DRAFT Environmental and Social Impact Assessment Report

Project Number: 50182-001
November 2018

INO: Riau Natural Gas Power Project
ESIA Vol.5_Technical Appendices Part J

Prepared by ESC for the Asian Development Bank

Appendix P. Biodiversity Action Plan

Riau 275 MW Gas Combined Cycle Power Plant IPP - ESIA

Medco Ratch Power Riau

Biodiversity Action Plan

AM039100-400-GN-RPT-1020 | V0

November 2018

Document history and status

Revision	Date	Description	By	Review	Approved
A	24/08/2018	First Draft	A Kubale	B Clarke	E Morrissey
B	27/08/2018	Addressing MRPR Comments	A Kubale	B Clarke	E Morrissey
C	05/09/2018	Addressing further MRPR Comments	A Kubale	B Clarke	E Morrissey
D	17/10/2018	Updating to reflect changes in ESIA	A Kubale	B Clarke	E Morrissey
E	12/11/2018	Updated to address Lenders comments	A Kubale	B Clarke	B Clarke
V0	28/11/2018	Revised first draft	A Kubale	B Clarke	B Clarke

Distribution of copies

Revision	Issue approved	Date issued	Issued to	Comments
D	Draft	17/10/2018	MRPR	Draft Final ESIA
E	Draft	12/11/2018	MRPR	Updated to address Lenders comments
V0	Draft	28/11/2018	MRPR	Updated to address further Lenders comments

Riau 275 MW Gas Combined Cycle Power Plant IPP -ESIA

Project No:	AM039100
Document Title:	Biodiversity Action Plan
Document No.:	AM039100-400-GN-RPT-1020
Revision:	V0
Date:	November 2018
Client Name:	Medco Ratch Power Riau
Project Manager:	Eamonn Morrissey
Author:	Anthony Kubale
File Name:	I:\AENVW\Projects\AM039100 Riau\Technical\Terrestrial Ecology\BAP\AM039100_Riau ESIA - BAP_V0.docx

Jacobs New Zealand Limited

Level 3, 86 Customhouse Quay,
PO Box 10-283
Wellington, New Zealand
T +64 4 473 4265
F +64 4 473 3369
www.jacobs.com

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1. Introduction

1.1 Project Overview

This Biodiversity Action Plan (BAP) has been prepared for the Riau 275 MW Combined Cycle Gas Fired Power Plant Independent Power Producer (IPP) IPP Project (referred to hereafter as the 'Project') which consists of a 275 MW combined cycle power plant and ancillary facilities, a 40 km long 12-inch gas pipeline, a switchyard and a 750 m long 150 kV transmission line. The Project Sponsors being PT Medco Power Indonesia (MEDCO) and Ratchaburi Electricity Generating Holding PCL (RATCH), have formed PT Medco Ratch Power Riau (MRPR) to build, own and operate the plant under the terms of the Power Purchase Agreement (PPA) which has been agreed with PT Perusahaan Listrik Negara (Persero) ("PLN").

The power plant and ancillary features, switchyard and transmission line are located in the Tenayan Industrial Village (previously known as Sail Village), Tenayan Sub District, Pekanbaru City, Province of Riau. The power plant is located approximately:

- 10 km due east of the city of Pekanbaru in central Sumatra, Indonesia;
- 3 km south of the Siak River; and
- 2 km south of PLN's existing 2 x 110 MW Tenayan Coal Fired Power Plant (CFPP).

The power plant and switchyard will be located within the 9.1 ha of privately owned land currently being used as a palm oil plantation. The site is bounded by palm oil plantations to the west, south and east and Road 45 on the North.

MRPR will construct a gas supply pipeline from a connection point at an offtake location known as SV1401 on the main Grissik to Duri gas pipeline which is located north-east of the power plant in the Siak Regency. The gas will be delivered to the power plant by approximately 40 km of pipeline, the majority of which, will be located within the existing road reserve and through government owned land with 4.5 km being through privately owned palm oil plantation.

An approximately 750 m long overhead 150 kV transmission line to connect the power plant to the PLN grid via interception with the existing Tenayan – Pasir Putih 150 kV transmission line with four transmission line tower bases that will be acquired from one private land owner will be constructed and transferred to PLN to operate.

A temporary jetty for transportation of heavy equipment to site during construction will constructed on government owned land on the bank of the Siak River. The temporary jetty will be removed once construction is completed.

