MEKONG STRATEGY
FOR BASIN-WIDE ENVIRONMENTAL MANAGEMENT FOR ENVIRONMENTAL ASSETS OF REGIONAL IMPORTANCE

2021–2025
The Mekong River Commission is funded by contributions from its Member Countries and Development Partners, including Australia, the European Union, Finland, Flanders/Belgium, France, Germany, Japan, Luxembourg, the Netherlands, New Zealand, Sweden, Switzerland, and the United States of America.
Mekong Strategy for Basin-wide Environmental Management for Environmental Assets of Regional Importance 2021–2025
Citation


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Preface

The Mekong Strategy for Basin-wide Environmental Management for Environmental Assets of Regional Importance (SBEM) has been developed as a cooperative regional strategy to protect environmental and ecological assets, including those providing ecosystem services in the basin.

Basin-wide scenarios and assessments undertaken by the Mekong River Commission (MRC) and others have shown that environmental assets will be further eroded unless key stakeholders – the four Member Countries (MCs), Cambodia, Lao PDR, Thailand and Viet Nam; MRC dialogue partners, China and Myanmar; local, regional and international civil society and non-government organizations; academia; the private sector, stakeholders, as well as the people living in the Mekong River Basin region – come together to implement a strategy to preserve prioritized environmental assets that are of mutual economic, social, and environmental value from a basin-wide perspective.

As this is the first strategy of its kind, the SBEM identifies measures to protect and conserve 12 prioritized regional environmental assets (REAs) in the LMB, as selected and agreed by the MCs due to their regional importance in supporting basin-wide processes or due to their transboundary nature. Underpinning the importance of the 12 REAs are the ecosystem services (ES) they contribute to the Mekong in providing food, water, medicine, fibre, and wood to support sustainable livelihoods. These ESs also regulate important processes such as soil formation and composition, pest and disease control, and climate, and support other services such as nutrient cycling, and aesthetic and cultural benefits. All of these services are mutually beneficial for current and future generations in the LMB.

To support the development of the SBEM, a regional review (Report 1) was undertaken of environmental assets with national and regional importance. Studies, policies, strategies, and action plans for the management of environmental assets in the LMB were also reviewed, all of which confirmed the importance of adopting an ES approach when managing important environmental assets. The regional review resulted in the development of a baseline of national and regional environmental assets through national and regional inventories, which supported the identification of environmental assets of high economic, social, and environmental value at a basin-wide level.

Following regional consultations at the first meeting of the Environmental Management Expert Group (EMEG) for the SBEM in Bangkok, Thailand, on 26 October 2018, and subsequent national consultations in the four MCs in March 2019, a list of regionally important environmental assets was developed by applying agreed selection criteria (Report 2) using international, regional and national expert opinions while also drawing from the national and regional inventories.

The Selection Criteria Report (Report 2) resulted in an agreed definition of environmental assets for use within the LMB:

- Naturally occurring areas that provide environmental ‘functions’ and ‘services’ for sustainable generations (current and future) of the Lower Mekong Basin.
Environmental assets could include but are not limited to terrestrial, aquatic ecosystems, including biodiversity hotspots, wetlands, fish species, etc., which provide important ecosystem functions and/or services that are mutually beneficial to the four Lower Mekong countries’ and their current and future generations.

The Selection Criteria Report (Report 2) also resulted in an agreed approach to prioritizing environmental assets of national and regional importance, leading to a mutually agreed final list of 12 prioritized environmental assets from more than 120 environmental assets identified by the four MCs. The SBEM was then prepared for these top 12 REAs by drawing its main recommendations from the Regional Review (Report 1) process.

The first draft of the SBEM (Report 3) was discussed and feedback provided at the second EMEG meeting on 5 June 2019 in Hanoi, Viet Nam. The second draft was discussed at the national consultations in September 2019, and the third and final draft of the SBEM was discussed and agreed at the third EMEG meeting on 30 October 2019 in Bangkok, Thailand.

Overall, there was a number of challenges during the preparation of the SBEM. These included the limited availability of data and conceptualizing environmental assets on a basin-wide scale for the first time, and ensuring that the strategy was relevant at local, national and regional levels and added value to existing programmes, policies, and legal frameworks.

The results of the national and regional consultations confirmed the real and immediate need for the SBEM to address the protection and management of the 12 prioritized environmental assets of regional importance in the LMB. There were some concerns that the SBEM was not comprehensive enough; however, the 12 REAs were rigorously reviewed and selected using selection criteria specifically designed for the SBEM. The result was a well distributed, representative selection of regionally important environmental assets covering 6% of the LMB or about 10% of the total number of environmental assets in the LMB. There were also concerns that the SBEM was too ambitious; however, the selection criteria were applied to over 120 environmental assets, which were assessed and narrowed down to the final list of 12 as agreed to by the four MCs.

The preparation of the SBEM would not of been possible without the expertise and perspectives of the EMEG and the national line/implementing agencies and national experts who attended the regional and national consultations. Further refinement was conducted through frank, open discussions and the sharing of important technical information with relevant national experts and local, national, regional and international stakeholders. The International Union for the Conservation of Nature (IUCN) also provided technical support to the EMEG on the development of the SBEM.

In developing the SBEM, the four MCs and their national governments confirmed their commitment, as did the broad range of regional stakeholders. The SBEM provides an opportunity to implement a cooperative strategy where capacity can be built, and best management practices and information can be shared. Ultimately, the SBEM will establish a permanent regional network of environmental assets of regional importance within the LMB, which will be protected and managed for generations to come.
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<tr>
<td>AHP</td>
<td>ASEAN Heritage–Park</td>
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<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
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<tr>
<td>BDS</td>
<td>Basin Development Strategy</td>
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<tr>
<td>BFMS</td>
<td>Mekong Basin-wide Fisheries Management Strategy</td>
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<tr>
<td>BR</td>
<td>Biosphere Reserve</td>
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<tr>
<td>EA</td>
<td>Environmental assets</td>
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<td>EMEG</td>
<td>Environmental Management Expert Group</td>
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<tr>
<td>ES</td>
<td>Ecosystem services</td>
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<td>GDP</td>
<td>Gross domestic product</td>
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<tr>
<td>ha</td>
<td>Hectares</td>
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<tr>
<td>IBRRI</td>
<td>Indo–Burma Ramsar Regional Initiative</td>
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<td>IIED</td>
<td>International Institute for Environment and Development</td>
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<tr>
<td>IUCN</td>
<td>International Union for the Conservation of Nature</td>
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<tr>
<td>IWWM</td>
<td>Integrated Water Resources Management</td>
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<td>LMB</td>
<td>Lower Mekong Basin</td>
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<tr>
<td>LSR</td>
<td>Lower Songkhram River</td>
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<tr>
<td>MC</td>
<td>Member County</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and evaluation</td>
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<td>MRC</td>
<td>Mekong River Commission</td>
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<tr>
<td>NEPL</td>
<td>Nam–Et Phoulei National Park</td>
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<td>NMC</td>
<td>National Mekong Committee</td>
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<td>NP</td>
<td>National Park</td>
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<td>NPA</td>
<td>National Protected Area</td>
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<td>PES</td>
<td>Payment for Ecosystem Services</td>
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<tr>
<td>REA</td>
<td>Environmental Asset of Regional Importance in the LMB</td>
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<tr>
<td>SBEM</td>
<td>Mekong Strategy for Basin–wide Environmental Management for Environmental Assets of Regional Importance</td>
</tr>
<tr>
<td>SOBR</td>
<td>State of the Basin Report</td>
</tr>
<tr>
<td>TBPA</td>
<td>Transboundary Protected Area</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Education, Scientific and Cultural Organization</td>
</tr>
<tr>
<td>WIAM</td>
<td>Wetland Inventory, Assessment and Monitoring Wetland</td>
</tr>
<tr>
<td>WNL</td>
<td>Wiang Nong Lhom</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wide Fund for Nature</td>
</tr>
</tbody>
</table>
Executive Summary

The Mekong Strategy for Basin-wide Environmental Management for Environmental Assets of Regional Importance 2021–2025 (SBEM) is a five-year strategy and one of a number of sector strategies supporting the overall vision for the Mekong River Basin as an economically prosperous, environmentally sound, and socially just river basin. It is the first step towards building regional, national and local capacity to protect and manage Environmental Asset of Regional Importance in the LMB (REAs) and the environment more broadly within the Lower Mekong River Basin (LMB).

The SBEM draws from relevant international, regional and national policies and strategies but is unique in terms of its objective, vision, strategic directions, priorities, actions, and its long-term outcomes and targets.

The objective of the SBEM is to:

Identify strategic priorities and related priority actions for the protection and management of the 12 REAs for implementation at national, transboundary, and regional levels.

The SBEM includes 12 REAs within the LMB, covering 6% of the LMB or about 10% of the total number of environmental assets in the LMB, and are a representative selection of similar types of sites throughout the basin. The four Member Countries (MCs) have identified the 12 REAs as being of the highest priority on a basin-wide scale, and include:
Ramsar Wetlands of Importance (and lakes) that provide habitats to a high diversity of fish species, water birds, migratory species, and important hydrological functions for flood and drought protection, as well as ecosystem services to local, national and regional communities.

National Protected Areas, Wildlife Sanctuaries and National Parks, generally in mountainous areas, that provide the last known habitats for important endangered species including tigers, cloud leopards, and elephants, as well as old growth forests and rare flora. These include areas that are transboundary with other important protected areas in an adjacent country, providing an important protective function in the watersheds along tributaries of the Mekong River and connecting to biodiversity corridors. They are often home to ethnic communities reliant on the forest for subsistence. Some are also listed as Association of Southeast Asian Nations (ASEAN) Heritage Parks and/or United Nations Education, Scientific and Cultural Organization (UNESCO) Natural World Heritage Areas.

National Parks and Ramsar Wetlands located within the Mekong Delta region, which are unique ecological systems of peatlands and natural salt-marsh forests with high values in terms of biodiversity, landscape, culture and history, and play an important role in balancing saltwater intrusion and protecting from sea level rise. Some are also listed as UNESCO Biosphere Reserves or ASEAN Heritage Parks.

Multiple Use areas of important floodplain and riverine habitats of the Tonle Sap Lake, Lower Songkhram River, and the Mekong River providing both riverine and floodplain ecosystems supporting a diversity of fish species, water birds, and playing an important hydrological role for the adjacent farmlands and urban areas, supplying water in most seasons of the year and also balancing floods, stabilising shorelines in the dry season, providing a tourism attraction, and supporting food security.

The SBEM’s 20–year vision for the LMB is one in which:

Regional environmental assets are wisely used, maintained, protected, and managed for their conservation value and to support ecosystem services for better environmental, social, and economic conditions that benefit everyone living in the LMB.

To deliver this vision, the SBEM has four strategic directions:

- building resilient environmental assets and adapting to change;
- engaging with the community and other actors, and establishing cooperative partnerships and networks;
- investing wisely and creating incentives; and
- strengthening regional and national environmental assets.
The ten strategic priorities under these four strategic directions, include:

- protecting the prioritized 12 REAs with inclusive and harmonious strategies, policies, plans, and project design; supporting regional and national capacity for regional and national planning processes regarding the 12 REAs; and developing and updating management plans for each REA;
- establishing a permanent regional network for the 12 REAs;
- developing strategies for the 12 REAs to transform and adapt to change;
- implementing a community engagement and awareness program to inform decision-making and develop stakeholder partnerships and awareness raising for the 12 REAs;
- nurturing partnerships and investigating new opportunities for managing the 12 REAs and implementing the SBEM;
- understanding the ecosystem services provided by the 12 REAs;
- investigating funding opportunities for the 12 REAs. For example, options to establish a Lower Mekong Conservation Fund to protect and manage the 12 REAs with a focus initially on opportunities from organizations interested in investing in sustainable activities;
- reviewing social and economic instruments and incentives for the 12 REAs, such as payment for ecosystem approaches;
- developing and reviewing guidance and/or action plans for services occurring within or near the 12 REAs, including agriculture, tourism, fisheries, and forestry; and
- reviewing and investigating the legal status of each of the 12 REAs to assess opportunities to strengthen transboundary cooperation. For example, establishing Transboundary Protected Areas or Transboundary Conservation Landscapes or Seascapes between the 12 REAs and/or other environmental assets in the LMB.

The SBEM is complementary to other relevant regional and national strategies, legislation, policies and projects, and its strategic priorities and actions will be included in the Basin Development Strategy 2021–2030 (BDS).

The Environmental Management Expert Group (EMEG) will provide oversight and guidance on how the agreed basin-wide strategic priorities and actions will be addressed and integrated into regional and national planning. Implementation will be participatory and engage with MCs, dialogue partners, national agencies, regional organizations, academic organizations, the private sector, civil society, and other non-state actors.

The SBEM will be reviewed and updated every five years, and expanded to include additional regional environmental assets and additional activities. The SBEM will be implemented through the development of a Project-based Action Plan to prioritize and identify sustainable funding. Through implementation of this cooperative strategy, the status of environmental and ecological assets will be maintained, protected and managed, ensuring that the ecosystem services they provide benefit the 70 million people of the LMB.
Mekong Strategy for Basin-wide Environmental Management for Environmental Assets of Regional Importance 2021–2025
1 RATIONALE AND BACKGROUND

1.1 Why do we need a Strategy for Basin-wide Environmental Management for Environmental Assets of Regional Importance?

The Mekong River Basin ecosystem and its environmental assets play an important role supporting critical ecological services and functions for close to 70 million riparian people (rising to 100 million in the next ten years) in the LMB.

The Mekong River Basin is recognized as a global biodiversity hotspot, comprising 12 habitat types, from highlands to coastal waters, including peat swamps, subterranean streams, and crater lakes. The basin ecosystem comprises many subsystems, with the Mekong River, its tributaries and low-lying habitats like floodplains, wetlands, swamps and the Mekong Delta in Viet Nam playing a prominent role. Progressive urbanization and emerging secondary and tertiary sectors in the economies of the four riparian countries is occurring; however, the majority of the population still depend on the basin ecosystem for their livelihoods – as a source of income and employment, and for food.

The main functions of the Mekong’s environmental assets are to supply food and other resources (water, medicines, fibre, wood, etc.), and provide aesthetic and cultural benefits. Recently, significant exploitation of the water resources and ecosystem services in the LMB has caused long-term negative impacts on the sustainability of livelihoods and socio-economic conditions. This now needs addressing.

Currently, there is insufficient knowledge with regards to the environment, particularly biodiversity and ecosystem services, at the basin-wide level. There is also a lack of agreed strategic priorities to protect and manage REAs from the impact of planned and emerging developments using a whole-of-landscape approach.
As a consequence, in preparing for the SBEM, a regional review was undertaken of environmental assets with national and regional importance. Studies, policies, strategies, and action plans for the management of environmental assets in the LMB were also reviewed, and a baseline of national and regional environmental assets was developed through national and regional inventories to identify REAs at a basin-wide level. The regional inventory was then reviewed and agreed selection criteria were used to prioritize REAs based on their importance regionally in supporting basin-wide or transboundary processes.

The SBEM includes 12 REAs as prioritized and agreed to by the four MCs (with three REAs selected for each country), as a first step to build capacity to protect, and manage the environment more broadly within the LMB. It should be noted that there are more than 120 regional environmental assets within the LMB. The list as prioritized, however, does not preclude the need for all environmental assets to be protected, and managed.

### 1.2 Regional Environmental Assets of Importance in the Lower Mekong River Basin

The concept of ecosystem services (ES), or natural capital, recognizes that environmental systems play a fundamental role in a country’s economic output and social well-being. The three main ecosystem service categories are identified as: provisioning services (e.g. biomass, water, fibre); regulating maintenance services (e.g. soil formation and composition, pest and disease control, climate regulation); supporting services such as soil formation and nutrient cycling; and cultural services (the physical, intellectual, spiritual, symbolic interactions of humans with ecosystems, land and seascapes) (EC, 2000).

To support the development of the SBEM, a regional review identified the relevance of adopting an ES approach when managing significant environmental assets. Lessons learned from international experience confirmed that an ES approach would be effective in the LMB and would enable important ecosystems to be valued in terms of the food and sustainable livelihoods they support within the Mekong watershed.

The definition of Environmental Assets (EAs), as agreed by the EMEG, is as follows:

- Naturally occurring areas that provide environmental ‘functions’ and ‘services’ for sustainable generations (current and future) of the Lower Mekong Basin (LMB).

- Environmental assets could include but are not limited to terrestrial, aquatic ecosystems, including biodiversity hotspots, wetlands, fish species, etc., which provide important ecosystem functions and/or services that are mutually beneficial to the four Lower Mekong countries and their current and future generations.
The regional review resulted in the development of a baseline of national and regional EAs, through the national and regional inventories, to support the next steps in identifying the environmental assets of high economic, social, and environmental value at a basin-wide level.

Following regional consultations at the first meeting of the Environmental Management Expert Group (EMEG) for the SBEM in Bangkok, Thailand, on 26 October 2018, and subsequent national consultations in the four MCs in March 2019, a list of regionally important environmental assets was developed through the application of agreed selection criteria (Report 2) using international, regional and national expert opinion, while also drawing from the national and regional inventories.

The national inventories first provided a list of the most important national EAs in the LMB based on their reserve status; biodiversity characteristics; functions; benefits; threats; national, regional or international significance or importance; relevant applicable national policies, action plans, and strategies; and geographical location.

The national inventories included Ramsar Wetlands of International Importance, biosphere reserves, UNESCO World Heritage Sites, UNESCO Biosphere Reserves, ASEAN Heritage Parks national protected areas (including terrestrial, aquatic and marine protected areas), national parks, wildlife sanctuaries, Greater Mekong Sub-region biodiversity corridors or hotspots, protected landscapes, national heritage parks, important water bird areas, multiple use areas, non-hunting areas, and aquatic reserves. By their very nature, all these sites hold ecological, social and economic value to varying degrees. Through their designation as national sites of importance they had already met certain criteria in determining this importance.

The selection criteria developed specifically for the SBEM to prioritize REAs adopted a pragmatic approach and was designed for ease of application by the MCs based on a number of assumptions. This resulted in the development of a hybrid method following an analysis of existing global and regional examples of selection criteria and given the diverse nature of the environmental assets identified.

A weighting system was developed to emphasize the importance of ecosystem services provided by these assets and their regional (basin-wide) or transboundary importance.

Six selection criteria were identified:

1. Biodiversity/Ecological Importance
2. Hydrological importance
3. Rareness and uniqueness (irreplaceability)
4. The Importance of the Ecosystem Services
5. Global importance
Regional (basin-wide) or transboundary importance.

Each MC selected its top 9–10 EA of national importance and then identified the top three sites using the selection criteria. The findings of this ranking process were then further debated nationally by the National Mekong Committee (NMC) Secretariats, national consultants, and line/implementation agencies, and the resultant list of 12 prioritized environmental assets of regional importance was agreed and finalised. This list is summarized in Table 1, with a detailed description provided in Table 2 and shown spatially in Figure 1. Figure 2 shows the World Wide Fund for Nature (WWF) ecoregions within the LMB for reference.

It can be observed that the final list of the 12 REAs provides a representative selection of EA types, including:

- **Ramsar Wetlands of Importance** (and lakes) that provide habitats to a high diversity of fish species, water birds, migratory species, and important hydrological functions for flood and drought protection, as well as ecosystem services to local, national, and regional communities.

- **National Protected Areas, Wildlife Sanctuaries and National Parks**, generally in **mountainous areas**, that provide the last known habitats for important endangered species including tigers, cloud leopards, and elephants, as well as old growth forests and rare **flora**. These include areas that are transboundary with other important protected areas in an adjacent country, providing an important protective function in the watersheds along tributaries of the Mekong River and connecting to biodiversity corridors. They are often home to ethnic communities reliant on the forest for subsistence. Some are also listed as ASEAN Heritage Parks and/or UNESCO Natural World Heritage Areas.

- **National Parks and Ramsar Wetlands located within the Mekong Delta region**, which are unique **ecological** systems of **peatlands** and **natural salt-marsh forests** with high values in terms of biodiversity, landscape, culture and history, and play an important role in balancing saltwater intrusion and protecting from sea level rise. Some are also listed as UNESCO Biosphere Reserves or ASEAN Heritage Parks.

- **Multiple-use areas of important floodplain and riverine habitats** of the Tonle Sap Lake, Lower Songkhram River, and the Mekong River, which provide both riverine and floodplain ecosystems, support a diversity of fish species and water birds, and play an important hydrological role in the adjacent farmlands and urban areas. They also supply water in most seasons of the year and balance floods, stabilize shorelines in the dry season, are a tourism attraction, and support food security.

In total, the 12 prioritized REAs cover almost 6% (47,202 km²) of the total area (795,000 km²) of the LMB – 2.9% within Cambodia, 0.4% within Lao PDR, 2.43% within Thailand, and 0.2% within Viet Nam of the LMB.
Table 1. The 12 prioritized REAs, their representativeness, regional risks, and opportunities

<table>
<thead>
<tr>
<th>Name of Environmental Asset of Regional Importance in the LMB (REA) and location</th>
<th>Ecoregions Represented</th>
<th>Regional Risks and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nam Et Phoulei National Park, north-eastern Lao PDR</td>
<td>Northern Indochina Subtropical Forest</td>
<td>Planned hydropower, mining, and agriculture development within the National Park (NP) could affect its condition and integrity. Provides watershed protection, groundwater recharge, and reduced sedimentation and erosion.</td>
</tr>
<tr>
<td></td>
<td>Luang Prabang Mountain Rainforest</td>
<td></td>
</tr>
<tr>
<td>Nong Bong Kai, Wiang Nong Lhom and Mainstream Mekong, northern Thailand</td>
<td>Northern Indochina Subtropical Forest</td>
<td>At risk from cascading hydropower development, agriculture development, rock blasting and dredging for international navigation and land-use/resource conflict. Provides flood protection, groundwater recharge, and reduced drought impacts.</td>
</tr>
<tr>
<td></td>
<td>Northern Thailand/Laos Moist Deciduous Forest</td>
<td></td>
</tr>
<tr>
<td>Lower Songkhram River, north-eastern Thailand</td>
<td>Northern Khorat Plateau Moist Deciduous Forests</td>
<td>At risk from cascading hydropower development, agriculture development and land-use/resource conflict. Provides flood protection, groundwater recharge, and reduced erosion and drought impacts. Occasionally creates a backflow effect similar to Tonle Sap, Cambodia.</td>
</tr>
<tr>
<td></td>
<td>Northern Annamites Rainforest</td>
<td></td>
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</tbody>
</table>

1. The 12 regional environmental assets of importance in the LMB are representative of all ecoregions that fall within the basin, except for the Southern Annamites Montane Rainforests, of which a small portion of these forest types are located in southern mountainous areas of Lao PDR and Viet Nam.

