Convention on Biological Diversity

UNDP

Aichi Biodiversity Target 11 Country Dossier: MYANMAR

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GLOSSARY

AZEs	Alliance for Zero Extinction sites
CEPF	Critical Ecosystem Partnership Fund
EBSA	Ecologically or Biologically Significant Marine Area
EEZ	Exclusive Economic Zone
GCF	Green Climate Fund
GD-PAME	Global Database on Protected Area Management Effectiveness
GEF	Global Environment Facility
IBA	Important Bird and Biodiversity Area
ICCAs	Indigenous and Community Conserved Area Area (may also be referred to as territories and areas conserved by Indigenous peoples and local communities or "territories of life")
IPLC	Indigenous Peoples and Local Communities
KBA	Key Biodiversity Area
MEOW	Marine Ecosystems of the World
MPA	Marine Protected Area
NBSAP	National Biodiversity Strategy and Action Plan
OECM	Other Effective Area-Based Conservation Measures
PA	Protected Area
PAME	Protected Area Management Effectiveness
PPA	Privately Protected Area
PPOW	Pelagic Provinces of the World
ProtConn	Protected Connected land indicator
SOC	Soil Organic Carbon
TEOW	Terrestrial Ecosystems of the World
WDPA	World Database on Protected Areas
WD-OECM	World Database on Other Effective Area-Based Conservation Measures

Disclaimer

The designations employed and the presentation of material in this dossier do not imply the expression of any opinion whatsoever on the part of the Secretariat of the Convention on Biological Diversity (SCBD) or United Nations Development Programme (UNDP) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The information contained in this publication do not necessarily represent those of the SCBD or UNDP.

This country dossier is compiled by the UNDP and SCBD from publicly available information. It is prepared, within the overall work of the Global Partnership on Aichi Biodiversity Target 11, for the purpose of attracting the attention of the Party concerned and other national stakeholders to facilitate the verification, correcting, and updating of country data. The statistics might differ from those reported officially by the country due to differences in methodologies and datasets used to assess protected area coverage and differences in the base maps used to measure terrestrial and marine area of a country or territory. Furthermore, the suggestions from the UNDP and SCBD are based on analyses of global datasets, which may not necessarily be representative of national policy or criteria used at the national level. The analyses are also subject to the limits inherent in global indicators (precision, reliability, underlying assumptions, etc.). Therefore, they provide useful information but cannot replace analyses at a national level nor constitute a future benchmark for national policy or decision-making.

The preparation of this dossier was generously supported by: the Government of the Federal Republic of Germany, *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GMbH*; the European Commission; the Government of the United Kingdom of Great Britain and Northern Ireland; and the Government of Japan (Japan Biodiversity Fund). The dossier does not necessarily reflect their views.

EXECUTIVE SUMMARY

This document provides information on the coverage of protected areas (PAs) and other effective area-based conservation measures (OECMs), as currently reported in global databases (the World Database on Protected Areas (WDPA) and World Database on Other Effective Area-Based Conservation Measures (WD-OECM)). It also includes details on the status of the other qualifying elements of Aichi Biodiversity Target 11 based on this data. These statistics might differ from those reported officially by countries due to difference in methodologies and datasets used to assess protected area coverage, differences in the base maps used to measure terrestrial and marine area of a country or territory, or if global datasets differ from the criteria and indicators used at the national level. Where available, data from national statistics for the elements of Target 11 are included alongside records from these global databases. This dossier also provides a summary of commitments made under Aichi Biodiversity Target 11, and a summary of potential opportunities regarding elements of the target for future planning.

The dossier has been developed in consultation with the UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), which manages the WDPA, WD-OECM and Global Database on Protected Area Management Effectiveness (GD-PAME). Parties to the CBD are requested to contact protectedareas@unep-wcmc.org with any updates to the information in these databases.

Aichi Biodiversity Target 11 Elements: Current status and opportunities for action

Coverage - Terrestrial & Marine

- **Status:** as of May 2021 (per the WDPA), terrestrial coverage in Myanmar is 44,289.0 km^2 (6.6%) and marine coverage is 2,456.8 km^2 (0.5%); according to national records, as of July 2021, terrestrial coverage is 40,764.71 km^2 (6.02%), and marine cover is 391.26 km^2 (0.06%).

- **Opportunities for action:** opportunities for the near-term include updating the WDPA with any unreported PAs, and the recognizing and reporting OECMs to the WD-OECM. In the future, focus on relatively intact areas, while addressing the elements in the following sections, could be considered when planning new PAs or OECMs.

Ecological Representativeness– Terrestrial & Marine

- **Status:** Myanmar has identified 64 ecosystem types in the country, of which 29 are considered as threatened; all threatened or near threatened ecosystems fall inside protected areas. Based on global ecoregions, Myanmar contains 20 terrestrial ecoregions, 3 marine ecoregions, and 1 pelagic province: the mean coverage by reported PAs and OECMs is 16.8% (terrestrial), 0.8% (marine), and 0.0% (pelagic); 4 terrestrial ecoregions, 1 marine ecoregion, and 1 pelagic province have no

coverage by reported PAs and OECMs (though 3 of these terrestrial ecoregions cove <0.1% of the country).

- **Opportunities for action:** there is opportunity for Myanmar to update information on ecosystem types in the country, and increase protected area coverage, where necessary. There is also opportunity increase protection in global ecoregions that have lower levels of coverage by PAs or OECMs. Ecoregions which currently have no coverage by PAs or OECMs are key areas for action.

Areas Important for Biodiversity

- **Status:** Myanmar has 122 Key Biodiversity Areas (KBAs): the mean protected coverage of KBAs by reported PAs and OECMs is 25.1%, while 78 KBAs have no coverage by reported PAs and OECMs.

- **Opportunities for action:** there is opportunity for Myanmar to update and revise the list of KBAs in Myanmar. There is also opportunity to increase protection of KBAs that have lower levels of coverage by PAs and OECMs; priority could be given to those with no current coverage.

Areas Important for Ecosystem Services

- **Status:** coverage of areas important for ecosystem services: In Myanmar, 10.3% of aboveground biomass carbon, 9.2% of belowground biomass carbon, 7.2% of soil organic carbon, 0.5% of carbon stored in marine sediments is covered by PAs and OECMs.

- **Opportunities for action:** for carbon, there is opportunity for Myanmar to increase PA and OECM coverage in both marine and terrestrial areas with high carbon stocks. Protecting areas with high carbon stocks secures the benefits of carbon sequestration in the area.

- For water, there is opportunity to increase the area of the water catchment under protection by PAs and OECMs, or in cases where there is high levels of protection, focus on effective management for these areas. Protecting the current area of forested land and potentially reforesting would have benefits for improving water security.

Connectivity and Integration

- **Status:** coverage of protected-connected lands is 4.3%. Since 2014, a total of 14 conservation corridors were identified in Myanmar, based on landscape maintaining connectivity between two or more KBAs

- **Opportunities for action:** there is opportunity for a general increase of PAs or OECMs and to focus on PA and OECM management for enhancing and maintaining connectivity. Improving connectivity increases the effectiveness of PAs and OECMs and reduces the impacts of fragmentation.

- As well, a range of suggested steps for enhancing and supporting integration are included in the voluntary guidance on the integration of PAs and OECMs into the

wider land- and seascapes and mainstreaming across sectors to contribute, inter alia, to the SDGs (Annex I of COP Decision 14/8).

Governance Diversity

- **Status:** the most common governance type(s) for reported PAs in Myanmar is: 84.9% under Government (Federal or national ministry or agency). The Conservation of Biodiversity and Protected Areas Law was updated in 2018, which provides legal provisions for co-management as well as community-management mechanism. So far, four protected areas have been proposed under the category of Community Conserved Protected Area.

- **Opportunities for action:** explore opportunities for governance types that have lower representation, for Myanmar this relates to governance by Indigenous Peoples and/or local communities (IPLC), shared governance, etc. Increase efforts to identify the governance types for the 11.3% of sites that do not have their governance type reported.

- There is also opportunity for Myanmar to complete governance and equity assessments, to establish baselines and identify relevant actions for improvement. As well, a range of suggested actions are included in the voluntary guidance on effective governance models for management of protected areas, including equity (Annex II of COP Decision 14/8).

Protected Area Management Effectiveness

- **Status:** 5.6% of terrestrial PAs and 72.2% of marine PAs have completed Protected Area Management Effectiveness (PAME) assessments reported.

- **Opportunities for action:** there is opportunity to report all complete protected area management effectiveness (PAME) evaluations in the GD-PAME. If the 60% targets for completed management effectiveness assessments (per COP Decision X/31) have not been met for terrestrial or marine PAs, there is opportunity to increase PAME evaluations to achieve the target.

- There is also opportunity to implement the results of completed PAME evaluations, to improve the quality of management for existing PAs and OECMs (e.g. through adaptive management and information sharing, increasing the number of sites reporting 'sound management') and to increase reporting of biodiversity outcomes in PAs and OECMs.

INTRODUCTION

The Strategic Plan for Biodiversity 2011-2020 was adopted at the tenth meeting of the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) held in Nagoya, Aichi Prefecture, Japan from 18-29 October 2010. The vision of the Strategic Plan is one of "Living in harmony with nature" where *"By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people"* (CBD, 2010). In addition to this vision, the Strategic Plan is composed of 20 targets, under five strategic goals. Aichi Biodiversity Target 11 states that *"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."*

With the conclusion of the Aichi Biodiversity Targets in 2020, Target 11 on area-based conservation has seen success in the expansion of the global network of protected areas (PA) and other effective area-based conservation measures (OECMs). The negotiation of the post-2020 Global Biodiversity Framework (GBF) and its future targets provide an essential opportunity to further improve the coverage of PAs and OECMs, to improve other aspects of area-based conservation, to accelerate progress on biodiversity conservation more broadly, while also addressing climate change, and the Sustainable Development Goals. This next set of global biodiversity targets are to be adopted at the fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity. These new targets must aim to build upon lessons learned from the last decade of progress to deliver transformative change for the benefit of nature and people, to realize the 2050 Vision for biodiversity.

The United Nations Development Programme (UNDP) and the Secretariat of the Convention on Biological Diversity have developed the Aichi Biodiversity Target 11 Country Dossiers, which provide countries with an overview of the status of Target 11 elements, opportunities for action, and a summary of commitments made by Parties over the last decade. Each dossier can support countries in assessing their progress on key elements of Aichi Biodiversity Target 11 and identifying opportunities to prioritize new protected areas and OECMs.

This dossier provides an overview of area-based conservation in Myanmar. Section I of the dossier presents data on the current status of Myanmar's PAs and OECMs. The data presented in Section I relates to each element of Target 11. Section I also presents the PA and OECM coverage for two critical ecosystem services: water security and carbon stocks. In addition, the dossier presents potential opportunities for action for Myanmar, in relation to each Target 11 element. The analyses present options for improving Myanmar's area-based conservation network to achieve enhanced protection and benefits for livelihoods and climate change. Section II presents details on Myanmar's existing PA and OECM commitments as a summary of existing efforts towards achieving Target 11. This gives focus not only to national policy and actions but also voluntary commitments to the UN.

Furthermore, where data is available, this dossier provides information on potential OECMs, Indigenous and Community Conserved Areas (ICCAs; also, often referred to as territories and areas conserved by Indigenous peoples and local communities or "territories of life") and Privately Protected Areas (PPAs) and the potential contribution they will have in achieving the post-2020 targets.

The information on PAs and OECMs presented here is derived from the World Database on Protected Areas (WDPA) and World Database on Other Effective Area-Based Conservation Measures (WD-OECM). These databases are joint products of UNEP and IUCN, managed by UNEP-WCMC, and can be viewed and downloaded at www.protectedplanet.net. Parties are encouraged to provide data on their PAs and OECMs to UNEP-WCMC for incorporation into the databases (see e.g., Decisions 10/31 and 14/8). The significant efforts of Parties in updating their data in the build up to the publication of the Protected Planet Report 2020 (UNEP-WCMC and IUCN, 2021) were greatly appreciated. UNEP-WCMC welcomes further updates, following the data standards described here (www.wcmc.io/WDPA_Manual), and these should be directed to protectedareas@unep-wcmc.org. The statistics presented in this dossier are derived from the May 2021 WDPA and WD-OECM releases, unless explicitly stated otherwise. Readers should consult www.protectedplanet.net for the latest coverage statistics (updated monthly).

Some data from the WDPA and WD-OECM are not made publicly available at the request of the data-provider. This affects some statistics, maps, and figures presented in this dossier. Statistics provided by UNEP-WCMC (terrestrial and marine coverage) are based upon the full dataset, including restricted data. All other statistics, maps, and figures are based upon the subset of the data that is publicly available.

Where data is less readily available, such as for potential OECMs, ICCAs and PPAs, data has also been compiled from published reports and scientific literature to provide greater awareness of these less commonly recorded aspects. These data are provided to highlight the need for comprehensive reporting on these areas to the WDPA and/or WD-OECM. Parties are invited to work with indigenous peoples, local communities and private actors to submit data under the governance of these actors, with their consent, to the WDPA and/or WD-OECM.

Overall, PAs and OECMs are essential instruments for biodiversity conservation and to sustain essential ecosystem services that support human well-being and sustainable development, including food, medicine, and water security, as well as climate change mitigation and adaptation and disaster risk reduction. The data in this dossier, therefore, aims to celebrate the current contributions of PAs and OECMs, whilst the gaps presented hope to encourage greater progress, not just for the benefit of biodiversity and the post-2020 GBF, but also to recognize the essential role of PAs and OECMs to the Sustainable Development Goals and for addressing the climate crisis.

