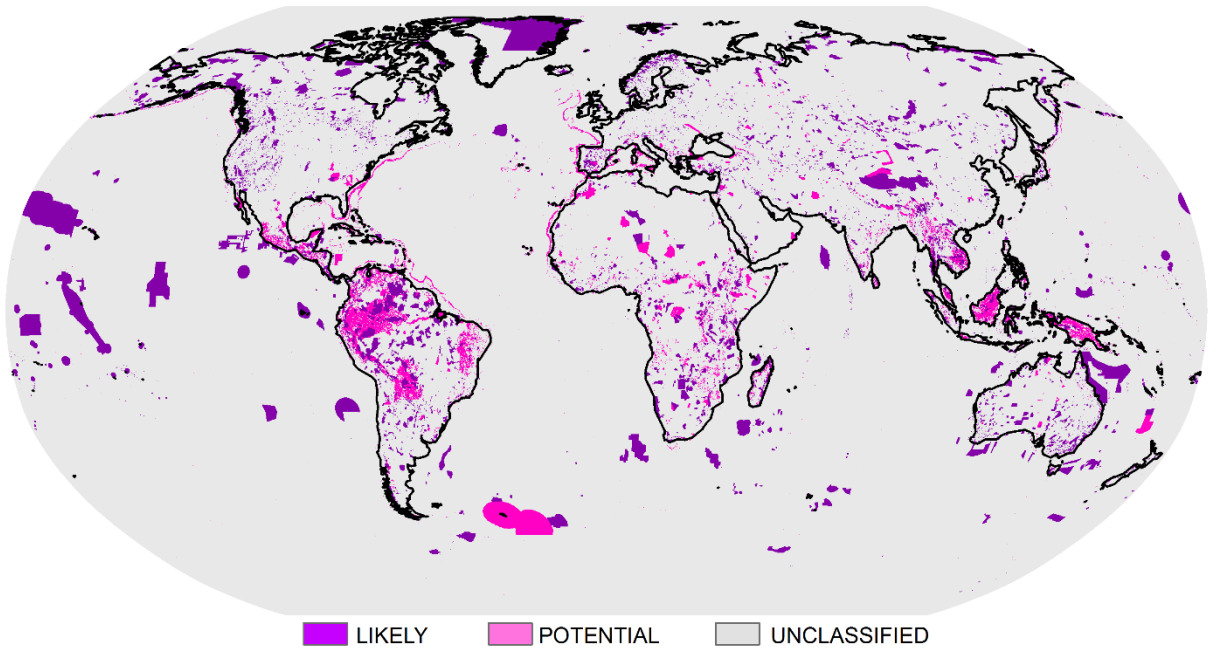
Screening for Critical Habitat

A global screening layer based on the Critical Habitat definition of the International Finance Corporation's Performance Standard 6 (IFC PS6)

Key messages

- A screening layer for Critical Habitat across both terrestrial and marine realms (Fig. 1) has been developed by UNEP-WCMC in consultation with a range of biodiversity experts. This product can support high-level screening for Critical Habitat to inform project development and investment decisions but cannot replace the required on-site assessment needed to confirm the presence of Critical Habitat.
- Areas are classified as 'likely' or 'potential' Critical Habitat depending on the resolution and reliability of the datasets and their alignment with the IFC Performance Standard 6 (PS6) criteria defining Critical Habitat. All other areas are considered 'unclassified' based on the lack of data for assessing the likelihood of Critical Habitat presence.
- The global screening layer draws on 20 global-scale spatial datasets. Of these, 12 datasets support the screening of Critical Habitat in the terrestrial realm, and 15 datasets support screening in the marine realm.
- Of the total terrestrial area, 10% (15 million km²) is classified as 'likely' and 5% (8 million km²) as 'potential' Critical Habitat. Of the total marine area, 3.2% (11 million km²) is classified as 'likely' and 0.7% (3 million km²) is classified as 'potential' Critical Habitat.
- The screening layer is distributed as a 1 x 1 km² raster dataset, available to Proteus Partners for testing. Information on underlying trigger features is recorded within the layer attribute table.
- The screening layer will evolve to include updated versions of existing data layers (e.g. World Database on Protected Areas, IUCN Red List of Threatened Species and World Database of Key Biodiversity Areas) and new data that become available and accessible for this purpose (e.g. Red List of Ecosystems, Ecologically or Biologically Significant Marine Areas, Vulnerable Marine Ecosystems).