2. Risks include increased soil erosion, decline in water quality and fisheries populations, obstruction of migratory fish species, decrease in sedimentation, increase in water pollution, increased vulnerability to changes in climate, etc.
<table>
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<tr>
<th>Name of Environmental Asset of Regional Importance in the LMB (REA) and location</th>
<th>Ecoregions Represented</th>
<th>Regional Risks and Opportunities</th>
</tr>
</thead>
</table>
| Xe Champhone Ramsar Wetland, south-eastern Lao PDR | 1. Central Indochina Dry Forest  
2. Southern Eastern Indochina Evergreen Forest | At risk from cascading hydropower development, agriculture development and land-use/resource conflict. Provides watershed protection and groundwater recharge, maintains dry season flow, and reduces erosion, flooding and impact of drought. |
| Beung Kiat Ngong Ramsar Wetland, southern Lao PDR | 1. Central Indochina Dry Forest | At risk from cascading hydropower development, agriculture development and land-use/resource conflict. Provides important component of the sites’ hydrological system, with lateral groundwater inflows critical for maintaining the wetlands’ water balance. Also provides protection from flooding and erosion. |
| Khao Yai and Thap Lan National Park (Dongphayayen-Khaoyai Forest Complex), eastern Thailand | 1. Central Indochina Dry Forest  
2. Southern Eastern Indochina Evergreen Forest  
3. Cardamom Mountain Rainforest | At risk from large-scale linear developments. Provides watershed protection, freshwater supply, groundwater recharge and discharge, and reduced sedimentation and erosion. |
| Virachey National Park, north-eastern Cambodia | 1. Central Indochina Dry Forest  
2. Southern Eastern Indochina Evergreen Forest | At risk from upstream hydropower development, agriculture development, and land-use/resource conflict. Provides watershed protection to the Sesan and Sekong Rivers, groundwater recharge, carbon storage, protection from flooding, and reduced sedimentation and erosion. |
<table>
<thead>
<tr>
<th>Name of Environmental Asset of Regional Importance in the LMB (REA) and location</th>
<th>Ecoregions Represented</th>
<th>Regional Risks and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sre Pok Wildlife Sanctuary, eastern Cambodia</td>
<td>1. Central Indochina Dry Forest</td>
<td>At risk from upstream hydropower development, mining, agriculture development, impacts of climate change, and land-use/resource conflict. Provides watershed protection, groundwater recharge, and reduced impacts from flooding, erosion and droughts.</td>
</tr>
<tr>
<td>Yok Don National Park, central highlands, Viet Nam</td>
<td>1. Central Indochina Dry Forest 2. Southern Eastern Indochina Evergreen Forest</td>
<td>Provides watershed protection, fresh water supply, groundwater recharge and discharge, and reduced sedimentation and erosion.</td>
</tr>
<tr>
<td>Tonle Sap Multiple Use Area, central Cambodia</td>
<td>1. Tonle Sap Freshwater Swamp Forest</td>
<td>At risk from cascading hydropower development, agriculture development, and land-use/resource conflict. Provides important function for the LMB hydrological system for the 12,876 km² Cambodian floodplain that the Mekong replenishes with water and sediments annually.</td>
</tr>
<tr>
<td>U Minh Thuong National Park, Mekong Delta, Viet Nam</td>
<td>1. Indochina Mangroves 2. Tonle Sap Mekong Peat Swamp Forest</td>
<td>At risk from cascading hydropower development, agriculture development, and land-use/resource conflict. Plays important role in maintaining the soil and water quality in the buffer zone by preventing the acidification of topsoil and surface water, filtering groundwater, and storing freshwater during the dry season.</td>
</tr>
</tbody>
</table>
### Table 2. Description of the 12 prioritized REAs

#### Cambodia

1. **Tonle Sap Multiple Use Area**

Located in Kampong Thom, Kampong Chhnang, Pursat, Batambang and Siem Reap provinces, the Tonle Sap Multiple Use Area includes the Tonle Sap Lake and River. The lake is the largest freshwater lake in Southeast Asia and contains an exceptionally large variety of interconnected ecoregions with a high degree of biodiversity, and is therefore a biodiversity hotspot. It was designated a UNESCO Biosphere Reserve in 1999.

The lake expands from 2,500 km² to more than 16,000 km², creating an enormous wetland area, comprising 2% of the LMB. The lake and river provide an important function for the central part of a complex hydrological system in the 12,876 km² Cambodian floodplain, which is covered with a mosaic of natural and agricultural habitats that the Mekong replenishes with water and sediments annually. As one of the world’s most varied and productive ecosystems, the region has always been of central importance for Cambodia’s food supply, including fisheries.

The site was ranked the number one site within the top three environmental assets for Cambodia based on its high ranking for all six criteria, as detailed below: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, and global and regional, or transboundary (basin-wide processes) importance.
<table>
<thead>
<tr>
<th><strong>Biodiversity/Ecological Importance</strong></th>
<th><strong>Score: 5</strong></th>
<th><strong>Rationale for score against each criterion</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonle Sap is very important due to its freshwater ecology. Many species are listed on the International Union for the Conservation of Nature (IUCN) Red List due to their conservation significance. There are 217 bird species known to reside in the lake, with 18 rare species present. It is highly abundant and diverse in fish species, with 296 known fish species in the Lake. It is a UNESCO Biosphere Reserve. The lake has 11 tributaries that flow into it, supporting habitats for aquatic species of flora and fauna. It also provides habitat connectivity to the Mekong River from the tributaries.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Hydrological Importance</strong></th>
<th><strong>Score: 5</strong></th>
<th><strong>Rationale for score against each criterion</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is very important for the seasonal flow reversal of the Mekong River and receives water flow from 11 key tributaries.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Rareness and Uniqueness</strong></th>
<th><strong>Score: 5</strong></th>
<th><strong>Rationale for score against each criterion</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Its flooded forest has diverse and unique species present. Its hydrological function of Inflow and outflow is also rare in the region. It is the biggest lake in Southeast Asia. It has the highest fish productivity for a lake in the region, and regulates flooding and provides flood protection downstream, including in the Mekong Delta. It is the largest catchment within the LMB. The difference in surface water of the lake is very large – from 2,500 km² during the dry season and 15,000 km² during the wet season.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>The Importance of the Ecosystem Services</strong></th>
<th><strong>Score: 5</strong></th>
<th><strong>Rationale for score against each criterion</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is highly productive in providing food and water to the town and for irrigation. It is important for ecotourism, culture, cycling, fishing, livelihood support, income generation, an agriculture. It ensures a nutrient supply, and provides a habitat for spawning, nursing, and foraging for key species of fish and birds, etc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Global Importance</strong></th>
<th><strong>Score: 5</strong></th>
<th><strong>Rationale for score against each criterion</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is designated as a UNESCO Biosphere Reserve.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Regional, Transboundary Importance</strong></th>
<th><strong>Score: 5</strong></th>
<th><strong>Rationale for score against each criterion</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonle Sap Lake is well-known as the largest freshwater lake in Southeast Asia and provides an important seasonal reversal flow for the Mekong.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Virachey National Park

Virachey National Park is located in north-eastern Cambodia covering an area of 3,380 km², comprising 0.43% of the LMB. The park is one of only two Cambodian ASEAN Heritage Parks and is one of the top priority areas for conservation in Southeast Asia. The park overlaps Ratanakiri and Stung Treng provinces and borders with Chu Mom Ray NP in Viet Nam (Kon Tum province) and the Xe Pian National Protected Area and the Dong Amphan National Biodiversity Conservation Area in Lao PDR (Attapeu province).

The park comprises dense semi-evergreen lowlands, montane forests, upland savannah, bamboo thickets, and occasional patches of mixed deciduous forest. Most of the area lies between 400 metres to 1,500 metres above sea level. It provides habitats for species such as guar, clouded leopard cats, elephants, gibbons, sun bears, and innumerable other mammal, bird, plant and tree species.

Virachey National Park was selected as the number two site within the top three environmental assets of national importance for Cambodia based on its high ranking for four criteria: biodiversity/ecology, rareness and uniqueness, global, and regional or transboundary (basin-wide processes) importance, as detailed below.

<table>
<thead>
<tr>
<th>Virachey National Park Ranked #2</th>
<th>Rationale for score against each criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Score:</strong> 26</td>
<td></td>
</tr>
<tr>
<td><strong>Biodiversity/Ecological Importance</strong></td>
<td>Habitat for species such as guar, clouded leopard cats, elephants, gibbons, sun bears, and innumerable other mammal, bird, plant, and tree species. Comprises dense semi-evergreen lowlands, montane forests, upland savannah bamboo thickets, and occasional patches of mixed deciduous forests.</td>
</tr>
<tr>
<td><strong>Score:</strong> 5</td>
<td></td>
</tr>
<tr>
<td><strong>Hydrological Importance</strong></td>
<td>Provides watershed and flood protection for the Sesan and Sekong Rivers, which flow into the Mekong, and together with the Sre Pok River, accounts for more than 20% of the Mekong River’s flow.</td>
</tr>
<tr>
<td><strong>Score:</strong> 3</td>
<td></td>
</tr>
<tr>
<td><strong>Rareness and Uniqueness</strong></td>
<td>Last known habitat for tigers, clouded leopard cats, and elephants in Cambodia. The National Park (NP) is one of only two areas in Cambodia known to support Germain’s Peacock Pheasant <em>Polyplectron germaini</em>, a restricted-range species. In addition, it supports a number of globally threatened and near-threatened species, including Siamese Fireback, <em>Lophura diardi</em>, Red–collared Woodpecker, <em>Picus rabieri</em>, and Great Hornbill, <em>Buceros bicornis</em>.</td>
</tr>
<tr>
<td><strong>Score:</strong> 5</td>
<td></td>
</tr>
</tbody>
</table>
The Importance of the Ecosystem Services

Score: 3

Provides biological processes for important endangered species, and watershed and flood protection of the Sesan River, which flows into the Mekong. Eco-tourism provides income for local minority communities. It is culturally important and crucial for carbon storage and flood protection.

Global Importance

Score: 5

One of only two ASEAN Heritage Parks in Cambodia.

Regional, Transboundary Importance

Score: 5

Transboundary with protected areas in Xe Pian and Dong Amphan National Protected Areas in Lao PDR and Chu Mom Rai National Park in Viet Nam. Identified as one of the top priority areas for conservation in Southeast Asia. Located within the Sesan River, which flows into the Mekong River.

3. Sre Pok Wildlife Sanctuary

The Sre Pok Wildlife Sanctuary (formerly the Mondulkiri Protected Forest) is a 3,720 km² protected forest in Mondulkiri province, eastern Cambodia, comprising 0.47% of the LMB. It borders Lumphat Wildlife Sanctuary in the northwest, Nsok Protected Forest in the north, Phnom Prich Wildlife Sanctuary in the southwest, and Phnom Nam Lyr Wildlife Sanctuary in the southeast.

The Sre Pok River Basin is an important transboundary tributary to the Mekong River and shares joint transboundary water with Yok Dong National Park in Viet Nam. It is rich in natural resources and has very high fish diversity. At least 81 (33%) of the species found in Sre Pok are migratory and depend on connectivity to adjacent areas. The area provides significant incomes for local communities.

The Srepok Wildlife Sanctuary was selected as the number three site of national importance for Cambodia based on its high ranking for three criteria: biodiversity/ecology, ecosystem services, and regional or transboundary (basin-wide processes) importance, as detailed below.

<table>
<thead>
<tr>
<th>Srepok Wildlife Sanctuary</th>
<th>Rationale for score against each criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranked #3</td>
<td>The Srepok Wildlife Sanctuary is home to globally endangered species including Asian elephant, leopard, clouded leopard, banteng, Giant ibis, white-shouldered ibis, and Siamese crocodile. It also has very high fish diversity.</td>
</tr>
<tr>
<td>Total Score: 24</td>
<td>Provides watershed protection and prevention from floods and reduces drought impacts.</td>
</tr>
</tbody>
</table>
### Rareness and Uniqueness

**Score: 3**  
The wildlife sanctuary was once home to wild Asian tigers and has been identified by the Cambodian Government as a site for the tiger reintroduction programme.

### The Importance of the Ecosystem Services

**Score: 5**  
The wildlife sanctuary is crucial for carbon storage and sequestration, as well as for preventing flooding, and reducing the impact of drought. The area provides food and income sources for the local indigenous community, who are reliant on its natural resources and fisheries. It is also important for ecotourism and income generation.

### Global Importance

**Score: 3**  
It is listed as being located among the 200 important ecoregions globally.

### Regional, Transboundary Importance

**Score: 5**  
Located in the Sre Pok River Basin, an important transboundary tributary to the Mekong River, and shares joint transboundary water with Yok Don National Park in Viet Nam. At least 81 of the fish species found in Sre Pok are migratory and depend on connectivity to adjacent areas. The area provides significant incomes for local communities and provides habitats for two regionally important populations of Asian Elephant and Banteng.

### Lao PDR

#### 1. Beung Kiat Ngong Wetlands Ramsar Site

The Beung Kiat Ngong Ramsar wetlands cover 2,360 ha (23.6 km²) and is located in Pathoumphone district, Champassak province in southern Lao PDR, approximately 56 km south of the provincial capital of Pakse. The area comprises 0.003% of the LMB. It is listed under the International Convention for Wetlands Ramsar, and is one of two Ramsar wetlands in Lao PDR. It provides important habitats for water birds, migratory fish species, and is an important source of natural resources for local villages.

The Beung Kiat Ngong Ramsar wetlands was selected as the number one site of the top three environmental assets of national importance for Lao PDR based on its high ranking for all six criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance.

### Beung Kiat Ngong Wetlands

**Rationale for score against each criterion**

<table>
<thead>
<tr>
<th>Ranked #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score: 30</td>
</tr>
<tr>
<td>Biodiversity/Ecological Importance</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Score: 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydrological Importance</th>
<th>Groundwater is an important component of the site's hydrological system, and lateral groundwater inflows are critical for maintaining the wetlands' water balance. A close connection between ground and surface waters also maintains key permanent areas of the site.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rareness and Uniqueness</th>
<th>The Beung Kiat Ngong Wetlands is one of only a few areas in Lao PDR where peatland can be found. And it is the largest known area of peatland within Lao PDR. The area also includes rich, semi-evergreen forest areas within the broader wetland mosaic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The Importance of the Ecosystem Services</th>
<th>Home to 11,500 people from eight core villages and several outer villages, most of whom are engaged in rice paddy cultivation while also earning extra income from collecting wetland and other forest products for food, household use, and for sale at the market. Villagers rely on the wetlands for their livelihoods, which are mainly derived from fishing and collecting wild vegetables. The wetlands also provide services including groundwater recharge, flood mitigation, sediment trapping, and fish spawning sites.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Global Importance</th>
<th>It is listed under the International Convention for Wetlands Ramsar and is one of two Ramsar wetlands in Lao PDR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional, Transboundary Importance</th>
<th>At the broadest regional scale, the Beung Kiat Ngong Wetland is included as an Indo-Burma Biodiversity Hotspot for the Central Indochina area (tropical lowland plain) (see Conservation International, 2006). The turtles found at Beung Kiat Ngong are of particular significance, regionally and nationally, as turtle populations across the region are becoming highly depleted.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
</tbody>
</table>
2. **Nam Et-Phoulei National Park**

Nam Et-Phoulei National Park (NP) is a protected area in northern Lao PDR. The park covers 5,959 km² and is located in three provinces: Houaphan, Luang Prabang, and Xieng Khouang, comprising 0.38% of the LMB. It includes a 3,000 km² core area where human access and wildlife harvest are prohibited, and a 2,950 km² buffer area where pre-existing villages are allocated land for subsistence living. Note that half of the Nam Et Phoulei NP flows within the Mekong River Basin and the other half towards Vietnam.

The NP is important for many large endangered mammals, providing the last known habitat in Lao PDR for species such as tiger, leopard, clouded leopard, Asian golden cat, marbled cat, civet, gaur, Sambar deer, and white-cheeked gibbon, etc.

The Nam Et-Phoulei National Park was selected as the number two site (equal with the Xe Champhone Ramsar Wetlands) of its top three environmental assets of national importance for Lao PDR based on its high ranking for four criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services and global importance, as detailed below.

<table>
<thead>
<tr>
<th>Nam Et Phoulei National Park</th>
<th>Rationale for score against each criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranked #2</td>
<td></td>
</tr>
<tr>
<td>Total Score: 28</td>
<td></td>
</tr>
</tbody>
</table>

**Biodiversity/Ecological Importance**

Score: 5

The National Park (NP) is important for many large endangered mammals, providing the last known habitat in Lao PDR for species such as tiger, leopard, clouded leopard, Asian golden cat, marbled cat, civet, gaur, Sambar deer, and white-cheeked gibbon. It has a high conservation value, with some of the highest faunal biodiversity of any protected area in northern Lao PDR.

**Hydrological Importance**

Score: 5

Located in a hilly mountainous area, it is the source of many rivers, including the Nam Nern, Nam Khan, Nam Et, Nam Seuang, and Nam Seng rivers. In addition, there are many tributaries that contribute significantly to the livelihoods of the local people.

**Rareness and Uniqueness**

Score: 5

It provides habitats for an endangered tiger population.
| The Importance of the Ecosystem Services | Income from the protected area’s wildlife ecotours: Nam Nern night safari or trekking tours. Ecotourism activities at Nam-Et Phoulei National Park (NEPL) have been developed to provide additional livelihood benefits. The area is located in some of the poorest districts in the country and is home to 98 communities; 30,000 people rely on its natural resources for sustenance. The livelihoods of the villagers in the area are closely associated with the natural environment by way of agricultural production and shifting cultivation. There are few sources of alternative employment, and settlements are highly scattered and often in remote and inaccessible areas. A small number of villages also manufacture handicrafts. |
| Global Importance | It supports a tiger population of international importance as well as other key large mammal species of conservation concern. |
| Regional, Transboundary Importance | It is the largest National Park in Lao PDR. It provides important watershed protection to Houaphan and Luang Prabang provinces and the Mekong River. |
3. **Xe Champhone Wetlands Ramsar Site**

The Xe Champhone wetlands is located in Savannakhet province, southern Lao PDR, and was designated a Ramsar Site in 2010 due to its importance for the conservation of the Siamese crocodile (largest population in the country), the occurrence of specific wetland habitats, and the support it brings to local livelihoods. The Xe Champhone Wetlands includes a large plain containing perennial and seasonal rivers, as well as scattered lakes, ponds, freshwater marshes, and rice paddy fields. These become interconnected during the wet season, and the wetlands extend into other wetlands areas. The northern part of the Xe Champhone includes rice paddy fields and two large reservoirs, while the southern part contains extensive vegetation, including open woodland, mixed semi-evergreen forest, as well as shrubs and grasses. Of the 12,400 ha catchment (120 km²), which comprises 0.015% of the LMB, 1,500 ha are designated as a core protected area because it serves as a conservation area for Siamese crocodiles. About 20 villages are within the core protected area, with an additional 22 villages within 5 km of the core protected area boundary. As all 44 villages rely on the wetlands for ecosystem services, the wetlands support the livelihoods of 42,000 inhabitants (half of whom are women).

The local residents rely on the wetlands for water resources, irrigation, food for people, feed for livestock, and other ecosystem services through fish and aquatic animals and plants, fibre from the flooded forests, and rice cultivation. The wetlands also provide hydrological recharge to nearby rivers, streams, and groundwater, and provide examples of oxbow lakes, deep pools, and mats of dense floating vegetation, which are rare in Lao PDR. The wetlands are important for cultural and biodiversity values with the presence of Siamese crocodiles, macaques, turtles (including the endangered elongated tortoise), and numerous water birds. The wetlands support a strong tourism industry and also play an important role in supporting migratory fish passage, habitats, and sanctuary for fish and aquatic animals during the dry season, as well as nutrient cycling, sediment retention, and fish spawning grounds.

The Xe Champhone Ramsar Wetlands was selected as the joint number two site with Nam Et Phoulei National Park in Lao PDR based on its high ranking for five criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, and global importance.

<table>
<thead>
<tr>
<th>Xe Champhone Wetlands</th>
<th>Rationale for score against each criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranked #3</td>
<td></td>
</tr>
<tr>
<td>Total Score: 28</td>
<td></td>
</tr>
</tbody>
</table>

**Biodiversity/Ecological Importance**

**Score: 5**

The Wetlands provide core habitats for an endangered population of Siamese crocodiles and the elongated tortoise, as well as habitats for numerous water birds. It also serves as a wildlife corridor and an important site for fish breeding.
The wetlands provide hydrological groundwater recharge and maintenance of dry season flows and acts as a buffer during flood periods. The wetlands provide examples of oxbow lakes, deep pools, and mats of dense floating vegetation, which are rare in Lao PDR.

Rare examples of oxbow lakes, pools and mats of dense floating vegetation can be found. It supports the largest population of endangered Siamese crocodiles in Lao PDR.

The wetlands are highly valued for their ecosystem services, particularly for: subsistence living; agriculture; non-timber forest products; fisheries; and eco-tourism. The wetlands also provide hydrological groundwater recharge and maintenance of dry season flows, and provide a buffer during flood periods. It is culturally important as home to a large group of ethnic communities. The local residents rely on the wetlands for water resources, irrigation, food for people and feed for livestock, fish and aquatic animals and plants, fibre from the flooded forests, and rice cultivation. The wetlands support a strong tourism industry with over 10,000 visits per year and play an important role in supporting migratory fish passage, habitats, and sanctuary for fish and aquatic animals during the dry season. The wetlands also play a role in nutrient cycling, sediment retention, and fish spawning grounds.

Globally important since it has the largest population of the endangered Siamese crocodile in Lao PDR. It is listed under the International Convention for Wetlands (Ramsar) and is one of two Ramsar wetlands in Lao PDR.

The Xe Champhone Wetlands (a part of the Xe Bieng Heng Wetlands) was part of the Mekong Integrated Water Resources Project, a bilateral pilot project between Lao PDR and the Nam Kam Wetlands in Thailand. This project provided a platform to exchange experiences and lessons learnt in wetland management in a transboundary context.
1. Lower Songkhram River

The Lower Songkhram River (LSR) was designated as a Wetland of International Importance (Ramsar) in 2019. It is the second largest basin in northeast Thailand (after the Mun–Chi River Basin) at 13,128 km², comprising 1.65% of the LMB, and is an important tributary of the Mekong River, contributing 1.8% of average annual flows. Over 50% of the Songkhram River Basin is classified as ‘wetlands’ (Blake and Pitakthepsombut, 2006), with the most extensive area being concentrated in the lowland floodplains of the Lower Songkhram River Basin. It is one of Thailand’s’ freshwater biodiversity hotspots.

The floodplain wetlands form a complex of wetland types, which include permanent and temporary surface water sources; artificial and natural wetland habitats; and a range of riverine, floodplain, lacustrine, palustrine, and saltwater wetland features. The outstanding feature of the LSR Basin is its annual flood event, which is intimately linked to the hydrology of the Mekong mainstream, which can occasionally cause a backflow effect similar to Tonle Sap, Cambodia. The wetlands provide important ecosystem services to the northeast of Thailand.

The Lower Songkhram River was selected as the number one site (equal with Nong Bong Kai, Wiang Nong Lhom and mainstream Mekong of Chiang Rai and Dong Phayayen Khaoyai Forest Complex) within the top three environmental assets of national importance for Thailand based on its high ranking for all six criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance, as detailed below.

<table>
<thead>
<tr>
<th>Lower Songkhram River</th>
<th>Rationale for score against each criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ranked #1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total Score: 30</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Biodiversity/Ecological Importance**

Score: 5

Provides habitats for 192 fish species, of which 80 are economically important; 208 plant species; and 136 bird species. The aquatic biodiversity present is an outstanding feature of the LSR Basin, especially due to its high diversity of fish, amphibians (16 spp.), and reptiles (40 spp.).

**Hydrological Importance**

Score: 5

The floodplain wetlands form a complex of wetland types, which include permanent and temporary surface water sources; artificial and natural wetland habitats; and a range of riverine, floodplain, lacustrine, palustrine, and saltwater wetland features. The outstanding feature of the LSR Basin is its annual flood event, which is intimately linked to the hydrology of the Mekong mainstream, which can occasionally cause a backflow effect similar to Tonle Sap, Cambodia.
Rareness and Uniqueness
Score: 5

One of Thailand’s freshwater biodiversity hotspots, and one of the country’s significant providers of ecosystem services (i.e. water and food to the local villages of north-eastern Thailand).