SECTION I: CURRENT STATUS

Aichi Biodiversity Target 11 refers to both protected areas (PAs) and other effective area-based conservation measures (OECMs). This section provides the current status for all elements of Aichi Biodiversity Target 11 where indicators with global data are available. Statistics for all elements are presented using data on both PAs and OECMs (where this data is available and reported in global databases like the WDPA and WD-OECM). It is recognized that statistics reported in the WPDA and WD-OECM might differ from those reported officially by countries due to differences in methodologies and datasets used to assess protected area coverage and differences in the base maps used to measure terrestrial and marine area of a country or territory. Details on UNEP-WCMC's methods for calculating PA and OECM coverage area available here. The global indicators adopted here for presenting the status of other elements of Target 11 may also differ from those in use nationally. Where available, results from national reporting are also included.

COVERAGE - TERRESTRIAL & MARINE

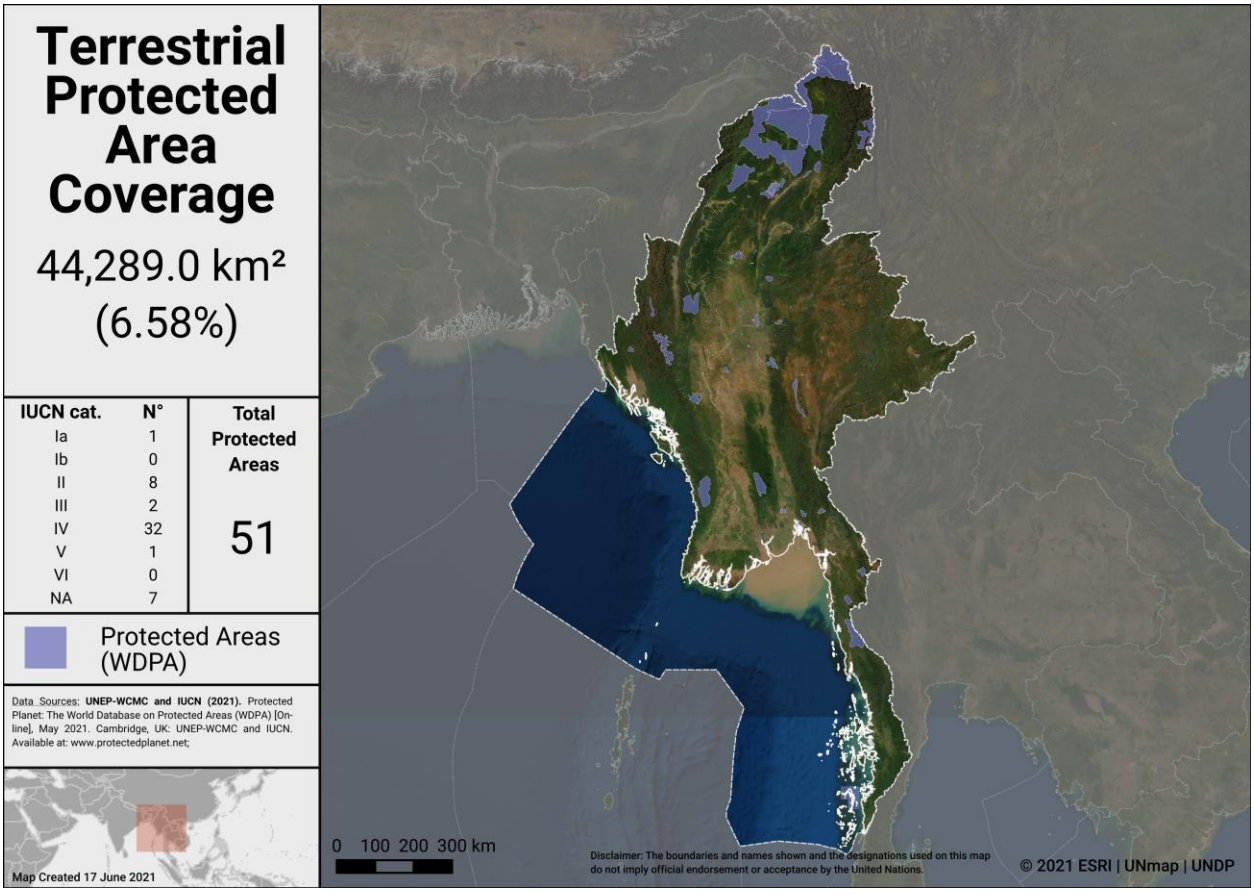
As of May 2021, Myanmar has **53** protected areas reported in the World Database on Protected Areas (WDPA). 2 UNESCO-MAB Biosphere Reserves are not included in the following statistics (see details on UNWP-WCMC's methods for calculating PA and OECM coverage **here**).

As of May 2021, Myanmar has **0** OECMs reported in the world database on OECMs (WD-OECM).

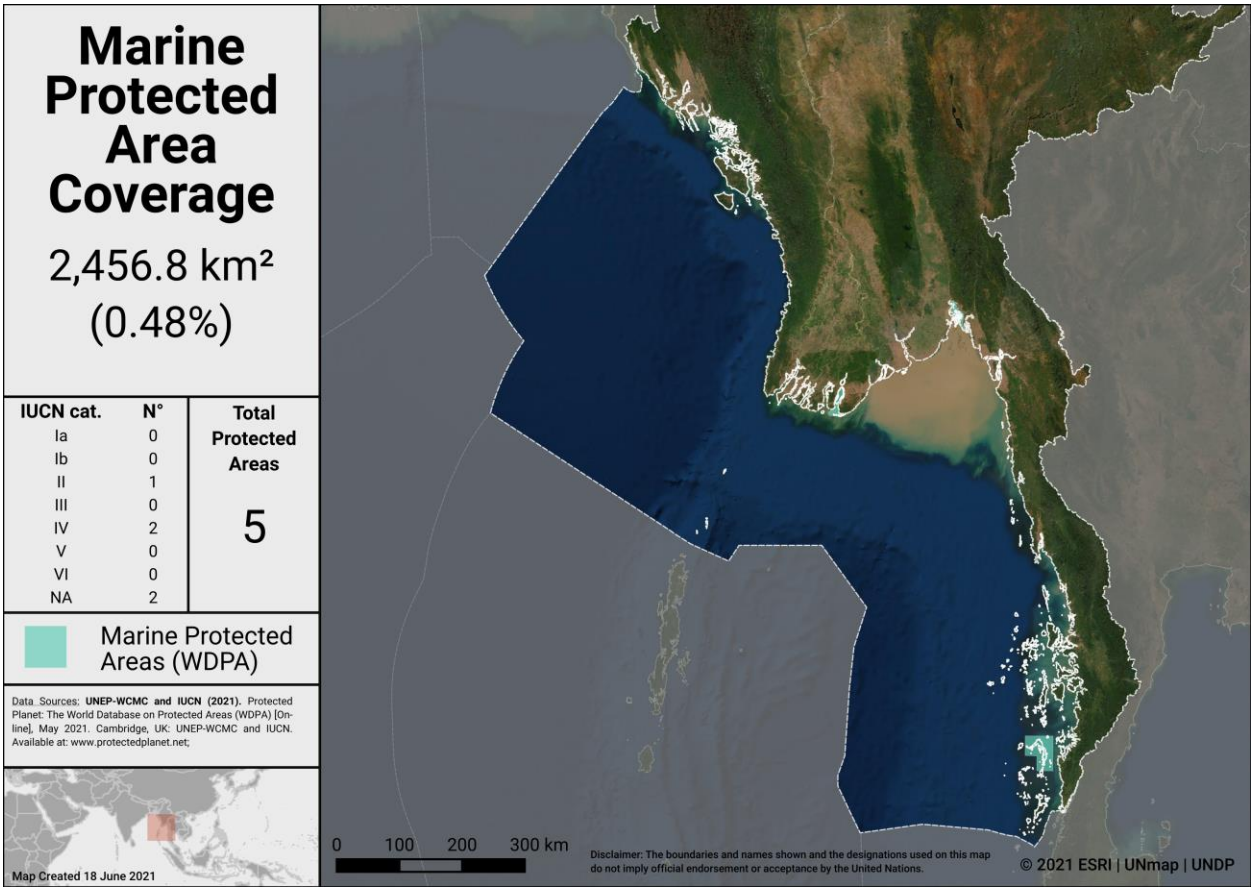
Current coverage for Myanmar (per the WDPA):

- 6.6% terrestrial (51 protected areas, 44,289.0 km^2)
- 0.5% marine (5 protected areas, 2,456.8 km^2)

According to national records, as of July 2021, 42 terrestrial protected areas cover 40,764.71 km^2 (6.02%), and 4 marine protected areas cover 391.26 km^2 (0.06%).



Terrestrial Protected Areas in Myanmar



Marine Protected Areas in Myanmar

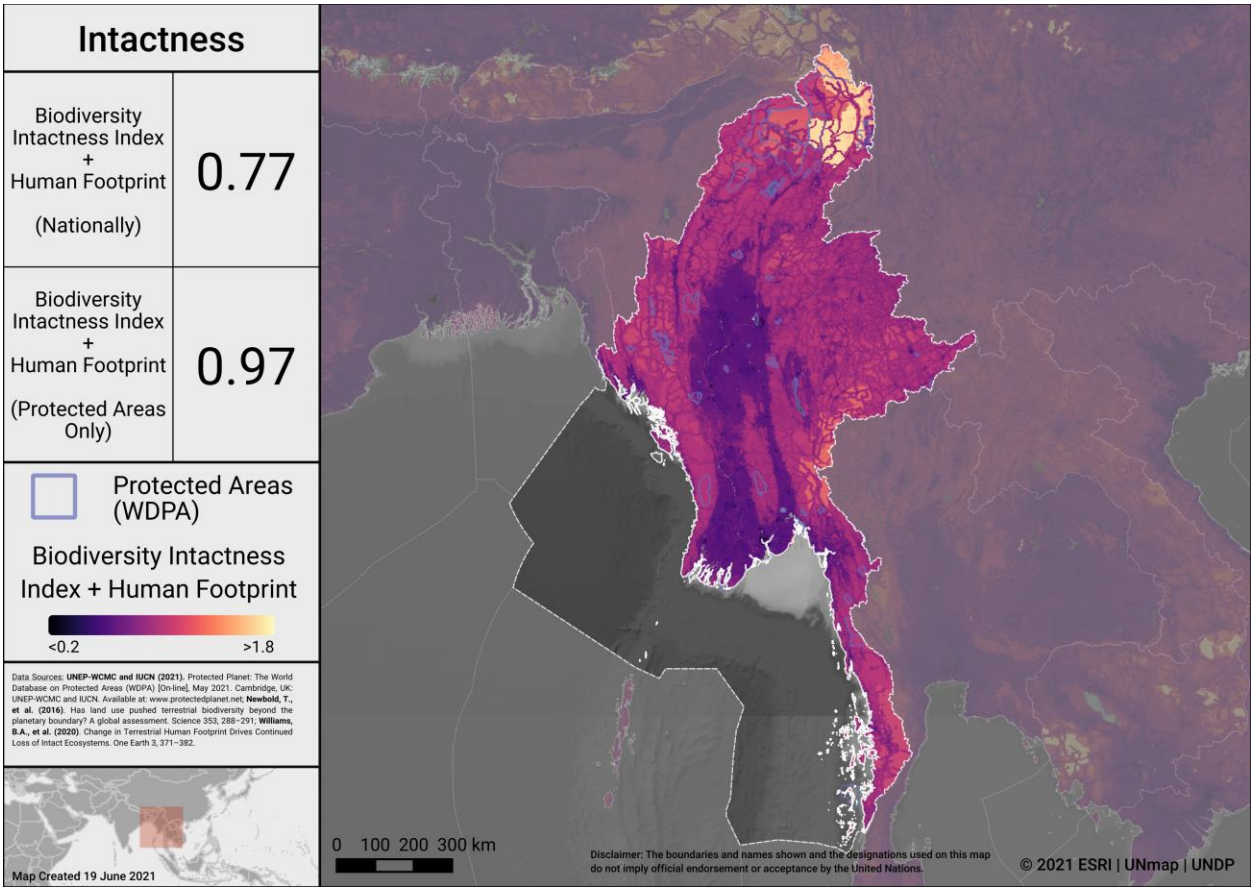
Potential OECMs

In Myanmar, the Forest Department has designated and managed permanent forest estates, including not only protected areas but also reserved forests and protected public forests. Some of these forests have similar conservation purposes as protected areas (e.g., watershed conservation forests, mangroves reserved forests etc.). Furthermore, the Department of Fisheries has designated Marine Protected Areas and Locally Managed Marine Areas in accordance with the Fisheries Law. These areas can be considered as OECMs. However, OECMs are not officially included yet in the national reporting system. Further legal procedures are still needed to recognize and include inside the OECMs.

Opportunities for action

Opportunities for the near-term include updating the WDPA with any unreported PAs, and the recognizing and reporting OECMs to the WD-OECM. In the future, as Myanmar considers where to add new PAs and OECMs, the map below identifies areas in Myanmar where intact areas are not currently protected. Focus on relatively intact areas, while

addressing the elements in the following sections, could be considered when planning new PAs or OECMs.



Intactness in Myanmar

To explore more on intactness visit the UN Biodiversity Lab: map.unbiodiversitylab.org.

ECOLOGICAL REPRESENTATIVENESS – TERRESTRIAL & MARINE

Ecological representativeness, globally, is assessed based on the PAs and OECMs coverage of broad-scale biogeographic units. Globally, ecoregions have been described for terrestrial areas (Dinerstein et al, 2017), marine coastal and shelf ecosystems (to a depth of 200m; Spalding et al 2007) and surface pelagic waters (Spalding et al 2012).

Myanmar has published a report (*Threatened Ecosystems of Myanmar*) in 2020, which identifies 64 ecosystem types in the country, in accordance with the IUCN Red List of Threatened Ecosystems classification system. According to this report, twenty-nine ecosystems are considered as threatened in Myanmar.