Figure 1: Global distribution of *likely* and *potential* Critical Habitat within the Global Critical Habitat screening layer (version 1.0)



Context

The International Finance Corporation Performance Standard 6 (IFC PS6) [1a, 1b] is one of the most influential biodiversity standards of current times, particularly within large-scale infrastructure and the extractive sector. This is demonstrated by Decision XI/7 at the 11th Conference of the Parties of the Convention on Biological Diversity, which "call[ed] upon businesses to consider the revised 2012 International Finance Corporation Performance Standards" [2].

PS6 not only defines the requirements for biodiversity performance of companies financed by the IFC, but also those financed by the 90 Equator Principle Finance Institutions (EPFIs) [3]. IFC's influence is global, with nearly US$19 billion invested across the world in the 2016 Financial Year, while the EPFIs cover over 70 percent of international Project Finance debt in emerging markets [4].

The three objectives of PS6 are:

- *To protect and conserve biodiversity*
- *To maintain the benefits from ecosystem services; and*
- *To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.*

To achieve these objectives, PS6 requires the identification of risks and impacts arising from projects occurring in three types of habitat; 'Modified', 'Natural' and 'Critical'.

Critical Habitats are a subset of Modified or Natural Habitats, representing areas of highest biodiversity value based on five criteria that address habitat of significant importance to threatened, endemic, congregatory and migratory species, threatened or unique ecosystems, and key evolutionary processes (Fig. 1). PS6 requires projects to achieve net gains in the biodiversity values for which the Critical Habitat was identified.

Why develop a screening layer?

Companies applying PS6 must undertake a scoping process to identify risks associated with potential impacts to biodiversity and ecosystem services. This may take the form of "an initial desktop analysis and literature review, including a review of regional studies and assessments, the use of global or regional screening tools such as the Integrated Biodiversity Assessment Tool (IBAT) and field reconnaissance" (GN4). The stages of project development, aligning financial, operational and biodiversity impact mitigation timelines, is laid out in the Cross-Sector Biodiversity Initiative (CSBI) Timeline Toolkit and indicates the screening phase prior to undertaking full environmental impact assessments and developing Biodiversity Action Plans, particularly in the context of mining and oil and gas projects (Fig. 2).

It is in this early, scoping phase that the Critical Habitat screening layer can be used, alongside other information where available, to indicate areas of potential or likely Critical Habitat presence. The Integrated Biodiversity Assessment Tool (IBAT) contains a number of relevant datasets for Critical Habitat assessment, but is not currently tailored for this purpose and does not contain all relevant and available datasets for Critical Habitat screening.

Figure 1. Relationship between Critical, Natural and Modified Habitat defined within IFC PS6.