The Importance of the Ecosystem Services
Score: 5

Average annual floods inundate around 80,000 ha – 96,000 ha of land during July to September, the peak flooding period. The most important value of the wetland is its significance as a capture fishery, which provides seasonal employment, income and food to many thousands of households. Other products are also sourced from the wetlands by local people (e.g. mushrooms, bamboo shoots, wild vegetables and reeds), especially from the rare and threatened, but biologically diverse, seasonally flooded forest.

Global Importance
Score: 5

It is listed as a Wetland of International Importance (RAMSAR).

Regional, Transboundary Importance
Score: 5

It is a major tributary of the Mekong River.

2. Nong Bong Kai, Wiang Nong Lhom and mainstream Mekong of Chiang Rai

The Nong Bong Kai Non-Hunting Area is designated as an International Wetland of Importance under the Ramsar Convention. It is located in Chiang Saen district, Chiang Rai province, with a total area of 38 km², comprising 0.005% of the LMB. The Wiang Nong Lom Marshland (WNL) is a grassy marshland confluent with the Mekong through the meandering Ing and Lua tributaries, covering seasonally flooded marshland and shrubs with grassy mats and mosaic bushes on alluvial clay and mosaic peat soil. The area is situated in Chiang Saen and Mae Chan districts in Chiang Rai province. Over 165 fishes from 24 families are found in the mainstream of the Mekong. Over 50 economic fishes are fished using gill net traps, 62 types of artisanal fishing methods, and 7 types of fishing boats. The site provides critical fish habitats for over 1% of the population the Mekong giant catfish, *Pangasianodon gigas*, (possibly the entire population more recently) and the Chao Phraya giant catfish, *Pangasius sanitwongsei*, during breeding season.

Both the riverine and floodplain ecosystems play an important hydrological role for the adjacent farmlands and urban areas, supplying water in most seasons of the year, and also balancing flood, stabilising shorelines in the dry season and providing a tourism attraction.

The Nong Bong Kai, Wiang Non Lhom and mainstream Mekong of Chiang Rai was selected as the number one site (equal with the Lower Songkhram River and the Dong Phayayen Khaoyai Forest Complex) of the top three environmental assets of national importance for Thailand based on its high ranking for all six criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance, as detailed below.
Nong Bong Kai, Wiang Non Lom and mainstream Mekong of Chiang Rai

<table>
<thead>
<tr>
<th>Rationale for score against each criterion</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biodiversity/Ecological Importance</strong></td>
<td>It is an important water bird area. The larger sandbars in the Mekong River between Chiang Saen and Chiang Kong provide breeding habitats for Great Thick-knee, <em>Esacus recurvirostris</em>, and River Lapwing, <em>Vanellus duvaucelli</em>, while the vegetated islands and riverbanks support a significant population of Jerdon’s Bushchat, <em>Saxicola jerdoni</em>, a species characteristic of the Indo-Gangetic Plains. The Wiang Nong Lhom Marshland (WNL) is a grassy marshland confluent with the Mekong through the meandering Ing and Lua tributaries, covering seasonally flooded marshland and shrubs with grassy mats and mosaic bushes on alluvial clay and mosaic peat soil.</td>
</tr>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
<tr>
<td><strong>Hydrological Importance</strong></td>
<td>Provides important groundwater discharge, stabilizes banks, protects from flooding and erosion, and reduces the impact of drought.</td>
</tr>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
<tr>
<td><strong>Rareness and Uniqueness</strong></td>
<td>Important wintering site for birds of prey. The site provides critical habitat for over 1% of the population of the Mekong giant catfish, <em>Pangasianodon gigas</em>, (possibly the entire population more recently) and the Chao Phraya giant catfish, <em>Pangasius sanitwongsei</em>, during the breeding season.</td>
</tr>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
<tr>
<td><strong>The Importance of the Ecosystem Services</strong></td>
<td>Ecosystem services include ecotourism and fishing (over 50 fish species), both of which generate income.</td>
</tr>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
<tr>
<td><strong>Global Importance</strong></td>
<td>Listed as a Wetland of International Importance (Nong Bong Kai Non–Hunting Area).</td>
</tr>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
<tr>
<td><strong>Regional, Transboundary Importance</strong></td>
<td>The site is a spawning ground and passage for two critically endangered fishes, providing critical habitats for over 1% of the population of the Mekong giant catfish and the Chao Phraya giant catfish during the breeding season. The WNL has the opportunity to be transboundary with other environmental assets in Lao PDR on the mainstream of the Mekong River.</td>
</tr>
<tr>
<td>Score: 5</td>
<td></td>
</tr>
</tbody>
</table>
3. Khao Yai and Thap Lan National Park (Dong Phayayen-Khaoyai Forest Complex)

The Dong Phayayen-Khaoyai Forest Complex is a Natural World Heritage Site nominated by UNESCO. The site spans 230 km between Ta Phraya National Park (transboundary site with Cambodia) in the east, and Khao Yai National Park in the west, covering a total area of 6,155 km², comprising 0.77% of the LMB.

The site is home to more than 800 species of fauna, including 112 mammal species (among which are two species of gibbon), 392 bird species, and 200 reptile and amphibian species. It is internationally important for the conservation of globally threatened and endangered mammal, bird and reptile species, among them: 19 are vulnerable, 4 are endangered, and 1 is critically endangered. The area contains substantial and important tropical forest ecosystems, which can provide viable habitats for the long-term survival of these species.

The Khao Yai and Thap Lan National Park was selected as the number one site (equal with the Lower Songkhram River and the Nong Bong Kai, Wiang Nong Lhom, and mainstream Mekong of Chiang Rai) of the top three environmental assets of national importance for Thailand based on its high ranking for all six criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance, as detailed below.

<table>
<thead>
<tr>
<th>Rationale for score against each criterion</th>
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</thead>
<tbody>
<tr>
<td><strong>Khao Yai and Thap Lan National Park (Dong Phayayen-Khaoyai Forest Complex)</strong></td>
</tr>
<tr>
<td>Ranked #1</td>
</tr>
<tr>
<td>Total Score: 30</td>
</tr>
</tbody>
</table>

**Biodiversity/Ecological Importance**

Score: 5

The site is home to more than 800 species of fauna, including 112 mammal species (including two species of gibbon), 392 bird species, and 200 reptile and amphibian species. Many species are on the IUCN Red List, among them: 19 are vulnerable, four are endangered, and one is critically endangered. The area contains substantial and important tropical forest ecosystems, which can provide viable habitats for the long-term maintenance of ecosystem services.

**Hydrological Importance**

Score: 5

The forest complex provides watershed protection to the Chao Praya, Bang Kapong and Mekong river basins. The water source is important as a reservoir for human use and farmland.

**Rareness and Uniqueness**

Score: 5

The Khao Yai National Park is one of relatively few known regular wintering sites for the globally threatened Silver Oriole in the world.
The Importance of the Ecosystem Services

Score: 5

It is a large natural area supporting the last known location for many endangered species in Thailand. It provides an important biodiversity corridor and transboundary forest complex with Cambodia. It is crucial for carbon storage and sequestration, as well as preventing flooding and reducing drought impact. The forest habitats are extremely valuable for conservation and sustainable development of the country, as well as for ecotourism.

Global Importance

Score: 5

It is listed as a UNESCO Natural World Heritage Site.

Regional, Transboundary Importance

Score: 5

It is transboundary with Cambodia: the Ta Phraya and Bantay Chmar Protected Landscape and the Pang Sida National Park, which provides a regional wildlife corridor, amounting to a combined total of 615,000 ha.

Viet Nam

1. Yok Don National Park

Yok Don National Park (NP) is located in Dak Lak province with an area of 115,545 ha of vast forests, a total of 1140 km2, comprising 0.14% of the LMB. Yok Don NP provides habitats for valuable wood species and numerous fauna and flora of conservation importance including wild elephants, chamois, phoenix and native orchids. The NP is ecologically part of the Eastern Plains Landscape and is contiguous with the transboundary Srepok Wildlife Sanctuary and Lumphat Wildlife Sanctuary in Cambodia and the Chu Prong Nature Reserve in Viet Nam. Representing one of the only sites in Viet Nam with potential for elephant conservation and recovery, it is designated as a high priority elephant conservation area.

Situated in seven communes across three districts of Dak Lak and Dak Nong provinces, Yok Don NP is Viet Nam’s largest park. The National Park provides important ES functions for ecotourism, scientific research, and biodiversity conservation.

Yok Don National Park (NP) was selected as the number one site of the top three environmental assets of national importance for Viet Nam based on its high ranking for all five criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, and regional or transboundary (basin-wide processes) importance, as detailed below.

Yok Don National Park

Rationale for score against each criterion

Ranked #1

Total Score: 28
| **Biodiversity/Ecological Importance** | There are 67 animal, 196 bird, 46 reptile, 15 amphibian, and 100 insect species occurring within the NP, with many recorded in the IUCN Red Book such as elephants, chamois, and phoenix. There are 464 plant species, of which orchid alone has 23 kinds. The NP is ecologically a part of the Eastern Plains Landscape. The NP is one of the most biodiverse forests in Viet Nam. |
| **Score: 5** |
| **Hydrological Importance** | The NP is located in the mountainous region of Viet Nam’s highlands and is located at the top of the catchment, flowing into the Mekong River via the Sre Pok River. It provides watershed protection, freshwater supply and groundwater recharge. |
| **Score: 5** |
| **Rareness and Uniqueness** | Representing one of the only sites in Viet Nam with potential for elephant conservation and recovery, it is designated as a high priority elephant conservation area. |
| **Score: 5** |
| **The Importance of the Ecosystem Services** | Ecosystem services include freshwater supply, flash flood and erosion protection and prevention, income provision from ecotourism, as well as income from non-timber forest products. The NP regulates the local climate and is important culturally and spiritually to the local community. |
| **Score: 5** |
| **Global Importance** | The park is an important site for the conservation of globally endangered species such as the Indochinese tiger, the Indochinese leopard, the Asian elephant and the gaur. |
| **Score: 3** |
| **Regional, Transboundary Importance** | The NP is part of a bioregional corridor, and is transboundary with the Sre Pok Wildlife Sanctuary and the Lumphat Wildlife Sanctuary in Cambodia and the Chu Prong Nature Reserve in Viet Nam. The NP provides an important transboundary habitat corridor for migratory water bird species such as the endangered Sarus crane. |
| **Score: 5** |
2. Mui Ca Mau National Park

Mui Ca Mau National Park is located in Ca Mau province and has a total natural area of 41,862 ha, i.e. a total of 418 km2, comprising 0.053% of the LMB. The terrestrial area is 15,262 ha and the coastal area is 26,600 ha. The Mui Ca Mau NP was designated as a Wetland of International Importance under the Ramsar Convention in 2013. It is also a UNESCO Biosphere Reserve. The NP provides habitats for a variety of rare precious animal species with a total 13 species of animal, with two species listed in the IUCN Red Book – the long-tailed monkey and ca khu (*Trachypithecus cristatus*).

It is also an important site for a number of migratory water birds, with five species listed in the IUCN Red Book, namely Chinese stork, white-faced stork (*Plegadis chihi*), grey-legged pelican (*Ibis leucocephalus*), curved beak snipe, and black-headed ibis. Important flora species reside within the NP with 22 different species of mangrove present including some small areas of old *Rhizophora apiculata* mangrove remaining. It is an ecological system of natural salt-marsh forests with high values in terms of biodiversity, landscapes, environment, culture, and history. The mangroves provide habitats for important mangrove fauna and species of mammals, reptiles, crustaceans, 43 molluscs, and fish.

The Mui Ca Mau National Park was selected as the number two site (equal with U Minh Thong NP) of the top three environmental assets of national importance for Viet Nam based on its high ranking for five criteria: Biodiversity/Ecological Importance, rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance, as detailed below.

### Mui Ca Mau National Park

**Ranked #2**

**Total Score: 26**

It is an important site for a number of migratory water birds, with 5 species listed in the IUCN Red Book, namely Chinese stork, white-faced stork, grey-legged pelican, curved beak snipe, and black-headed ibis. Important flora species are present in the NP with 22 species of mangrove, including some small areas of old *Rhizophora apiculata* mangrove. It is an ecological system of natural salt-marsh forests with high values in terms of biodiversity, landscapes, environment, culture, and history. The mangroves provide habitats for important mangrove fauna and species of mammals, reptiles, crustaceans, and 43 species of molluscs and fish.

### Hydrological Importance

**Score: 1**

It provides protection from coastal erosion and a special hydrological condition to support sediment transfer within the Mekong Delta.

### Rareness and Uniqueness

**Score: 5**

The NP provides habitats for two mammal species listed in the IUCN Red Book, the long-tailed monkey and ca khu (*Trachypithecus cristatus*).
The Importance of the Ecosystem Services

The mangroves perform an important coastal protection function. The NP is the ideal environment for the reproduction and development of shrimp, fish, and molluscs, which provide food security and generate incomes. The NP also has great potential for recreation, ecotourism, conservation education, and scientific research. It provides the function of carbon storage and sequestration, and also provides income generation from non-timber forest products for the local community.

Global Importance

The Mui Ca Mau NP was designated as a Wetland of International Importance under the Ramsar Convention in 2013 and is also a Biosphere Reserve.

Regional, Transboundary Importance

The NP is important regionally because it is representative of the Indochina Mangroves ecoregion, with only a small proportion of this forest type remaining in the LMB. As an ecological system of natural salt-marsh forests located within the Mekong Delta, it is also of regional or transboundary (basin-wide) importance due to its functions of protecting the Mekong Delta from saltwater intrusion, providing important regional habitats for migratory species, and transporting sediment and nutrients upstream.

3. U Minh Thuong National Park

U Minh Thuong National Park (NP) is located in Kien Giang province and supports one of the last significant areas of peat swamp forest remaining in Viet Nam. The park is also one of the three highest priority sites for wetland conservation in the Mekong Delta. In 2015, U Minh Thuong was designated a Wetland of International Importance by the Ramsar Convention on Wetlands. It has a total natural area of 8,038 ha, i.e. a total of 80 km², comprising 0.01% of the LMB, and is the first ASEAN Heritage Park located on peatland within the region.

The NP supports a diversity of wildlife species including mammals, birds, reptiles and amphibians, fish, insects and many aquatic species. There are 72 species of rare animals and plants residing in the NP that are listed in the IUCN Red Book. Birds of global conservation significance include the: oriental darter, spot-billed pelican, painted stork, lesser adjutant, black-headed ibis, glossy ibis, greater spotted eagle, grey-headed fish eagle, and the Asian golden weaver.

U Minh Thuong NP was selected as the number two site (together with Mui Ca Mau NP) out of the top three environmental assets of national importance for Viet Nam based on its high ranking for four criteria: rarity and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance, as detailed below.
<table>
<thead>
<tr>
<th>U Minh Thuong National Park</th>
<th>Rationale for score against each criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranked #2</td>
<td></td>
</tr>
<tr>
<td>Total Score: 26</td>
<td></td>
</tr>
</tbody>
</table>

**Biodiversity/Ecological Importance**  
Score: 3  
The NP supports a diversity of wildlife species including mammals, birds, reptiles and amphibians, fish, insects, and many aquatic species. There are 72 species of rare animals and plants present that are listed in the IUCN Red Book. Birds of global conservation significance include the oriental darter, spot-billed pelican, painted stork, lesser adjutant, black-headed ibis, glossy ibis, greater spotted eagle, grey-headed fish eagle, and the Asian golden weaver. The natural vegetation is classified into 10 types, belonging to four main classes: Melaleuca forests, seasonally inundated grasslands, permanent swamps, and vegetation along canals and streams. The NP is one of the last areas of peat swamp forest remaining in Viet Nam.

**Hydrological Importance**  
Score: 3  
The Melaleuca forest in the core zone plays an important role in maintaining soil and water quality in the buffer zone by preventing the acidification of topsoil and surface water, filtering groundwater, and storing freshwater during the dry season.

**Rareness and Uniqueness**  
Score: 5  
U Minh Thuong National Park supports one of the last significant areas of peat swamp forest remaining in Viet Nam, and is also one of the three highest priority sites for wetland conservation in the Mekong Delta.

**The Importance of the Ecosystem Services**  
Score: 5  
The NP/Wetland maintains soil and water quality by preventing the acidification of topsoil and surface water, filtering groundwater, and storing freshwater during the dry season. The area also provides ecotourism and scientific services. The NP provides food security, habitats for black fish that are commercially viable, carbon storage, and sequestration. The NP is also Important for historical aspects.

**Global Importance**  
Score: 5  
In 2015, U Minh Thuong was designated a Wetland of International Importance under the Ramsar Convention with a total natural area of 8,038 ha, and is the first ASEAN Heritage Park located in peatland within the region.

**Regional, Transboundary Importance**  
Score: 5  
It is one of the last areas of peat swamp forest remaining in Viet Nam and one of the three highest priority sites for wetland conservation in the Mekong Delta. The NP provides important regional habitats for migratory birds in terms of feeding, nesting, and breeding.
Figure 1. Map of the 12 prioritized environmental assets of regional importance in the LMB
All of the 12 prioritized REAs selected by the four MCs demonstrate their importance as a transboundary areas and/or their importance due to their contribution to regional basin-wide processes. Regarding transboundary cooperation for environmental asset management, there are a number of bilateral cooperation mechanisms between the MCs. For example, the fishing season of the endangered Giant Mekong Catfish is regulated and agreed between Lao and Thailand. Cambodia and Viet Nam have also established transboundary cooperation for the management of protected areas in the highlands between Yok Don National Park and Sre Pok Wildlife Sanctuary. The MRC also has a Joint Project, under the National Indicative Plans, with Cambodia, Lao PDR, and Viet Nam in the Sekong, Sesan, and Sre Pok river basins, which is focusing on transboundary sustainable development and management of water resources. Other sites provide important hydrological support to the Mekong River Basin, such as Tonle Sap Lake, in Cambodia; the Lower Songkhram River in Thailand; the Nam Et Phoulei NP in Lao PDR; and the Mui Ca Mau NP in Viet Nam.
There is also the opportunity to establish a transboundary cooperation mechanism between a select number of the 12 REAs with other environmental assets that are transboundary but may not be on the prioritized list of 12 such as: the Dong Phayen-Khaoyai Forest Complex in Thailand and Ta Phraya and Bantay Chmar Protected Landscape and Pang Sida NP in Cambodia; and the Virachey National Park in Cambodia with Xe Pian and Dong Amphan National protected areas in Lao PDR and Chu Mom Rai NP in Viet Nam. The SBEM includes an activity to further explore transboundary cooperation and conservation.

A detailed profile for each of the 12 REAs is included in Annex 2. The SBEM will further explore these 12 REAs in terms of the mutual benefits they provide, the threats they face, and the recommended strategic priorities and actions for their protection and management at the basin-wide level through the adoption of an ecosystem and whole-of-landscape approach.
Mekong strategy for basin-wide environmental management for environmental assets of regional importance 2021–2025
2.1 International Policy Context

There are a number of international conventions, policies, and programmes that are relevant in managing the environmental assets of regional importance in the LMB that provide guidance for the development and identification of strategic priorities and actions in the SBEM as well as regional and national planning processes.

2.1.1 International Convention on Biological Diversity

The International Convention on Biological Diversity is a multilateral treaty (www.cbd.int/convention) whose main goal is to develop national strategies (and action plans) for the conservation and sustainable use of biological diversity. It has three main objectives: the conservation of biological diversity (or biodiversity); the sustainable use of its components; and the fair and equitable sharing of benefits arising from genetic resources. All four MCs are party to the Convention, and each have a National Biodiversity Strategy and Action Plan.

Under the Convention on Biodiversity, a set of 20 global targets – Aichi Targets – were established in the Strategic Plan for Biodiversity 2011–2020, grouped under five strategic goals:

Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society, for example, by achieving Target 3, “By 2020 at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socioeconomic conditions”
and Target 4, “By 2020 at the latest, governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts from the use of natural resources well within safe ecological limits”.

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

**Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity,** for example, by achieving Target 11, “By 2020, at least 17% of terrestrial and inland water, and 10% 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.”

**Enhance the benefits to all from biodiversity and ecosystem services,** for example, by achieving Target 14, “By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods, and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.”

**Enhance implementation through participatory planning, knowledge management and capacity building,** for example, by achieving Target 19, “By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.”

The SBEM aims to achieve these key targets.

**2.1.2 International Convention on Wetlands**

All four MCs are party to the **International Convention on Wetlands**, known as the **Ramsar Convention**. Under the Ramsar Convention, countries are expected to promote the conservation of Ramsar wetlands and, as far as possible, the wise use of all wetlands. Wise use is defined as “[…] the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development”. One aspect of wise use is the identification of ‘limits of acceptable change’, which is defined as the variation that is considered acceptable in a particular component or process of the ecological character of the wetland (Ramsar, 2012). This may include population measures, hectares covered by a particular wetland type, the range of certain water quality parameters, etc. It is inferred that if the particular measure or parameter moves outside the ‘limits of acceptable change’, this may indicate a
change in ecological character that could lead to a reduction or loss of the values for which the site was designated for. In most cases, change is considered in a negative context, leading to a reduction in the values for which a site was listed.

Limits of acceptable change can be a useful tool to help managers understand and describe the ecological character of the wetland. This information can help managers monitor the site, identify management actions, and determine limitations to activities to maintain the ecological character of the site. The limits of acceptable change can be used to monitor ecological character over time to inform wetland managers of the status or health of a wetland.

The concept of ‘limits of acceptable change’ recognizes that some degree of change may be inevitable, but that there are bounds beyond which the character of the site will be fundamentally changed and the provision of ecosystem services compromised. Identifying the limits of acceptable change is important at the regional level to assist regional planning and decision-making, particularly where there are potential transboundary impacts. Thus, adopting this approach for all of the 12 prioritized REAs would be useful as a means to monitor the ecological character of a site and develop specific management actions where necessary. While the quantitative limits for the 12 prioritized REAs are not currently available, actions towards this would be beneficial. In the context of the LMB, the Procedures for the Maintenance of Flow on the Mainstream (PMFM) use monthly flow limits for hydrological changes in a similar way. The SBEM includes a strategic action to address this issue.

Under the Ramsar Convention, the Indo–Burma Regional Ramsar Initiative (IBRRI) has been established between Cambodia, Lao PDR, Myanmar, Thailand and Viet Nam., with support from the IUCN. The adopted purpose of the IBRRI is to be a transboundary facilitation platform that “...supports engagement, cooperation and knowledge sharing, provides a regionally focused multi-stakeholder forum for establishing partnerships and improving wetland management, supports research and dissemination of scientific information relating to drivers of wetland loss and degradation, and engages in advocacy, policy development and improving capacity and awareness.” A Strategic Plan (2019–2024) for IBRRI has been developed to:

- facilitate and promote wetland knowledge and experience sharing;
- support integrated management of Ramsar Sites and other wetlands, and ensure conservation of key wetland species in the region;
- assist with the development and/or strengthening and implementation of policy frameworks, taking into account wetland management and conservation across sectors at all levels;
- support wetland communication, capacity building, education, participation, and awareness; and
- ensure sound and sustainable governance and management of the Regional Initiative.
These initiatives provide a platform to build transboundary cooperation, build capacity, and undertake policy dialogue to improve legal and policy frameworks, and harmonize national approaches for managing Ramsar Wetlands within the region.

### 2.1.3 UNESCO biosphere reserves and World Heritage Sites

**UNESCO biosphere reserves** are areas comprising terrestrial, marine, and coastal ecosystems. Each reserve promotes solutions reconciling the conservation of biodiversity with its sustainable use. Biosphere reserves are ‘Science for Sustainability support sites’ – special places for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity (UNESCO, 2019).

