Screening for Natural and Modified Habitat

A global screening layer aligned with the International Finance Corporation's Performance Standard 6 (IFC PS6) definitions of Natural and Modified Habitat

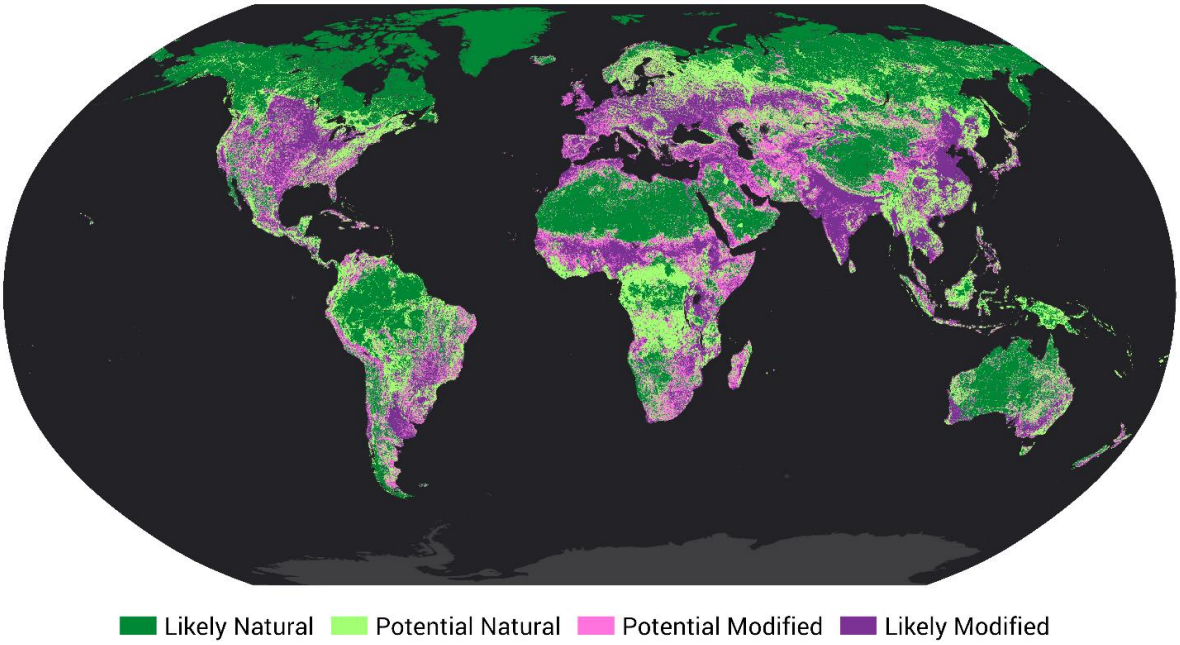


Figure 1: Global screening layer for Natural and Modified Habitat within the terrestrial realm. Source: Gosling *et al.* (2020).

Key messages

Pre-emptive and precautionary actions in regulatory and management institutions and businesses have been identified as one of five key interventions to tackle the drivers of the deteriorating state of nature by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment Report on Biodiversity and Ecosystem Services (2019). The International Finance Corporation's Performance Standard 6 (IFC PS6) on Biodiversity Conservation and Sustainable Management of Living Natural Resources is one tool that can be used to help achieve these interventions.

A core element of IFC PS6 is the need to consider "natural and modified habitat" within investment screening processes. UNEP-WCMC, along with partners, have produced a global screening layer for terrestrial Natural and Modified Habitat (Figure 1). Areas are classified as "*likely*" or "*potential*" Natural or Modified Habitat, depending on the accuracy of the datasets and how well they align with the definitions of Natural and Modified Habitat in IFC PS6.

Of the global terrestrial area 36.7% is classified as *likely* Natural Habitat, 24.9% as *potential* Natural Habitat, 16.6% as *potential* Modified Habitat, and 21.8% as *likely* Modified Habitat. This screening layer is intended to be used alongside other data as part of screening and scoping exercises, and should be validated on-ground as appropriate.

Introduction

One of the five key interventions proposed by the recent global assessment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) was "taking pre-emptive and precautionary actions in regulatory and management institutions and businesses to avoid, mitigate and remedy the deterioration of nature, and monitoring their outcomes"[1]. Performance standards are one tool that can be used by businesses and the institutions that finance their activities to support these actions.

One highly influential and widely adopted performance standard is the International Finance Corporation's Performance Standard 6 (IFC PS6)[2]. IFC PS6 defines the biodiversity performance required of companies financed by the IFC. IFC PS6 also underpins aspects of the Equator Principles, which are adopted by 105 financial institutions[3].