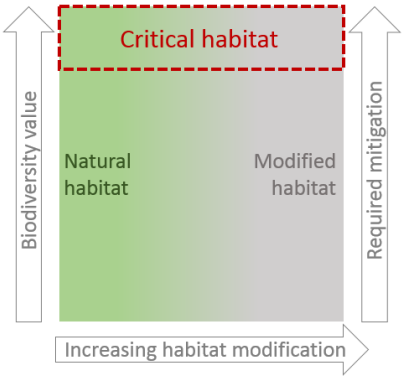
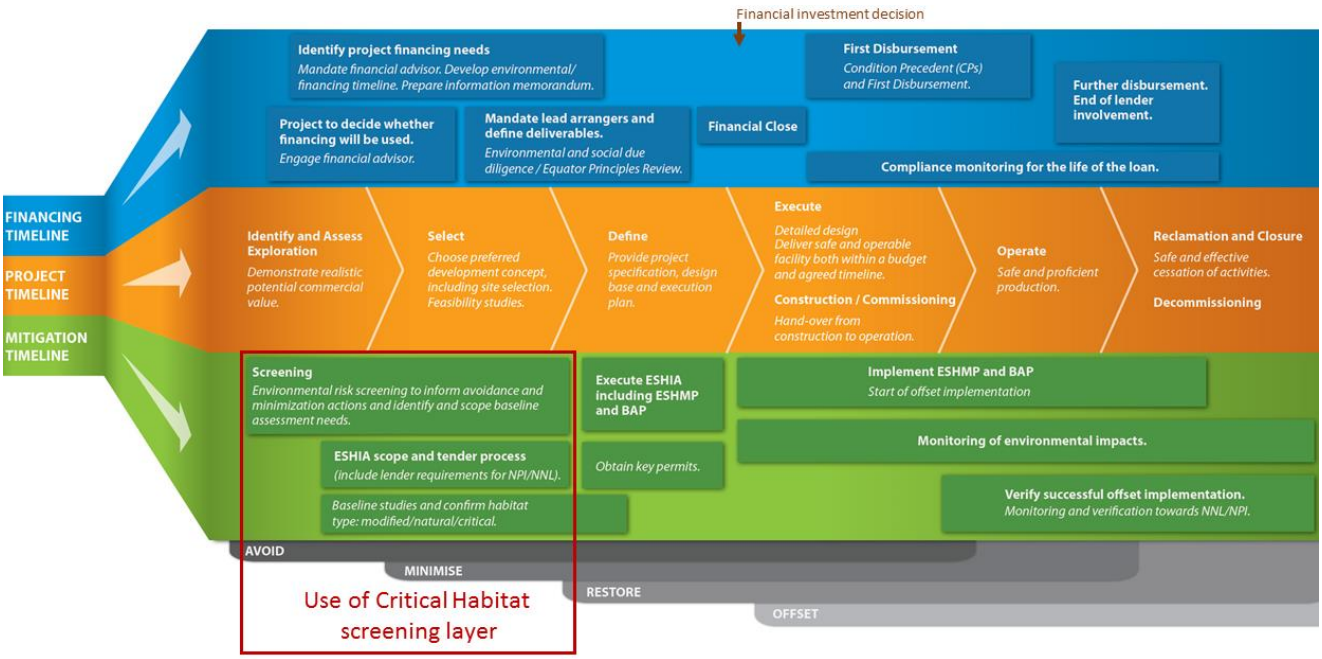


Figure 2. Timeline for project development showing the stage at which the screening layer could be used. Adapted from the Cross-Sector Biodiversity Initiative Timeline Toolkit.

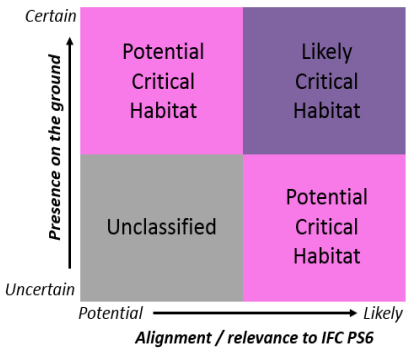


Introducing the Critical Habitat screening layer

Working with a group of biodiversity data experts and consultants with experience in the implementation of IFC PS6, UNEP-WCMC identified datasets that are of direct relevance to one or more of the Critical Habitat criteria and/or the associated Guidance Note text (Box 1). All data used are (i) global in extent; (ii) assembled using a standardised protocol; (iii) the best available data for the biodiversity feature of interest; and (iv) of sufficiently high resolution to indicate presence of biodiversity on the ground at scales relevant to business operations.