Water supply and discharge pipelines to and from the Siak River to the power plant will be installed via a right of way on land which will be leased from the government. An overview of the Project area and key components is detailed in Figure 1.1 below.

1.2 Purpose

The BAP includes a set of actions that lead to the conservation or enhancement of biodiversity. Specifically, the BAP is required to ensure that the Project:

- Implements the mitigation hierarchy presented in the Environmental and Social Impact Assessment (ESIA);
- Achieve net gain goals for Critical Habitat and no net loss goals for Natural Habitat;
- Complies with national legislation/policy requirements; and
- Complies with the including the Asian Development Bank (ADB) Safeguard Policy Statement 2009, International Finance Corporation (IFC) Performance Standard 6 (PS6) 2012, and the Equator Principles.

The level of detail required for a BAP is commensurate with the level of impact to the biodiversity values present in a Project area as a result of the Project activities.

1.3 Structure of the Report

The BAP is structured into seven main sections:

- Section 1: Introduction
- Section 2: Scope and Objectives of the Biodiversity Action Plan
- Section 3: Ecological Setting, Biodiversity Values and Stakeholder Engagement
- Section 4: Project Policies and Commitments
- Section 5: Corporate Framework and Roles and Responsibilities
- Section 6: Project Mitigation
- Section 7: Biodiversity Monitoring and Evaluation Plan