Biosphere reserves are nominated by national governments and remain under the sovereign jurisdiction of the states where they are located. Their status is internationally recognized. Biosphere reserves have three interrelated zones that aim to fulfil three complementary and mutually reinforcing functions:

- The core area(s) comprise(s) a strictly protected ecosystem that contributes to the conservation of landscapes, ecosystems, species and genetic variation.
- The buffer zone surrounds or adjoins the core areas, and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education.
- The transition area is the part of the reserve where the greatest activity is allowed, fostering economic and human development that is socio-culturally and ecologically sustainable.

Tonle Sap Multiple Use Area in Cambodia and Mui Ca Mau National Park in Viet Nam are designated as Biosphere Reserves within the LMB.

Natural World Heritage sites are globally recognized as the world’s most significant protected areas and are listed under the [UNESCO World Heritage Convention](https://whc.unesco.org/en) (UNESCO, 2019a). It is the only international conservation instrument that explicitly links nature and culture, recognizing the complex interactions between humankind and the environment.

The World Heritage List now includes more than 1,000 sites, with about 20% that are listed for their natural ‘Outstanding Universal Value’. Natural World Heritage sites include iconic places such as the Galapagos Islands, Serengeti, Kilimanjaro, Yellowstone, the Great Barrier Reef, and Ha Long Bay.
The identification of these sites through the World Heritage Convention is a direct response to the need to preserve and restore globally outstanding protected areas based on criteria that include scale of natural habitats, intactness of ecological processes, viability of populations of rare species, and rarity, as well as aesthetic appeal, which almost always accompanies these natural wonders.

The Convention provides a unique platform for developing and sharing best practice, and can act as a barometer of global protected area performance. The Dong Phayayen–Khao Yai Forest Complex is listed as a Natural World Heritage site due to its high conservation significance and natural features.

2.1.4  IUCN’s Global Protected Areas Programme and Transboundary Conservation

The IUCN’s Global Protected Areas Programme has three priorities:

- Valuing and conserving biodiversity;
- Governing nature’s use and sharing its benefits equitably;
- Deploying nature based solutions to global challenges.

The IUCN’s Global Protected Areas Programme (IUCN, 2019d) emphasizes the maintenance of ecosystem resilience as an essential prerequisite for maintaining resilient socio-economic systems in the face of global change, and that an expanded connected network of well-managed conservation areas is the most robust proven solution to confront these problems. Simply put, large healthy protected ecosystems conserve biodiversity and address climate change impacts directly and indirectly. Evidence of their value in many sectors is increasing in quality and substance, including for health promotion, food security, water provision, disaster and risk reduction, and poverty alleviation, and for dealing with the causes and impacts of climate change on ecosystems and society. Establishing protected areas, especially when considering the full set of management categories and governance types, is essential for maintaining ecosystem integrity and for restoration efforts at the scale of the landscape and the seascape.

The IUCN has also established the Green List, which measures the effectiveness of protected areas, rewarding the best sites, and providing an incentive for sites around the world to improve their management. Green-listed sites are certified as being effectively managed and fairly governed, with a positive impact on people and nature. In 2015, for example, the Van Long Nature Reserve, Viet Nam became a candidate. In this case, the certification process has helped secure commitment to expand the protected area into two neighbouring provinces.
The SBEM includes a strategic direction for building resilience of the REAS.

The IUCN also provides guidance on the concept of transboundary conservation (IUCN, 2019c). Transboundary conservation has emerged as a practical way to overcome these differences and is considered a process of cooperation to achieve conservation goals across one or more international boundaries. Three types and one special designation of Transboundary Conservation Areas have been identified:

- **Transboundary Protected Area**: A clearly defined geographical space that consists of protected areas that are ecologically connected across one or more international boundaries and involves some form of cooperation.

- **Transboundary Conservation Landscape and/or Seascape**: An ecologically connected area that sustains ecological processes and crosses one or more international boundaries, and which includes both protected areas and multiple resource-use areas, and involves some form of cooperation.

- **Transboundary Migration Conservation Areas**: Wildlife habitats in two or more countries that are necessary to sustain populations of migratory species and involve some form of cooperation.

- **Special designation: Park for Peace**: A special designation that may be applied to any of the three types of Transboundary Conservation Areas, which is dedicated to the promotion, celebration and/or commemoration of peace and cooperation.

The SBEM includes a strategic action to investigate the establishment of transboundary cooperation between the 12 REAs and/or with other environmental assets within the region.

### 2.2 The Regional Policy Context

The Mekong River Commission (MRC) was established under the 1995 Mekong Agreement on Cooperation for the Sustainable Development of the Mekong River Basin between the Governments of Cambodia, Lao PDR, Thailand, and Viet Nam (the 1995 Mekong Agreement), with the mission to: “promote and coordinate sustainable management and development of the water and related resources for the countries’ mutual benefit and the people’s well-being by implementing strategic programmes and activities and providing scientific information and policy advice.” China and Myanmar, the upstream countries of the Mekong River Basin, are Dialogue Partners of the MRC. The Commission engages a wide range of stakeholders in its strategies, plans, and work.

The 1995 Mekong Agreement provides the strategic framework for the implementation of Integrated Water Resources Management (IWRM) within the LMB and makes specific reference to the environment and ecological assets under Article 3, ‘Protection of the Environment and Ecological Balance’. Article 3 emphasizes the importance of protecting the environment and ecological assets including those that provide ecosystem services. It is important as a stand-
alone provision of the 1995 Mekong Agreement for the management of the environment and ecological assets, and in its interaction with other Articles of the Agreement, especially Article 5, ‘Reasonable and equitable use’, Article 7, ‘Prevention and cessation of harm’, and Article 8, State responsibility for damages’.

Also, of relevance to the SBEM are the five MRC Procedures and their supporting technical guidelines which were developed to manage key issues relating to water and related resources as agreed under this cooperative framework for the LMB, as follows:

- **Procedures for Data and Information Exchange and Sharing (PDIES)**, which provide rules on the sharing and exchange of data and information;
- **Procedures for Notification, Prior Consultation and Agreement (PNPCA)**, which provide rules on the referral of a proposed use of water on the mainstream and tributaries of the Mekong;
- **Procedures for Water Use Monitoring (PWUM)**, which provide rules on water use that may have a significant impact on flows or water quality;
- **Procedures for the Maintenance of Flows on the Mainstream (PMFM)**, which provide guidance on cooperation for the maintenance of a mutually acceptable hydrological flow regime on the mainstream to optimize the multiple uses and mutual benefits of all riparian countries and to minimise the harmful effects; and
- **Procedures for Water Quality (PWQ)**, which provide guidance on water quality parameters and monitoring techniques.

### 2.2.1 MRC Summit and the Siem Reap Declaration

The third MRC Summit was held in April 2019, resulting in the highly successful Summit of Mekong Prime Ministers and Ministers from China and Myanmar. The leaders issued the Siem Reap Declaration (MRC, 2018b), reaffirming the unique mandate and role of the MRC as a treaty-based, inter-governmental river basin organization in the Mekong.

The Siem Reap Declaration confirmed the MRC’s primary importance as a regional cooperation framework and its unique role as a knowledge hub. The Declaration acknowledged the achievements of the MRC since the 2014 Summit, the current major challenges and opportunities, priority areas of actions, and the way forward.

The Declaration also recognized, through its studies and assessment work during the previous four years, that the MRC had obtained a better understanding and a clearer focus of the crucial development and management opportunities and challenges in the Mekong River Basin. The Declaration noted that the Mekong River Basin offers development and cooperation opportunities for mainstream and tributary water resources development, fisheries, navigation, flood and drought management, tourism, and the environment, including ecosystem management.
It was noted, however, that there remained significant challenges, such as rapid economic and population growth; increased demand for water, food and energy; urbanization and industrialization; the loss of environmental assets, wetlands and natural fisheries; deforestation; floods and droughts; and risks to biodiversity and people’s livelihoods and assets. All these are compounded by the effects of climate change, as well as past and ongoing developments in all water and related sectors. The increasing development in the mainstream and tributaries highlight the increasing need for the sustainability and coordinated operational management of tributary and mainstream water resources development projects.

Ways forward identified in the Siem Reap Declaration included the consideration of key findings from the Council Study, both at the policy and technical levels, in order to capture development opportunities and address trade-offs, benefit sharing, and risks as a reference for planning and implementation of national plans and projects, and in relevant MRC work. THE SBEM has included actions to address this for the 12 REAs.

### 2.2.2 MRC IWRM-based Basin Development Strategy 2021–2030

Upon approval by the MRC Council, the MRC IWRM-based Basin Development Strategy 2021–2030 (BDS) is a statement of the LMB countries on how they will utilize, manage and conserve the water and related resources of the Mekong, and falls within the Strategic Planning Cycle, as show in Figure 3.

The BDS builds on progress achieved under the previous BDS (2016–2020), much of it through the implementation of the MRC Strategic Plan (MRC, 2016) and the National Indicative Plans of the MRC Member Countries during 2016–2020. For a 10-year period (2021–2030), the BDS identifies five strategic priorities:

a). **Environment**: Maintain the ecological function of the Mekong River Basin;

b). **Social**: Enable inclusive access and utilisation of the basin’s water and related resources;

c). **Economic**: Enhance optimal and sustainable development of water and related sectors;

d). **Climate change**: Strengthen resilience against climate risks, extreme floods and droughts; and

e). **Cooperation**: Strengthen cooperation among all basin countries and stakeholders.
The BDS cited the considerable environmental losses that have already occurred within the LMB but observed that there was still an opportunity to sustainably manage the remaining naturally functioning ecosystems. To achieve this, a common understanding of the functions and services of environmental assets within the basin was identified as a requirement, followed by appropriate actions to protect selected assets.

The BDS acknowledged that this would inevitably involve a discussion of trade-offs between development and protection, with potential impacts on all water and related sectors. Actions identified as necessary included the assessment of alternative basin-wide development scenarios to examine the above trade-offs and more optimal development pathways using all new information as well as the latest IWRM and water-food-energy nexus thinking. This assessment would also need to consider emerging criteria for the protection of key environmental hotspots (environmental assets) under the strategic priority for maintain the ecological functions of the Mekong River Basin. Thus, the results would inform the development and implementation of sector and cross-cutting strategies that are relevant to major trade-offs.

2.2.3 MRC State of the Basin Report 2018

The MRC State of the Basin Report (SOBR), completed in 2018, reported that environmental assets in the LMB remain under threat, and the status of the environmental assets strategic indicator was rated as ‘considerable concern and urgent action needed’. There appears to be a continuing decline in wetland area, particularly for sensitive areas such as mangroves, although updated wetland maps being prepared by the MRC and MCs will be crucial for confirming its current status.

An increasing amount of fish are being caught, of which smaller fish are making up an increasing proportion. There are also concerning signs of overfishing as increasing efforts are required to
achieve the same production levels. The proportion of exotic species making up the overall catch appears to be increasing. Aquaculture production continues to grow strongly. Where previously this growth in aquaculture had corresponded with a decline in mangrove areas in the Mekong Delta, aquaculture production is increasingly displacing rice fields, forestry lands, and areas otherwise considered wastelands (MRC, 2018a).

The LMB remains one of the most biologically diverse regions of the world. However, many plants and animals are threatened because habitat fragmentation, water resource development, agricultural expansion, and harvesting, among other threatening processes, continue.

There are a large number of ecologically significant areas covering a substantial part of the LMB with a wide range of management regimes and protection systems in place. Following decades of decline, forest cover appears to be increasing in some areas of the LMB, with Lao PDR in particular showing a substantial increase between 2010 and 2015. In its concluding statement, the SOBR 2018 identified two development opportunities that relate to regionally significant environmental assets:

- to preserve and leverage the remaining wetlands and regionally significant environmental assets for both ecological purposes, enhance biodiversity, and extend and promote greater tourism income;
- to continue to invest in rehabilitation and improvement of forest areas to better manage catchments, enhance the lifetime of storage reservoirs, and contribute to reducing greenhouse gases.

In the SOBR, the strategic indicator for the status of environmental assets uses the following assessment indicators:

- Wetland area;
- Condition of riverine habitats;
- Condition and status of fisheries and other aquatic resources;
- Condition and status of ecologically significant areas.

The SBEM is the first step in managing and protecting the 12 REAs within the LMB with a view to improving the condition and status of ecologically significant areas, as well as improving wetland area/extent, the condition of riverine habitats, and the status of fisheries and other aquatic resources. The Strategic Priorities and Actions in the SBEM could very well maintain or improve the condition and status of these assets if implementation is well resourced and occurs expediently. A first and critical step in the SBEM is the identification of ‘limits of acceptable change’ for the 12 REAs in order to assist in regional planning decisions, such as the BDS, and where there are transboundary impacts.
The SBEM includes strategic priorities and actions that need to occur at the local, national and regional levels. The SBEM cannot, however, improve the status of the indicators in isolation since protection of these assets requires good regional and national development planning, well designed developments that consider transboundary impacts, the enforcement of robust national laws that protect environmental assets, and suitable national investment in environmental assets supported by key actors in the wider Mekong River Basin, the community, businesses, and partnerships. The SBEM includes actions to address these issues.

2.2.4 Mekong Basin-wide Fisheries Management Strategy 2018–2022

The Mekong Basin-wide Fisheries Management Strategy 2018–2022 (BFMS) identifies the sustainable use and conservation of fish resources as its top priority while also addressing issues of stakeholder participation, gender equity, and property rights in fisheries management and development. Of relevance to the management of environmental assets in the LMB, the BFMS proposes priority actions with respect to the conservation of key habitats:

- Update identification, mapping and demarcation of key habitats of the LMB ecosystem and ranking key conservation areas, including spawning grounds, according to their consistency with medium- and long-term sustainability of the basin ecosystem.
- Assess and catalogue the efficiency of existing protection and conservation measures of key species, including high economic value migratory and endangered fish species, in relation to present and future threats. Develop and implement guidelines for their long-term conservation.
- Agree on economic and social costs of habitat degradation or loss according to Mekong Agreement 1995 Principle 5, ‘Principle of State Responsibility for Damages’ (Art. 8).
- Apply management and conservation of key habitats through co-management arrangements or community-based management, drawing from regional experience.
- Include management and conservation of key habitats in transboundary fisheries-management arrangements.
- Conduct in-depth country investigations into status and key issues/constraints for effective and responsible fish-stock and habitat-enhancement activities in all four MCs.

3 For example, the MRC facilitates the implementation of transboundary fisheries management, including the protection of key habitats in the bordering provinces of Bokeo, Lao PDR, and Chiang Rai, Thailand. The main objective of the project is to encourage fisheries stakeholders in the bordering provinces of Bokeo in Lao PDR and Chiang Rai in Thailand to jointly manage fisheries resources in a sustainable way based on transboundary cooperation and commonly agreed principles, tools, and targets.
The BFMS will be implemented through a Project-based Action Plan to address regional and transboundary issues and challenges. The priority actions from the BFMS highlighted above directly link to Strategic Priority 4.2.3 to strengthen the protection of mutually agreed environmental assets.

2.2.5 ASEAN Heritage Parks

ASEAN Heritage Parks (AHPs) are selected protected areas in the ASEAN region (i.e. consisting of Indonesia, Brunei, Malaysia, Singapore, Philippines, Viet Nam, Thailand, Cambodia, Lao PDR, and Myanmar) that are known for their unique biodiversity and ecosystems, wilderness and outstanding values. AHPs are given the highest recognition because of their importance as conservation areas (ASEAN, 2019).

Through the ASEAN Declaration on Heritage Parks and Reserves, the ASEAN Member States agreed to effectively manage these AHPs so as to maintain ecological processes and life support systems; preserve genetic diversity; ensure sustainable utilisation of species and ecosystems; and maintain wildernesses that have scenic, cultural, educational, research, recreational and tourism values. U Minh Thuong National Park in Viet Nam, Virachey National Park in Cambodia and Khao Yai National Park in Thailand are listed as ASEAN Heritage Parks.

2.2.6 Regional review of studies, policies, strategies, action plans and environmental assets

To support the development of the SBEM, a regional review (Report 1) on environmental assets with national and regional importance was undertaken. In addition, existing studies, policies, strategies and action plans for the management of environmental assets in the LMB were also reviewed. The review included recommendations for the management of environmental assets in the LMB, summarized in Annex 4. Following the regional review, agreed selection criteria (Report 2) were developed to prioritize national environmental assets to identify the 12 REAs included in the SBEM by country (Figure 4).
2.3 National Policy Context

The four national review reports prepared by each MC to contribute to Report 1 demonstrated that each country has a legal and institutional framework that supports the protection of environmental assets. The framework also sets criteria for listing significant biodiversity assets, which also supports the utilization of natural resources that may include environmental assets for the benefit of economic development. International frameworks such as the Ramsar Convention on Wetlands of International Importance, Biosphere Reserves and UNESCO World Heritage listings, also guide the management of environmental assets in their respective locations. Each country also has a suitable institutional structure for managing natural resources, biodiversity, and socio-economic development. Customary and indigenous rights are present in most countries, allowing access for local communities to nationally protected areas and their resources.

The limitations to the legal and institutional frameworks for each country were identified as follows:

- regulations on environmental services and compensation that are often too general and unclear to be effective;
- difficulties in ensuring strong coordination between different ministries due to their competing interests and goals;
- insufficient data, information, or effective monitoring programmes, leading to a lack of accountability;
lack of clear boundaries for efficient management and regulation plans;
difficulties in managing invasive species;
difficulties in controlling illegal activities such as logging, hunting, trapping and fishing;
land encroachment and migration;
land-use conflicts; and
a lack of human and institutional capacity, funding, or clear commitment to implement sustainable development.

New regulations, laws and institutional frameworks, such as the new Water Law and Office of Water in Thailand, are being introduced and enacted for managing and protecting environmental assets with a clear commitment to working towards sustainable development objectives. Financial and technical support is required to ensure effective implementation. This could be sourced by establishing a Lower Mekong Conservation Fund and/or by seeking other opportunities.

Solutions to these limitations include building institutional capacity, training human resources, sourcing adequate funding, interlinking socio-economic development plans with the protection of environmental assets, and improving transboundary coordination between national environmental assets.

Opportunities lie in the steps that have already been taken in the LMB to manage environmental assets for multiple benefits where local communities are included in their management. Through awareness raising and capacity building, as well as the development of economic incentives and benefits, it is most likely that environmental assets will be managed for multiple objectives, including maintaining the conservation values of the sites and the ecosystem services that they provide.

For example, in Cambodia, success in the conservation of environmental assets of national importance occurs at the provincial and village level, supported by the Cambodian Government and non-government organizations. An example of financial incentives for conservation in Cambodia is the Bird Nest Protection Programme, which enlists local residents to locate, monitor, and protect bird nesting sites. The project was initiated by the Wildlife Conservation Society, but responsibilities have increasingly been transferred to the Tmatboey village community, as experience has shown that a greater number of nests can be found and successfully protected by working in direct cooperation with local communities. Under the programme, community members are offered a financial incentive (in the form of a monetary award of up to USD 5) for reporting nests and serving as monitors of such sites until chicks have hatched and matured. Monitors receive USD 1 per day and earn an extra USD 1 after the chicks successfully fledge. Full payment is made if it can be verified that nests failed due to natural causes, including predation. Rates were agreed upon in consultation with the community.

In Lao PDR, the Law on Environmental Protection includes provisions that require the development of a natural resources inventory for natural resource value identification, as well as provisions for environment taxation and payment for ecological services. Although these initiatives may not yet have been implemented, the provisions provide an opportunity to manage environmental assets,
and provide environmental incentives for maintaining ecosystem services and disincentives for harming or destroying environmental values.

In Thailand, the Sarus crane re-introduction programme has been implemented to reintroduce captive bred Sarus cranes in two selected wetland sites in the north-east. The project has focused on empowering farmers and locals to undertake organic farming and best practice wetland management. Successful aspects have included: compensation to farmers whose rice fields are chosen as nesting sites, nest-monitoring undertaken by volunteers, and organic rice farming and marketing promoting produce sold in this area as a clean green brand. The result is that the Sarus crane has been brought back from extinction with five nesting bird sites now present in the area.

In Viet Nam, the national policy for payment for ecosystem services provides an example of a tool that has been piloted in the country, as does the biodiversity offsetting approach adopted in Lao PDR in the Nam Theun 2 Hydropower project. These policy tools should be considered more broadly for the management of regionally important environmental assets and in the development of the action plan under the SBEM. Also, this SBEM is referred to in the Viet Nam’s Law on Environmental Protection 2020 (LOEP 2020).

Based on the national reviews of the four member countries, a snapshot has been developed in Annex 3 for Cambodia, Lao PDR, Thailand and Viet Nam regarding the current status of their national environmental assets, and the legal and institutional frameworks that are currently in place.

The following section outlines the SBEM strategic framework for managing the 12 REAs.

### 2.4 Strategic Framework for Management of the 12 REAs

The SBEM strategic framework (Figure 5) for managing the 12 prioritized REAs starts with a long-term, 20-year vision for the protection and management of regional environmental assets of importance in the LMB. The environmental asset outcomes help to identify the necessary components of the vision and help measure these outcomes. Targets are used to quantify, where possible, an end state for key elements of regional environmental assets (REAs). Together, the outcomes and targets are the long-term indicators of progress towards the vision.

The strategic directions are the top thematic areas identified to address the challenges for REAs, measured by key indicators of success. The strategic priorities and actions are the practical measures and activities that will be undertaken in the next five years to achieve these strategic directions, and thus are steps towards achieving the overall vision of the SBEM.
**Vision (20 years)**
Regional environmental assets are wisely used, maintained, protected and managed for their conservation and to support ecosystem services for shared and better environmental, social, and economic quality in the LMB.

**Environmental asset outcomes**
- 12 prioritized regional environmental assets protected
- Landscape, watershed, and habitat of 12 REAs integrated, connected, and of high quality and integrity
- *Transboundary environmental and biological processes flow
- Diverse ecosystem services maintained and functioning

**Long-term environmental asset targets**
- Regional environmental assets co-managed and prioritized
- Transboundary EAs protected
- Ecosystem services incentivized
- Trade-offs, including risks and benefits, of REAs and the services they provide are considered

**Strategic Directions (5 years)**
- Building resilient environmental assets and adapting to change
- Building resilient environmental assets and adapting to change
- Building resilient environmental assets and adapting to change

**Indicators of Strategic Directions**
- Priorities, trade-offs, risks, and benefits considered
- REA network established
- Management Plans implemented
- No. of REAs co-managed (sites) increased
- No. of partnerships increased
- Lower Mekong Conservation Fund for REAs established
- Increased investment by organizations in various incentive schemes established in REAs
- Guidance for services (agricultural, payment for ecosystem services, non-forest timber products, tourism and relevant sectors) in REAs developed
- No. of TBPAs established increased and TBPA cooperation mechanisms developed and strengthened

**Strategic Priorities (as summarized)**
- Protect REAs by inclusion and harmonization in strategies, policies, plans, and project design
- Establish a REA network
- Develop strategies for REAs to transform and adapt to change.
- Implement a Community Engagement and Awareness Programme for decision-making, stakeholder partnerships, and for raising awareness on REAs
- Nurture partnerships and investigate new opportunities.
- Understand the ecosystem services provided by REAs
- Investigate opportunities for funding REAs
- Review Social and Economic Instruments and incentives (payment for ecosystem services) for REAs.
- Develop and review guidance and/or action plans for services (e.g. agriculture, tourism, fisheries and forestry in REAs)
- Review/investigate legal status of each REA, and cooperation mechanisms (Transboundary Protected Areas)

**Actions (see Sections 2.3.1–2.3.4)**

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**Figure 5.** Strategic framework for the SBEM
2.5 Strategic Directions – Key Strategic Priorities and Actions

The SBEM 2021–2025 proposes key strategic priorities and actions clustered under four strategic directions:

a). Building resilient environmental assets and adapting to change
b). Engaging the community and other actors, and establishing cooperative partnerships and networks
c). Investing wisely and creating incentives
d). Strengthening regional and national environmental assets.

