



# Biodiversity

PETRONAS Chemicals Group Berhad (PCG)

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# Enhancement Plan on PETRONAS Chemical Group on Biodiversity and Ecosystem Services

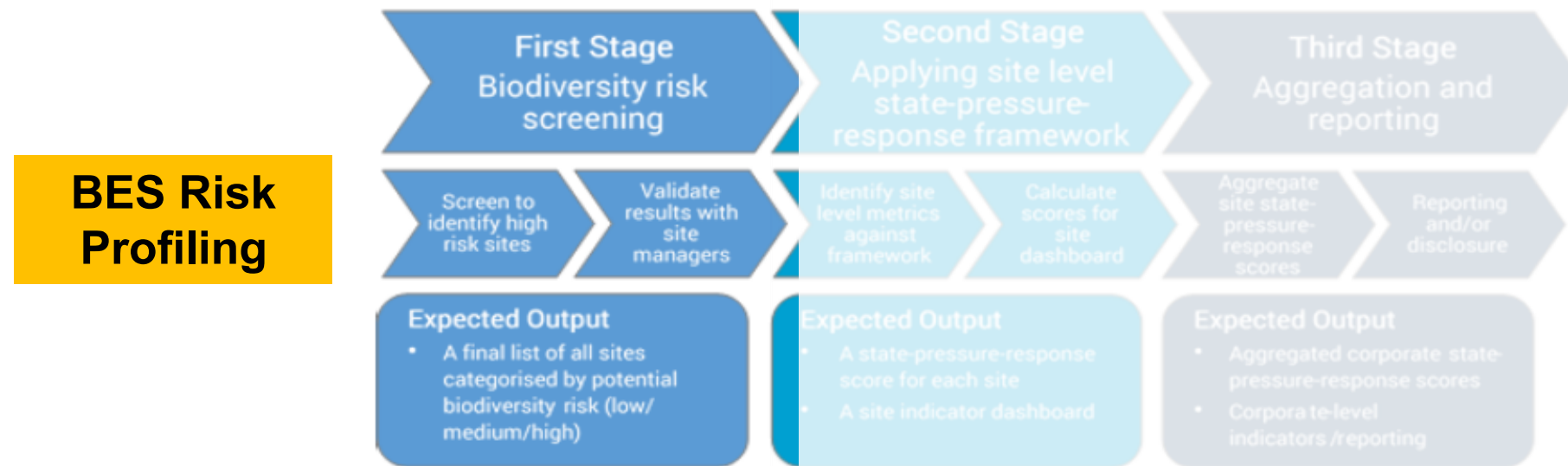
- PETRONAS Chemical Group (PCG) has established a holistic Environment, Social, Governance (ESG) indicators/metrics to enhance business and social value from its business activities.
- For biodiversity and ecosystem services, the company aims to operate petrochemical operations with no or minimum negative impact to biodiversity.
- The company has implemented a Biodiversity & Ecosystem Service (BES) risk profiling process to identify the risk to biodiversity and ecosystem services from our operations and business activities. The scope of the identification covers PCG's assets in Malaysia. The detailed assessment, i.e. BES risk assessment (BESRA), is further conducted for the assets with high risk profile to assess the potential impact from operational activities to the surrounding biodiversity and ecosystem services.
- A Biodiversity Action Plan (BAP) is then developed and implemented, applying the mitigation hierarchy principles by avoiding, minimizing, restoring and offsetting impacts, to manage potential adverse biodiversity impacts related to our operations.
- The BESRA process helps ensure that our developments will not cause negative impact to the World Heritage areas, IUCN Category I-IV protected areas, and national reserved forest.

# Biodiversity & Ecosystem Services (BES) Risk Profiling for PETRONAS Chemicals Facilities in Malaysia

# BES Risk Profiling

Approach: the first step to develop suitable biodiversity indicator is to first understand the risk PCG is facing with regards to biodiversity. Therefore, BES risk profiling is conducted.

This step is aligned with the first stage in methodology proposed in document “Biodiversity Indicators for Site-based Impacts” by UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), Conservation International and Fauna & Flora International.