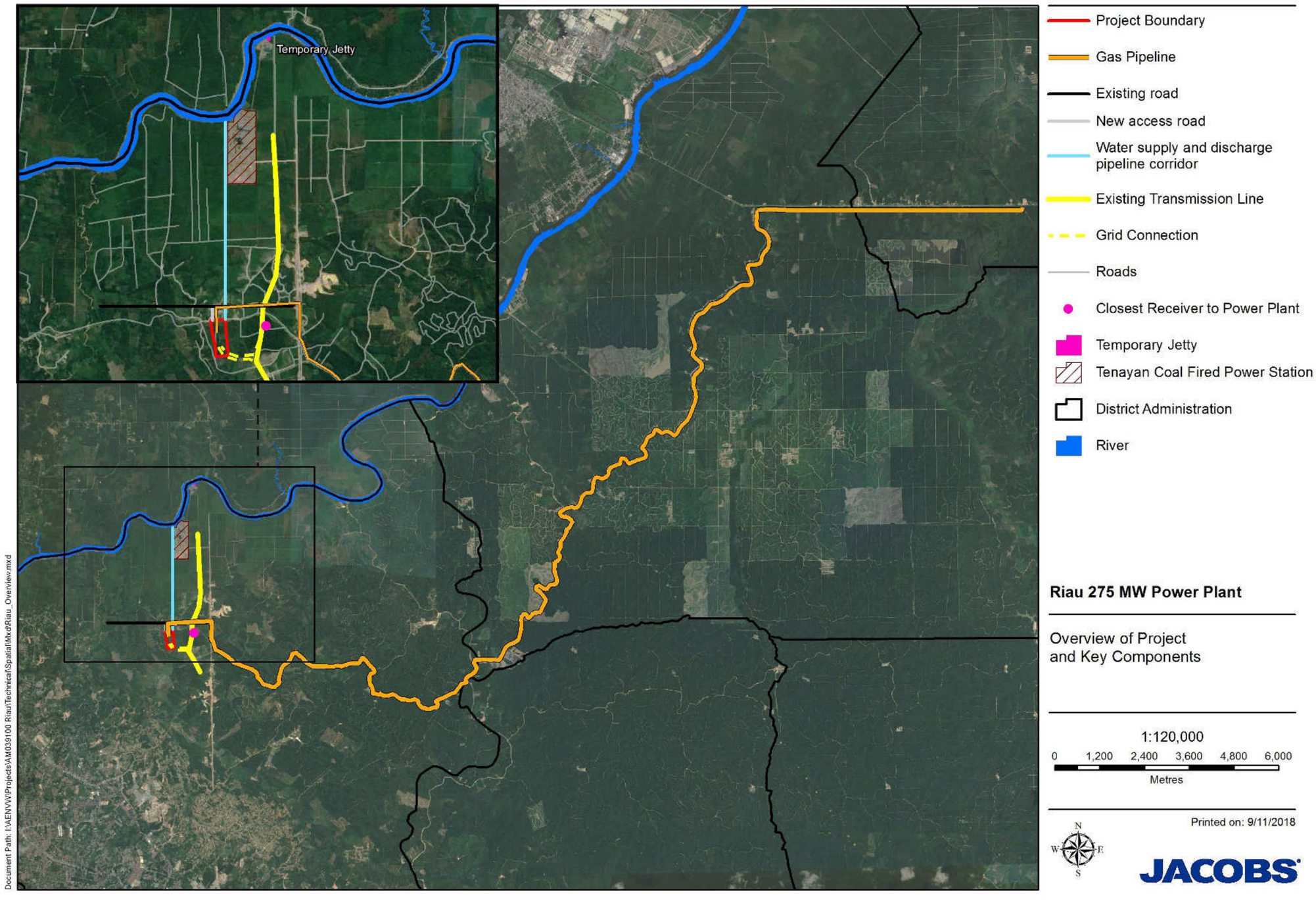

Figure 1.1 : Project Components and Location Overview

2. Scope and Objectives of the Biodiversity Action Plan

The aim of the BAP is to achieve a net gain for triggers of Critical Habitat and no net loss for areas of Natural Habitat impacted in accordance with IFC Performance Standard 6 and ADB Safeguards. This will be achieved by ensuring that the biodiversity is protected and enhanced where possible through a set of mitigation actions and by establishing a monitoring and evaluation programme for successful implementation of the BAP. The BAP also provides a summary of all consultation undertaken to date with stakeholders and biodiversity experts.

Whilst MRPR is committed to implementing and achieving the goals of this BAP, it should be noted that the areas identified as Natural Habitat are not within land owned by MRPR and therefore MRPR has no direct control over the future use of this land. The Critical Habitat area is also predominantly not within land owned by MRPR other than the areas of the Project footprint which are being acquired. MRPR will be responsible for ensuring that all Project activities including those of the EPC Contractors will adhere to IFC Performance Standards and ADB Safeguard requirements and the mitigation, net gain and no net loss goals set out in this BAP. This includes compliant mitigation of all impacts by the Project that occur within the Project area including induced access, habitat conversion and EPC Contractor activities.

The BAP updates and supplements biodiversity information detailed in the ESIA and outlines mitigation actions relevant to biodiversity required under the Environmental and Social Management Plan (ESMP).

The conservation objectives and actions in this BAP have been developed to ensure the systematic implementation of the mitigation hierarchy i.e. avoid, minimise, restore and offset. The concept of the mitigation hierarchy is outlined in Figure 2.1. This will allow for the careful management of risk and the best possible outcomes for the project and local communities, without compromising the health, function and integrity of the ecological system.

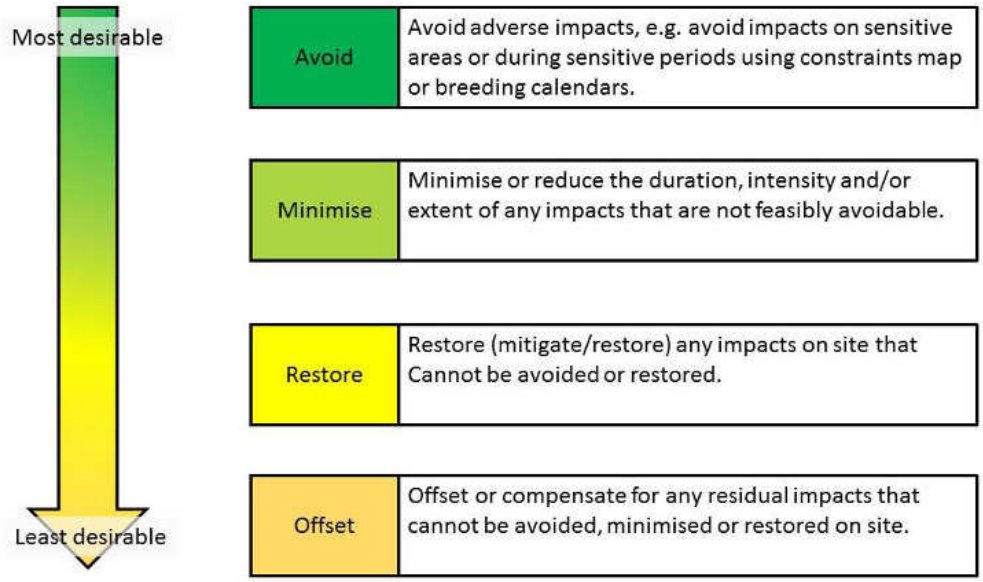

Figure 2.1 : Mitigation Hierarchy

3. Project Policies and Commitments

This section provides a summary of policies and commitments in relation to biodiversity that apply to this Project.