2.5.1 Building resilient environmental assets and adapting to change

‘Resilience’ is the capacity of a system to absorb disturbance and reorganize while undergoing change to still retain essentially the same function, structure, identity, and feedback (Walker et al., 2004). Ecosystem resilience needs to be considered alongside a complex, evolving, integrated socio-ecological system in which humans are a part of nature (Preiser et al., 2018). Central to giving ecosystems the best possible chance to adapt and evolve is to enhance resilience by building connections across fragmented and intact ecosystems, enhancing the protected natural areas system, protecting key refuge areas, and implementing effective control of invasive species, all of which are integrated with enhancing social capacity.

At the regional level, the Mekong River Basin is experiencing major changes due to development opportunities and pressures. Policy drivers are changing, and new cooperation mechanisms are emerging, changing the political landscape for integrated water resources management in the region. Larger-scale developments will have an impact on environmental assets in the LMB. These include: the planned cascade of hydropower projects on the mainstream and tributaries; irrigated agriculture and other floodplain infrastructure projects; forestry and urbanization. Climate change is likely to exacerbate these impacts, particularly those associated with a drier climate, but also from flooding and severe storm events. Impacts will include a decline in fisheries, a reduction in nutrient important sediment, and a reduction in wetland vegetation. The need to identify acceptable limits of change for mutually agreed environmental assets within the LMB is therefore important.

These projected pressures will reduce the resilience and increase vulnerability of rural communities in the LMB, particularly in Lao PDR and Cambodia, but also in certain areas of Thailand and Viet Nam. Poor households along the Mekong River are likely to be most disadvantaged, but the urban poor are also likely to face considerable challenges as fish prices are expected to increase. Measures that build the resilience of regional environmental assets, which improve the ability for these sites to cope with these changes are important, not only to conserve the biodiversity values of these sites but also the social and economic values, particularly where communities are living
within these environmental asset sites and rely on them for subsistence.

Also, these sites need to be managed sustainably at the national level to ensure that these same communities do not overexploit natural resources to the detriment of the environmental asset, and thus the social, environmental and economic values. Overharvesting and illegal activities, such as poaching, are also having a marked effect.

Key indicators of success for Strategic Direction 1 (Building resilient environmental assets and adapting to change) include:

- Priorities, trade-offs, risks and benefits for REAs considered;
- A regional environmental asset network established;
- Management plans for all 12 REAs implemented.

### Building resilient regional environmental assets and adapting to change: Strategic Priorities and Actions

1.1 Identify and explicitly define regional policy drivers that currently or in the future will significantly impact (positively or negatively) on regional environmental assets, and develop a process for these regional environmental assets to be considered in terms of trade-offs, risks and synergy benefits in project design.

- 1.1.1 Review all 12 prioritized environmental assets of regional importance in the LMB to understand their characteristics and the ‘limits of acceptable change’ at the regional level to assist in regional planning decisions, such as the Basin Development Strategy, to identify where there are potential impacts.
- 1.1.2 Annually identify regional and national priorities for sectoral and national development (including budgetary considerations), and develop an approach to ensure the strategic priorities for the 12 prioritized environmental assets of regional importance in the LMB are included in these processes.
- 1.1.3 Develop a guidance document for the 12 prioritized environmental assets of regional importance in the LMB to be considered in project planning and design processes in terms of trade-offs, risks and benefits.
- 1.1.4 Promote the protection and management of the 12 prioritized environmental assets of regional importance in the LMB in the development of sector-based strategies and national planning processes.
- 1.1.5 Implement the priority actions in the BFMS with respect to upstream and downstream influences on the conservation of key habitats.

1.2 Identify and establish an integrated permanent regional environmental asset network across the whole of the LMB landscape.
1.2.1 Review the need for a permanent regional environmental asset network in each country and throughout the Lower Mekong region, and consider ways to legitimize this formally.

1.2.2 Contribute to regional planning to ensure it is improved so that the 12 prioritized environmental assets of regional importance in the LMB are considered for their biodiversity and watershed protection values, and retained as an essential part of the surrounding development landscape.

1.2.3 Introduce appropriate monitoring systems for relevant management objectives for the 12 prioritized environmental assets of regional importance in the LMB (e.g. biodiversity protection, watershed protection and ecosystem services) supported by appropriate indicators to measure such changes. The special monitoring and reporting systems should be set in place to oversee the conditions and trends in the permanent regional environmental asset network and act as a basis for cooperative bilateral/multilateral action.

1.3 Identify actions to improve or maintain REAs so they are well-functioning, and develop strategies for them to adapt (and transform if necessary) to mounting pressures

1.3.1 Develop or update management plans for all 12 prioritized REAs, which include actions to protect and enhance ecosystem conditions, strengthen habitat connectivity, control invasive species, and introduce breeding programmes.

1.3.2 Review and develop spatial planning and zoning mechanisms for all 12 REAs to manage the consequences of changes resulting in a shifting habitat, and introduce long term planning of buffer zones and corridors, for shifting habitats ecosystems. This includes extensive scientific research for best practice management actions to balance conservation and development around the 12 REAs. The zones in each country may differ according to national legislation.

1.3.3 Provide suggestions to guide and direct regional and national policies, plans and actions to ensure effective protection and enhanced ecosystem conditions within habitat patches, and strengthen habitat connectivity across landscapes to enhance the capacity of ecosystems to naturally respond and adapt to a changing environment.

1.3.4 Investigate and implement priority restoration activities for the 12 prioritized REAs including reafforestation (e.g. of flooded forests) and the regeneration of endemic species.

2.5.2 Engaging the community, other actors and establishing cooperative partnerships and networks

Within the LMB, the environmental asset sites of regional importance are generally inhabited by local communities who rely on the natural resources of the area for their livelihoods and subsistence. In managing environmental assets, it is therefore important that there is a strong emphasis on engaging with the community and other actors, and establishing cooperative
partnerships and networks to achieve environmental outcomes.

REA protection and management will require the development of various partnerships: between government and communities; between REA managers and users; and between REA managers and international organizations.

Forming partnerships requires new management structures, forms of agreement, a sharing of roles, responsibilities and benefits, and concentrated capacity building so that those involved can make credible and useful contributions. At a regional level, training programmes and exchanges are needed in conjunction with pilot projects to test and demonstrate methods of collaboration.

Community engagement is central to building the resilience of the 12 REAs and adapting to change in the LMB. Community awareness of the challenges in protecting and managing ecosystems, and on adaptation to climate change will influence their ongoing use and continued productivity of the areas.

Community programmes and cooperative partnerships need to be reviewed so that appropriate partners can be identified.

Key indicators of success for Strategic Direction 2 (Engaging with the Community, Other Actors and establishing Cooperative Partnerships and Networks) include:

- number of regional environmental assets (sites) co-managed increased;
- number of partnerships increased.

### Community Engagement and Cooperative Partnerships: Strategic Priorities and Actions

#### 2.1 Ensure community engagement and awareness programmes are central to the protection and management of regional environmental assets

- 2.1.1 Introduce a regional, national and local communication education programme to raise awareness about the importance of the 12 prioritized REAs, the ecosystem services they provide, and the need for sustainable management practices to ensure the ongoing resilience of these areas and their ability to adapt to change.

- 2.1.2 Ensure adequate public consultation and input into the development of management and zoning plans for the 12 prioritized REAs.

- 2.1.3 Review examples of REAs currently implementing co-management practices with local communities and investigate opportunities to enter into co-management arrangements in other REAs where applicable, feasible, and beneficial.
• 2.1.4 Build capacity at the national and local levels to implement the conservation policies for the 12 prioritized environmental assets of regional importance in the LMB, including the promotion of gender equity and equality in EA management.

• 2.2 Nurture existing partnerships and investigate new opportunities

• 2.2.1 Identify new opportunities for the management of the 12 prioritized REAs through philanthropic and private industry sponsorship.

• 2.2.2 Produce a report identifying and legitimizing past, current, and future partnerships, and recommending where improvements are necessary (as appropriate).

• 2.2.3 Review and identify opportunities for stakeholder participation in the implementation of the SBEM and for managing the 12 prioritized REAs including planning, funding and monitoring, evaluation, and reporting issues.

• 2.2.4 Undertake community-based monitoring and mapping of the 12 prioritized REAs where appropriate.

2.5.3 Investing wisely and creating incentives

Wise investment of limited funds is an important principle for the SBEM. The identification of the 12 REAs has already been prioritized based on biodiversity, hydrology, rareness and uniqueness, ecosystem services, and global and basin-wide benefits.

This SBEM emphasizes the need to build greater clarity of the trade-offs and risks of investment decisions so that better overall outcomes are generated. The approach adopted focuses on broader ecosystems rather than threatened species in order to ensure that overall biodiversity conditions are maintained with adequate and sustainable financial support in a limited funding environment.

The way investment is made for environmental assets also needs to consider the likely impacts of climate change. Steffen et al. (2009, p.13) stresses that we must undertake a vastly enhanced conservation effort:

Management approaches that seek to maintain current spatial arrangements of species will be very difficult to implement under a changing climate – and could well be counterproductive. Management objectives will need to be reoriented from preserving all species in their current locations to maintaining the provision of ecosystem services through a diversity of well-functioning ecosystems.
The SBEM aims to achieve the above through its prioritization process.

Ensuring the translation between policy and the implementation well-formed research priorities is crucial. Increasing the use of risk assessments at all scales (e.g. species, sites, ecosystems) will help to assess the vulnerability of biodiversity and help shape appropriate management options and investment choices.

The public and private benefits of investment also need to be determined to ensure that the right policy instruments are applied. Natural resources currently provide a substantial financial benefit to those that exploit them. Only a small proportion of those benefits return to the management of the REA; many other beneficiaries of good REA management often pay nothing at all. For instance, water supply authorities, hydro-electric authorities, commercial agriculture, tourism, fisheries and those who gain from biodiversity preservation and carbon sequestration generally do not provide financial aid to sustainable EA management. What is needed, therefore, is a way of sharing the costs and benefits between managers and other stakeholders where they do not already exist. This will require a proper valuation of the costs of management.

### Investing Wisely and Creating Incentives: Strategic Priorities and Actions

#### 3.1 Assess the ecosystem services provided by the 12 prioritized REAs and adopt a ES approach in relevant regional and national strategies

- 3.1.1 Evaluate all 12 REAs in terms of the food security and sustainable livelihoods they provide within the Mekong watershed to enable informed management decisions and trade-offs to be made.
- 3.1.2 Drawing from the work already undertaken by the MCs, with the United Nations Environment Plan and other organizations, develop a guidance document on how an ES approach could be integrated into the next strategic planning cycle, including the BDS, and considering new information, such as the findings of the Council Study.
- 3.1.3 Implement conservation-based economic development models in buffer zones or in zones provided for development according to national law such as community-based enterprises, non-timber products, and projects to cope with climate change.

#### 3.2 Identify opportunities for regional funding

- 3.2.1 Identify and pursue organizations looking for ‘green’ or sustainable branding as a source of potential funding for managing the 12 prioritized REAs.
- 3.2.2 Investigate options to establish a Lower Mekong Conservation Fund to protect and manage the 12 prioritized REAs.

#### 3.3 Review social and economic instruments and other incentive mechanisms to manage regional environmental assets
• 3.3.1 Assess social and economic instruments, such as Payment for Ecosystem Services, and other incentive mechanisms for adoption in the 12 prioritized REAs, and develop guidance for consideration by each country.

• 3.3.2 Implement a number of pilot projects to test the 'user pays' approach where groups and individuals benefit from EA hydrological and other services. Three main groups of users should be considered in targeting economic instruments; (i) local communities and subsistence uses; (ii) private sector commercial operations; and (iii) government operations. Special attention would need to be given to concession holders in forestry and agriculture, industrial facilities, energy facilities, and irrigation and water supply systems.

The valuation of goods and services supplied when REAs are well-managed is also required. The removal of inappropriate subsidies that impede good management, such as low tax regimes, is also an optimal outcome. Finally, adequate regulation and supervision to ensure that prescribed payments are assessed, collected, appropriately managed and to support agreed conservation activities is necessary.

Key indicators of success for Strategic Direction 3 (Investing Wisely and Creating Incentives) include:

• the Lower Mekong Conservation Fund established;

• increased investment by organizations in various incentive schemes established in REAs.

2.5.4 Strengthening regional and national environmental assets

Biodiversity and environmental assets underpin the processes that make all life possible. The importance of biodiversity to human welfare needs to be understood by the community to ensure appropriate and increased investment by the government and the community.

Although the connection between land, water, and related resources use, on the one hand, and natural systems, on the other hand, is not always immediate, all human land and water use ultimately relies on natural systems and the biodiversity they support.

Forestry, fisheries, and agricultural systems can be obviously and immediately connected to biodiversity. For example, pollination of crops by insects or year-round ground cover and summer feed for stock provided by well-managed native pastures. There may be more remote connections as well, such as the provision of water via rainfall that falls hundreds of kilometres away and filters through landscapes. Biodiversity conservation is often thought to be at the opposite end of the spectrum to these activities and this dichotomy is not useful. Farmers, foresters, and fishers rely on natural systems, which need active stewards.

With regard to soil and its biodiversity, land managers can play a crucial role in supporting healthy and functioning ecosystems. Increasingly, there are examples of research and land management
approaches where both biodiversity and production benefits are being realised (Crosthwaite et al., 2009). This information needs to be more widely disseminated and understood to affect greater levels of change to benefit both biodiversity and production.

Better defining land managers’ duty of care is considered crucial in establishing obligations and incentives for supporting land managers to improve biodiversity management. The boundaries of some REAs in the region occur in such a way that they include communities of farmers, foresters and fishers, some of whom have resided there for very long periods. It requires a culturally sensitive approach and innovative thinking about agricultural systems and practices.

There is a clear demand for tourism within the 12 prioritized environmental assets of regional importance in the LMB. Many assets already implementing successful tourism programmes, particularly ones that focus on ecotourism due to the uniqueness and rareness of the area for flora, fauna and ethnic communities. It is important to manage tourism appropriately and sustainably. A regional action plan for tourism that takes into consideration relevant background information on the region’s natural and cultural assets, infrastructure and tourism products, market analysis and industry structure, coordination, and research and plans is therefore necessary to ensure this. Ecotourism is important to local communities and the management of REAs because it generates long-term income and provides incentives to maintain these important ecosystem services.

The development of complementary transboundary legal frameworks to enhance cross-border collaboration is important. These transboundary frameworks have varying degrees of formality, with a Transboundary Protected Area (TBPA) being one of the more secure options.

The LMB forms a common ecological context in which improved methods of natural resource conservation needs to be implemented. Yet, due to the differences across the region in terms of the extent of remaining vegetation and natural resources, economic situations, and political structures, there may be considerable advantages in simplifying legal frameworks and making them more complementary to enhance the opportunity for greater collaboration in EA management across the region.

Key indicators of success for Strategic Direction 4 (Strengthening regional environmental assets of importance in the LMB) include:

- guidance prepared for services (agriculture, non-timber forest products, tourism and other relevant sectors) in REAs;
- the number of TBPA s established increased and TBPA cooperation mechanisms developed and implemented.
2.6 Implementation, Monitoring and Evaluation

Strengthening Regional and National Environmental Assets of Importance in the LMB: Strategic Priorities and Actions

4.1 Develop guidance and regional action plans for agriculture, tourism, fisheries and forestry, and other activities in REAs

- 4.1.1 Prepare regional guidance for agriculture, forestry, fisheries, and other activities inside the 12 REAs to improve the sustainability of practices.

- 4.1.2 Develop a regional action plan for tourism for the 12 REAs in order to help attract different segments of the tourist market to the most appropriate locations at the most appropriate times and in accordance with the best management practices for sustainable ecotourism.

- 4.1.3 Prepare guidance for ‘green’ tourism infrastructure development and tourist behaviour to reduce the negative impacts of tourism development, including further research on how management decisions for the 12 REAs impact on tourism activity so as to maintain natural and tourism values. In addition, develop monitoring protocols to ensure that the integrity of environmental and cultural assets is maintained.

4.2 Develop complementary legal frameworks to enhance cross-border collaboration in the management of REAs

- 4.2.1 Review the national legal frameworks of each MC to simplify existing legal frameworks and make them more complementary to enhance the opportunity for greater collaboration in the management of the 12 REAs in the LMB.

- 4.2.2 Assess and identify where there are likely opportunities to establish Transboundary Protected Areas or Transboundary Conservation Landscapes or Seascapes between the 12 prioritized environmental assets of regional importance and/or with other environmental assets in the LMB.

- 4.2.3 Assess and identify opportunities to set up green corridors between the 12 REAS or other environmental assets (transboundary) in the LMB.

The Expert Group on Environmental Management is responsible for the development and implementation of the SBEM 2021–2025. The EMEG will provide oversight and guidance as to how the agreed basin-wide Strategic Priorities and Actions are addressed and integrated into regional and national planning. Implementation will be participatory, engaging with national agencies, regional organizations, academic organizations, the private sector, civil society and other non-state actors.
A Project-based Action Plan will be developed to assist with implementing the SBEM so as to prioritize the Strategic Priorities and Actions and identify responsibilities and options for sustainable funding.

Monitoring and evaluation (M&E) of the SBEM 2021–2025 and its implementation will be carried out by the EMEG and coordinated with the MRC Environmental Management Division. The EMEG will develop specific, objectively verifiable indicators following the logframe proposed in the SBEM and approved by the MRC Council. The monitoring will focus on three levels of evaluation, as outlined in Table 3.

**Table 3.** Levels of evaluation

<table>
<thead>
<tr>
<th>Level</th>
<th>Analysis terminology</th>
<th>Typical questions used to assist analysis</th>
<th>Examples of evidence to inform analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Annual performance</td>
<td>How did we do this year against what we said we would do?</td>
<td>Outputs achieved and funds spent against targets set</td>
</tr>
<tr>
<td>2</td>
<td>Long-term strategy implementation progress</td>
<td>How have we done against what we said we would do when we wrote the Strategy?</td>
<td>Outputs and assumptions of their impact listed in strategies</td>
</tr>
<tr>
<td>3</td>
<td>Environmental asset condition change</td>
<td>What shape is the asset we are managing in now compared with the one in 20 years?</td>
<td>Resource conditions; trends; tipping points; indicators of resilience, adaptation and transformation responses</td>
</tr>
</tbody>
</table>

The updated BDS, and MRC Strategic Plan, and the national planning cycles will need to integrate the strategic priorities and actions, and secure appropriate national budgets for implementation and monitoring.

M&E results will be integrated into the MRC’s M&E system in accordance with the agreed SOBR indicators and the MRC Indicator Framework. The system will record and evaluate efficiency, effectiveness, impacts, and sustainability, including in the overall context of the MRC BDS.

The SBEM will be reviewed every five years.
ASEAN Heritage Parks are selected protected areas in the ASEAN region that are known for their unique biodiversity and ecosystems, wilderness and outstanding values, and are given the highest recognition because of their importance as conservation areas (ASEAN, 2019).

Biodiversity or biological diversity is defined as “the variability among living organisms from all sources, including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems” (Hawksworth, 1995). This definition is used in the International Convention on Biological Diversity.

Biodiversity hotspot is a biogeographic region with a significant reservoir of biodiversity that is threatened with destruction (Conservation International, 2010). A similar term ‘environmental hotspot’ is used in MRC reports, such as the State of the Basin Report 2018.

Ecological resilience is the capacity of an ecosystem to respond to a disturbance by resisting damage and recovering quickly. Such disturbances include flooding, drought, fire, storms, invasive species, and human activities such as deforestation, development and pesticide use. Disturbances of sufficient magnitude or duration can profoundly affect an ecosystem and may result in an ecosystem reaching a threshold beyond which different processes dominate. Human activities that adversely affect ecosystem resilience such as the reduction of biodiversity, exploitation of natural resources (including water and related resources), pollution, land use and climate change are increasingly creating shifts in ecosystems, often to a less desirable and degraded condition. Currently, the concept of resilience includes consideration of the interactions of humans and ecosystems via socio-ecological systems, and the need to shift from a maximum sustainable yield approach to an environmental resource management approach that aims to build ecological resilience through “resilience analysis, adaptive resource management, and adaptive governance” (Folke et al., 2004).

Ecoregions are a classification system developed by WWF (Olson et al., 2001) and a biogeographic regionalization of the earth’s biodiversity. Biogeographic units are ecoregions, which are defined as relatively large units of land or water containing a distinct assemblage of natural communities sharing a large majority of species, dynamics, and environmental conditions. There are 867 terrestrial ecoregions, classified into 14 different biomes such as forests, grasslands, and deserts. Ecoregions represent the original distribution of distinct assemblages of species and communities. Classification of biophysical and ecological units can assist with developing effective conservation
strategies, and understanding the units that are at threat and need immediate action to preserve and manage.

According to the concept of ecosystem services or natural capital, environmental systems play a fundamental role in a country’s economic output and social well-being. The three main ecosystem service categories are identified as: provisioning services (e.g. biomass, water, fibre); regulating maintenance services (e.g. soil formation and composition, pest and disease control, climate regulation); supporting services (e.g. soil formation and nutrient cycling), and cultural services (e.g. the physical, intellectual, spiritual, symbolic interactions of humans with ecosystems, land and seascapes) (EC, 2000).

**Environmental assets** in the context of the LMB as agreed to by the MRC Environmental Management Expert Group (EMEG), environmental assets were defined as follows:

- Naturally occurring areas that provide environmental ‘functions’ and ‘services’ for sustainable generations (current and future) of the Lower Mekong Basin (LMB).

- Environmental assets could include but are not limited to terrestrial, aquatic ecosystems, including biodiversity hotspots, wetlands, fish species, etc., which provide important ecosystem functions and/or services that are mutually beneficial to the four Lower Mekong countries and their current and future generations.

**Incentives (for biodiversity conservation):** incentive mechanisms are increasingly being applied to address the conservation of biodiversity and provision of ecosystem services – i.e. the services that ecosystems provide. Examples of incentives include: payments for environmental service schemes, in which natural resource users are paid to conserve natural resources or manage them more sustainably; conservation enterprise and certification of ‘biodiversity-friendly products’, the production of which conserves key species and habitats while improving people’s livelihoods; and ecotourism that is either community-based or involves benefit-sharing to give local communities a stake in conserving critical habitats and species (IIED, 2019).

**IUCN Red List of Threatened Species** (IUCN, 2019a) is a globally comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as an authoritative guide to the status of biological diversity.

**Limits of acceptable change** is defined as the variation that is considered acceptable (or not) in a particular component or process of the ecological character of the wetland (Ramsar, 2012). The concept of ‘limits of acceptable change’ recognizes that some degree of change may be inevitable but that there are bounds beyond which the character of the site will be fundamentally changed and the provision of ecosystem services compromised. Identifying the limits of acceptable change is important at the regional level to assist regional planning and decision-making, particularly where there are potential transboundary impacts.
**National Parks**, according to IUCN Category II (IUCN, 2019b), are large natural or near natural areas set aside to protect large-scale ecological processes, together with species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational, and visitor opportunities. A national park is similar to a wilderness area in its size and its main objective of protecting functioning ecosystems. However, national parks tend to be more lenient with human visitation and its supporting infrastructure. They are managed in a way that may contribute to local economies by promoting educational and recreational tourism on a scale that will not reduce the effectiveness of conservation efforts. The surrounding areas of a national park may be for consumptive or non-consumptive use but should nevertheless act as a barrier for the defence of the protected area’s native species and communities to enable them to sustain themselves in the long term. Category II areas should be more strictly protected where ecological functions and native species composition are relatively intact; surrounding landscapes can have varying degrees of consumptive or non-consumptive uses but should ideally serve as buffers to the protected area. **Multiple Use Areas** also fall under this category.