Selected datasets were then classified as 'likely' or 'potential' Critical Habitat based on two variables: strength of alignment of the dataset with the Critical Habitat definition, and spatial resolution of the dataset indicating presence of the biodiversity feature on the ground (Fig. 3). Biodiversity features represented by data with strong alignment with one or more Critical Habitat criteria or scenarios and high spatial resolution were classified as likely Critical Habitat. Where alignment with Critical Habitat criteria and scenarios was less strong and/or the spatial resolution of the dataset was coarser, features were mapped as potential Critical Habitat. Areas outside of likely or potential Critical Habitat are recorded as 'Unclassified'. These areas include Critical Habitat for which no suitable global-scale biodiversity data are known to exist, and areas that do not qualify as Critical Habitat based on their biodiversity values.

Figure 3. Critical Habitat was classified as 'Likely' or 'Potential' based on alignment of data with the PS6 definition of Critical Habitat and the spatial resolution of the data. 'Unclassified' areas indicate a lack of data to screen for the presence of the Critical Habitat.



Box 1: Definition of IFC Critical Habitat

IFC PS6 defines Critical Habitat using five key criteria:

- Criterion 1 – Habitat of significant importance to Critically Endangered and/or Endangered species
- Criterion 2 – Habitat of significant importance to endemic and/or range restricted species
- Criterion 3 – Habitat supporting globally significant concentrations of migratory species and/or congregatory species
- Criterion 4 - Highly threatened and/or unique ecosystems
- Criterion 5 – Areas associated with key evolutionary processes

In addition, Critical Habitat may also be triggered by other recognized high biodiversity values, described in detail in the IFC Guidance Note 6 (GN6). These are referred to here as scenarios A and B:

- Scenario A – Other recognised high biodiversity values that might also support a Critical Habitat designation
- Scenario B – Internationally and/or nationally recognised areas of high biodiversity value that in general will likely qualify as Critical Habitat

Composition of the layer

A total of 20 global-scale datasets were used to generate the screening layer. Of these, 12 datasets support the screening of Critical Habitat in the terrestrial realm, and 15 datasets support screening in the marine realm. Some datasets were disaggregated into their subsets if the underlying criteria were known and differed in their alignment to the Critical Habitat definition (Table 1). The layer attributes each grid cell as 'likely' or 'potential' Critical Habitat, or 'unclassified' based on the underlying data.

The methodology for selecting datasets was first described in Martin et al. [5] for the marine realm. As the layer was developed for the terrestrial realm, further consultation became necessary due to the greater number of potential datasets available. This led to slight changes in the methodology, which was subsequently applied to both the marine and terrestrial realms. The data for the marine realm have also been updated to accommodate recent advances.

Interpreting the layer

This screening layer is intended as only one part of a larger scoping exercise to identify biodiversity values at a site that may trigger Critical Habitat. It can support and help direct these more detailed assessments but does not have an official role in the classification of Critical Habitat.

In the process of selecting data for this screening layer, a large number of biodiversity data sets were reviewed. Of those which were rejected for use in the analysis, there are several datasets that could provide important additional context for the review of biodiversity values in an area. A number of these are included in the IBAT tool (e.g. Biodiversity Hotspots, Endemic Bird Areas) as well as the Ocean Data Viewer (e.g. seal and cetacean distribution maps).

Given data limitations, care must be taken when interpreting sites classified as potential or likely Critical Habitat by the screening layer. All global datasets may contain errors of commission (stating a feature occurs when it does not) and errors of omission (stating a feature does not occur when it does), and therefore areas classified as likely or potential Critical Habitat require on-ground validation. Similarly, 'unclassified" areas may include Critical Habitat for which there were no datasets to indicate presence.

The global screening layer for Critical Habitat is an evolving product and will be updated as new and updated datasets become available and accessible for commercial use. For example, the Red List of Threatened Ecosystems being developed by the IUCN, and datasets outlining the locations of Ecologically or Biologically Significant Marine Areas (EBSAs) and Vulnerable Marine Ecosystems (VMEs), could provide important additions to the layer. The process of compiling the data has identified gaps and potential sources where investment is needed or where access rights need to be negotiated. Options will continue to be explored to improve the availability and accessibility of biodiversity data for this purpose.