3.1 International Legislation and Policy

The following international laws and conventions have been ratified by Indonesia:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973);
- United Nations (UN) Framework Convention on Climate Change; and
- UN (Rio) Convention on Biological Diversity (1992).

3.2 Indonesian Environmental Regulatory Framework

National legislation in relation to biodiversity is covered specifically under the following key laws and regulations:

- Law No. 5 of 1990 regarding the Conservation of Natural Resources and Ecosystems;
- Law No. 19 of 2004 regarding Forestry; and
- Government Regulation 7 of 1999 regarding Conservation of Plants and Animals.

3.3 ADB Safeguard Policy Statement

ADBs commitment to ensuring the social and environmental sustainability of the projects it supports are outlined in the ADB Safeguard Policy Statement (ADB, 2009) which cover Environmental, Involuntary Resettlement and Indigenous Peoples Safeguards. The objectives of the Environmental Safeguards are to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process.

3.3.1 Natural Habitat

In areas of natural habitat the project will not significantly convert or degrade such habitat, unless the following conditions are met:

- No alternatives are available.
- A comprehensive analysis demonstrates that the overall benefits from the project will substantially outweigh the project costs, including environmental costs.
- Any conversion or degradation is appropriately mitigated.

Mitigation measures will be designed to achieve at least no net loss of biodiversity. They may include a combination of actions, such as post-project restoration of habitats, offset of losses through the creation or effective conservation of ecologically comparable areas that are managed for biodiversity while respecting the ongoing use of such biodiversity by Indigenous Peoples or traditional communities, and compensation to direct users of biodiversity.

3.3.2 Critical Habitat

No project activity will be implemented in areas of critical habitat unless the following requirements are met:

- There are no measurable adverse impacts, or likelihood of such, on the critical habitat which could impair its high biodiversity value or the ability to function.
- The project is not anticipated to lead to a reduction in the population of any recognized endangered or critically endangered species or a loss in area of the habitat concerned such that the persistence of a viable and representative host ecosystem be compromised.

- Any lesser impacts are mitigated in accordance with the requirements set out above for Natural Habitat.

3.4 IFC Performance Standards

IFC's Performance Standards on Environmental and Social Sustainability (IFC, 2012), define the client's roles and responsibilities for managing their projects and the requirements for receiving and retaining IFC support. Performance Standard 6 relates to the Biodiversity Conservation and Sustainable Management of Living Natural Resources. The objectives of this Performance Standard are to:

- Protect and conserve biodiversity;
- Maintain the benefits from ecosystem services; and
- Promote the sustainable management of living natural resources through the adoption of practices that integrates conservation needs and development priorities.

Where a project is within areas of Natural Habitat, the IFC requires mitigation measures to be implemented that achieve no net loss of biodiversity. For projects within areas of Critical Habitat mitigation measures to be implemented are required to achieve a net gain in biodiversity.

3.4.1 Natural Habitat

MRPR and/or their EPC Contractors will not significantly convert or degrade natural habitats, unless all of the following are demonstrated:

- No other viable alternatives within the region exist for development of the project on modified habitat;
- Consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation; and
- Any conversion or degradation is mitigated according to the mitigation hierarchy.

In areas of natural habitat, mitigation measures will be designed to achieve no net loss of biodiversity where feasible. Appropriate actions include:

- Avoiding impacts on biodiversity through the identification and protection of set-asides;
- Implementing measures to minimize habitat fragmentation, such as biological corridors;
- Restoring habitats during operations and/or after operations; and
- Implementing biodiversity offsets.

3.4.2 Critical Habitat

In areas of critical habitat, the client will not implement any project activities unless all of the following items are demonstrated:

- No other viable alternatives within the region exist for development of the project on modified or natural habitats that are not critical;
- The project does not lead to measurable adverse impacts on those biodiversity values for which the critical habitat was designated, and on the ecological processes supporting those biodiversity values;
- The project does not lead to a net reduction in the global and/or national/regional population of any Critically Endangered or Endangered species over a reasonable period of time; and
- A robust, appropriately designed, and long-term biodiversity monitoring and evaluation programme is integrated into the client's management programme.