Furthermore, all threatened or near threatened ecosystems fall inside the protected areas. We are planning to update these figures in the future.

Myanmar has 20 **terrestrial** ecoregions. Out of these:

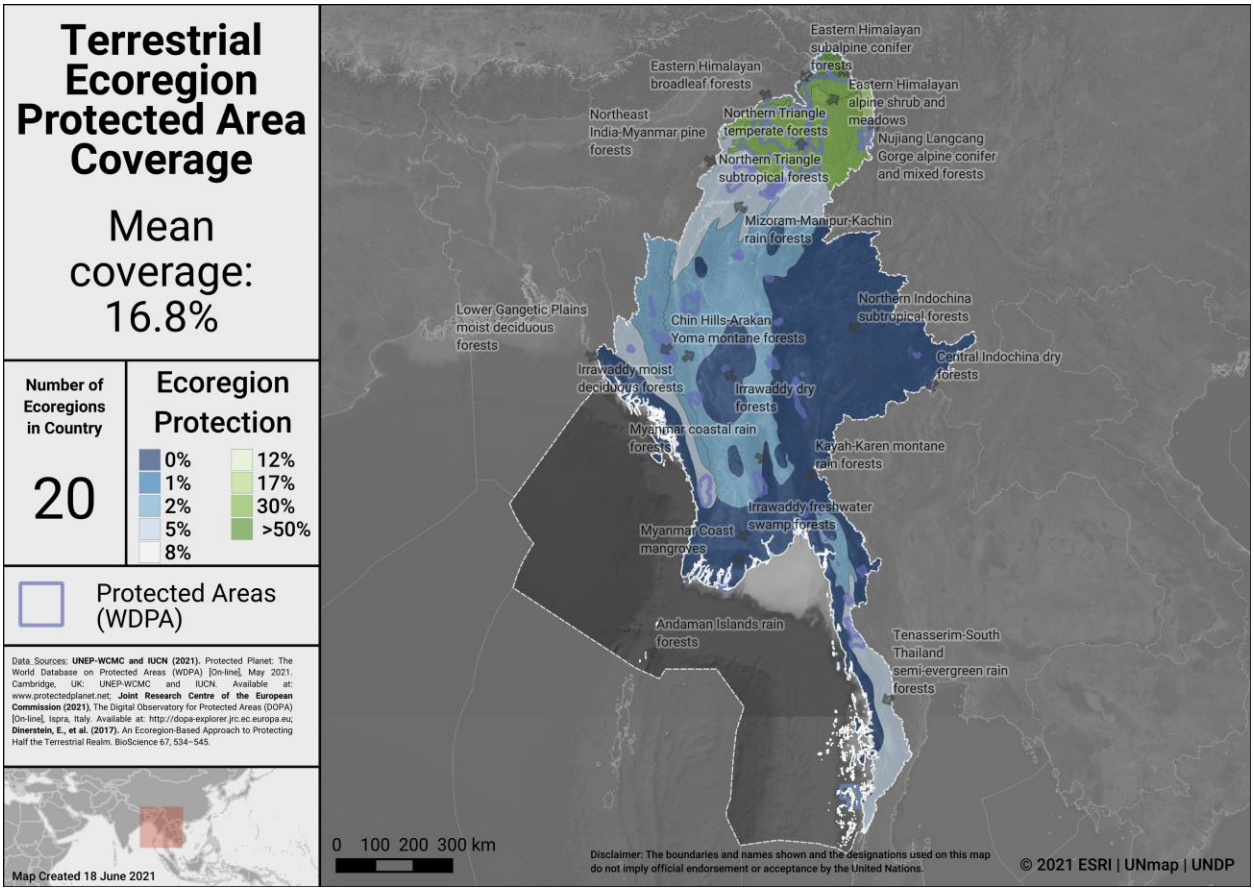
- 16 ecoregions have at least some coverage from PAs and OECMs.
  - 3 of the remaining ecoregions cover <0.1% of the coutnry
- 6 ecoregions have at least 17% protected within the country.
- The average coverage of terrestrial ecoregions is 16.8%.

Myanmar has 3 **marine** ecoregions and 1 **pelagic province**. Out of these:

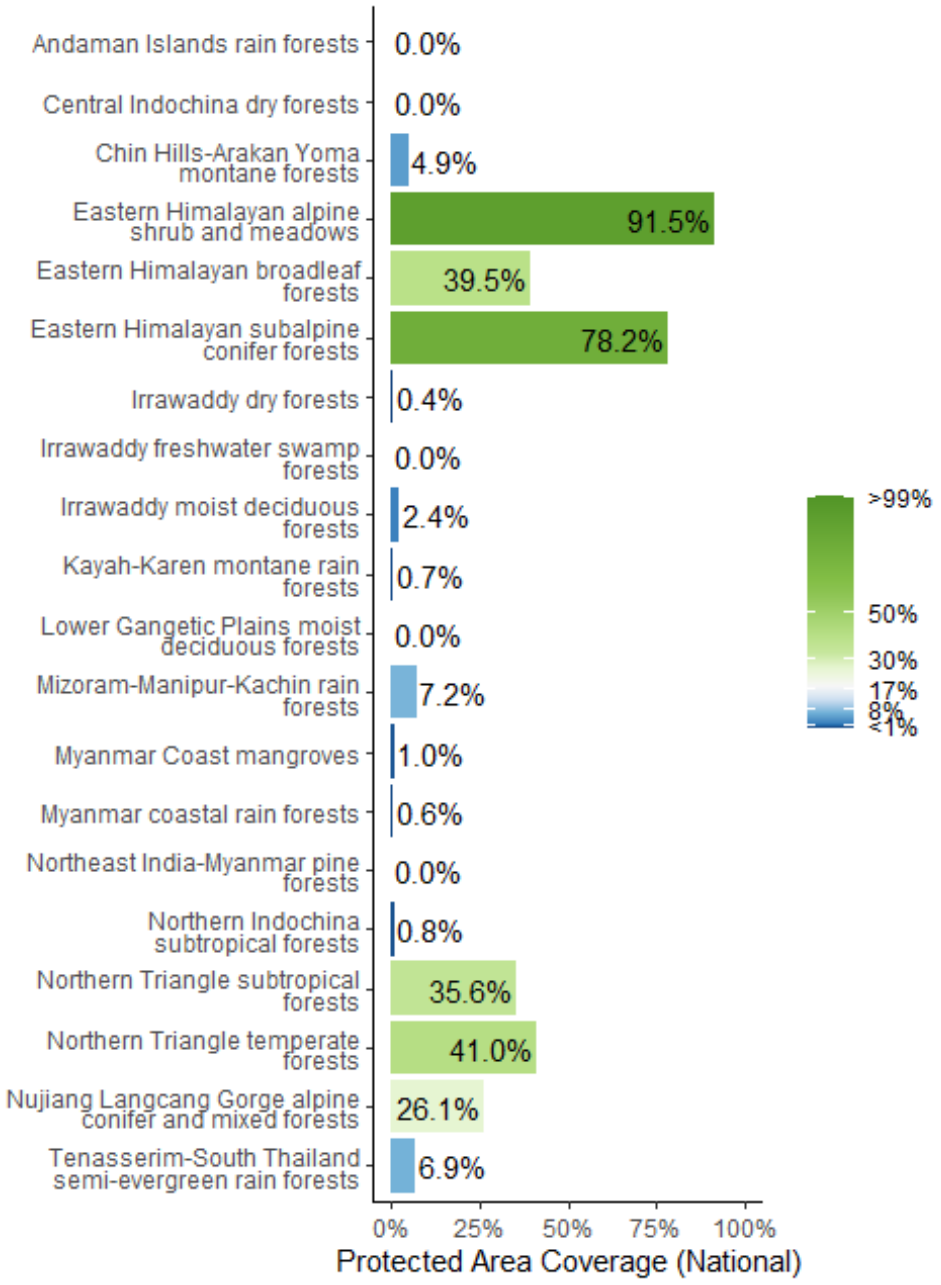
- 2 marine ecoregions and 0 pelagic provinces have at least some coverage from reported PAs and OECMs.
- 0 marine ecoregions and 0 pelagic provinces have at least 10% protected within Myanmar's exclusive economic zone (EEZ).
- The average coverage of marine ecoregions is 0.8% and the coverage of the 1 pelagic province is 0.0%.

If the ecoregion coverage were calculated with only the 46 protected areas that are nationally recognized, there may be slight differences in the results.

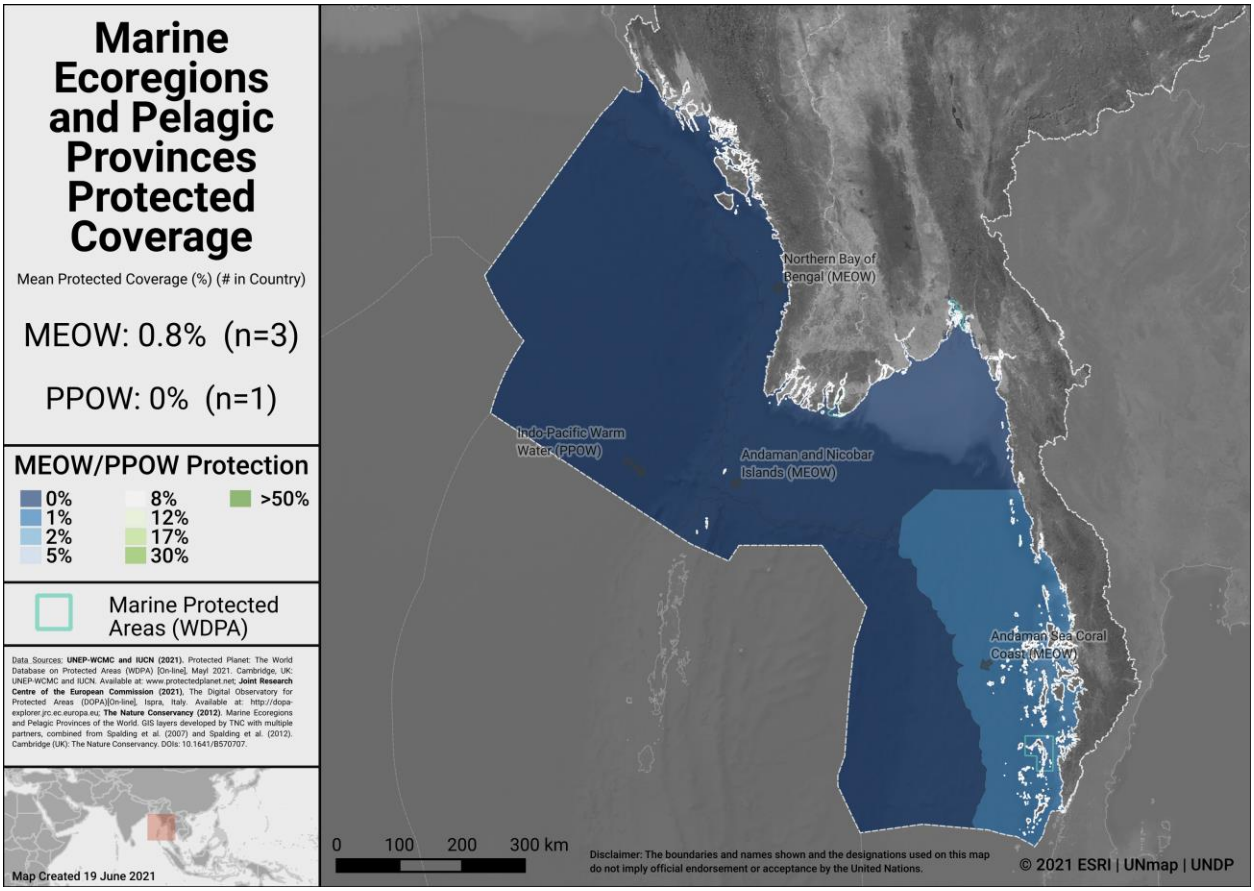
A full list of terrestrial ecoregions in Myanmar is available in Annex I.



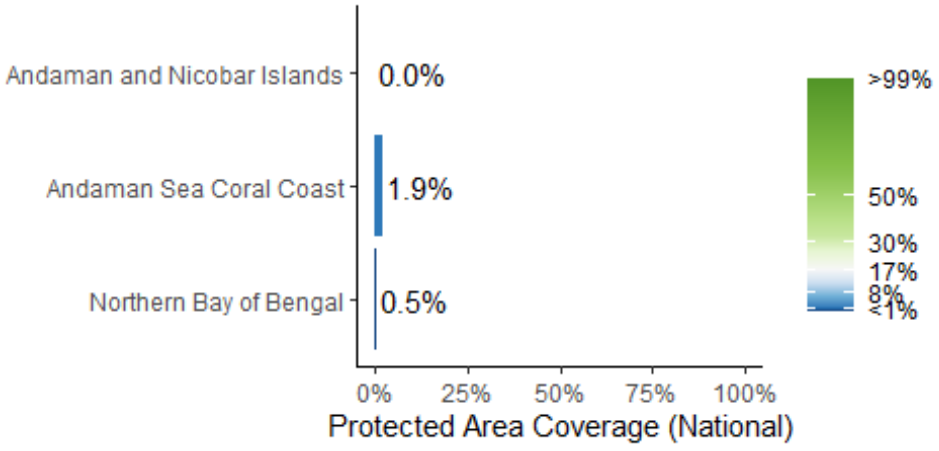
Terrestrial ecoregions in Myanmar



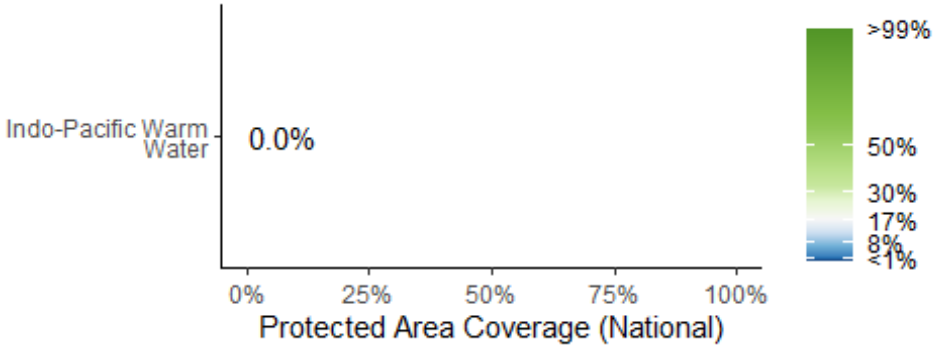
Terrestrial ecoregions of the World (TEOW) in Myanmar



Marine ecoregions and pelagic provinces



Marine Ecoregions of the World (MEOW) in Myanmar



Pelagic Provinces of the World (PPOW) in Myanmar

Opportunities for action

There is opportunity for Myanmar to update information on ecosystem types in the country, and increase protected area coverage, where necessary. There is also opportunity increase protection in global ecoregions that have lower levels of coverage by PAs or OECMs. Ecoregions which currently have no coverage by PAs or OECMs are key areas for action.