**National Protected Areas**, according to IUCN Category VI (IUCN, 2019b), are protected areas with sustainable use of natural resources. Although human involvement is a major factor in the management of these areas, developments are not intended to allow for wide-scale industrial production. The IUCN recommends that a proportion of the park remains in its natural condition – a decision to be made on a national level, usually with specificity to each protected area. Governance has to adapt to a diverse range of interests that arise from the production of sustainable natural resources. Category VI may be particularly suitable to vast areas that already have a low level of human occupation or in which local communities and their traditional practices have had little permanent impact on the environmental health of the region.

**Natural World Heritage** sites are globally recognized as the planet’s most significant protected areas listed under the UNESCO World Heritage Convention (UNESCO, 2019).

**RAMSAR Wetlands** are Wetlands of International Importance listed under the International Convention on Wetlands, known as the Ramsar Convention. Under the Ramsar Convention, countries are expected to promote the conservation of Ramsar wetlands and as far as possible, the wise use of all wetlands. Wise use is defined as “… the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development” (Ramsar, 2012).

**Transboundary conservation**: The IUCN provides guidance on the concept of transboundary conservation. Transboundary conservation has emerged as a practical way to overcome differences and is considered a process of cooperation to achieve conservation goals across one or more international boundaries. Three types of Transboundary Conservation Areas and one Special Designation have been identified: (i) a **Transboundary Protected Area** is a clearly defined geographical space that consists of protected areas that are ecologically connected across one or more international boundaries and involves some form of cooperation; (ii) a **Transboundary Conservation Landscape and/or Seascape** is an ecologically connected area that sustains ecological processes and crosses one or more international boundaries, and which includes both protected areas and multiple resource-use areas, and involves some form of cooperation; and (iii) a **Transboundary Migration Conservation Area** consists of wildlife habitats in two or more
countries that are necessary to sustain populations of migratory species and involve some form of cooperation. **A Special Designation, Park for Peace**, may be applied to any of the three types of Transboundary Conservation Areas, and is dedicated to the promotion, celebration and/or commemoration of peace and cooperation (IUCN, 2019c).

**UNESCO biosphere reserves** are areas comprising terrestrial, marine and coastal ecosystems. Each reserve promotes solutions reconciling the conservation of biodiversity with its sustainable use. Biosphere reserves are ‘Science for Sustainability support sites’ – special places for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity (UNESCO, 2019b).

**Wildlife sanctuaries** are most closely related to a habitat or species management area, as defined under the IUCN Category IV, which focuses on more specific areas of conservation, such as an identifiable species or habitat that requires continuous protection rather than a natural feature. These protected areas are controlled to ensure the maintenance, conservation, and restoration of particular species and habitats, possibly through traditional means. In addition, public education of these areas is widely encouraged as part of the management objectives. Habitat or species management areas may exist as a fraction of a wider ecosystem or protected area and may require varying levels of active protection. Management measures may include (but are not limited to) the prevention of poaching, creation of artificial habitats, halting natural succession, and supplementary feeding practices. Non-hunting Areas and Important Bird Areas also fall under this category (IUCN, 2019b).


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<tr>
<td>3</td>
<td>1st draft of the Strategy for basin-wide environmental management of environmental assets of regional importance – Report 3</td>
<td>Discussed and agreed at the 2nd Environmental Management Expert Group (EMEG) meeting on 5 June 2019 in Hanoi, Viet Nam</td>
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<tr>
<td>4</td>
<td>2nd draft of the Strategy for basin-wide environmental management of environmental assets of regional importance</td>
<td>National Consultations – September 2019</td>
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<td>5</td>
<td>3rd draft of the Strategy for basin-wide environmental management of environmental assets of regional importance</td>
<td>Discussed and agreed at the 3rd EMEG meeting on 30 October 2019 in Bangkok, Thailand</td>
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**Synthesis Phase**

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<td>6</td>
<td>Preparation of the final version (4.) SBEM 2021–2025</td>
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**Endorsement and Approval Phase**

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<td>7</td>
<td>Endorsement of the final version of the SBEM 2021–2025 by MRC Joint Committee</td>
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<tr>
<td>8</td>
<td>Approval of the final version of the SBEM 2021–2025 by the MRC Council</td>
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1. **Tonle Sap Multiple Use Area**

The Tonle Sap Multiple Use Area, Ramsar Wetland, and Biosphere Reserve is located in Kampong Thom, Kampong Chhnang, Pursat, Batambang and Siem Reap provinces.

The Tonle Sap Multiple Use Area was selected as the number one site of the top three environmental assets of national importance for Cambodia, using the selection criteria for prioritized REAs.
Mekong strategy for basin-wide environmental management for environmental assets of regional importance 2021–2025

(Report 2). This was based on its high ranking for all six criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance.

The lake is the largest freshwater lake in Southeast Asia and is linked to the Mekong River by the Tonlé Sap River. From November until June, the lake flows into the Mekong. However, each year during the rainy season (mid-June to late October), the Mekong River is inundated with rainwater. Its lower delta becomes flooded and cannot flow into the sea quickly enough to eliminate all the excess water. This causes the Mekong River to rise enough to reverse the flow of the Tonlé Sap River, causing it to flow back into the lake. The lake expands from 2,500 km² to more than 16,000 km², creating an enormous wetland area.

The lake supports a tremendous amount of biodiversity including plants, reptiles, mammals, birds, and other animals, many of which are known to be rare or endangered. These wetlands are also an important breeding area for fish from the lake and Mekong River. Both Siamese crocodiles (Crocodylus siamensis) and saltwater crocodiles (Crocodylus porosus) once occurred side-by-side in the lake, and it is believed that there is inter-species breeding among the crocodiles found in the floating farms on the western part of the Lake in and around Prek Toal. The lake represents the Tonle Sap Freshwater Swamp Forest ecoregion and is home to a vast variety of flora, fauna and fish providing habitats to 100 water bird species, 296 fish species, as well as a number of other wildlife species. Among them, there are rare animal species at risk of extinction such as turtles, macaques, otters, and tortoises.

**Function**

The globally unique hydrological system supports economically important fisheries and unique human-natural resource patterns.

**Benefits**

The lake is locally, nationally, and regionally beneficial due to its important hydrological function, its provision of fish and other natural resources for human consumption, tourism, other natural resources, and as a habitat supporting endangered biodiversity. It provides an important function for the LMB hydrological system and for the 12,876 km² Cambodian floodplain that the Mekong replenishes with water and sediments annually.

**Threats**

The population in the Ramsar Site increased by 37% from 1998 to 2003, leading to increased pressure on fish resources and wood collection, with more frequent dry season fires, all of which are affecting the site’s ecological character by turning the forest into grasslands and shrublands (Ramsar Secretariat, 2012).
Habitat loss and degradation as a result of development activities, Illegal logging, hunting, poisoning, overfishing, population growth, and associated development. The Council Study indicated that the lake is at risk from cascading hydropower development, agriculture development and land-use/resource conflict impacting on the natural hydrological regime of the lake and also fish species and fisheries. In addition, there are impacts from localized dams, irrigation, and the invasive plant *Mimos pigra*.

### Ecosystem Services

The Tonle Sap Lake is a good example of near-natural wetlands that play a substantial hydrological and biological role in the natural functioning of two major rivers – Stoeng Stoutng and Stoeng Chikreng. The area supports a large assemblage of plant, fish, and water bird species, many of which are listed as rare and threatened. The Tonle Sap region plays a vital role in Cambodia’s economy by supplying fish to the population. Several million people depend upon its continued productivity.

### Management

The Tonle Sap Lake is well-known as the largest freshwater lake in Southeast Asia, as well as for being a unique and rich Biosphere Reserve, which was recognized by UNESCO in 1997. The Royal Decree of 1 November 1993, the Law on Environmental Protection and Natural Resources Management, the Protected Area Law, 2008, National REDD+ Strategies (2018–2028), and National Protection Areas Strategic Management Plan, 2017–2031 also apply.

Efforts to manage the pressures on the lake are recommended, including the creation of new fish sanctuaries and more effective implementation of the Ramsar Site management plan. Particular attention is needed to control overexploitation of fish species for the ornamental fish trade. Management of the area needs to include measures that protect the condition of the natural areas and ensure that species of conservation significance are protected adequately. Thus, facilities that ensure minimal impact are recommended to encourage nature-based recreation. Human activity should occur in less sensitive areas, and the park should be protected from overuse. Studies should be undertaken continuously to update the national inventory and monitor the condition of its natural features and the ecosystem services the site provides.
2. Virachey National Park

Virachey National Park is located in north-eastern Cambodia covering an area of 3,380 km². The park is one of only two Cambodian ASEAN Heritage Parks and one of the top priority areas for conservation in Southeast Asia. The park is situated in Ratanakiri and Stung Treng provinces.

The Park comprises dense semi-evergreen lowlands, montane forests, upland savannah, bamboo thickets, and occasional patches of mixed deciduous forest. Most of the area lies between 400 metres and 1,500 metres above sea level. It provides habitats for species such as guar, clouded leopard cats, elephants, gibbons, sun bears, and innumerable other mammal, bird, plant, and tree species. The NP represents the Central Indochina Dry Forest and the Southern Eastern Indochina Evergreen Forest ecoregions.

The Park was selected as the number two site of the top three environmental assets of national importance for Cambodia, using the selection criteria for prioritized REAs (Report 2). This was based on its high ranking for four criteria: biodiversity/ecology, rareness and uniqueness, global, and regional or transboundary (basin-wide processes) importance.

Virachey National Park was created under the Royal Decree Concerning the Creation and Designation of Protected Areas, issued on 1 November 1993, and is under the administration of the Cambodian Ministry of Environment. It is a joint transboundary area with Xe Pian and Dong Amphan National Protected Areas in Lao PDR and Chu Mom Rai NP in Viet Nam.

Functions
The Park provides important habitats for endangered mammals, birds, plants, and tree species. It has one of the most organized ecotourism programmes in Cambodia, focusing on small-scale culture, nature and adventure trekking. The programme aims to involve and benefit local minority communities.

Benefits
Livelihoods are improved through ecotourism and protection of endangered species.
**Threats**

The Park’s flora and fauna is threatened by illegal logging. Major developments including hydropower and agriculture will also impact on the NP. From a regional perspective, the Park is at risk from upstream hydropower, agriculture development, and land-use/resource conflict.

**Ecosystem Services**

The Park provides protection to the watershed of the Sesan River Basin which flows into the Mekong River. Crucial for carbon storage and protection from flooding.

**Management**

The site is managed by the Cambodian Ministry of Environment. Management actions should aim to protect biodiversity and maintain ecosystem services for the local community. The management plan scheduled to be updated, but currently a lack of budget and capacity is delaying the process.

3. **Srepok Wildlife Sanctuary**

The Sre Pok Wildlife Sanctuary (formerly the Mondulkiri Protected Forest) is a 3,720 km² protected forest in eastern Cambodia. The wildlife sanctuary is located in Mondulkiri province and borders Lumphat Wildlife Sanctuary in the northwest, Nsok Protected Forest in the north, Phnom Prich Wildlife Sanctuary in the southwest, and Phnom Nam Lyr Wildlife Sanctuary in the southeast. It is also transboundary with the Yok Don NP in Viet Nam.

The Sre Pok River Basin is an important transboundary tributary to the Mekong River and shares joint transboundary water with Yok Don National Park in Viet Nam. It is rich in natural resources and has a very high fish diversity. At least 81 (33%) of the species found in the Sre Pok are migratory and depend on connectivity to adjacent areas. Fisheries provide a significant income for local communities.

The Srepok Wildlife Sanctuary was selected as the number three site of the top three environmental assets of national importance for Cambodia, using the selection criteria for prioritized REAs (Report
This was based on its high ranking for three criteria: biodiversity/ecology, ecosystem services, and regional or transboundary (basin-wide processes) importance.

The Srepok Wildlife Sanctuary is home to globally endangered species including Asian elephant, leopard, clouded-leopard, banteng, giant ibis, white–shoulder ibis, and Siamese crocodile. It was once home to wild Asian tigers and has been identified by the Cambodian Government as a priority site for the Tiger reintroduction programme. Moreover, it is important in terms of social and cultural aspects for the indigenous communities who live within the realms of the forest. The wildlife sanctuary represents the Central Indochina Dry Forest ecoregion.

### Functions

The Sanctuary provides a habitat for endangered mammals, reptiles, and a high diversity of fish. The local indigenous community are reliant on its natural resources for their livelihoods and incomes.

### Benefits

Ecotourism and conservation: The Sanctuary provides watershed protection, groundwater recharge, and reduced impacts from flooding, erosion and drought.

### Threats

The Sanctuary is threatened by poaching, forest destruction and illegal land encroachment, the impact of upstream hydropower, mining, agricultural development, impacts of climate change, and land-use/resources conflict.

### Ecosystem Services

It is crucial for carbon storage and sequestration as well as preventing flooding and reducing drought impact. The forest habitats are extremely valuable for conservation and sustainable development.

### Management

The new government sub-decree issued on 1 February 2019 will ensure effective protection against environmental crimes such as wildlife poaching, forest destruction and illegal land encroachment.

The Ministry of the Environment is currently preparing the management plan, with the zoning exercise already approved. The three key steps include: zoning, state land registration, and management actions.

The zoning plan inside the protected areas allows clear demarcation between different types of land use: core zones, conservation zones, sustainable use zones and community zones. This commitment will promote strong participation from local communities as it evokes support from the people to conserve the country’s rich biological diversity.
4. Beung Kiat Ngong Wetland

The Beung Kiat Ngong Wetland covers 2,360 ha and is located in Pathoumphone district, Champassak province in southern Lao PDR, approximately 56 km south of the provincial capital of Pakse.

It is listed under the International Convention for Wetlands (Ramsar), and is one of two Ramsar wetlands in Lao PDR. It provides an important habitat for water birds, migratory species, and is an important source of natural resources for local villages.

The Beung Kiat Ngong Wetland was selected as the number one site of the top three environmental assets of national importance for Lao PDR using the selection criteria for prioritized REAs (Report 2). This was based on its high ranking for all six criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance.

The elevation of the site is 120 to 200 metres above sea level. The southern parts of the wetland, as well as most of the village of Ban Kiat Ngong, are located within the Xe Pian National Protected Area (NPA) (Duckworth, 2008). At the broadest regional scale, the Beung Kiat Ngong Wetland is included as an Indo-Burma Biodiversity Hotspot for the Central Indochina area (tropical lowland plain) (Conservation International, 2006).

There are a number of important wetlands within the Beung Kiat Ngong Wetlands complex including swamps, lakes, and marshes scattered throughout the area. The edge of the wetland is forested and is surrounded by large stunning trees and perennial flooded grasses. The area supports over 150 fish species, including walking catfish, snakeheads, and swamp eel, and 33 wetland-associated bird species, including cattle egrets, immediate egrets, lesser tree ducks, painted snipes, and Chinese pond heron.

The Beung Kiat Ngong Wetlands is one of the few areas in Lao PDR where peatland areas can be found. The area also includes rich semi-evergreen forest areas within the broader wetland mosaic. The wetlands represent the Central Indochina Dry Forest ecoregion.
**Functions**

It is a natural wetland of cultural importance, offering ecosystem services.

**Benefits**

It provides livelihood support for the surrounding area, and a natural habitat for aquatic wildlife and water birds.

**Threats**

Threats include: peat extraction; overharvesting of fish, aquatic resources, and non-timber forest products; increasing cattle and buffalo populations; land conversion; and insufficient human and financial resources to implement regulations or a management plan. Climate change impacts have resulted in increased extreme droughts and floods. The wetland is also at risk from cascading hydropower development, agriculture development, and land-use/resource conflict.

**Ecosystem services**

More than 11,500 people in 13 villages rely on the wetlands for their livelihoods, which are mainly derived from fishing and collecting wild vegetables. With an area of only 3,000 ha, the Beung Kiat Ngong Wetlands provide enormous direct and indirect benefits for local communities. It was estimated in 2008 that the wetlands provide USD 897,607 (Khamlibounthavi, 2008) of annual direct economic value. Economic research conducted in the wetlands and with the communities living in and around the area in 2009 (IUCN, 2012) revised the estimated of economic benefits to USD 849,682 annually from fish, non-forest timber products (non-forest timber products and agricultural products. Additional “provisioning” services of the wetland provide incomes for dollar figures associated with additional ecosystem services.

The wetlands play an important role in:

- Flood mitigation
- Storing and maintaining groundwater
- Sediment/nutrient trapping
- Sequestering carbon in peatlands and surrounding forests
- Water purification/treatment.

The area is characterized by rural Lao Loum culture, including a continuing traditional elephant mahout culture. As noted in Maurer (2009), the tradition of domesticated elephant ownership is viewed by government officials and villagers alike as an important element of Pathoumphone district’s cultural heritage. Ban Kiat Ngong is home to around half of Champassak province’s remaining domestic elephant population of 33 elephants (Maurer, 2009; Elefant Asia, 2010). A local elephant festival is also held each year in February at Beung Kiat Ngong; however, populations are declining.
During the wet season, the wetlands provide spawning grounds and passage for a variety of fishes to move upstream. The wetlands also form an especially important habitat for fish during the low water dry season. Other functions include: sediment trapping (due to the slow water flow); habitats for key conservation species (fishing cat, sambar, and Malayan snail-eating turtle) and economic species (malva nut); as well as bird feeding grounds and sometimes as a nesting site.

Management

The Government of Lao PDR, with support from IUCN, has taken steps to conserve the Beung Kiat Ngong Wetland, especially in establishing a dialogue with the community to build their support and involvement for conservation through the drafting of a community-based 5-year (2013–2017) management plan.

The long-term objectives of the management plan are:

- To ensure the conservation and restoration of the site by working with local communities to decrease overfishing and overharvesting, and improving land-use planning. The community will also be involved in site management and monitoring through the establishment of community patrols and participatory workshops and training.
- To maintain and enhance food security, livelihoods and incomes of the community by increasing the yield from rice cultivation and diversifying cultivation.
- To maintain the cultural value of the site by documenting and disseminating local tradition and history.
- To prioritize local community’s involvement in the management process and improve coordination between local authorities and the village level in order to maintain the collaborative dynamic initiated during the drafting of the plan.

A new Management Plan has been drafted for 2019–2023 for the wetlands but has not yet been approved by the Lao Government.

5. **Nam Et Phoulei National Park**

Nam Et-Phoulei (NEPL) National Park (NP) is located in northern Lao PDR, covering 5,950 km² in three provinces: Houaphan, Luang Prabang, and Xieng Khouang. The Park includes a 3,000 km² core area where human access and wildlife harvesting are prohibited and a 2,950 km² buffer area where pre-existing villages are allocated land for subsistence living. Half of the NP is situated in the Mekong River Basin and the other towards Viet Nam.

The Park is important for many large endangered mammals because it provides the last known habitats in Lao PDR for species such as tiger, leopard, clouded leopard, Asian golden cat, marbled cat, civet, gaur, Sambar deer, white-cheeked gibbon, sun bear, black bear, Asian elephant, dhole, and hornbill, and three species of otter.

The Nam Et-Phoulei National Park was selected as the number two site of the top three environmental assets of national importance for Lao PDR jointly with Xe Champhone Ramsar Wetland, using the selection criteria for prioritized REAs (Report 2). This was based on its high ranking for four criteria: biodiversity/ecology, rareness and uniqueness, global importance, and regional, transboundary importance.

The Park consists mainly of mountains and hills, with elevations ranging between 336 and 2257 metres above sea level and is named after the Nam Et River and Phou Louey Mountain (‘Forever Mountain’).

The highest point is the peak of Phou Louey, and the lowest the Nam Et River valley. The topography of the area is steep and land suitable for agriculture is limited. Being such a mountainous area, the park is the source of many major rivers including the Nam Nern, Nam Khan, Nam Et, Nam Seuang, and Nam Seng. The NP represents the Northern Indochina Subtropical Forest and the Luang Prabang Mountain Rainforest ecoregions.
Functions
The Park provides protection to the watershed and provides habitats for many endangered species. There are many tributaries, which contribute significantly to the livelihoods of local people. The rivers are mainly important to villagers for transportation, fishing, household water supply, and irrigation. Approximately half of the protected area is co-managed with local communities to sustainably harvest wild plants and meat, and practice traditional agriculture.

Benefits
An economic benefit is currently being derived through the protected area’s wildlife ecotours: Nam Nern Night Safari or Trekking Tours. Ecotourism activities at NEPL NP have been developed to provide an additional livelihood opportunity for local people surrounding the protected area. All tours have been designed to create a direct link between conservation and tourism so that the income from visitors has a positive impact on encouraging local people to protect endangered wildlife.

Threats
Threats include overharvesting for trade and subsistence, habitat loss, climate change, emerging disease, and lack of scientific studies for rare species for their proper management and protection. Agricultural encroachment, and potential mining and hydropower inside the core zone of the NP threaten the long-term sustainability of the area to support its people.

Ecosystem Services
NEPL is located in some of the poorest districts in the country and is home to 98 communities and 30,000 people who rely on its natural bounty for sustenance. The livelihoods of the villagers in the area are very much associated with the natural environment by way of agricultural production and shifting cultivation. There are few sources of alternative employment and settlements are highly scattered and often in remote and inaccessible areas. A small number of villages also manufacture handicrafts and provide simple services.

According to the 2001 Poverty Assessment, the three main districts in Nam Et-Phou Louey, Houameuang, Viengkham, and Viengthong, fall into the second highest poverty bracket with poor villages making up more than 90% of the total (the poorest districts have 100% poor villages). Villagers living in Nam Et-Phou Louey National Park include Tai Dam, Tai Daeng, Tai Kao, Tai Puan, Tai Lue, Tai Yuan, Khmu, Hmong Kao, Hmong Lai, and Yao.

Management
The ecotourism products at NEPL NP have been designed to create a direct link between conservation and tourism so that the money that tourists pay has a positive impact on encouraging local people to protect endangered wildlife. This is achieved through both direct employment of local people in service provider groups and through incentives that provide benefits to a larger number of villages linked to wildlife conservation.
There is a lack of natural resource management systems in place in the controlled use zones and a low understanding among local people about conservation’s long-term benefits, which is undermining the NPs sustainability. The challenge is, therefore, to develop management systems and build awareness among local people about conservation in order to improve the sustainable harvest of wild plants and animals for local use and provide local people with greater food security.

Initiatives, in partnership with the Wildlife Conservation Society, include:

- community-based research on the use of wildlife to help communities design methods for managing populations sustainably;
- training of and support to national protected area/national park managers at NEPL to create a model for protected area management in the country. The team visits communities regularly to raise awareness about conservation and its long-term benefits for food security;
- partnering with district agriculture and livestock authorities to assist communities to improve livestock raising methods and reduce the conflict between humans and predators;
- ecotourism activities at NEPL developed to provide an additional livelihood opportunity for local people surrounding the protected area;
- village fund generation directly linked to ecosystem health; and
- assigned as the first National Park System in Lao PDR.