3.4.3 Environmental and Social Action Plan

The Environmental and Social Action Plan prepared by IFC for the Project required the following in relation to biodiversity.

- The Company shall develop a BAP based on ESIA findings, including a zero-tolerance policy, and associated procedures, with regards collection, possession or transport of pangolin and any other species that are IUCN Red List threatened, CITES listed, and legally protected.

4. Ecological Setting, Biodiversity Values and Stakeholder Engagement

This section provides a summary of the ecological setting and biodiversity values of the Project area which is outlined in ESIA Volume 2 – EIA. The section also provides a summary of stakeholder engagement undertaken to date in relation to biodiversity and ongoing activities planned.

4.1 Ecological Setting and Biodiversity Values

The ecological setting of the Project area is characterised by oil palm and rubber plantations and areas of scrub and grass adjacent to roads which the gas pipeline predominantly follows. These areas have been determined to be Modified Habitat. In discrete areas adjacent to the gas pipeline there are areas of plantation that have been left unmanaged for a number of years allowing natural regrowth to occur. These areas are still zoned as oil palm plantation and therefore may be subject to future use as plantations as determined by the land owners. These discrete areas are considered to be low grade Natural Habitat due to the mix of native species that have adapted within an area of non-native species. Although these discrete areas are generally now characterised by native species they are indicative of a young and relatively disturbed habitat. Figure 3.1 below provides an overview of areas of Modified and Natural Habitat within the Project area. The 1 km buffer around the Project area gives a total of 8,793 ha. Of this 8,666.5 ha is determined to be Modified Habitat and 118.5 ha (1%) is determined to be low grade Natural Habitat.