# Scope of Assessment – PCG operations

List of facilities assessed (100% of local, Malaysian assets):

1. Asean Bintulu Fertiliser Sdn Bhd
2. PETRONAS Chemicals Methanol Sdn Bhd
3. PETRONAS Chemicals LDPE Sdn Bhd/ PETRONAS Chemicals Ammonia Sdn Bhd
4. PETRONAS Chemicals Olefins Sdn Bhd/ PETRONAS Chemicals Glycols Sdn Bhd/ PETRONAS Chemicals Derivatives Sdn Bhd
5. PETRONAS Chemicals Polyethylene Sdn Bhd/ PETRONAS Chemicals Ethylene Sdn Bhd
6. PETRONAS Chemicals Fertiliser Sabah Sdn Bhd
7. PETRONAS Chemicals Fertiliser Kedah Sdn Bhd
8. PETRONAS Chemicals Aromatics Sdn Bhd
9. PETRONAS Chemicals MTBE Sdn Bhd

Sources of data/information:

1. Integrated Biodiversity Assessment Tool (IBAT)
2. Public researches of the Forestry Department of Terengganu, Sarawak and Sabah
3. Environmental Impact Assessment (EIA) reports
4. Other technical reports available

# To assess the severity of potential BES impacts, we look into several areas

1. Proximity to Protected Areas (PA) or any sensitive ecosystem
2. Possibilities of operational activities impacting Protected Areas/ environmentally-sensitive areas
3. Key ecosystem services/functions of critical importance in the project area (e.g. breeding and feeding areas for global and regional migratory bird species or migration corridor for terrestrial species, critical watershed, carbon capture, soil stabilization)?
4. Ecological corridor between other isolated habitats of ecological importance
5. Presence of endangered flora and fauna
6. Provision of ecosystem services
7. Has the project/ operation experienced any significant BES issues?
8. System/process available to manage BES issues at site

# BES Risk Profiling preliminary result for PETRONAS facilities in Malaysia

In summary, 9 PCG assets were assessed with the following results:

- 2 facilities were assessed to have Low risk:
  - PETRONAS Chemicals Fertiliser Sabah Sdn Bhd
  - PETRONAS Chemicals Fertiliser Kedah Sdn Bhd
- 6 facilities Medium risk:
  - PETRONAS Chemicals Aromatics Sdn Bhd
  - PETRONAS Chemicals Ammonia Sdn Bhd/ PETRONAS Chemicals LDPE Sdn Bhd
  - PETRONAS Chemicals Olefins Sdn Bhd/ PETRONAS Chemicals Glycols Sdn Bhd/ PETRONAS Chemicals Derivatives Sdn Bhd
  - PETRONAS Chemicals Polyethylene Sdn Bhd/ PETRONAS Chemicals Ethylene Sdn Bhd (PCEPE)
  - PETRONAS Chemicals MTBE Sdn Bhd
  - ASEAN Bintulu Fertiliser Sdn Bhd
- One facility with High risk:
  - PETRONAS Chemicals Methanol Sdn Bhd