IFC's influence is global, with US$19.1 billion invested in the 2019 Financial Year[4]. In addition, Equator Principle Financial Institutions (EPFIs) cover "the majority of international project finance debt within developed and emerging markets"[5].

IFC PS6 has three main objectives that it recognises are fundamental to sustainable development:

- Protecting and conserving biodiversity.
- Maintaining the benefits from ecosystem services.
- Promoting the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

To achieve these objectives, IFC PS6 requires projects to identify risks and impacts to Natural Habitat, Modified Habitat and Critical Habitat, with Critical Habitat being a subset of Modified and Natural Habitats (see Box 1).

Global screening layers for Critical Habitat across the terrestrial[6] and marine[7] realms have already been produced and are used by businesses at early assessment stages of projects. However, there was no global layer for identifying Natural and Modified Habitats.

This briefing note outlines a new global screening layer for Natural and Modified Habitat in the terrestrial realm[8]. It was produced by UNEP-WCMC in collaboration with several external partners.

Why develop a screening layer?

Companies applying IFC PS6 must undertake a scoping process to identify potential issues relating to biodiversity and ecosystem services. This scoping "may take the form of an initial desktop analysis and literature review, including a review of regional studies and assessments, and the use of global or regional screening tools, such as the Integrated Biodiversity Assessment Tool (IBAT)"[2]. It is in this early stage where a screening layer for Natural and Modified Habitat can be used to indicate the presence of *likely* and *potential* Natural and Modified Habitat.

Box 1: IFC PS6 habitat definitions[2]

Natural Habitat: "areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition."

Modified Habitat: "areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition."

Critical Habitat: "areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes." Critical Habitats are a subset of Natural and Modified Habitats, with both Natural and Modified Habitat also able to be classified as Critical Habitat.

Introducing the screening layer

Data selection

Relevant spatial datasets were identified through consultation with biodiversity mapping experts in and outside UNEP-WCMC. All datasets:

- Were global in extent.
- Used data regarded as sufficiently recent to inform current and future policy (i.e. from the past ten years)[9].
- Represented the best available/most up to date data for the feature of interest.
- Were available for use by the private sector.

Data classification

Selected datasets were then classified as supporting screening for either *'likely'* or '*potential*' Natural Habitat or '*likely*' or '*potential*' Modified Habitat based on two variables:

- Alignment to the IFC PS6 definitions of Natural and Modified Habitat.
- Spatial resolution of the dataset indicating presence on the ground (Figure 2).

Datasets with features that aligned strongly with the IFC PS6 definitions of Natural and Modified Habitat and had a high spatial resolution (<= 1km or vector data) were classified as supporting screening for *likely* Natural and Modified Habitat. Datasets with features that aligned strongly with the IFC PS6 definitions of Natural and Modified Habitats but had a lower spatial resolution (>1km) or vice versa were classified as supporting screening for *potential* Natural and Modified Habitat. Where alignment of features to the definitions of Natural and Modified Habitats was weak and spatial resolution was lower, datasets were not included. Selected datasets are shown in Annex 1.