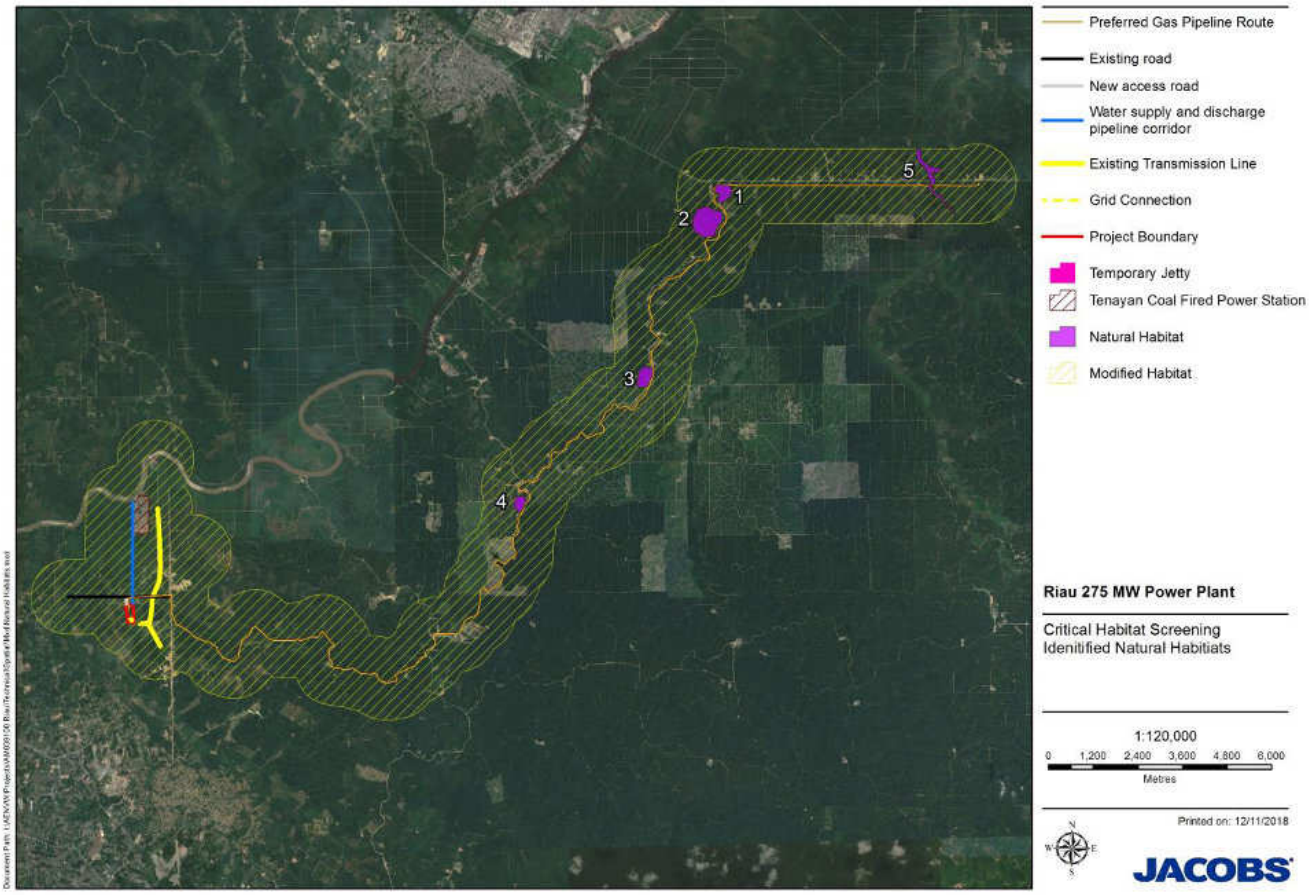

Figure 4.1 : Modified and Natural Habitat within the Project Area

There are no legally protected areas of conservation concern or areas of conservation interest within a 5 km radius of the Project area. The ecological surveys undertaken for this Project found the majority of the flora and fauna to be characteristic of the region and in particular one that is dominated by oil palm plantation.

The IUCN Red List of Threatened species that were noted during the ecological surveys and will be treated as species of concern in this BAP included:

- IUCN Vulnerable: (legume/tree species) (*Afzelia rhomboidea*), black partridge (*Melanoperdix niger*), sunda blue flycatcher (*Cyornis caerulatus)* and southern pig-tailed macaque (*Macaca nemestrina*), sun bear (*Helarctos malayanus*) and sambar deer (*Rusa unicolor*).
- IUCN Endangered: *Anisoptera marginata* korth and agile gibbon (*Hylobates agilis*); and
- IUCN Critically Endangered: sunda pangolin (*Manis javanica*).

Mitigation and management measures for these species are outlined further in Section 6.

A Critical Habitat Screening Assessment in accordance with IFC Performance Standards and ADB Safeguard Policy Statement has been undertaken for the Endangered and Critically Endangered species, the details of which can be found in ESIA Volume 2 – EIA, Section 3.10. Anisoptera marginata Korth (IUCN endangered) was located 50 m down a slope on the other side of the road from the proposed route of the gas pipeline in an area of dense vegetation which is bounded by oil palm plantation. As such it is located outside of the project footprint and is not considered in this assessment of critical habitat.

For the Project, the Discrete Management Unit (DMU) has been defined based on the sunda pangolin (IUCN Critically Endangered) which has been noted in the Project area and the agile gibbon. Sunda pangolins are understood to be wide ranging species that are found across all of Sumatra. The species has a diverse range of habitats from primary and secondary forest, including lowland dipterocarp forest to cultivated areas including gardens and oil palm and rubber plantations. It is also noted as being found near human settlements. The Critical Habitat Assessment determined that given the regular occurrence of the species and its wide ranging nature Critical Habitat is triggered under Criterion 1, Tier 2 in relation to the regular occurrence of a Critically Endangered Species within the DMU, see Figure 3.2 below. The agile gibbon (IUCN Endangered) is found only in one of the discrete areas of Natural Habitat identified (area 2, see Figure 4.2). The agile gibbon is generally found in primary or secondary forest and the low grade natural habitat used by a small family of agile gibbons on site is outside the Project footprint and will not be impacted. As such, Critical Habitat is not triggered for the agile gibbon. Although the area of habitat where the agile gibbons are located is avoided by the Project and Critical Habitat is not triggered for this species, mitigation and management measures will be implemented to avoid and minimise any potential disturbance to this Endangered Species during constriction.