# BES Risk Profiling preliminary result for PETRONAS facilities in Malaysia

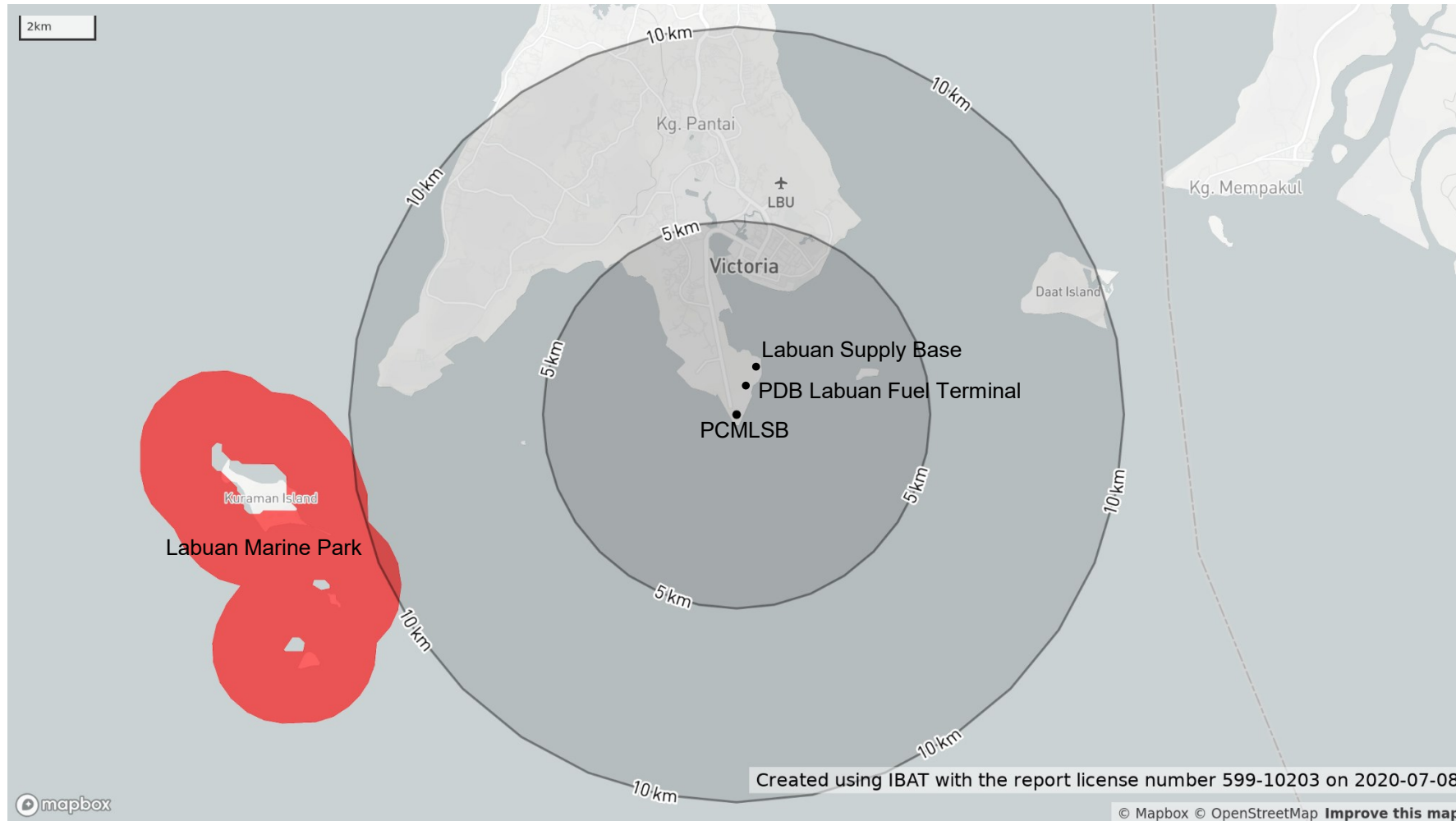
Facility/Asset	LIKELIHOOD	SEVERITY	RISK RATING	JUSTIFICATION	APPROXIMATE DISTANCE TO NEAREST PA BORDER
PETRONAS Chemicals Methanol Labuan Sdn Bhd	(C) Possible	(4) Major	C4 HIGH	Proximity to marine protected areas, mangroves, turtle landing and migration route and island ecosystem around Labuan. Previous oil spill incident had caused impact to coastal and marine ecosystem (to check impact on fisheries and tourism activity)	<ul style="list-style-type: none"> <li>• 4 km to Pulau Kuraman</li> <li>• 8.5 km to Pulau Rusukan Kecil</li> <li>• 10 km to Pulau Rusukan Besar</li> </ul>
<ul style="list-style-type: none"> <li>• PETRONAS Chemicals Aromatics Sdn Bhd</li> <li>• PETRONAS Chemicals LDPE Sdn Bhd</li> <li>• PETRONAS Chemicals Ammonia Sdn Bhd</li> <li>• PETRONAS Chemicals Olefins Sdn Bhd</li> <li>• PETRONAS Chemicals Glycols Sdn Bhd</li> <li>• PETRONAS Chemicals Derivatives Sdn Bhd</li> <li>• PETRONAS Chemicals Polyethylene Sdn Bhd</li> <li>• PETRONAS Chemicals Ethylene Sdn Bhd</li> </ul> Note: All above located in Kertih region	(C) Possible	(3) Moderate	C3 MEDIUM	Because of the size and complexity of Kertih operations, any spill or pollution incident can reach into sensitive riverine, marine and coastal ecosystem, which may impact surrounding BES and community livelihood.  Note: Although Kertih is not within any protected area, the area does contain important ecosystems.	6 KM (Bukit Labohan Forest Reserve)
Asean Bintulu Fertiliser	(C) Possible	(3) Moderate	C3 MEDIUM	Proximity to protected areas (i.e. forest reserve, marine park)	Less than 10km to Similajau National Park
Petronas Chemical MTBE Sdn Bhd	(C) Possible	(3) Moderate	C3 MEDIUM	Proximity to protected areas (i.e. forest reserve)	Less than 10km to Balok Forest Reserve