AREAS IMPORTANT FOR BIODIVERSITY

Key Biodiversity Areas (KBAs)

Protected area and OECM coverage of Key Biodiversity Areas (KBAs) provide one proxy for assessing the conservation of areas important for biodiversity at national, regional and global scales. KBAs are sites that make significant contributions to the global persistence of biodiversity (IUCN, 2016). The KBA concept builds on four decades of efforts to identify important sites for biodiversity, including Important Bird and Biodiversity Areas, Alliance for Zero Extinction sites, and KBAs identified through Hotspot ecosystem profiles supported by the Critical Ecosystem Partnership Fund. Incorporating these sites, the dataset of internationally significant KBAs includes Global KBAs (sites shown to meet one or more of 11 criteria in the Global Standard for the Identification of KBAs, clustered into five categories: threatened biodiversity; geographically restricted biodiversity; ecological integrity; biological processes; and irreplaceability), Regional KBAs (sites identified using pre-existing criteria and thresholds, that do not meet the Global KBA criteria based on existing information), and KBAs whose Global/Regional status is Not yet determined, but which will be assessed against the global KBA criteria within 8-12 years. Regional KBAs are often of critical international policy relevance (e.g., in EU legislation and under the Ramsar Convention on Wetlands), and many are likely to qualify as Global KBAs in future once assessed for their biodiversity importance for other taxonomic groups and ecosystems. To date, nearly 16,000 KBAs have identified globally, and information on each of these is presented in the World Database of Key Biodiversity Areas: www.keybiodiversityareas.org.

Myanmar has 123 Key Biodiversity Areas (KBAs) [**122 KBAs** included in analysis]

- Mean percent coverage of all KBAs by PAs and OECMs in Myanmar is **25.1%**.
- **15** KBAs have full (>98%) coverage by PAs and OECMs.
- **29** KBAs have partial coverage by PAs and OECMs.
- **78** KBAs have no (<2%) coverage by PAs and OECMs.
- *1 KBA lacks spatial data to allow PA and OECM coverage to be determined*

According to Myanmar's NBSAP, there were 132 KBAs in the country. Out of these: 53 KBAs (40%) are covered by PAs. The rest (79 KBAs, 60%) have no PA coverage.

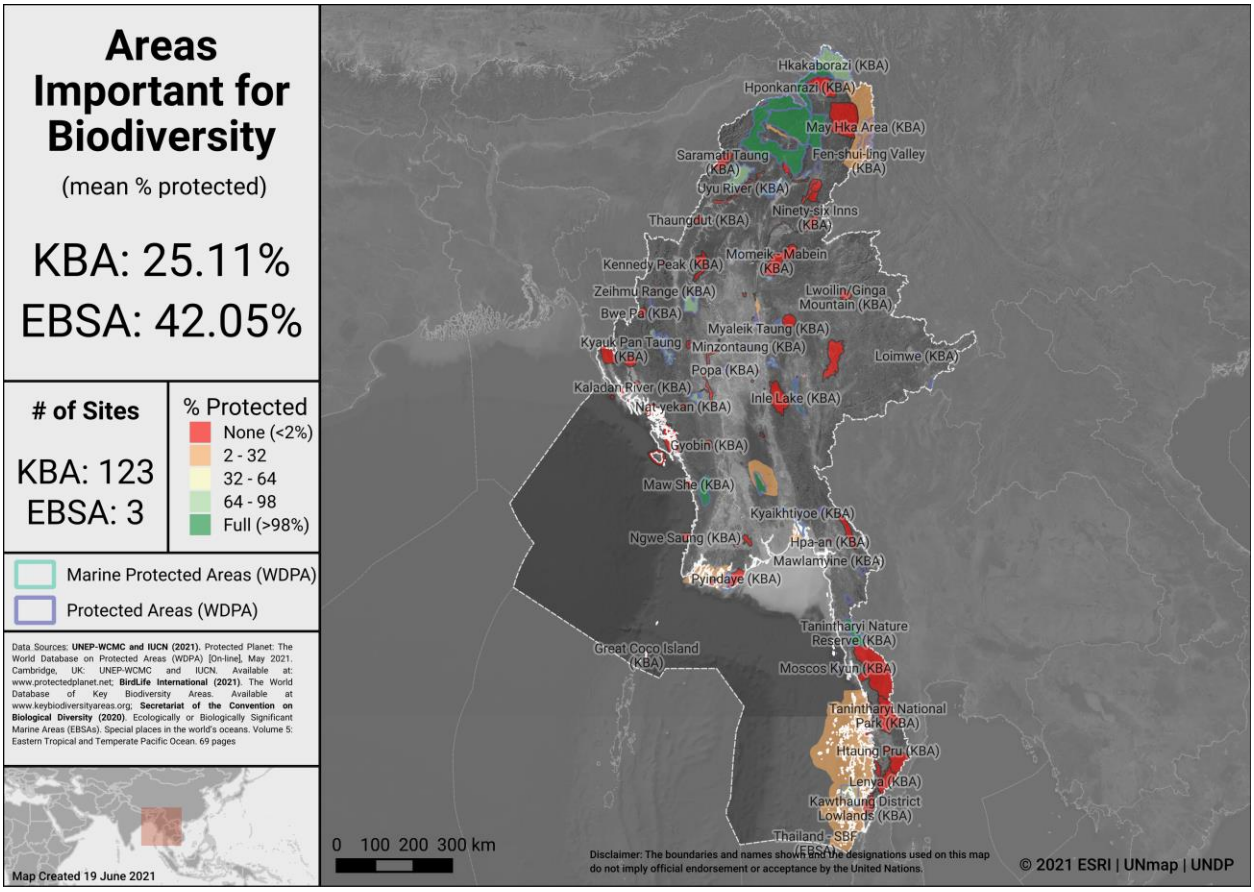
It should be noted that most KBA information is outdated, as the data were more than 10 years old. We are planning to update and revise the list of KBAs in Myanmar.

Ecologically or Biologically Significant Marine Areas (EBSAs)

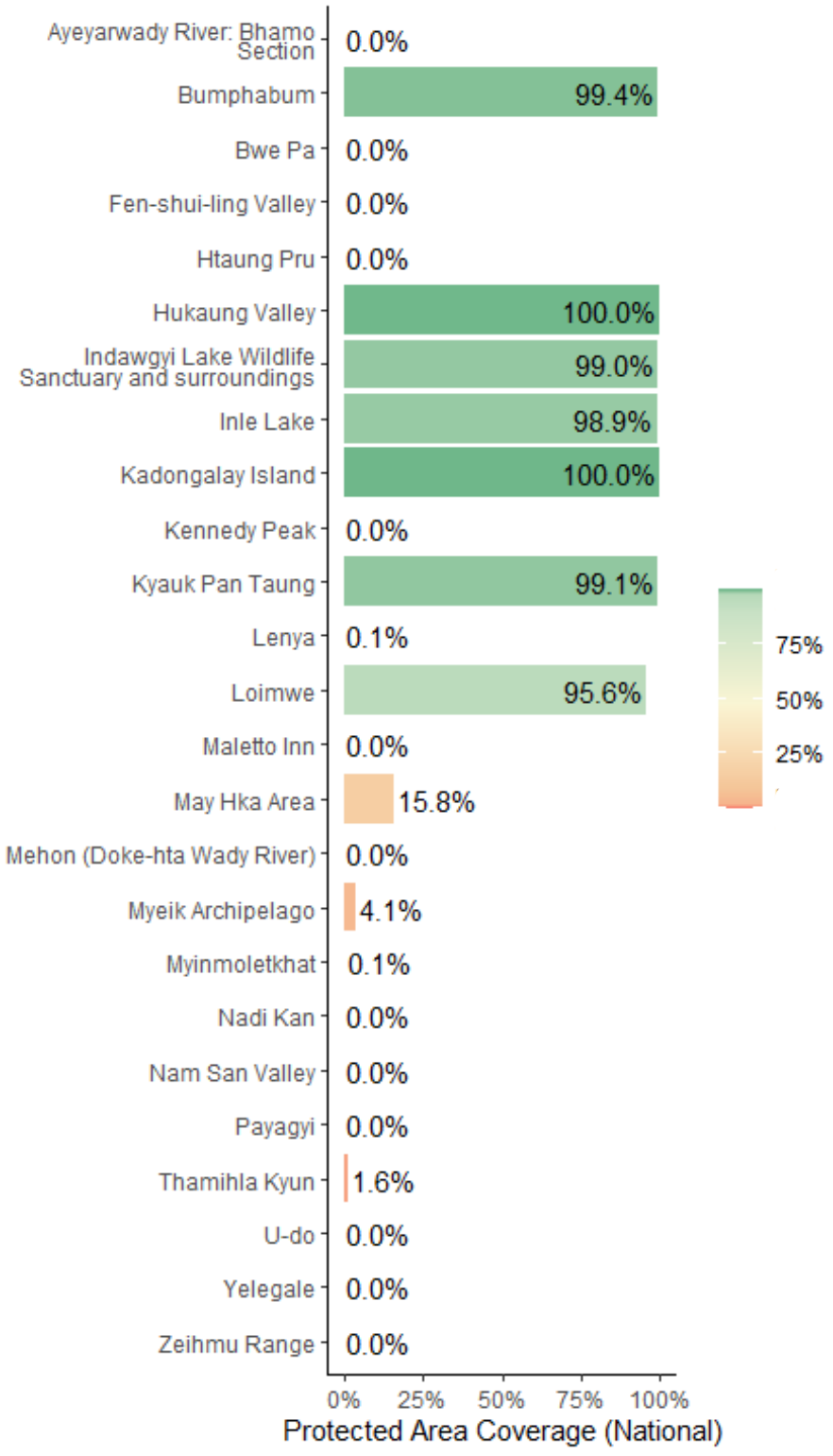
Other important areas for biodiversity may also include Ecologically or Biologically Significant Marine Areas (EBSAs), which were identified following the scientific criteria adopted at COP-9 (Decision IX/20; see more at: https://www.cbd.int/ebsa/). Sites that meet the EBSA criteria may require enhanced conservation and management measures;

this could be achieved through means including MPAs, OECMs, marine spatial planning, and impact assessment.

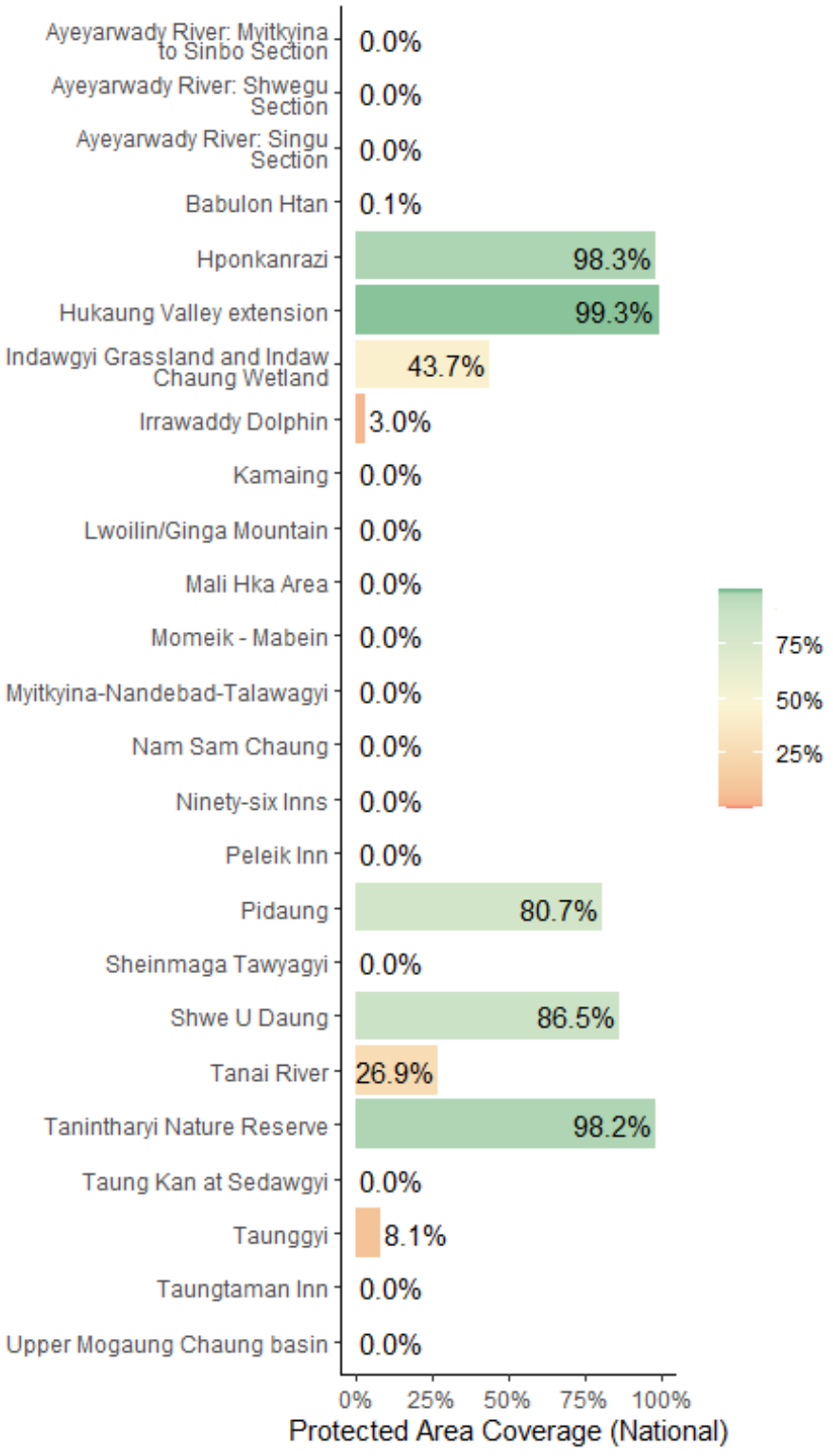
There are 3 EBSAs with some portion of their extent within Myanmar's EEZ, of which 1 EBSA have no coverage from PAs or OECMs.