Critical Habitat screening layer – Frequently asked questions

Do data gaps occur within the screening layer?

Yes. This analysis uses the best available global data that is aligned with the criteria describing IFC's Critical Habitat, however data gaps remain and need to be considered when interpreting screening results.

Data gaps may occur both in terms of:

- Completeness and representativeness of existing datasets (errors of commission / omission)
- Data availability for the different biodiversity values referred to in the Critical Habitat definition. For instance, all criteria are represented in the marine realm, yet important composite datasets on spawning habitats and migratory routes are not yet available for inclusion at the global scale.

It is essential to recognize that the availability of datasets for each criterion does not imply that all biodiversity values which may trigger Critical Habitat are represented.

Are all of the criteria that define Critical Habitat equally represented by the layer?

Data availability varies significantly across criteria, resulting in unequal representation of the individual Critical Habitat criteria. For example, in the terrestrial realm no suitable datasets were identified for criterion 5 (key evolutionary processes). In contrast, Scenario B contributes to over half of the area identified as *likely* Critical Habitat, as suitable global datasets have been identified (e.g. the World Database on Protected Areas, WDPA, provided data on protected areas under IUCN Management Categories I - II).

Can Critical Habitat still be present if an area is unclassified?

Yes. The unclassified areas in the screening layer include locations for which there are no data available to indicate Critical Habitat, and locations which are not Critical Habitat based on the lower biodiversity values present.

Is Critical Habitat more likely in an area triggered by many features in the screening layer?

Yes. For each of the datasets there is a level of uncertainty in triggering Critical Habitat as a result of data inaccuracies. Overlapping features may therefore increase the likelihood of an area being classified as Critical Habitat by diminishing the effect of inaccuracies in any one dataset.

How would results in the screening layer compare to on site results?

This is unknown. To verify how accurate the layer is at predicting the location of Critical Habitat, it would be necessary to analyse the layer using data from on-ground Critical Habitat assessments. This would indicate the relative strengths and weaknesses of the layer and highlight key data priorities in order to improve its reliability.

Are all protected areas included in the layer?

No. Protected areas under IUCN management categories Ia, Ib and II are categorically defined as Critical Habitat within IFC PS6. These are included as likely Critical Habitat within the screening layer.

Protected areas under IUCN management categories III-VI and protected areas whose categories are Not Assigned or Not Reported, may qualify as Critical Habitat if they meet PS6 criteria at the site-level. As a proxy for these sites, the layer includes:

- The top 100 irreplaceable protected areas worldwide [24]
- A subset of protected areas from the WDPA, which overlap with ≥10% of the range of one or more Critically Endangered (CR) or Endangered (EN) species
- A subset of protected areas from the WDPA, which overlap with ≥95% of the range of one or more restricted-range species

Does the layer differentiate tier 1 and tier 2 Critical Habitat?

No. Underlying datasets are not refined enough to determine the tier of Critical Habitat present. IFC PS6 differentiates two levels of Critical Habitat under criteria 1 and 3: Tier 1 and Tier 2. The likelihood of project investment in Tier 1 habitat is significantly lower than in Tier 2 habitat, due to exceptionally high biodiversity values [1b].

IFC PS6 defines the "discrete management unit" (DMU) as its spatial analysis unit. How does the screening layer relate to the DMU?

The DMU is defined as "an area with a definable boundary within which the character of biological communities and/or management issues have more in common with each other than they do with those in adjacent areas". While some of the underlying datasets are based on DMUs (e.g. KBAs and protected areas) these have been dissolved and combined with other datasets to create a raster grid. There will therefore be a variable relationship between DMUs and the screening layer based on the different types of underlying data.

In what spatial data format is the screening layer distributed, and how can it be accessed?

The screening layer is distributed as a raster dataset, with a grid cell size of 1 x 1 km. Information on underlying trigger features is recorded within the layer attribute table. The Data Pack is available to Proteus Partners upon request by contacting businessandbiodiversity@unep-wcmc.org.