# BES Risk Profiling preliminary result for PETRONAS facilities in Malaysia

Facility/Asset	LIKELIHOOD	SEVERITY	RISK RATING	JUSTIFICATION	APPROXIMATE DISTANCE TO NEAREST PA BORDER
PETRONAS Chemicals Fertiliser Sabah Sdn Bhd	(B) Unlikely	(1) Insignificant	B1 LOW	Rating is given with consideration that Mengalong Forest Reserve has been degazetted. There is no other protected areas and minimal sensitive ecosystem (terrestrial) surrounding the plant.	
PETRONAS Chemicals Fertiliser Kedah Sdn Bhd	(B) Unlikely	(1) Insignificant	B1 LOW	Though the plant is near forest reserve, the plant operation is unlikely to cause any impact.	4 km to Gunung Jerai Forest Reserve (IUCN Category 1a)

# PC Methanol in Labuan – proximity to Protected Areas



# Identified Environmentally Sensitive Receptors

ESR	Location	Approximate distance from nearest facility
Labuan Marine Park (PA)	Pulau Kuraman	5km southwest from LGAST 18km west-southwest from PCMLSB
	Pulau Rusukan Kecil	8.5km south-southwest from LGAST 20.5km southwest from PCMLSB
	Pulau Rusukan Besar	10km south-southwest from LGAST 23km southwest from PCMLSB
Mangroves	Sungai Kina Benua	7 km northwest*
Fishing villages	Patau-Patau	2.5 km north*
	Kampung Bebuloh Laut	8.5 km northwest*
Other islands	Pulau Burong	7 km west*
	Pulau Papan	2 km east*
	Pulau Daat	7 km east*
	Pulau Belangkasen	12 km east*

## Species of concern

<b>Pulau Ular</b>	Bridled Tern (Camar Batu) Black-naped Tern (Camar Topi Hitam) Roseate Tern.
<b>Pulau Burong</b>	Perculina sp. Miogypsina sp. Lepidocyclina sp.
<b>Kinabenuwa (endangered flora)</b>	Moluccan ironwood (Intsia bijuga) Hainan mangrove hybrid (Sonneratia x hainanensis) Gedabu (Sonneratia avata) Myrtle mangrove (Osbornia octadonta).
<b>Kg. Bebuloh and Kg. Ranza Ranza Darat</b>	Sonneratia ovata Sonneratia alba
<b>Kg. Bebuloh</b>	the mangrove palm Nypah fructus
<b><u>Fish families</u></b>	Gobiidae Pomacentridae Labridae
<b><u>Mangrove species</u></b>	Rhizophora apiculata (Bakau minyak) Rhizophora mucronata (Bakau kurap) Sonneratia ovata (Gedabu).
<b><u>Mangrove residents</u></b>	mudskippers (ikan belacak), giant mud crabs (ketam bakau), horseshoe crabs (belangkas), archerfish (ikan sumpit), smooth-coated otter (memerang licin) and Asian water monitor (biawak air)