Other relevant legislation includes the Forestry Law, Water Law, Forestry Strategy 2020, etc. There are the necessary plans in place whose strict enforcement is crucial.

6. Xe Champhone Wetlands Ramsar site

The Xe Champhone Wetlands are located in Savannakhet province in southern Lao PDR, and was designated as a Ramsar Site in 2010 due to its importance for the conservation of the Siamese crocodile (largest population in the country), the occurrence of specific wetland habitats, and the support it brings to local livelihoods (Timmins, 2014). The Xe Champhone Wetlands include a large plain containing perennial and seasonal rivers, as well as scattered lakes, ponds, freshwater marshes, and rice paddy fields. These become interconnected during the wet season and the wetlands extend into other wetlands areas.
The wetlands represent the Central Indochina Dry Forest and the Southern Eastern Indochina Evergreen Forest ecoregions.

The northern part of the Xe Champhone Wetlands includes rice paddy fields and two large reservoirs, while the southern part contains extensive vegetation, including open woodland, mixed semi-evergreen forest, shrubs and grasses. Of the 12,400 ha catchment, 1,500 ha is designated as core protected area as it serves as a conservation area for Siamese crocodiles. About 20 villages are within the core protected area, with an additional 22 villages within 5 km of the core protected area boundary. Given that all 44 villages rely on the wetlands for ecosystem services, the wetlands support the livelihoods of 42,000 inhabitants, half of whom are women.

The Xe Champhone Wetlands was selected as the number two site of the top three environmental assets of national importance in Lao PDR, based on its high ranking for five criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, and global importance.

Functions

Xe Champhone Wetlands provided a habitat for endangered populations of Siamese crocodiles and the elongated tortoise, as well as numerous water birds, wildlife corridors, and fish breeding. Home to a large group of ethnic Lao PDR. Groundwater supply.

Benefits

Benefits include subsistence living, agriculture, non-timber forest products, fisheries, and eco-tourism. The wetlands also provide hydrological groundwater recharge and maintenance of dry season flows and buffer during flood periods. The wetlands provide examples of oxbow lakes, deep pools and mats of dense floating vegetation, which are rare in Lao PDR.

Threats

The Wetlands are threatened by land conversion, unsustainable harvesting of its resources, cascading hydropower development, agricultural development, and land-use/resource conflict.

Ecosystem Services

The local residents rely on the wetlands for water resources, irrigation, food for people and feed for livestock, other ecosystem services through fish and aquatic animals and plants, fibre from the flooded forests, and rice cultivation. The wetlands are important for cultural and biodiversity values with the presence of Siamese crocodiles, macaques, turtles (including the endangered elongated tortoise) and numerous water birds. They support a strong tourism industry, with over 10,000 visits per year, and also play an important role in supporting migratory fish passage. The wetlands also provide habitats and sanctuary for fish and aquatic animals during the dry season, as well as nutrient cycling, sediment retention, and fish spawning grounds.
Management

A management plan was prepared for the Xe Champhone Ramsar Wetlands but is still in draft form.

THAILAND

7. Lower Songkhram River

The Lower Songkhram River (LSR), designated as a Ramsar Wetland in 2018, is the second largest river basin in northeast Thailand (after the Mun-Chi River Basin). It covers 128 km² and is an important tributary of the Mekong River, contributing 1.8% of average annual flows. Over 50% of the Songkhram River Basin is classified as ‘wetlands’ (Blake and Pitakthepsombut, 2006), with the most extensive area concentrated in the lowland floodplains of the Lower Songkhram River Basin. The Lower Songkhram River is one of Thailand’s freshwater biodiversity hotspots. The wetlands represent the Northern Khorat Plateau Moist Deciduous Forest ecoregion.

The floodplain wetlands form a complex of wetland types, which include permanent and temporary surface water sources; artificial and natural wetland habitats; and a range of riverine, floodplain, lacustrine, palustrine, and saltwater wetland features. The outstanding feature of the LSR Basin is its annual flood event, which is intimately linked to the hydrology of the Mekong mainstream, which can occasionally cause a backflow effect similar to Tonle Sap Lake in Cambodia.

The Lower Songkhram River was selected as the number one site (jointly with Nong Bong Kai, Wiang Nong Lhom and the mainstream Mekong of Chiang Rai and Dong Phayayen Khaoyai Forest Complex) of its top three environmental assets of national importance for Thailand, using the selection criteria for prioritized REAs (Report 2). This was based on its high ranking for all six criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance.

Average annual floods are said to inundate about 80,000–96,000 ha of land during the July to September peak flooding period. The most important value of the wetland is its significance as a capture fishery, which provides seasonal employment, incomes and food to many thousands
of households, and other products sourced from the wetlands by local people (e.g. mushrooms, bamboo shoots, wild vegetables and reeds), especially from the rare and threatened, but biologically diverse, seasonally flooded forest/shrubs. There have been relatively few studies conducted on the flora of the Lower Songkram River basin and due to the size of the area only relatively few sites have been visited and their species recorded. One recorded 111 species at nine sites, including 29 tree species, 34 herb species, 13 scandents, and climbers, 15 shrubs and 10 epiphytes. There is a significant underestimation of the actual plant biodiversity found in the seasonally flooded forest, indicated by the recording of 191 plant species of benefit to local villagers identified by local researchers in four villages in Sri Songkhram district, Nakhon Phanom province. In addition, 17 species of edible mushrooms are gathered by local villagers from the floodplain, mostly in areas covered by seasonally flooded forest.

The aquatic biodiversity is the outstanding feature of the LSR Basin, especially fish (192 spp.), amphibians (16 spp.) and reptiles (40 spp.). While avifauna and mammals are not well studied due to habitat disturbance and high local hunting pressure, it is thought that neither group offers good conservation prospects at present.

### Function
The floodplains support a large diversity of aquatic and fish species, and agriculture.

### Benefits
The LSR Bain provides capture fishery, non-timber forest products and is a food source for local villagers. The wetlands occasionally create a backflow effect similar to the Tonle Sap Lake in Cambodia.

### Threats
Threats include overfishing, pollution, land conversion, encroachment, cascading hydropower development and agricultural development.

### Ecosystem Services
The LSR Basin Wetlands provide a wide variety of social and economic benefits and functions, including the biodiverse, seasonally flooded forest habitat. Traditionally seen as a “wasteland” by the state, the true value of paa boong paa thaam (flooded forests) to local communities has only been appreciated relatively recently (e.g. Tai Baan Research Network of Lower Songkram Basin, 2005). For example, in one survey it was found that 46.1% of the sampled households go to the paa bung paa thaam daily and that the collection of wild products (both terrestrial and aquatic) was a more important livelihood component for many households than agricultural production (Blake and Pitakthepsombut, 2006).

Villagers collect wetland products on a seasonal basis, with some of the produce used for subsistence and some for sale, either in the local market or through middlemen who buy direct from villagers (i.e. bamboo shoots and fish are generally bought by middlemen). In contrast,
another survey found that the average value of fishery products and non-forest timber products obtained from the wetlands averaged BHT 38,403 per household, of which fishery products were by far the most valuable single category.

**Management**

in 2018, the Lower Songkhram River Wetlands was designated as a globally significant wetland under the Ramsar Convention in order to gain recognition at the international level. Over the past three years, the Wetland Watch Programme of WWF Thailand has been supported by the Hong Kong and Shaghai Banking Corporation (HSBC), both financially and through voluntary activities (WWF, 2017). As part of this programme, HSBC sent 50 of its employees to participate in water quality monitoring in Nakhon Phanom province and about 200 employees to volunteer in a variety of activities related to this project. Seeing water as vital to building healthy communities and developing national economies, HSBC has chosen to invest its time and resources in this project. A long-term management plan is not currently in place, and it is urgently needed as is an ecosystem service assessment. Agro-eco tourism promotion is recommended for poverty alleviation.

8. **Nong Bong Kai, Wiang Nong Lhom, and mainstream Mekong of Chiang Rai**

The Nong Bong Kai Non-Hunting Area is designated as an International Wetland of Importance under the Ramsar Convention. It is located in Chiang Saen district in Chiang Rai province. The Wiang Nong Lhom Marshland (WNL) is a grassy marshland confluent with the Mekong through the meandering Ing and Lua tributaries, covering seasonally flooded marshland and shrubs with grassy mats and mosaic bushes on alluvial clay and mosaic peat soil. It is situated in Chiangsae and Mae Chan districts in Chiang Rai province. Over 165 fishes from 24 families are found in the mainstream of the Mekong. Over 50 economic fishes are fished by gill net, 62 types of artisanal fishing methods, and 7 types of fishing boats. The site provides critical fish habitats for over 1% of the Mekong giant catfish population, *Pangasianodon gigas* (possibly the entire population more recently) and the Chao Phraya giant catfish, *Pangasius sanitwongsei*, during the breeding season.

Both the riverine and floodplain ecosystems play an important hydrological role for the adjacent farmlands and urban areas, supplying water in most seasons of the year, and also balancing flood, stabilizing shorelines in the dry season, and providing a tourism attraction.

The Nong Bong Kai, Wiang Non Lhom, and mainstream Mekong of Chiang Rai was selected as the number one site (jointly with the Lower Songkhram River and the Dong Phayayen Khaoyai
Forest Complex) of the top three environmental assets of national importance for Thailand, using the selection criteria for prioritized REAs (Report 2). This was based on its high ranking for all six criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance.

<table>
<thead>
<tr>
<th>Area in the site</th>
<th>Habitat type</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mekong at Chiang Saen (tourism name: Golden Triangle)</td>
<td>Sand dunes and riverbanks</td>
<td>Feeding and wintering habitat of most water birds</td>
</tr>
<tr>
<td>2. Mekong below Chiangsaen to Wiang gaen district</td>
<td>Rocky rapids and sandy shorelines</td>
<td>Wintering area of over 100 water birds and nesting site of over 1,000 <em>Glareola lactea</em> (&gt;1% of the population)</td>
</tr>
<tr>
<td>3. Nong Lom or Wiangnonglom at Chiangsaen district</td>
<td>Marshland and non-forest peatland</td>
<td><em>Esacus recurvirostris</em>,</td>
</tr>
</tbody>
</table>

The larger sandbars in the Mekong River between Chiang Saen and Chiang Kong provide breeding habitats for great thick-knee, *Esacus recurvirostris*, and river lapwing, *Vanellus duvaucelli*, while the vegetated islands and riverbanks support a significant population of Jerdon’s bushchat, *Saxicola jerdoni*, a species characteristic of the Indo–Gangetic Plains. In the mainstream Mekong, at Baan Haad Krai, a fishing ground for Giant Mekong catfish has operated seasonally in April–May for 60 years. The area represents the Northern Indochina Subtropical Forest and the Northern Thailand/Lao Moist Deciduous Forest ecoregions.

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**Functions**

Grassy marshlands with man-made reservoirs and patches of dry dipterocarp tropical forest.

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**Benefits**

The WNL marshland supports local small-scale fisheries of shrimp *Macrobrachium lanchesteri*, 14 economic swamp fishes, and 4 shellfishes of 11 fishing types.

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**Threats**

One of the most immediate threats to biodiversity is dynamite blasting of rock cliffs and dredging of the main Mekong channel to improve navigation access to southern China for larger container vessels. Urban development, including community expansion, construction of resorts and recreation areas, and drainage and filling in of wetlands for conversion to construction areas, is another major threat. Other threats to biodiversity at the site include overfishing, hunting (including egg collection), and disturbance to sandbar-nesting birds. The site is also at risk from the impacts of cascading hydropower development, agriculture development, and land-use/resource conflict.
Ecosystem Services

Both riverine and floodplain ecosystems play important hydrological roles for the adjacent farmlands and urban areas supplying water in most seasons of the year, flood balancing, shoreline stabilisation in the dry season, as well as fisheries resources and tourism. The area provides flood protection, groundwater recharge, and reduces the impact of drought.

Management

Local public awareness is undertaken for the Mekong giant catfish fishing regulation by limiting licences and establishing a transboundary fishermen agreement between Thailand and Lao PDR. The Ruk Chiangkong Group, a local NGO, also conducts public awareness and advocacy for local environmental protection and reviews impacts from development projects.

The area surrounding the Non–Hunting Area belongs to private land. The boundary has not been clearly delineated on the ground so there is a tendency for people to intrude into the important habitat. Government organizations and the people understand that although the boundary of the Non–Hunting Area is the water boundary, the water level fluctuates between the wet and dry seasons. There is the potential to extend the area of the Ramsar Wetland site. There is currently no management plan in place.

9. Khao Yai and Thap Lan National Park (Dong Phayayen–Khaoyai Forest Complex)

The Dong Phayayen–Khaoyai Forest Complex is included as a UNESCO Natural World Heritage Site. The site spans 230 km between Ta Phraya National Park (transboundary site with Cambodia) in the east, and Khao Yai National Park in the west. The Forest Complex represents the Central Indochina Dry Forest, the Southern Eastern Indochina Evergreen Forest, and the Cardamom Mountain Rainforest ecoregions.

The site is home to more than 800 species of fauna, including 112 mammal species (among which 2 species of gibbon), 392 bird species, and 200 reptile and amphibian species. It is internationally important for the conservation of globally threatened and endangered mammal, bird and reptile species, among them 19 that are vulnerable, four that are endangered, and one that is critically endangered. The area contains substantial and important tropical forest ecosystems, which can provide a viable habitat for the long-term survival of these species.

The Khao Yai and Thap Lan National Park was selected as the number one site (jointly with the Lower Songkhram River and the Nong Bong Kai, Wiang Nong Lhom and mainstream Mekong of Chiang Rai) of the top three environmental assets of national importance for Thailand, using
Khao Yai National Park is one of relatively few known regular wintering sites for the globally threatened silver oriole in the world. Another globally threatened species, pale-capped pigeon, has also been recorded at the site, although there have been no confirmed records in the last decade. The site also supports significant populations of a number of globally near-threatened species, including brown hornbill, great hornbill, and Siamese fireback, the latter of which occurs at the site in relatively high densities. Oriental darter, also globally near-threatened, occurs at the site in small numbers. The site qualifies because it supports 12 species restricted to the Sino-Himalayan Subtropical Forests (Biome 08), 16 species restricted to the Indochinese Tropical Moist Forests (Biome 09), and 9 species restricted to the Indo-Malayan Tropical Dry Zone (Biome 11).

Other important biodiversity includes: Asian elephant, tiger, gaur, southern serow, Asian golden cat, dhole, pileated gibbon, East Asian porcupine, smooth-coated otter, northern pig-tailed macaque, clouded leopard, marbled cat, Asian black bear, warted treefrog, and many threatened flora species.

The Thap Lan NP is covered in dry evergreen forest, particularly on lower mountain slopes. There are a number of important plant species found within this forest type, including Dipterocarps and Hopia. Bamboo is also often found in drier forests.

Near Ban Thap Lan, Ban Khun Sri Bupram, and Ban Wang Mued, is a rare fan palm forest. These forests covered much of the northeast region of Thailand in the past; however, the spread of agriculture caused the destruction of a large number of them. Today, Thap Lan is home to one of the few such forests remaining in Thailand. The fan palm is important in Thai culture because its leaves were used as the parchment on which Buddhist texts were inscribed. Fan palms are an ancient plant that produce a single massive inflorescence, the largest in the plant kingdom, containing up to 60 million flowers. After this huge exertion of energy, the tree dies.

Since Thap Lan National Park covers such a large area, and is connected to Khao Yai, Pang Sida, and Ta Praya National Parks, it is home to a number of wild animals, including tigers, elephants, buffaloes, bangtang, serow, black bears, sun bears, crown gibbons, hornbills, pheasants, and lorikeets. According to researchers, the park may have more tigers than China. A total of 149 bird species have been confirmed within the park, including several rare species restricted to lowland evergreen forest, such as the green imperial pigeon, stork-billed kingfisher, and scaly-crowned babbler. It is also hoped that one of the world's most endangered mammals, the kouprey, may still survive in Thap Lan and Pang Sida National Parks. Although this primitive cattle species has not been sighted within Thailand for more than 30 years, it could provide genes valuable in the production of disease-free strains of domestic cattle.
Functions
It is a UNESCO Natural World Heritage Area, an NP, a forest complex, and a wildlife corridor.

Benefits
This large natural area supports the last known location for many endangered species in Thailand. It is also an important biodiversity corridor and transboundary forest complex within Cambodia. Provides watershed protection, freshwater supply, groundwater recharge and discharge, and reduced sedimentation and erosion.

Threats
This complex is threatened by development, including road construction, resource conflict, habitat degradation, elephant hunting, pollution, and invasive alien species.

Ecosystem Services
It is crucial for carbon storage and sequestration, as well as preventing flooding and reducing drought impact. The forest habitats are therefore extremely valuable for conservation and sustainable development.

Management
Queen Sirikit’s Dong Phayayen-Khao Yai Forest Complex includes Thap Lan and five other related areas: Khao Yai National Park, Pang Sida National Park, Ta Phraya National Park, Phra Phuttha Chai National Park, and Dongyai Wildlife Sanctuary. While elephant hunting is common in the Dangrek Range, elephants are protected in Thap Lan. Long-term participatory management is recommended for the environmental asset, and any large-scale developments need to be adequately reviewed and mitigated to avoid negative impacts. One wildlife corridor was built to mitigate the fragmentation of habitats from road construction. Buffer zones and wildlife conflict mitigation are implemented in the surrounding communities.
Yok Don National Park is located in Dak Lak province with an area of 115,545 ha of vast forests. The Yok Don National Park provides habitats for valuable wood species, numerous fauna and flora of conservation importance, including wild elephants, chamois, phoenix, and native orchids. The Park is ecologically part of the Eastern Plains Landscape and is contiguous with the transboundary Sre Pok Wildlife Sanctuary and Nsok Protected Forest in Cambodia and Chu Prong Nature Reserve in Viet Nam. Representing one of the only sites in Viet Nam with the potential for elephant conservation and recovery, it is designated as a high priority elephant conservation area.

Situated in seven communes across three districts of Dak Lak and Dak Nong provinces, Yok Don NP is Viet Nam’s largest park. The National Park provides important functions for ecotourism, scientific research, and biodiversity conservation.

Yok Don National Park was selected as the number one site of the top three environmental assets of national importance for Viet Nam, using the selection criteria for prioritized REAs (Report 2). This was based on its high ranking for all five criteria: biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, and regional or transboundary (basin-wide processes) importance.

There are a great number of ecological gardens with a lot of valuable kinds of wood such as baria dalbergia, poplar, and red wood, etc. The park is an important site for the conservation of globally endangered species such as the Indochinese tiger, Indochinese leopard, Asian elephant, and gaur.

There are 67 animal species, 196 bird species, 46 reptile species, 15 amphibian species, and 100 insect species, many of which are recorded in the IUCN Red Book, such as elephants, chamois, and phoenix. There are 464 plant species, of which one orchid alone consists of 23 kinds. The NP represents the Central Indochina Dry Forest and the Southern Eastern Indochina Evergreen Forest ecoregions.
Functions
Functions include tourism, scientific research, conservation, and biodiversity.

Benefits
The Park contains wood species of commercial significance. It also provides watershed protection, freshwater supply, and reduced flooding, erosion and drought impacts. The NP is part of a bioregional corridor and is transboundary with the Sre Pok Wildlife Sanctuary, the Lumphat Wildlife Sanctuary in Cambodia and the Chu Prong Nature Reserve in Viet Nam. It also provides an important transboundary habitat corridor for migratory water bird species such as the endangered Sarus crane.

Threats
The Park is threatened by overharvesting and illegal logging.

Ecosystem Services
The Park is crucial for carbon storage and sequestration, as well as preventing flooding and reducing drought impact. The forest habitats are therefore extremely valuable for conservation and sustainable development.

Management
The priorities for management of Yok Don National Park include providing opportunities for recreation, tourism and other favourable sectors, as well as managing a transboundary biodiversity corridor between Viet Nam and Cambodia.

Although there may be a management plan in place, it likely needs updating.

11. **Mui Ca Mau National Park**

Mui Ca Mau National Park is located in Ca Mau province and has a total natural area of 41,862 ha. The terrestrial area is 15,262 ha and the coastal area 26,600 ha. The Mui Ca Mau NP was designated as a Wetland of International Importance under the Ramsar Convention on Wetlands in 2013 and is also a UNESCO Biosphere Reserve. The NP provides habitats for a variety of rare precious animal species, with 13 species of animals known to reside in the NP, including 2 species listed in the IUCN Red Book; the long-tailed monkey and ca khu
It is also an important site for a number of migratory water birds, with 5 species listed in the IUCN Red Book; the Chinese stork, white-faced stork, grey-legged pelican, curved beak snipe and black-headed ibis. Important flora species are also present in the NP with 22 species of mangrove trees, including some small remaining areas of old *Rhizophora apiculata* mangrove. It is an ecological system of natural salt-marsh forests with high values in terms of biodiversity, landscapes, environment, culture and history. The mangroves provide habitat for important mangrove fauna including species of mammals, reptiles, crustaceans, 43 molluscs and fish. The NP represents the Indochina Mangroves ecoregion, with only a small portion of this forest type remaining in the LMB.

The Mui Ca Mau National Park was selected as the number two site (jointly with the U Minh Thuong NP) of the top three environmental assets of national importance for Viet Nam, using the selection criteria for prioritized REAs (Report 2). This was based on its high ranking for four criteria: rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance.

### Functions

This is an ecological system of natural salt-marsh forests with high values in terms of bio-diversity, landscapes, environment, culture, tourism, and history.

### Benefits

The mangroves perform an important coastal protection function. The NP is the ideal environment for the reproduction and development of shrimp, fish, and molluscs. The national park also has great potential for recreation, ecotourism, conservation education and scientific research. It provides an important protection from saltwater intrusion and erosion, and transports sedimentation and nutrients upstream in the Mekong Delta. The NP also provides important regional habitats for migratory bird species.

### Threats

- Rapid unplanned population growth
- harvesting/cutting of mangrove trees by local people
- Hunting
- Destructive fishing and exploitation of natural resources
- Overexploitation of aquatic stocks
- Violations against law enforcement
- Impact of climate change on ecosystems
- Cascading hydropower development, agriculture development, and land-use resource conflict.
**Ecosystem Services**

The Park provides coastal protection, cultural importance, scientific research, and ecotourism. Income from shrimp, fish and mollusc harvesting.

**Management**

Although there may be a management plan, it likely needs updating.

### 12. **U Minh Thuong National Park**

U Minh Thuong National Park, located in Kien Giang province, supports one of the last significant areas of peat swamp forest remaining in Viet Nam, and is one of the three highest priority sites for wetland conservation in the Mekong Delta. In 2015, U Minh Thuong was designated a Wetland of International Importance under the Ramsar Convention with a total natural area of 8,038 ha, and is the first ASEAN Heritage Park of peatland located in the region.

The site supports a diversity of species of wildlife including mammals, birds, reptiles and amphibians, fish, insects, and many aquatic species. There are 72 species of rare animals and plants present in the NP that are listed in the IUCN Red Book. Birds of global conservation significance include the oriental darter, spot-billed pelican, painted stork, lesser adjutant, black-headed ibis, glossy ibis, greater spotted eagle, grey-headed fish eagle, and the Asian golden weaver. Natural vegetation is classified into 10 types, belonging to four main classes: Melaleuca forests, seasonally inundated grasslands, permanent swamps and vegetation along canals and streams.

U Minh Thuong National Park was selected as the number two site (jointly with Mui Ca Mau NP) of the top three environmental assets of national importance for Viet Nam, using the selection criteria for prioritized REAs (Report 2). This was based on its high ranking for four criteria: rareness and uniqueness, ecosystem services, global, and regional or transboundary (basin-wide processes) importance.