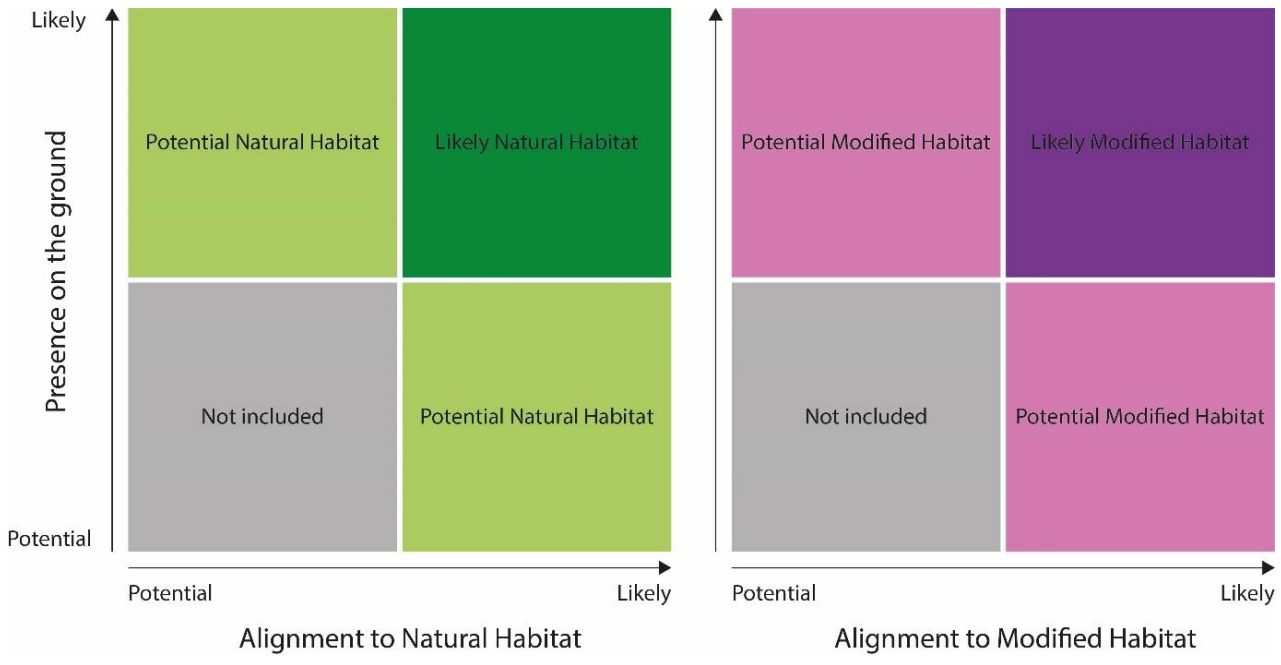
Filling the gaps

The datasets selected include the most up to date data available that also align with the IFC PS6 definitions of Natural and Modified Habitat. However, they do not cover the whole land surface. Once combined, the datasets selected covered 62.5% of the global land surface (not including Antarctica). Instead of leaving the remaining areas as 'unknown', they were filled in using a categorised version of the updated Human Footprint Layer[10]. The Human Footprint Layer is a cumulative pressure map which scores and sums a variety of human pressures per grid cell[10].

Composition of the layer

A total of 11 global datasets (five relating to Natural Habitats and six to Modified Habitats) plus the Human Footprint Layer were used to produce the screening layer (Annex 1).

Figure 2: Classification of datasets as *likely* or *potential* Natural or Modified Habitat was based on the strength of alignment with IFC PS6 definitions and the accuracy on the ground (i.e. the spatial resolution)



Of the total global terrestrial area (excluding Antarctica and waterbodies):

- 36.7% is classified as *likely* Natural Habitat;
- 24.9% is classified as *potential* Natural Habitat;
- 16.6% is classified as *potential* Modified Habitat; and
- 21.8% is classified as *likely* Modified Habitat.

This means that there is the possibility that 61.6% of the global terrestrial habitat remains in a natural state according to the interpretation within IFC PS6.

The findings of the IBPES Global Assessment stated that 75% of the terrestrial environment has been altered by human actions[1]. The difference between these figures is accounted for by the definition of Natural within the IFC PS6 guidance, which allows for some human intervention.

Validating the screening layer

The screening layer was validated using existing global validation points which are randomly distributed across the globe. These validation points were produced by visually interpreting human pressures in 3114 plots of 1km^2 using high-resolution satellite imagery and assigning each plot a visual pressure score. We classified low scores as Natural Habitat and high scores as Modified Habitat, using the same thresholds as other similar analyses[10, 11].

This validation resulted in an overall accuracy of 77% (the percentage of validation points that were correctly classified). The validation of plots in areas of *likely* Natural Habitat and *likely* Modified Habitat indicated 90% accuracy. Classification of *potential* Natural Habitat and *potential* Modified Habitat was accurate for 60% of the plots. This indicates that the *likely* Natural and *likely* Modified categories are highly accurate, and the *potential* categories are less so. This is what was expected as the data underlying the *likely* categories were selected (in part) because of their higher spatial accuracy.

Using the screening layer

Main use cases

The layer is designed to support five main use cases:

- Compliance with IFC PS6, in particular augmenting the existing Critical Habitat screening layer to provide a more holistic and complete early screening of projects and investment opportunities at the landscape scale.
- Decisions on the location of new operations for companies who are not in receipt of funding from IFC or EPFI but are looking to adopt an international good practice approach.
- Portfolio-level analysis of existing operations by companies or financial institutions to understand the scale of their presence in Natural or Modified Habitats.
- Supply chain analysis of sourcing regions to understand indirect impact on Natural and Modified Habitat.
- Supporting action by businesses to protect and enhance existing biodiversity values and to contribute to appropriate habitat restoration.

Using in combination with the Critical Habitat Layer

The layer is designed to be used alongside the Critical Habitat Layer[6]. A similar data classification scheme was used, and the global layers are produced at the same spatial resolution. Using the layers together will help provide insights into both the state and value of habitat present.

Limitations of the screening layer

The screening layer may overestimate the amount of remaining Natural Habitat for two reasons. The first is that a precautionary approach was taken when classifying areas as Natural or Modified Habitat. Where there was disagreement between datasets used to indicate Natural or Modified Habitat for a given area, the area was categorised as *likely* or *potential* Natural Habitat.

The second is that not all aspects of human modification could be included due to data limitations. One example of this is hunting, which is a major cause of biodiversity loss[12]. Hunting has large impacts on the ecological function and species composition of habitats, but there is no global data available on it.