# PCG facilities in Kerteh, Terengganu – proximity to Protected Areas



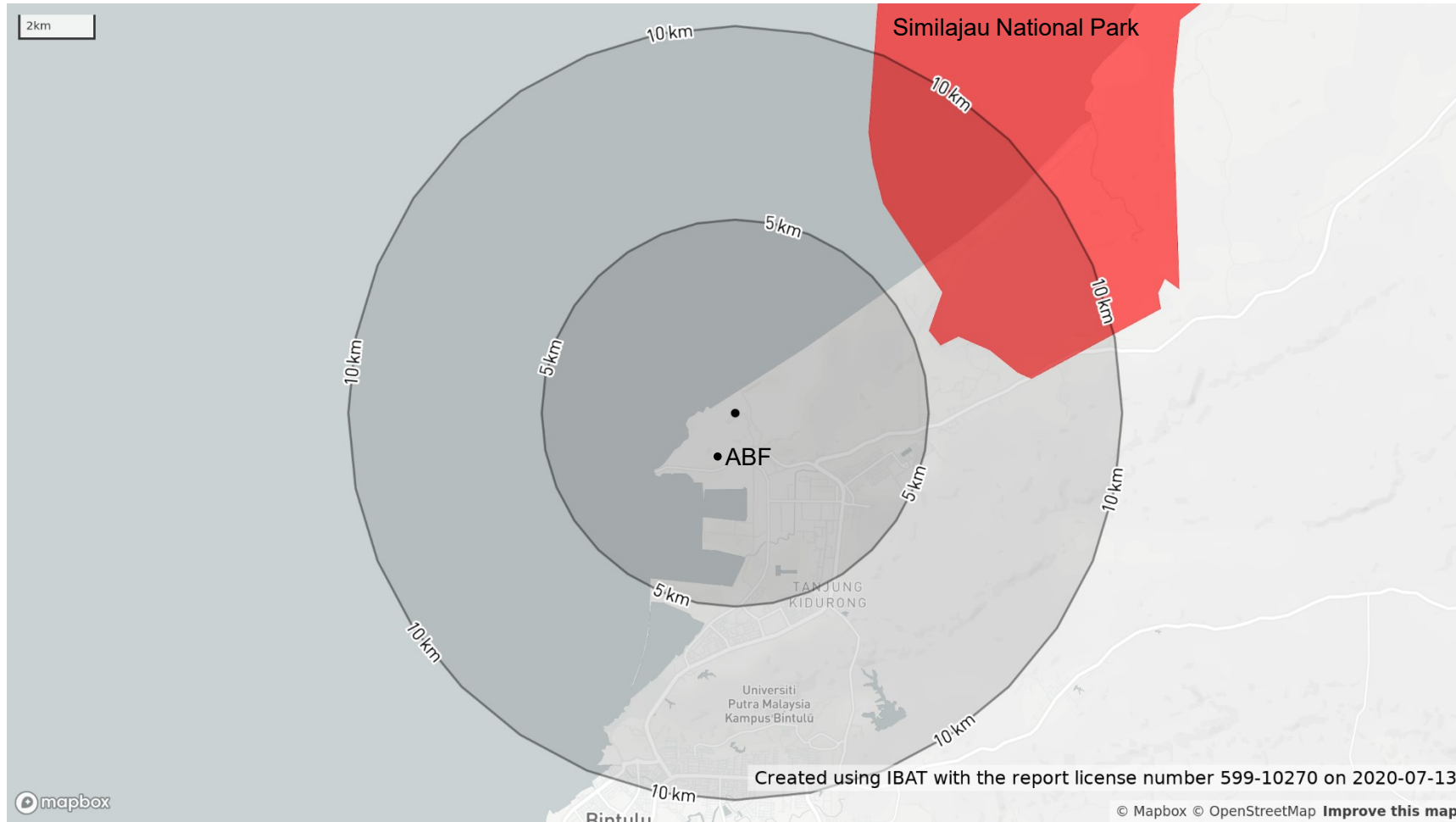
## Key Biodiversity Areas/ Protected Areas (within 20km radius)\*

KBA/PA	Protection Category
Bukit Bauk Forest Reserve	Forest Reserve (IUCN Category VI)
Rasau Kertih Forest Reserve	Forest Reserve (IUCN Category VI)
Ma' Daerah Turtle Sanctuary	Wildlife Reserve (IUCN Category IV)

*\*Larger radius is used to cover the whole PETRONAS operations in Kertih*



# ASEAN Bintulu Fertilizer in Bintulu, Sarawak – proximity to Protected Areas



# Key Biodiversity Areas/ Protected Areas (within 10km radius)

KBA/PA	Protection Category	Significance
Similajau National Park	IUCN Category II*	<p>Ecosystems and habitats concerned</p> <ol style="list-style-type: none"> <li>1. Mixed Dipterocarp Forest</li> <li>2. Coral reef</li> <li>3. Sandy beaches</li> <li>4. Mangrove forest</li> <li>5. Tropical heath forest</li> </ol> <p>Key ecosystem services/ functions of critical importance:</p> <ol style="list-style-type: none"> <li>1. Marine and coastal habitats</li> <li>2. Fisheries</li> <li>3. Tourism</li> <li>4. Turtle landings/breeding sites</li> <li>5. Important habitat/refuge for coastal cetaceans</li> </ol>

*\*Category II: National Park*

*Large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.*

Source: <https://www.iucn.org/theme/protected-areas/about/protected-areas-categories/category-ii-national-park>

# Way Forward

- For sites with Very High and High risk, a more detailed assessment i.e. BES risk assessment (BESRA) will be conducted to assess the potential impact from operational activities to the surrounding ecosystem. Activities include:
  - Interview with operation personnel to understand their activities
  - site visits to the nearest environmentally-sensitive areas for ground-truthing purposes
  - discussion with relevant local government agencies, researchers and/or NGOs

This is to understand the surrounding biodiversity, the habitat condition, identify any species of concern and to learn any other issues regarding biodiversity conservation in that area.

- Upon completion of assessment, BESRA report will be developed to detailed out findings from activities above and Biodiversity Action Plan (BAP) will be developed for implementation, to mitigate risks and potential impact identified from the assessment.