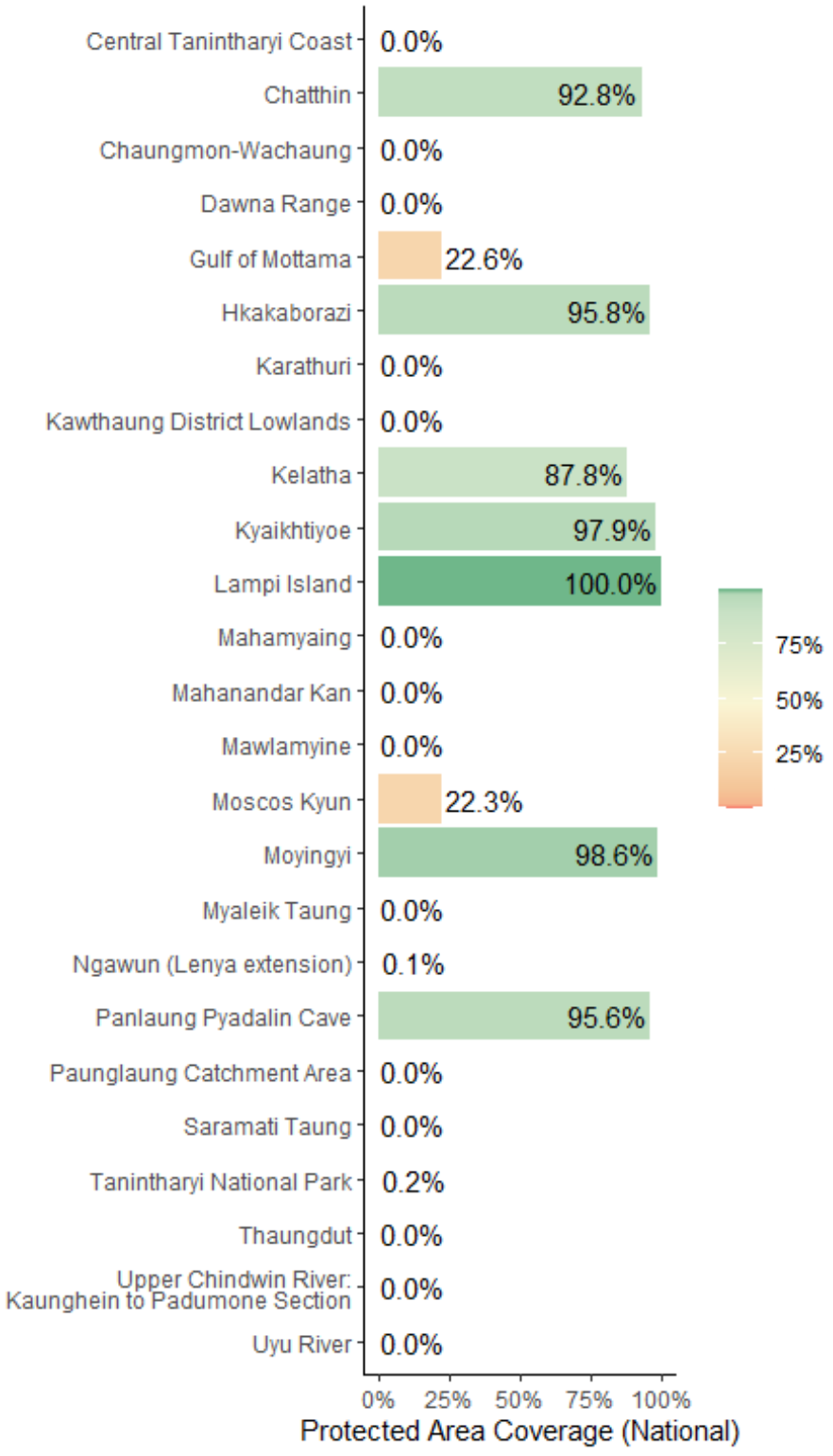
Areas Important for Biodiversity in Myanmar



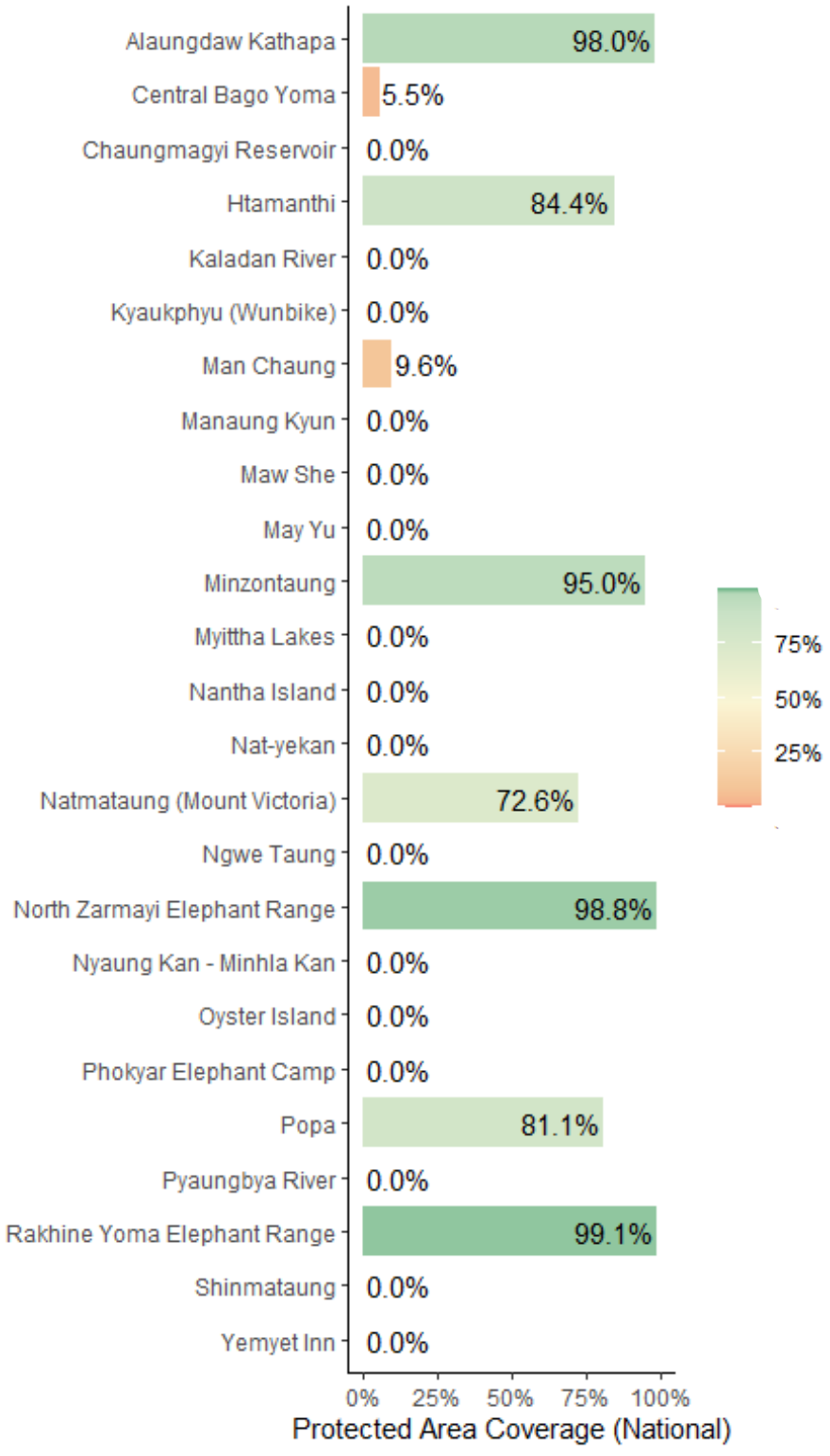
Key Biodiversity Area Coverage (KBA) in Myanmar



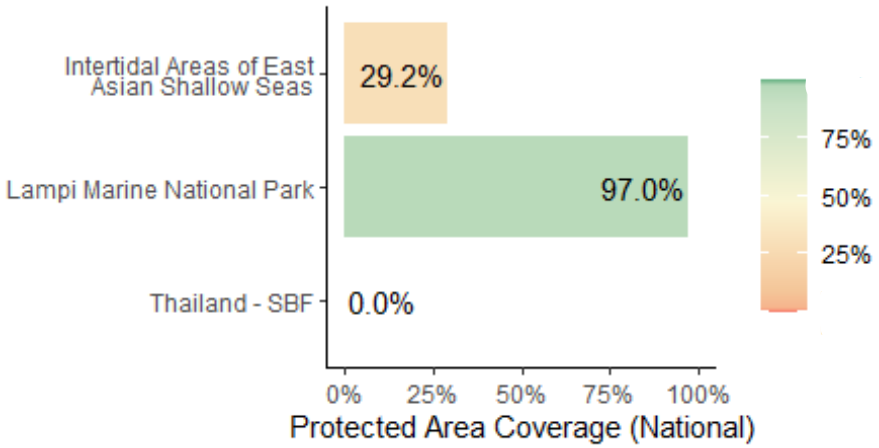
Key Biodiversity Area Coverage (KBA) in Myanmar (continued)



Key Biodiversity Area Coverage (KBA) in Myanmar (continued)



Key Biodiversity Area Coverage (KBA) in Myanmar (continued)



Ecologically or Biologically Significant Marine Areas (EBSAs) in Myanmar

Opportunities for action

There is opportunity for Myanmar to update and revise the list of KBAs in Myanmar. There is also opportunity to increase protection of KBAs that have lower levels of coverage by PAs and OECMs; priority could be given to those with no current coverage

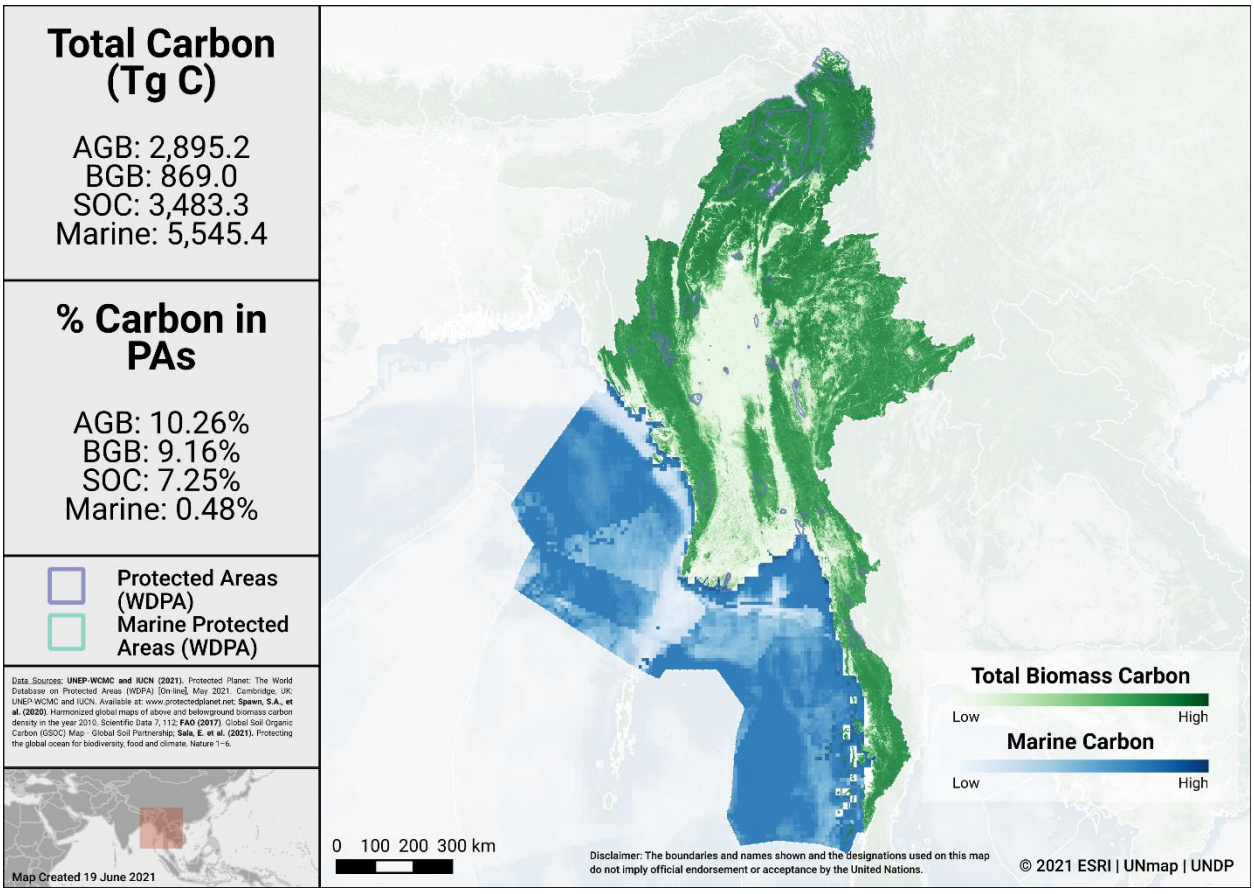
AREAS IMPORTANT FOR ECOSYSTEM SERVICES

There is no single indicator identified for assessing the conservation of areas important for ecosystem services. For simplicity, two services with available global datasets are assessed here (carbon and water). In future, other critical ecosystem services could be explored.