However, even where areas are subject to such human activities, they may still contain biodiversity values that would meet the

definition of Natural Habitat according to IFC PS6.

In reality, naturalness is a continuum, with very few habitats on earth existing in a completely natural state. IFC PS6 guidance states that "natural habitats are not to be interpreted as untouched or pristine habitats. It is likely that the majority of habitats designated as natural will have undergone some degree of historical or recent anthropogenic impact"[2].

Conclusions

Natural and Modified Habitat is an important component of IFC PS6, but until now there has been no global dataset to identify these habitat states. This new screening layer, produced by UNEP-WCMC, will now enable Proteus Partners to identify areas of Natural and Modified Habitat in the early stages of projects.

It is vital that companies have the most up to date data available for accurate decision making. The Natural and Modified Habitats screening layer is easily adapted to include updated and additional datasets, as well as producing outputs at higher resolutions. This means the screening layer can continue evolving as new data becomes available, allowing it to stay up to date.

This layer can be used, in combination with the Critical Habitat Screening Layer and other datasets, in the early screening stages of projects. Using these layers together or individually does not remove the need for more detailed ground surveys at a site level.

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Annex 1: Datasets used in the Natural and Modified Habitat screening layer

Classification of datasets included in the Natural and Modified Habitat screening layer, including a justification of how they align with the IFC PS6 definition of Natural or Modified Habitat. The overall classification of the dataset is shown in the far-left column. The Human Footprint Layer is not included in the table as it covers all categories.

				Accuracy		Alignment	
	Dataset	Reference	Year	Spatial resolution	Accuracy classification	Justification	Alignment Classification
Likely Natural	Terrestrial wilderness	13	2009	Polygon	Likely	They are defined as "areas free of industrial scale activities and other human pressures which result in significant biophysical disturbance, are important for biodiversity conservation and sustaining the key ecological processes" [13].	Likely
Likely Natural	Intact forest landscapes	14	2016	Polygon	Likely	They are defined as "a seamless mosaic of forests and associated natural treeless ecosystems that exhibit no remotely detected signs of human activity or habitat fragmentation and are large enough to maintain all native biological diversity, including viable populations of wide-ranging species" [15].	Likely
Potential Natural	Global Distribution of Saltmarshes	16	1973 - 2015	Polygon	Likely	This dataset displays the extent of saltmarshes globally, however the presence of saltmarsh does not necessarily mean that it is in a natural state. For this reason it has been classified as *potential* Natural.	Potential
Potential Natural	Global Mangrove Watch	17	2016	Polygon	Likely	This dataset displays the extent of mangroves globally, however the presence of mangrove does not necessarily mean that it is in a natural state. For this reason it has been classified as *potential* Natural.	Potential
Potential Natural	Hansen Global Forest Change* with plantations removed	18, 19	2018	30m	Likely	Tree cover in 2018 with plantations removed results in a *potential* natural tree cover layer. However, some areas may be secondary forest or modified in other ways which is why it has	Potential

* The Hansen Global Forest Change forest loss and current forest extent layers were considered separate datasets for the purposes of this work.

				Accuracy		Alignment	
	Dataset	Reference	Year	Spatial resolution	Accuracy classification	Justification	Alignment Classification
						been classified as *potential* Natural.	
Likely Modified	Copernicus global land cover (built and cropland cells)	20	2015	100m	Likely	Built-up areas and croplands are some of the most heavily modified landscapes on the planet.	Likely
	GRIP (Global Roads Inventory Project) major roads	21	1997-2015	Polyline	Likely	Roads are a large driver of habitat conversion and fragmentation, mortality, and also provide access for hunting and other nature uses [22–24]	Likely
	Hansen Global Forest Change* (forest loss)	18	2018	30m	Likely	Forest loss has major impacts on wildlife, hydrology and climate [25].	Likely
	OpenStreetMap quarries	26	2019	Polyline	Likely	Mining inevitably leads to habitat modification and biodiversity loss on the site and surrounding area [27]	Likely
Potential Modified	GRIP (Global Roads Inventory Project) minor roads	21	1997-2015	Polyline	Likely	Minor roads may have less of an impact in terms of mortality and fragmentation, but can still cause considerable modification [24, 28].	Potential
	DMSP OLS: Nighttime Lights Time Series Version 4	29	2014	30 arc seconds	Likely	As well as built environments, night-time lights also depict human infrastructure in rural and suburban areas which may cause considerable modification to habitats [10].	Potential
	OpenStreetMap railways	26	2019	Polyline	Likely	Railways can cause habitat modification and fragmentation, but their impacts differ from those of roads. Passengers rarely disembark in places other than rail stations, meaning they do not provide access to the habitat they cross [10].	Potential

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