**Functions**

Functions include co-tourism and scientific research.
Benefits
The Melaleuca forest in the core zone plays an important role in maintaining soil and water quality in the buffer zone by preventing the acidification of topsoil and surface water, filtering groundwater, and storing freshwater during the dry season.

Threats
The park is threatened by rapid unplanned population migration growth and over-harvesting by the local people and is at risk from cascading hydropower development, agriculture development and land-use/resource conflict.

Ecosystem Services
The NP provides an important ecosystem service in maintaining soil and water quality in the buffer zone by preventing the acidification of topsoil and surface water, filtering groundwater, and storing freshwater during the dry season. The NP also provides ecotourism and scientific services, food security, carbon storage, and sequestration, and is important for its historical aspects.

Management
While there may be a management plan, it likely needs updating.
Snapshot of Cambodia and its environmental assets

- Cambodia has a population of 15.8 million people and covers an area of 181,035 km².
- It is classified as a lower middle income developing country by the United Nations.
- The Mekong River flows into the Mekong Delta (MD) of Viet Nam from the border with Cambodia. At Phnom Penh, the river is joined on the right bank by the Tonle Sap river and lake system. When the Mekong is low, the Tonle Sap is a tributary and water flows from the lake and river into the Mekong. When the Mekong floods, the flow reverses, the floodwaters of the Mekong flow up the Tonle Sap. Immediately after the Sap River joins the Mekong by Phnom Penh, the Bassac River branches off the right (west) bank. The Bassac River is the first and main distributary of the Mekong. This is the beginning of the Mekong Delta. The two rivers, the Bassac to the west and the Mekong to the east, enter Viet Nam shortly after this.
- Natural forest covers only 3.1% of its land surface with one of the highest deforestation rates in the world. Hydropower development is a new interest for Cambodia’s economic development.
- Cambodia’s natural resources and environmental assets centre around Tonle Sap, as it supports rich terrestrial and aquatic biodiversity.
- In 1985, agriculture accounted for 90% of Cambodia’s gross domestic product (GDP). There has, however, been recent growth in its garment industry and tourism. Most rural households rely on agriculture and its subsectors. Major exports are rice, fish, timber, garments and rubber.
- Cambodia has the following environmental assets:
  - 4 Ramsar Wetland Sites – Stung Treng, Koh Kapik, Boeng Chmar, and Prek Toal
  - 1 Biosphere Reserve – Tonle Sap
  - 11 National Parks (includes one marine park)
  - 10 Wildlife Sanctuaries
  - 3 Biodiversity Corridors
  - 8 Protected Landscapes
  - 1 National Heritage Parks
  - 5 Multiple Use Areas.
- Cambodia’s environmental assets provide ecological services to people through provisioning, regulating, culture, aesthetics, and supporting services through: timber and non-timber products; fish and other aquatic animals; and water, flood and drought regulation.
Laws on environmental protection and natural resources management, protected areas, forestry, fisheries, mineral resource management and exploitation, land, water resources as well as sub-decrees on water pollution control and environmental impact assessment processes are in place. They include relevant provisions for conservation and protection, the right of forest-dependent and indigenous peoples to sustainable use and reside within protected areas, as well as customary rights to use forest products and by-products. The legal framework also includes provisions on fish conservation zones, the payment of royalties and premiums to the national budget for commercial forestry, and for supporting strategies and action plans.

There are limitations to the implementation of these laws, policies, strategies, and action plans due to: the lack of clear boundaries for management, zoning, and protection of conservation zones; difficulties controlling illegal logging, hunting, trapping and fishing, land encroachment and migration; land-use conflict; and limited collaboration between ministries.

Solutions to the challenges in implementing existing laws, policies, strategies and action plans include interlinking environmental assets with relevant plans for enhanced coordination, ensuring adequate resourcing and training of human resources, and adequate levels of funding to build institutional capacity.

Case studies for environmental asset management already exist in Cambodia, such as: Preah Vihear province in the remote northern plains of Cambodia, where eco-tourism is focusing on community-based initiatives to conserve the world’s largest breeding populations of giant ibis and white-shouldered ibis, both critically endangered species.

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**Snapshot of Lao PDR and its environmental assets**

- Lao PDR has a population of 7 million people.
- Lao PDR covers an area of 236,800 km².
- It is classified as a least developed country by the United Nations.
- The Mekong River flows through Lao PDR and the country is abundant in water resources.
- Natural forest covers more than 40% of its land surface (up to 11.6 million ha of forest).
- Lao PDR is rich in natural resources and environmental assets.
- Hydropower (29% of GDP), agriculture, and forestry (50% of GDP combined including non-timber forest products) are important for Lao PDR’s economic growth and for sustaining livelihoods as is tourism and mining.
- Lao PDR is home to a large range of biodiversity, with the following environmental assets:
  - 2 Ramsar Wetland Sites – Xe Champone and Beung Kiat Ngong. And 26 wetlands of importance.
Mekong strategy for basin-wide environmental management for environmental assets of regional importance 2021–2025

- Hin Nam No NPA, also now listed as a UNESCO World Heritage Site
- 24 Nationally Protected areas (2 recently listed as National Parks)
- 2 biodiversity corridors
- Forms part of 3 Greater Mekong Subregion Biodiversity Conservation Corridors
- 340 aquatic reserves
- 4 significant water bird areas.

✓ Lao PDR’s environmental assets provide ecological services to people through provisioning, regulating, culture, aesthetics and supporting services through: timber and non-timber products; fish and other aquatic animals; and water, flood and drought regulation.

✓ Laws on environmental protection, water and water resources, forestry and fisheries are in place with provisions for protection, inventories, environmental taxation, etc. The legal framework also supports strategies and action plans.

✓ There are limitations implementing these laws, policies, strategies and action plans because of: an overlap of responsibilities for implementation with competing or conflicting interests and goals; a lack of concrete action; inadequate funding support; and insufficient data and information on environmental assets.

✓ Solutions include interlinking environmental assets with relevant plans of ministries such as national socio-economic development plans; ensuring stakeholder engagement is effective and inclusive, especially the local communities; and building institutional capacity.

✓ Case studies for environmental asset management already exist in Lao PDR such as: the Nam Theun 2 Hydropower Project, which is a public/private partnership that resulted in the formation of a Water Management and Protection Authority and enabled biodiversity offsetting of the impact of the development; a NPA is being co-managed by the guardian villages to protect, enhance and manage the Hin Nam No NPA and World Heritage site; and the sustainable management of That Luang Marsh, an urban wetland, is providing goods and services to the local community valued at USD 5 million annually. This demonstrates the different benefits that can be gained from managing environmental assets to support local livelihoods while supporting the protection of the environmental asset’s biodiversity values.

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Snapshot of Thailand and its environmental assets

✓ Thailand has a population of 68.9 million people.

✓ Thailand covers an area of 513,120 km2.

✓ It is classified as an upper middle income country by the UN.

✓ The Mekong River flows through Lao PDR and forms the border between Lao PDR and Thailand. There are 8 principal tributaries of the Mekong River that flow into Thailand.

✓ Natural forest covers more than 37.1% of its land surface (up to 18.9 million ha of forest).
Thailand is rich in natural resources and environmental assets.

Agriculture accounts for 8.4% of GDP, industry for 43.9% of GDP, and services (including tourism, banking and finance), 44.7%. Thailand is a large consumer of energy and relies on obtaining its hydroelectricity from Lao PDR.

Thailand is home to a large range biodiversity, with the following environmental assets, located in the LMB:

- 3 Ramsar Wetland Sites – Nong Bong Kai Non-Hunting Area, Beung Khong Long Non-Hunting Area, and the Goot Ting Marsh
- 1 Biosphere Reserve – Sakerat BR
- 27 National Parks with two Natural World Heritage Sites
- 10 Wildlife Sanctuaries
- 11 Non-hunting Areas
- 3 Water Bird Areas
- 4 Greater Mekong Sub-Region biodiversity hotspots. For example, the Songkhram River.

Thailand’s environmental assets provide ecological services to people through provisioning, regulating, culture, aesthetics and supporting services through: timber and non-timber products; fish and other aquatic animals; and water, flood and drought regulation.

Laws on wild animal reserves and protection, fisheries, wildlife sanctuaries, national parks, and environmental protection are in place with provisions for protection, inventories, environmental taxation, etc. The legal framework also supports strategies and action plans. A new Water Law has been introduced and is in its early phases of implementation and institutional changes.

Limitations to the implementation of these laws, policies, strategies and action plans exist because of a lack of communication between the different levels; limited capability of staff at different levels; limited available data; and limited funding.

Solutions include: updating the database to evaluate environmental assets, ecosystem services and key biodiversity areas; identifying champions for community forest and wetland management; strengthening legislation to control the impacts on forests and wetlands due to human intervention; developing action plans for invasive species management; and undertaking research into the importance of environmental assets and their value in provisioning of renewable energy or soil improvement.

Case studies for environmental asset management already exist in Thailand such as: the community-based management approach for the Goot Ting marshes in Nong Khai province, where the management and zoning of the marshes was developed in close collaboration with local communities based on their knowledge of important fishing grounds.
Snapshot of Viet Nam and its environmental assets

- Viet Nam has a population of 92.7 million people and covers an area of 331,210 km².
- It is classified as a lower middle income developing country by the UN.
- In Viet Nam, the Mekong Delta begins as the Mekong and Bassac Rivers enter a large fertile plain in southern Viet Nam. In this area, known as the ‘Nine Dragons’, a series of smaller distributaries split off from the main stream of the Mekong and Bassac.
- Natural forest covers more than 42% of its land surface (up to 13.3 million ha of forest). With the central highlights having a total of 2.8 million ha (52.6% cover) and the Mekong Delta 270,000 ha (4.3% forest cover).
- Viet Nam is rich in natural resources (ranked 16th richest in natural resources in the world).
- The service industry makes up almost 50% of GDP, followed by Industry (33%), and agriculture (17%). Other significant industries include timber, fishing, mining, banking and finance. Specifically, in the Mekong Delta, rice cultivation and aquaculture are important for the local and national economy, and hydropower is of importance in the Central Highlands.
- Viet Nam is home to a large range of biodiversity, with the Mekong Delta and Central Highland regions containing the following environmental assets:
  - 4 Ramsar Wetland Sites – Tram Chim NP, Mui Ca Mau NP, U Minh Thuong NP, and Lang Sen Wetland National Park. There are also 8 important wetland areas, including four which are important for marine and intertidal ecosystems
  - 3 Biosphere Reserves – Kien Giang BR, Langbian Plateau BR, and Dong Nai BR
  - 6 nationally Protected Areas (includes one marine protected area)
  - 13 significant Water Bird areas
  - Se San and Srepok rivers have a high diversity of fish species with the highest number ever recorded in a sub-basin occurring in the Srepok (73% of the entire number of species found in the LMB), with 14 endangered fish species present.
- Viet Nam’s environmental assets provide ecological services to people through provisioning, regulating, culture, aesthetics and supporting services through: timber and non-timber products; fish and other aquatic animals; and water, flood and drought regulation.
- Laws on forest protection and development, environmental protection, biodiversity, and water resources are in place and comprehensive with relevant provisions for conservation and protection, criteria for determining endangered species and their management; payments for forest ecosystem services; and compensatory requests for environmental damage, etc. The legal framework also supports strategies and action plans.
- There are limitations to their implementation due to: the lack of supporting regulations to handle violations and invasive species; overlapping responsibilities for implementation of such laws with competing interests and goals and conflicting approaches; a lack of concrete action; inadequate human resources and funding; general and unclear regulations on environmental services and compensation for damage; and insufficient data and information.
Solutions include interlinking environmental assets with relevant plans for enhanced coordination, including transboundary issues; ensuring stakeholder engagement is effective and awareness is raised; and building institutional capacity.

In Viet Nam, case studies for environmental asset management have been carried out, such as: the pilot Payments for Forest Ecosystem Services scheme; and the adaptive management of the Tram Chim NP to restore its natural hydrological regime through water control structures, managing fires and introducing a buffer zone for resource sharing with the local people.

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ANNEX 4

RECOMMENDATIONS FROM THE REGIONAL REVIEW FOR MANAGEMENT OF ENVIRONMENTAL ASSETS OF REGIONAL IMPORTANCE IN THE LMB

The regional review report on Environmental Assets with National and Regional Importance and Existing Studies, Policies, Strategies, and Action Plans for the Management of Environmental Assets in the LMB (Report 1) resulted in a stock taking of regional and national inventories of environmental assets in the LMB, as well as a better understanding of the context, threats, and challenges facing the management of these environmental assets. In conclusion, the regional review made a number of recommended actions for consideration in developing the SBEM. These have been further assessed, categorized, prioritized and included in Section 2.4 of the SBEM, where applicable, and are summarized below.

4 Building on recommendations in ICEM 2003.

5 Some of the actions have been addressed through the implementation of other MRC activities. For example, the MRC Council Study, the Transboundary Environmental Impact Assessment Guidelines, and the MRC Sustainable Hydropower Program, and implementation of the Procedures for Notification, Prior Consultation and Agreement process.
**Ecosystem Services**

- Adopt the ES approach for important ecosystems through the evaluation of environmental assets (EAs), such as Tonle Sap, in terms of the food and sustainable livelihoods it supports within the Mekong watershed. This will enable management decisions to be made that are appropriate to the trade-offs of development scenarios.

- Develop a guidance document on how ES could be integrated into the next strategic planning cycle, considering new information such as the Council Study.


- Implement the priority actions in the BFMS with respect to the conservation of key habitats.

**Economic Instruments**

- Generally, water supply authorities, hydro-electric authorities, commercial agriculture, tourism, fisheries and others who gain from biodiversity preservation and the carbon sequestration functions of EAs do not currently provide any financial aid to sustainable EA management. Economic instruments such as Payment for Ecosystem Services should be considered for adoption in the EAs of regional importance in the LMB. A number of pilot projects are needed to test the ‘user pays’ approach where groups and individuals benefit from EA hydrological and other services. Three main groups of users should be treated differently in targeting economic instruments: (i) local communities and subsistence users; (ii) private sector commercial operations; and (iii) government operations. Special attention would need to be given to concession holders in fisheries, forestry and agriculture, industrial facilities, energy facilities, and irrigation and water supply systems.

- Experience from other regions suggests that hydropower schemes in the Mekong region should be developed and operated according to the following set of policy principles:

  - All hydropower facilities should pay for the ecosystem services they receive and for the ecosystem services they degrade.

  - In cases where these services are provided in part or in full by one or more protected areas, the payments should go to the rehabilitation, maintenance, and enhancement of the natural systems protected.

  - All hydropower developments should lead to net benefits for local livelihoods and well-being in ways that contribute to and enhance their involvement in the conservation of ecosystem services and products.
Strategic Environmental and Social Impacts of Development

- A strategic environmental and social assessment of potential basin-wide cumulative impacts of existing and proposed activities is required to identify trade-offs and conflicting interests associated with the schemes and to engage stakeholders in developing and considering the broadest possible range of options. The recent MRC Council Study provides an understanding of the likely cumulative impact of future development scenarios in the LMB.

- A platform for stakeholder negotiation and conflict resolution regarding trade-offs and appropriate compensation.

- Mechanisms for effectively addressing transboundary impacts in the context of environmental and economic interdependence among the countries involved.

- Establishment of rules, protocols, and a regulatory framework for regional power trade needed to support the use of economic instruments and transfer of payments that are adequate to ensure that environmental and social costs are reflected in the costs of electricity generated by hydropower.

- Methods to maintain and improve local livelihoods in the development of large infrastructure projects and for the effective participation of marginalized groups in the decision process.

Regional Forest Management

- Establish a permanent regional forest estate: Experience in the region suggests that present forest policies and programmes are insufficient and will need modification. Some of the underlying causes of apparent policy failure are outside the protected area forests and production forest sector (e.g. shortages of agricultural land and inadequate land-use planning) but many are not. A key policy requirement is for the recognition of the need for a 'permanent forest estate' in each country and throughout the Lower Mekong region.

- This has been partly achieved in the form of the protected areas (PA) network in most countries within the LMB. However, effective forest conservation across regional landscapes requires that these special forests are complemented by a linked network of forests managed for other purposes including timber production; i.e. effective forest conservation within and outside Pas depends on having a number of forests managed for social, economic and environmental goals. The management emphasis may vary but policies should facilitate: (i) management and protection at local levels and not just at national level; and (ii) a high degree of coordination between managers of production forests and forests in the PA network.

- Not all forests need to be government-owned or -controlled. Another key policy area is to develop the means of fostering permanent forests and forest management on privately owned or managed land. Arrangements might be made to foster new forms of land tenure or access such that communities might undertake some of the management tasks currently undertaken by government agencies. This would require that these agencies adopt a facilitation role in place of a management role.

- Prepare integrated regional plans: Many decisions regarding forests are made in a
piecemeal fashion and the collective impact of these across a region can lead to sub-standard practices. Better regional planning is needed so that forests that are important for biodiversity or for watershed protection reasons are identified and retained as an essential part of the surrounding development landscape.

- Build capacity to implement forest conservation policies: Good policies must be matched by an appropriate supply of human and financial resources to implement them. Capacity is needed at the national and local levels to undertake the increasingly complex demands placed on Pas and other forest managers.

- Develop monitoring programmes to trigger corrective responses: Appropriate monitoring systems to a management objective (e.g. biodiversity protection, watershed protection, and timber production) need to be developed together with indicators for the kind of changes that should trigger corrective management intervention (ITTO, 1999). The special monitoring and reporting systems should be put in place to oversee the conditions and trends in the permanent regional forest estate and act as a basis for cooperative bilateral and multilateral action.

- Create partnerships to support forest conservation: effective forest conservation will require the development of various partnerships: between government and communities: between forest managers and users and between forest managers and international organizations. Forming partnerships requires new management structures, forms of agreement, a sharing of roles, responsibilities and benefits, and concentrated capacity building so that those involved can make credible and useful contributions. At a regional level, training programmes and exchanges are needed in conjunction with pilot projects to test and demonstrate methods of collaboration.

- Rehabilitate degraded forest landscapes: Large areas of degraded landscapes have been created in all countries of the LMB. There are a variety of means by which rehabilitation might be carried out to recover at least some (although usually not all) of the original forest goods and services, and to take the pressure off existing protected areas. Rehabilitation is expensive and innovative ways of financing it must be found. Furthermore, the responsibility for rehabilitation and who must pay needs to be established. Regional guidance on these issues and priorities should be provided.

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**Transboundary Cooperation**

- Develop complementary legal frameworks to enhance cross-border collaboration: There are significant macro-economic drivers of forest degradation both within and outside EAs in the region. Markets have a large impact on the way that forests are used or managed, especially in situations of under-development. These market forces are mostly beyond the control of forest managers. There are advantages in seeking common solutions to the problems associated with the trade in timber and non-timber forest products. The LMB forms a common ecological context in which improved methods of forest conservation need to be implemented. Yet, due to the differences across the region in the extent of remaining forest cover, in economic situations, and political structures, there may be considerable advantages in simplifying legal frameworks and making them more complementary to enhance opportunities for greater collaboration in forest and EA management across the region.
**Agriculture**

- Develop a regional action plan for conservation in agricultural landscapes.

- Adopt a landscape approach for biodiversity protection: resilient biodiversity landscapes can only be achieved by addressing a whole range of landscape biodiversity protection approaches in the context of the whole landscape and, in the case of the agricultural sector, in a way that has meaning for farmers. This involves adopting a landscape perspective as a basis for biodiversity conservation planning and management; focussing on the understanding and working with native biodiversity (both wild species and those that constitute local agricultural biodiversity) and the ecological processes which are important for sustainable agricultural production to improve local food security; and developing and adopting measures to encourage native biodiversity throughout the agricultural landscape.

- Prepare regional guidelines for agriculture inside EAs: the boundaries of some EAs in the region have been drawn in such a way that they include communities of farmers, some of whom have resided there for very long periods. These are usually upland farmers practicing shifting cultivation. Since this farming practice is not consistent with management of the surrounding forest for its biodiversity values, EA managers have attempted to support these farmers in changing to a settled form of agriculture that does not require further forest clearance. This is an issue of regional importance. It requires a culturally sensitive approach and innovative thinking about agricultural systems and practices.

**Tourism Development**

- Prepare a regional action plan for tourism in EAs to help attract different segments of the tourist market to the most appropriate locations, at the most appropriate times and in accordance with the best management practices for sustainable ecotourism. The plan would provide relevant background information on the region’s natural and cultural assets, infrastructure and tourism products, market analysis and industry structure, coordination, and research. Sustainable ecotourism generates long-term incentives for ecosystem services.

- Reduce the negative impacts of tourism development through guidelines for tourism infrastructure development and tourist behaviour to minimize negative impacts; conduct further research on how EA management decisions can impact on tourism activity to maintain natural and tourism values; and develop monitoring protocols to ensure that the integrity of conservation and cultural assets is maintained.

**Climate Adaptation**

- To adapt to climate change, EAs need to be managed effectively through appropriate zoning. Thus, each EA would benefit from a management plan that identifies appropriate zones of use, fundamental to the effective management of activities within EAs of the LMB. Zoning defines what can and cannot occur in different areas of an EA in terms of: natural resources management; cultural resources management; human uses and benefits;
visitor uses, experiences, access, and facilities; and EA development, maintenance, and operations. An important consequence of climate change is shifting habitats. In turn, this shift may force the migration of species to become more frequent and necessary for genetic exchange. Facilitating this migration requires long-term planning of buffer zones and corridors, including extensive scientific research to best place management actions. Climate-induced shifts of ecosystems may also require rezoning of EAs to balance conservation and development around EAs. Key actions for zoning management include the establishment of a core zone of significant ecosystems or habitats, a buffer zone, and a transition area.

Managing ecosystem resilience and connecting landscapes

- Climate adaptation capacity is generally increased through the improvement of landscape-scale connections between core habitat patches. Corridors provide available habitats for organisms to move freely through the landscape following preferred habitat and climatic conditions. A key factor in the successful management of connected habitats will be effective collaboration across boundaries. Ecosystems and watersheds transcend national borders. Poor management in one area often has negative cross-border impacts in adjacent areas, and cross-country management will be key to EA conservation in the LMB. Management policies, plans, and actions must work effectively to protect and enhance ecosystem conditions within habitat patches and strengthen habitat connectivity across landscapes in order to enhance the capacity of ecosystems to naturally respond and adapt to a changing climate. These actions will amplify the ecological, social, and economic benefits provided by EAs. Actions towards this aim include:

  - maintenance of appropriate disturbance regimes including fire control and managed flood pulses;
  - pest management including mitigation of threats from invasive species and pests;
  - the definition and application of key concern thresholds for critical protected area management objectives;
  - maintenance or creation of habitat corridors; and
  - breeding programmes, for example, for some threatened or critical species, including those in captivity, may assist the re-establishment of breeding populations.
Education and public engagement

Community engagement is central to adaptation planning in the LMB, particularly with regard to EAs. Community awareness of ecosystem adaptation issues dictates their usage and continuing productivity. Actions include:

- Holding adequate public consultation and providing input into protected area management zoning plans;
- Linking climate change to immediate community issues, such as limited access to water or declining crop productivity;
- Implementing communication activities concerning the benefits of resilient protected area systems and environmental assets for the maintenance of ecosystem services;
- Enhancing understanding and management of disturbance regimes such as floods and fires;
- Raising awareness and understanding of the economic contribution of protected areas to water resources management; and
- Promoting sustainable agriculture through minimized use of pesticides to protect pollinators and water resources; the promotion of agroforestry and forestry activities on cleared land; and support for the adoption of organic farming methods and associated supply chains.