Carbon

Data for biomass carbon comes from temporally consistent and harmonized global maps of aboveground biomass and belowground biomass carbon density (at a 300-m spatial resolution); the maps integrate land-cover specific, remotely sensed data, and land-cover specific empirical models (see Spawn et al., 2020 for details on methodology). The Global Soil Organic Carbon Map present an estimation of SOC stock from 0 to 30 cm (see FAO, 2017). Data is also presented from global maps of marine sedimentary carbon stocks, standardized to a 1-meter depth (see Sala et al., 2021, and Atwood et al., 2020).

The map below presents the total carbon stocks in Myanmar and the percent of carbon in protected areas. The total carbon stocks is 2,895.2 Tg C from aboveground biomass (AGB), with 10.3% in protected areas; 869.0 Tg C from below ground biomass (BGB), with 9.2% in protected areas; 3,483.3 Tg C from soil organic carbon (SOC), with 7.2% in protected areas; and 5,545.4 Tg C from marine sediment carbon, with 0.5% in protected areas.



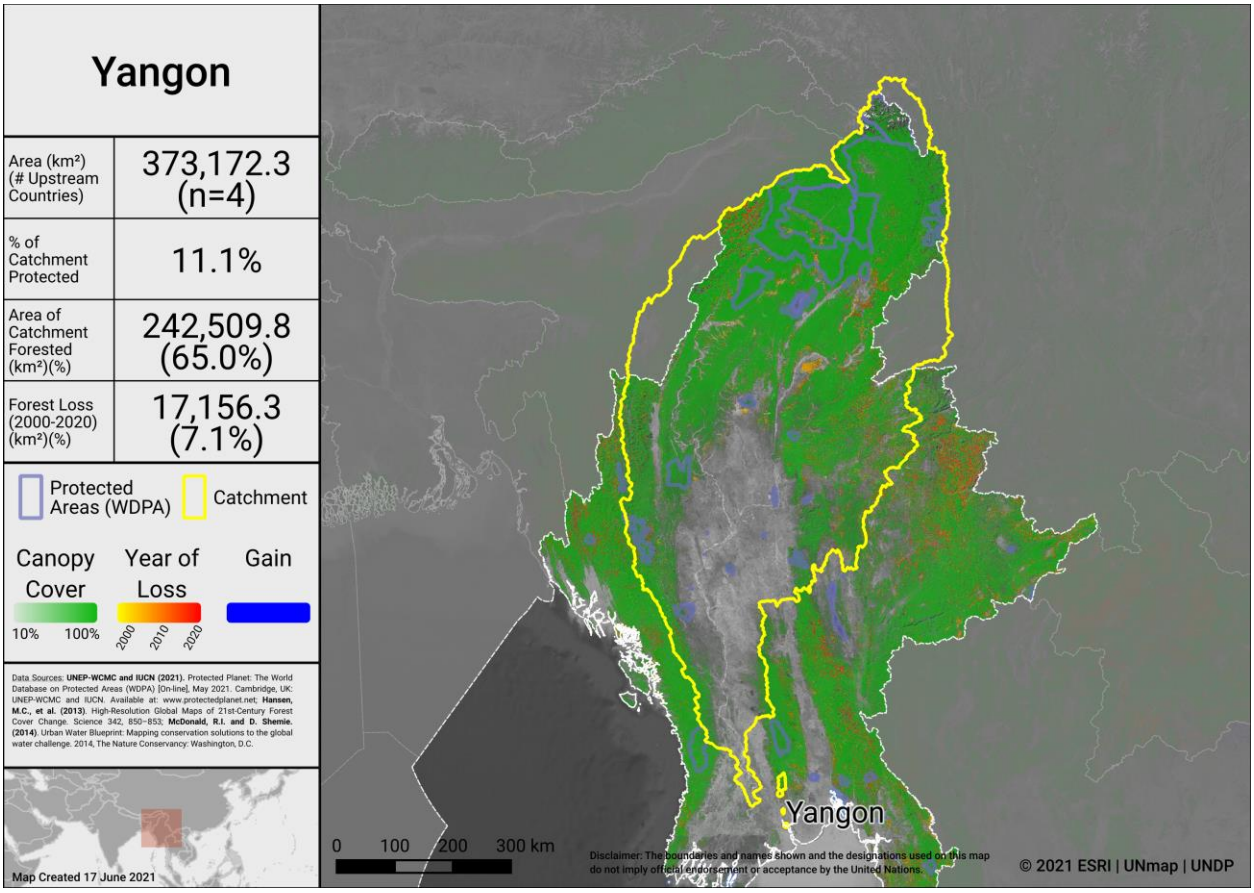
Carbon Stocks in Myanmar

Water

Information on the water sources for 534 cities is available via the City Water Map (CWM) and provides details on the catchment area of the watershed that supplies these cities (see McDonald et al., 2014 for details on methodology).

Forests support stormwater management and clean water availability, especially for large urban populations. Research that has examined the role of forests for city drinking water supplies shows that of the world's 105 largest cities, more than 30% (33 cities) rely heavily on the local protected forests, which provide ecosystem services that underpin local drinking water availability and quality (Dudley & Stolton, 2003).

Drinking water supplies for cities in Myanmar may similarly depend on protected forest areas within and around water catchments. The map below shows the percentage forest cover and the forest loss from 2000-2020 in the most heavily populated water catchment of Myanmar. Intact catchments can support more consistent water supply and improved water quality.



Water supply area for the city of Yangon

Opportunities for action

For carbon, there is opportunity for Myanmar to increase PA and OECM coverage in both marine and terrestrial areas with high carbon stocks, as identified in the map above. Protecting areas with high carbon stocks secures the benefits of carbon sequestration in the area.

For water, there is opportunity to increase the area of the water catchment under protection by PAs and OECMs, or in cases where there is high levels of protection, focus on effective management for these areas. Protecting the current area of forested land and potentially reforesting would have benefits for improving water security.

CONNECTIVITY & INTEGRATION

Two global indicators, the Protected Connected land indicator (ProtConn; EC-JRC, 2021; Saura et al., 2018) and the PARC-Connectedness indicator (CSIRO, 2019), have been proposed for assessing the terrestrial connectivity of PA and OECM networks. To date there is no global indicator for assessing marine connectivity, though some recent developments include proposed guidance for the treatment of connectivity in the planning and management of MPAs (see Lausche et al., 2021).

Protected Connected Land Indicator (Prot-Conn)

As of January 2021, as reported in the Joint Research Centre of the European Commission's Digital Observatory for Protected Areas (DOPA) (JRC, 2021), the coverage of protected-connected lands (a measure of the connectivity of terrestrial protected area networks, assessed using the ProtConn indicator) in Myanmar was 4.3%.

PARC-Connectedness Index

In 2019, as assessed using the PARC-Connectedness Index (values ranging from 0-1, indicating low to high connectivity), connectivity in Myanmar is 0.43. This represents no significant change since 2010.

Corridor case studies

Since 2014, a total of 14 conservation corridors were identified in Myanmar, based on landscape connectivity and maintaining connectivity between two or more KBAs. Landscape connectivity is also considered in protected area management in Myanmar.

The Forest Department is implementing the *Re-stablishing Natural Habitats Programme* (2019-2020 to 2028-2029) in 19 protected areas. One of the activities in this programme is the restoration of wildlife habitats and corridors inside the target protected areas.

Opportunities for action

There is opportunity for a general increase of PAs or OECMs and to focus on PA and OECM management for enhancing and maintaining connectivity. Improving connectivity increases the effectiveness of PAs and OECMs and reduces the impacts of fragmentation.

As well, a range of suggested steps for enhancing and supporting integration are included in the voluntary guidance on the integration of PAs and OECMs into the wider land- and seascapes and mainstreaming across sectors to contribute, inter alia, to the SDGs (Annex I of COP Decision 14/8).

GOVERNANCE DIVERSITY

There is a lack of comprehensive global data on governance quality and equity in PAs and OECMs. Here, we provide data on the diversity of governance types for reported PAs and OECMs.

One PA (Hlawga Park), has an official joint government mechanism. Co-management is piloted in many other protected areas but not formally integrated into the formal management system yet.

The Conservation of Biodiversity and Protected Areas Law was updated in 2018 which provides legal provisions for co-management as well as community-management mechanism. So far, four protected areas have been proposed under the category of Community Conserved Protected Area.

As of May 2021, PAs in Myanmar reported in the WDPA have the following governance types:

- 84.9% are governed by **governments** (by federal or national ministry or agency)
- 3.8% are under **shared** governance (by joint governance)
- 0.0% are under **private** governance
- 0.0% are under **IPLC** governance
  - 0.0% by Indigenous Peoples
  - 0.0% by local communities
- 11.3% **do not** report a governance type

OECMs

As of May 2021, there are **0** OECMs in Myanmar reported in the WD-OECM, therefore there is no data available on OECM governance types.

Privately Protected Areas (PPAs)

There is currently no data available on PPAs for Myanmar (see Gloss et al., 2019, and Stolton et al., 2014 for details).

Territories and areas conserved by Indigenous Peoples and local communities (ICCAs)

There is currently no data available on ICCAs for Myanmar (see Kothari et al., 2012 and the ICCA Registry for further details).

Other Indigenous lands

Lands managed and/or controlled by Indigenous Peoples cover an area of 393,754.0 km^2, of which 359,089.0 km^2 falls outside of formal protected areas. Indigenous lands with a human footprint less than 4 (considered as 'natural landscapes') cover an area of 112,424.0 km^2 (for details on analysis see Garnett et al., 2018).

For Myanmar evidence for the presence of Indigenous Peoples comes from: Indigenous Work Group on Indigenous Affairs. Indigenous World 2017 (Indigenous Working Group on Indigenous Affairs, 2017).

Boundaries of the lands Indigenous Peoples manage or have tenure rights over come from: Indigenous Knowledge and Peoples (IKAP). Map of ethnic groups in MMSEA. http://pacling.anu.edu.au/materials/SEAMLES/map_ethnicgroup.jpg (2005).

Opportunities for action

Explore opportunities for governance types that have lower representation, for Myanmar this relates to governance by Indigenous Peoples and/or local communities (IPLC), shared governance, etc. Increase efforts to identify the governance types for the 11.3% of sites that do not have their governance type reported.

There is also opportunity for Myanmar to complete governance and equity assessments, to establish baselines, and identify relevant actions for improvement. Examples of existing tools and methodologies include: Governance Assessment for Protected and Conserved Areas (Franks & Brooker, 2018), Social Assessment of Protected Areas (Franks et al 2018), and Site-level assessment of governance and equity (IIED, 2020). As well, a range of suggested actions are included in the voluntary guidance on effective governance models for management of protected areas, including equity (Annex II of COP Decision 14/8).

Equator Prize Projects

The Equator Initiative brings together the United Nations, governments, civil society, businesses and grassroots organizations to recognize and advance local sustainable development solutions for people, nature and resilient communities.

The Equator Prize projects provide examples of unique and locally based governance of natural resources. Myanmar has the following Equator Prize winners that showcase examples of local, sustainable community action:

Organization	Year	Project Description
Salween Peace Park	2020	In an area of South-Eastern Myanmar marked by 70 years of conflict, the Salween Peace Park is the result of a Karen Indigenous grassroots movement for stability and conservation of a 5,400km^2 continuous ecosystem made up of protected areas, community forests and Indigenous lands. Based on an Indigenous vision of sustainable use of natural resources, coupled with traditional practices and taboos, local communities lead a life that respects wildlife and local ecosystems. A camera-trap program led by female researchers has shown remarkable species diversity in the area, contributing to the conservation of the Indo-Burma biodiversity hotspot. Organic agriculture has allowed villagers to recover livelihoods in an area impoverished from decades of conflict. Established in 2014 in a highly participatory process and founded upon principles of peace and self-determination, ecological integrity and cultural survival, the Salween Peace Park is an expression of Karen Indigenous identity.

PROTECTED AREA MANAGEMENT EFFECTIVENESS

This section provides information on the coverage of PAs and OECMs with completed protected area management effectiveness (PAME) assessments as reported in the global database (GD-PAME). The proportion of terrestrial and marine PAs with completed PAME assessments is also calculated and compared with the 60% target agreed to in COP-10 Decision X/31. Information is also included regarding changes in forest cover nationally within PAs and OECMs.

Protected area management effectiveness (PAME) assessments

As of May 2021, Myanmar has 53 PAs reported in the WDPA; of these PAs, 5 (9.4%) have management effectiveness evaluations reported in the global database on protected area management effectiveness (GD-PAME).