Are all underlying datasets available to Proteus Partners?

The majority of underlying datasets are available under the Proteus Partnership, as using these datasets in conjunction with the layer may provide additional information on trigger features. Access for commercial use has not yet been fully negotiated for spatial data on Ever wet tropical forests [20], Tropical dry forests [21], tropical montane cloud forests [22] and Tiger Conservation Landscapes [23].

How can I provide feedback on the layer?

The screening layer is an evolving product. Version 1.0 of the screening layer is distributed for testing by Proteus Partners. Feedback is welcome by email businessandbiodiversity@unep-wcmc.org.

Table 1. Datasets used to develop the global Critical Habitat screening layer (adapted from Martin et al. [5])

Biodiversity feature	Data source	Designation criterion / Trigger	IFC PS6 criteria / scenario							Classification
			1	2	3	4	5	A	B	
Key Biodiversity Areas (KBAs)	[6]	Vulnerability criterion for CR species	L							Likely
		Vulnerability criterion for EN species	L							Likely
		Irreplaceability criterion, sub-criterion a		L						Likely
		Irreplaceability criterion, sub-criteria b, c and d			L					Likely
		Irreplaceability criterion, sub-criterion e				P				Potential
Alliance for Zero Extinction sites (AZEs)	[6]	All sites	L	L	L					Likely
Important Bird and Biodiversity Areas (IBAs)	[6]	Criterion A1 for CR species	L							Likely
		Criterion A1 for EN species	L							Likely
		Criterion A2		P						Potential
		Criterion A4			L					Likely
		Criterion A3				P				Potential
		CR and EN species which occupy 10 or fewer sites	L							Likely
Protected areas	[7]	IUCN management categories Ia, Ib, II							L	Likely
		Natural and mixed World Heritage sites							L	Likely
		Ramsar sites designated under criteria 1, 3				L				Likely
		Ramsar sites designated under criterion 2	L							Likely
		Ramsar sites designated under criteria 5, 6			L					Likely
		Ramsar sites designated under criteria 4, 7, 8, 9			P					Potential
		All Ramsar sites							L	Likely
	[24]	Irreplaceable protected areas							L	Likely
	[7, 8]	Protected Areas overlapping with ≥10% of the global range of a CR or EN species	P							Potential
	[7, 8]	Protected Areas overlapping with ≥95% of the global range of endemic or restricted-range species (range < 50,000 km^2)		P						Potential
Tiger Conservation Landscapes (T)	[23]	Source sites	L							Likely
		Potential source sites	P							Potential
Distributions of Threatened species	[8]	CR species qualifying under IUCN Red List criterion D	L							Likely
		EN species qualifying under IUCN Red List criterion D	P							Potential
		VU species qualifying under IUCN Red List criterion D2		P						Potential
Sea Turtle Nesting Sites	[12]	CR species	L							Likely
		EN species	L							Likely
		All species			P	P				Potential
Hydrothermal vents (M)	[17]	Active and confirmed vents.		L			L	L	P	Likely
Cold seeps (M)	[18]			P		L	L	L	P	Likely
Mangroves (M)	[14]					L				Likely
Saltmarshes (M)	[15]					L				Likely
Seagrass beds (M)	[16]					L				Likely
Warm-water coral reefs (M)	[13]					L	L	L	P	Likely
Cold-water corals (M)	[9]	Stony corals (observed, polygon)				L		L	P	Likely
	[10]	Stony corals (modelled, raster, probability >90%)				P		P	P	Potential
	[9, 11]	Soft corals (observed, polygon)				P		P	P	Potential
	[11]	Soft corals (modelled, raster, probability >90%)				P		P	P	Potential
Seamounts (M)	[19]					P		P	P	Potential
Ever wet tropical forests (T)	[20]					P				Potential
Tropical dry forests (T)	[21]					P				Potential
Tropical montane cloud forests (T)	[22]					P				Potential

(M) , (T) : Biodiversity feature limited to marine (M) or terrestrial (T) realm

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