- 0.4% (2,480 km^2) of the terrestrial area of the country is covered by PAs with completed management effectiveness evaluations.
  - 5.6% of the area of terrestrial PAs have completed evaluations.
- 0.3% (1,775 km^2) of the marine area of the country is covered by PAs with completed management effectiveness evaluations.
  - 72.2% of the area of marine PAs have completed evaluations.

The 60% target for completed management effectiveness assessments (per COP Decision X/31) **has not** been met for terrestrial PAs and **has** been met for marine PAs.

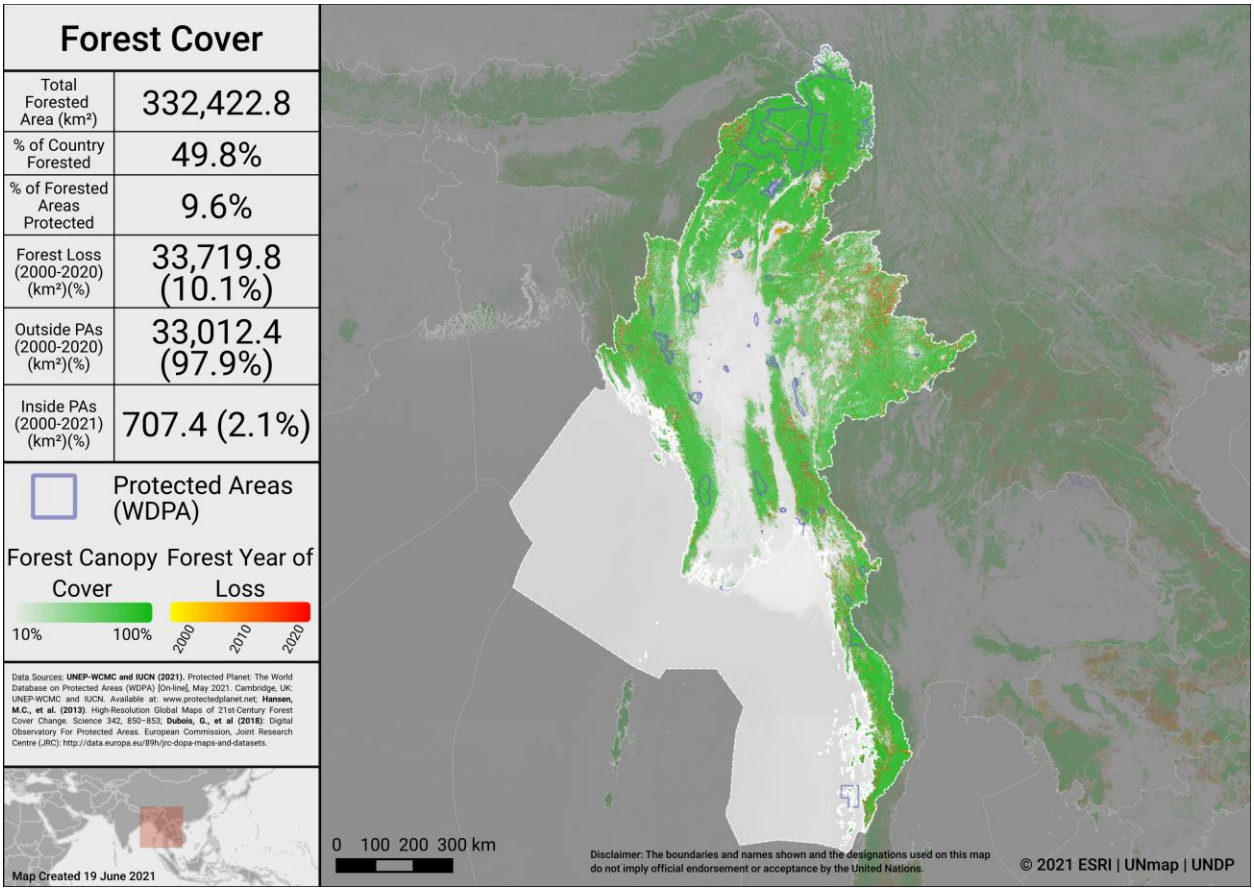
In 2018, METT was conducted for 22 PAs with technical support from IUCN and Norwegian Environment Agency (NEA). The data will be updated in the upcoming national report.

Updating METT requires both technical and financial supports from external donors. No government budget has not been allocated for METT for all PAs in Myanmar.

As of May 2021, there are 0 OECMs in Myanmar reported in the WD-OECM and no information available on the management effectiveness of potential OECMs.

Changes in forest cover in protected areas and OECMs

Forested areas in Myanmar cover approximately 49.8% of the country, an area of 332,422.8 km^2. Approximately 9.6% (31,895.1 km^2) of this is within the protected area estate of Myanmar. Over the period 2000-2020 loss of forest cover amounted to over 33,719.8 km^2, or 5.0% of the country (10.1% of forest area), of which 707.4 km^2 (2.1% of forest loss) occurred within protected areas. The map below shows how forest cover has changed in Myanmar from 2000-2020 both inside and outside of PAs. This can indicate how effective PAs are in reducing forest cover loss



Forest Cover and Forest Loss in Myanmar

Opportunities for action

There is opportunity to report all complete protected area management effectiveness (PAME) evaluations in the GD-PAME. If the 60% targets for completed management effectiveness assessments (per COP Decision X/31) have not been met for terrestrial or marine PAs, there is opportunity to increase PAME evaluations to achieve the target.

There is also opportunity to implement the results of completed PAME evaluations, to improve the quality of management for existing PAs and OECMs (e.g. through adaptive management and information sharing, increasing the number of sites reporting 'sound management') and to increase reporting of biodiversity outcomes in PAs and OECMs.

SECTION II: EXISTING PROTECTED AREA AND OECM COMMITMENTS

NATIONAL BIODIVERSITY STRATEGY AND ACTION PLANS (NBSAPs)

Myanmar has submitted an NBSAP during the Strategic Plan for Biodiversity 2011-2020 (most recent NBSAP is available at: https://www.cbd.int/nbsap/search/).

This NBSAP **did** include a quantitative target for **terrestrial** PAs or OECMs.

By 2020, 8% of Myanmar's land area Is conserved within PAs, including ICCAs

- As of December 2020, 6.02% of total land area is conserved as protected area. An additional 30 areas have been proposed for future designations and land settlement processes are already in place. Once these areas are designated, the total coverage of PA will be 7.66% of total land area.

Target 10.1: By 2020, 15 percent of Myanmar's coral reefs conserved within MPAs, including LMMAs (locally managed marine area) and other area-based conservation measures

Actions from the NBSAP will also address other elements of Aichi Biodiversity Target 11:

NBSAP Action number	Action (original language from NBSAP)
1.4.1	Increase number of annual discussions, outreach, and extension activities with local communities living in and around PAs
5.1.1	Establish ICCAs, CF, and/or PAs in priority DMDF and mangrove forest areas to improve sustainable management
5.3.2	Nominate three additional Ramsar sites to Ramsar Secretariat
5.3.3	Establish community-based participatory monitoring and management programme in Ramsar sites and potential Ramsar wetlands
10.1.1	Carry out detailed feasibility assessments and public consultations at priority sites for establishing new LMMAs and MPAs
11.1	Approve proposed Lenya National Park, Lenya National Park Extension, Mahamyaing Wildlife Sanctuary and lnkh-ine Bum National Park
11.2	Establish Taninthayi National Park, Pan The Taung National Park

NBSAP Action number	Action (original language from NBSAP)
11.2.1	Conduct a review of opportunities for recognizing governance and management diversity, including ICCAs, within the current legal and governance framework, including forests, fisheries, protected area categories, and other area-based conservation approaches
11.2.2	Recognize additional governance types and management categories using appropriate legal tools, including amendments of laws and revisions of implementing rules and regulations
11.2.3	Pilot governance types and management categories by establishing co-management PA systems, recognizing ICCAs, and developing PA zonation
11.3	Establish Hkakaborazi National ParkSE,Imawbum National Park and Za Loon Taung Protected Area
11.3.1	Complete METT survey in at least 20 PAs
11.3.2	Implement SMART in at least 15 PAs
11.3.3	Implement management plans addressing conservation priorities and investment in at least five PAs
11.3.4	Implement pilot projects in at least five PAs involving local communities in designating buffer zones and co-management providing incentives for conservation and compensation for restricted access
11.3.5	Expand community-based participatory biodiversity monitoring in and around PAs
11.4.1	Nominate at least one natural site for inclusion on the UNESCO World Heritage list
11.4.2	Nominate at least two additional Ramsar sites
11.4.3	Nominate at least one additional Biosphere Reserve
11.5.2	Establish at least one additional MPA that can together with Lampi Marine National Park serve as a model and pilot for future M PA management
18.3.1	Incorporate traditional knowledge, practices, and beliefs in PA education materials

Updates on progress:

- IUCN governance categories and management categories are recognized in policy and practice

- Work has only been done on with respect to improving laws to recognize traditional governance types. New Conservation of Biodiversity and Protected Areas Law was enacted in 2018

By 2020, the management effectiveness of Myanmar's PA system has significantly improved, with 15 PAs implementing

- SMART, at least five PAs implementing management plans, and local communities are involved in management activities in at least five PAs SMART is being applied in 19 protected areas with involvement of local communities.
- By 2020, Myanmar's sites of premier conservation value are recognized by relevant international designations, through the designation of one natural WHS, three additional Ramsar sites, and one Biosphere Reserve
- The target of two has been exceeded: number of Ramsar sites added (5) and number of Biosphere Reserves (2).

By 2020, a Marine Spatial Plan with nested MPAs is prepared for the Myeik Archipelago.

- Implementation is in progress. Marine Spatial Plan has been prepared and some marine areas form Myeik Archipelago are already identified for designating Marine National Park.
- The main barrier was the communication between WDPA for updating the database. Further barrier would be the inclusion of OECMs into the national PA database which requires communication and active participation from relevant departments

APPROVED GEF-5 & GEF-6 PROTECTED AREA PROJECTS

Approved GEF-5 and GEF-6 PA-related biodiversity projects

This includes biodiversity projects from the fifth and sixth replenishment of the Global Environment Facility (GEF-5 and GEF-6) with a clear impact of the quantity or quality of PAs; also including some projects occurring within the wider landscapes/seascapes around PAs. Only those with a status of 'project approved' or 'concept approved' as of June 2019 were considered. The qualifying elements likely benefiting from each GEF project is assessed based on a keyword search of Project Identification Forms (PIF). Where spatial data for the proposed PAs was available, further details (based on an analysis by UNDP) regarding their impacts for ecological representation, coverage of KBAs, and coverage of areas important for carbon storage is included.

GEF ID	PA increase?	Area to be added (km^2)	Type of new protected area	Qualitative elements potentially benefitting (based on keyword search of PIFs)
5159	Yes	already in WDPA	Terrestrial	Ecologically representative; Areas important for biodiversity; Effectively managed; Equitably managed
6992	Yes	3,046	Terrestrial	All except Areas important for biodiversity and Connectivity
9261	No	N/A	N/A	All except Areas important for biodiversity and Connectivity
9267	No	N/A	N/A	All except Ecologically representative

Based on spatial data available for GEF project 5159, benefits will arise for several elements of Target 11:

Coverage of Terrestrial and Marine Ecoregions:

- 11 terrestrial ecoregions will have improved coverage. These ecoregions are: Chin Hills-Arakan Yoma montane forests; Eastern Himalayan alpine shrub and meadows; Eastern Himalayan broadleaf forests; Eastern Himalayan subalpine conifer forests; Irrawaddy moist deciduous forests; Mizoram-Manipur-Kachin rainforests; Myanmar coastal rainforests; Northern Triangle subtropical forests; Northern Triangle temperate forests; Nujiang Langcang Gorge alpine conifer and mixed forests; Tenasserim-South Thailand semi-evergreen rain forests;.
  - The average increase in coverage of Terrestrial Ecoregions will be 0.01%.

Coverage of KBAs:

- Coverage will improve for 7 KBAs.

Ecosystem services:

- 0.23 % increase in the PA coverage of aboveground biomass.
- 0.33 % increase in the PA coverage of important aboveground biomass areas.
- 0.11 % increase in the PA coverage of soil organic carbon (SOC).
- 0.14 % increase in the PA coverage of areas important for SOC.

UN OCEAN CONFERENCE VOLUNTARY COMMITMENTS

Voluntary commitments for the UN Ocean Conference are initiatives voluntarily undertaken by governments, the UN system, non-governmental organizations, among other actors—individually or in partnership—that aim to contribute to the implementation of SDG 14 (here we focus in particular on SDG 14.5). The registry of commitments was opened in February 2017, in the lead up to the first UN Ocean Conference (5 to 9 June 2017).

Ocean Actions improving MPA or OECM coverage:

#OceanAction16178: Protecting 1 million sq kms through the $15 million WCS Marine Protected Area Fund, by Wildlife Conservation Society (Non-governmental organization (NGO)).

- Area to be added: 2500 km^2.
  - See details in country profile for WCS MPA project: https://mpafund.wcs.org/.
- Progress report: Yes (2019), status=On Track.
- Further details available at: https://oceanconference.un.org/commitments/?id=16178.

OTHER ACTIONS/COMMITMENTS

Commitments for PAs and OECMs from Other National Policies

Policy document	Ecosystem	Policy text
Nationally Determined Contribution	Forest ecosystems	Avoided forest conversion: 52.37 Mt CO2e/yr
Nationally Determined Contribution	Wetland ecosystems	Avoided peat impacts: 0.52 Mt CO2e/yr
Nationally Determined Contribution	Coastal ecosystems	Avoided mangrove impacts: 16.56 Mt CO2e/yr
Nationally Determined Contribution	Forest ecosystems	By 2030, Myanmar's permanent forest estate (PFE) target is to increase national land area as forest land with the following percent of total land area)Reserved Forest (RF) and Protected Public Forest (PPF) = 30% of total national land area, Protected Area Systems (PAS) = 10% of total national land area.
National Sustainable Development Plan	Forest ecosystems	Conserve and protect terrestrial and inland water areas, coastal and marine areas, and national sanctuaries through integrated resources planning and effective and equitable management
National Sustainable Development Plan	Forest ecosystems	Prevent the extinction of threatened species and improve their conservation status
National Energy Policy	Forest ecosystems	In order to reduce the rate of forest degradation for the protection of forests, the Ministry of Environmental Conservation and Forestry has been implementing measures for protection of forests. The major element of the program includes firewood plantation, fuel briquette/pellets production and distribution, sales of energy efficient stoves and over all greening programs.
Myanmar Tourism Master Plan	Forest ecosystems	Develop an Ecotourism Management Strategy for Protected Areas
National Biodiversity Strategy Action Plan	Forest ecosystems	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

Policy document	Ecosystem	Policy text
National Adaptation Program of Action	Forest ecosystems	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
Reducing emissions from deforestation and forest degradation	Forest ecosystems	Enhancement of forest carbon stocks by 90 million tonnes of C02e by 2030
Reducing emissions from deforestation and forest degradation	Forest ecosystems	Reduce degradation on existing overexploited forests and prevent future forest degradation. This will be achieved by addressing drivers such as fuelwood extraction, charcoal production, timber harvesting (legal and illegal), fire and grazing.
Reducing emissions from deforestation and forest degradation	Forest ecosystems	Conserve forest carbon stocks, particularly in Protected Areas
National Wetlands Policy	Wetland ecosystems	Environmental needs of aquatic ecosystem, wetlands and embanked floodplains need to be recognized and taken into consideration while planning
National Biodiversity Strategy Action Plan	Coastal ecosystems	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
National Biodiversity Strategy Action Plan	Coastal ecosystems	By 2020, at least 17 percent of terrestrial and inland water areas, and 10 percent 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
	Coastal ecosystems	Sources of water and water bodies including marine water should not be allowed to get polluted. System of third-party periodic inspection should be evolved and stringent punitive actions be taken against the persons responsible for pollution

Policy document	Ecosystem	Policy text
	Coastal ecosystems	Quality conservation and improvements are even more important for groundwaters, since cleaning up is very difficult. It needs to be ensured that industrial effluents, local cesspools, residues of fertilizers and chemicals, etc., do not reach the groundwater
National Adaptation Program of Action	Coastal ecosystems	Reduced climate change vulnerability of rural and subsistence farmers through locally relevant technologies, climate resilient rice varieties, and ex/in-situ conservation of plant genetic resources.
National Adaptation Program of Action	Coastal ecosystems	Reducing the vulnerability of livelihoods in agroecological zones to climate change through the transfer of a wide range of high-yielding and climate resilient rice varieties.
National Adaptation Program of Action	Coastal ecosystems	Buffering marine habitats and sustaining fish populations under climate change conditions through community-based MPA management and ecosystem sensitive fishery practices at the Sister Group Islands of the Myeik Archipelago, Thameehla Island, Ayeyarwady Region, and Wetthay Chaing (bay) coastal area.
Reducing emissions from deforestation and forest degradation	Forest ecosystems	Reduction of deforestation and related carbon emissions by 30% by 2030.

ANNEX I

FULL LIST OF TERRESTRIAL ECOREGIONS

Ecoregion Name	Area (km^2)	% of Global Ecoregion in Country	% of Country in Ecoregion	Area Protected (km^2)	% Protected in Country
Andaman Islands rain forests	25.8	0.5	0.0	0.0	0.0
Central Indochina dry forests	2.7	0.0	0.0	0.0	0.0
Chin Hills-Arakan Yoma montane forests	29,561.4	99.8	4.4	1,451.6	4.9
Eastern Himalayan alpine shrub and meadows	5,253.3	4.3	0.8	4,807.3	91.5
Eastern Himalayan broadleaf forests	144.8	0.2	0.0	57.2	39.5
Eastern Himalayan subalpine conifer forests	14.9	0.1	0.0	11.7	78.2
Irrawaddy dry forests	34,987.4	100.0	5.2	146.3	0.4
Irrawaddy freshwater swamp forests	15,107.2	100.0	2.3	5.8	0.0
Irrawaddy moist deciduous forests	137,909.8	100.0	20.6	3,364.5	2.4
Kayah-Karen montane rain forests	54,983.3	46.1	8.2	372.3	0.7
Lower Gangetic Plains moist deciduous forests	26.1	0.0	0.0	0.0	0.0
Mizoram-Manipur-Kachin rain forests	70,346.1	52.0	10.5	5,045.4	7.2
Myanmar coastal rain forests	66,312.2	100.0	9.9	424.6	0.6

Ecoregion Name	Area (km^2)	% of Global Ecoregion in Country	% of Country in Ecoregion	Area Protected (km^2)	% Protected in Country
Myanmar Coast mangroves	16,703.4	78.6	2.5	161.8	1.0
Northeast India-Myanmar pine forests	44.7	0.5	0.0	0.0	0.0
Northern Indochina subtropical forests	136,733.6	31.4	20.4	1,149.2	0.8
Northern Triangle subtropical forests	53,703.3	99.9	8.0	19,110.5	35.6
Northern Triangle temperate forests	10,673.3	99.7	1.6	4,375.9	41.0
Nujiang Langcang Gorge alpine conifer and mixed forests	4,499.3	5.4	0.7	1,176.6	26.2
Tenasserim-South Thailand semi-evergreen rain forests	30,172.8	31.1	4.5	2,080.7	6.9

REFERENCES

Atwood, TB, Witt, A, Mayorga, J, Hammill, E, & Sala, E. (2020). Global patterns in marine sediment carbon stocks. *Frontiers in Marine Science*. https://doi.org/10.3389/fmars.2020.00165

BirdLife International (2021). World Database of Key Biodiversity Areas. Available at: http://www.keybiodiversityareas.org

CBD (2010). Decision adopted by the Conference of the Parties to the Convention on Biological Diversity at its tenth meeting. Decision X/2. Strategic plan for biodiversity 2011–2020. Retrieved from https://www.cbd.int/doc/decisions/cop-10/cop-10-dec02-en.pdf.

CSIRO (2019). Protected area connectedness index (PARCconnectedness). https://www.bipindicators.net/indicators/protected-area-connectedness-index-parcconnectedness

Dinerstein, E., et al. (2017). An ecoregion-based approach to protecting half the terrestrial realm. BioScience 67(6), 534-545.

Donald et al., 2019, The prevalence, characteristics and effectiveness of Aichi Target 11′ s "other effective area-based conservation measures" (OECMs) in Key Biodiversity Areas. Conservation Letters, 12(5).

EC-JRC (2021). DOPA Indicator factsheets: http://dopa.jrc.ec.europa.eu/en/factsheets

FAO (2017). Global Soil Organic Carbon (GSOC) Map - Global Soil Partnership [WWW Document]. URL http://www.fao.org/global-soil-partnership/pillars-action/4-information-and-data/global-soil-organic-carbon-gsoc-map/en/.

Franks, P and Booker, F (2018). Governance Assessment for Protected and Conserved Areas (GAPA): Early experience of a multi-stakeholder methodology for enhancing equity and effectiveness. IIED Working Paper, IIED, London. https://pubs.iied.org/17632IIED

Franks, P. et al. (2018). Social Assessment for Protected and Conserved Areas (SAPA). Methodology manual for SAPA facilitators. Second edition. IIED, London. https://pubs.iied.org/14659iied

Garnett et al. (2018). A spatial overview of the global importance of Indigenous lands for conservation. Nature Sustainability, 1(7), 369.

Global Environment Facility (GEF-5 and GEF-6); all projects can be found online at: https://www.thegef.org/projects

Gloss, L. et al. (2019). International Outlook for Privately Protected Areas: Summary Report. International Land Conservation Network (a project of the Lincoln Institute of Land Policy) and United Nations Development Programme. Summary report, and individual country profiles, available at: https://nbsapforum.net/knowledge-base/resource/international-outlook-privately-protected-areas-summary-report

Hansen, M.C., Potapov, P.V., Moore, R., Hancher, M., Turubanova, S.A., Tyukavina, A., Thau, D., Stehman, S.V., Goetz, S.J., Loveland, T.R., Kommareddy, A., Egorov, A., Chini, L., Justice, C.O., Townshend, J.R.G., (2013). High-Resolution Global Maps of 21st-Century Forest Cover Change. Science 342, 850–853. https://doi.org/10.1126/science.1244693

Hilty, J et al. (2020). Guidelines for conserving connectivity through ecological networks and corridors. Best Practice Protected Area Guidelines Series No. 30. Gland, Switzerland: IUCN. https://portals.iucn.org/library/sites/library/files/documents/PAG-030-En.pdf

IIED 2020. Site-level assessment of governance and equity (SAGE) https://www.iied.org/site-level-assessment-governance-equity-sage.

IUCN (2016). A Global Standard for the Identification of Key Biodiversity Areas, Version 1.0. First edition. Gland, Switzerland: IUCN. https://portals.iucn.org/library/sites/library/files/documents/2016-048.pdf

IUCN-WCPA (2017). IUCN-WCPA Task Force on OECMs collation of case studies submitted 2016-2017. https://www.iucn.org/commissions/world-commission-protected-areas/our-work/oecms/oecm-reports

Joint Research Centre of the European Commission (JRC) (2021), The Digital Observatory for Protected Areas (DOPA) Explorer 4.1 [On-line], [Apr/2021], Ispra, Italy. Available at: http://dopa-explorer.jrc.ec.europa.eu

Kothari, A., et al. (Eds) (2012). Recognising and Supporting Territories and Areas Conserved By Indigenous Peoples And Local Communities: Global Overview and National Case Studies. Secretariat of the CBD, ICCA Consortium, Kalpavriksh, and Natural Justice, Montreal, Canada. Technical Series no. 64.

Lausche, B., Laur, A., Collins, M. (2021). *Marine Connectivity Conservation 'Rules of Thumb' for MPA and MPA Network Design*. Version 1.0. IUCN WCPA Connectivity Conservation Specialist Group's Marine Connectivity Working Group.

McDonald, R.I., Weber, K., Padowski, J., Flörke, M., Schneider, C., Green, P.A., Gleeson, T., Eckman, S., Lehner, B., Balk, D., Boucher, T., Grill, G., Montgomery, M., (2014). Water on an urban planet: Urbanization and the reach of urban water infrastructure. Global Environmental Change 27, 96–105. https://doi.org/10.1016/j.gloenvcha.2014.04.022

National Biodiversity Strategy and Action Plan (NBSAPs); most recent NBSAP is available at: https://www.cbd.int/nbsap/search/

Newbold, T., Hudson, L.N., Arnell, A.P., Contu, S., Palma, A.D., Ferrier, S., Hill, S.L.L., Hoskins, A.J., Lysenko, I., Phillips, H.R.P., Burton, V.J., Chng, C.W.T., Emerson, S., Gao, D., Pask-Hale, G., Hutton, J., Jung, M., Sanchez-Ortiz, K., Simmons, B.I., Whitmee, S., Zhang, H., Scharlemann, J.P.W., Purvis, A., (2016). Has land use pushed terrestrial biodiversity beyond the planetary boundary? A global assessment. Science 353, 288–291. https://doi.org/10.1126/science.aaf2201

Sala, E. et al. (2021). Protecting the global ocean for biodiversity, food and climate. Nature, 592(7854), 397-402. https://doi.org/10.1038/s41586-021-03496-1

Saura, S. et al. (2018). Protected area connectivity: Shortfalls in global targets and country-level priorities. Biological Conservation, 219, 53-67.

Saura, S. et al (2017). Protected areas in the world's ecoregions: How well connected are they? Ecological Indicators, 76, 144-158.

Spalding, M.D., et al. (2012). Pelagic provinces of the world: a biogeographic classification of the world's surface pelagic waters. Ocean & Coastal Management 60, 19–30.

Spalding, M.D., et al. (2007). Marine ecoregions of the world: a bioregionalization of coastal and shelf areas. BioScience 57(7): 573–583.

Spawn, S.A., Sullivan, C.C., Lark, T.J., Gibbs, H.K., (2020). Harmonized global maps of above and belowground biomass carbon density in the year 2010. Scientific Data 7, 112. https://doi.org/10.1038/s41597-020-0444-4

Stolton, S. et al. (2014). The Futures of Privately Protected Areas. Gland, Switzerland: IUCN.

UNEP-WCMC and IUCN (2021) Protected Planet Report 2020. UNEP-WCMC and IUCN: Cambridge UK; Gland, Switzerland.

UNEP-WCMC and IUCN (2021), Protected Planet: The Global Database on Protected Area Management Effectiveness (GD-PAME) [On-line], [May/2021], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net.

UNEP-WCMC and IUCN (2021), Protected Planet: The World Database on Protected Areas (WDPA) [On-line], [May/2021], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net.

UNEP-WCMC and IUCN (2021), Protected Planet: The World Database on Other Effective Area-based Conservation Measures (WD-OECM) [On-line], [May/2021], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net.

UN Ocean Conference Voluntary Commitments, available at: https://oceanconference.un.org/commitments/

Williams, B.A., Venter, O., Allan, J.R., Atkinson, S.C., Rehbein, J.A., Ward, M., Marco, M.D., Grantham, H.S., Ervin, J., Goetz, S.J., Hansen, A.J., Jantz, P., Pillay, R., Rodríguez-Buriticá, S., Supples, C., Virnig, A.L.S., Watson, J.E.M., (2020). Change in Terrestrial Human Footprint Drives Continued Loss of Intact Ecosystems. One Earth 3, 371–382. https://doi.org/10.1016/j.oneear.2020.08.009

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