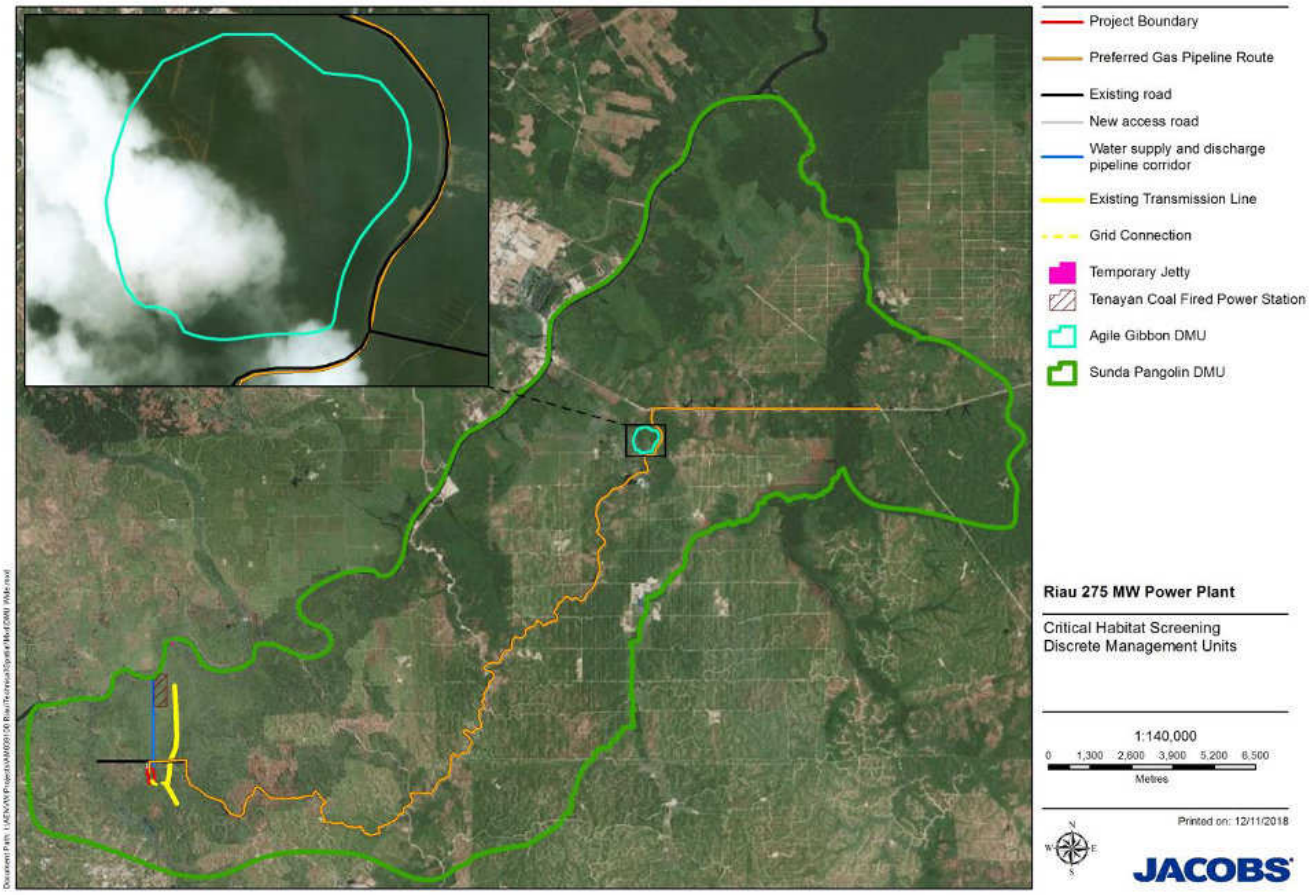

Figure 4.2 : Critical Habitat Area

The terrestrial ecology impact assessment detailed in ESIA Volume 2 – EIA, Section 12 identified the following key impacts that will be mitigated and managed through actions set out in Section 6.

- Critical Habitat was triggered for the sunda pangolin for the entire DMU boundary which is a total of 28,800 ha. The determination of Critical Habitat is based on the acknowledgement that sunda pangolin are likely to regularly occur across the DMU boundary rather than based on specific suitable habitat areas. The entire Project construction footprint (33.105 ha) is within the DMU boundary and therefore within the Critical Habitat area although only 6.605 ha of the Project footprint is permanent.
- Temporary direct impacts will occur to low grade Natural Habitat Areas 1 and 5 during construction of the gas pipeline. Although efforts to re-route around the area of Natural Habitats (Area 1 and 5 as outlined in Figure 3.44) have been considered they are not determined to be viable due to land acquisition issues and therefore the gas pipeline will directly impact these Natural Habitat areas. The combined area to be directly impacted is 0.29 ha from a combined area size of 36 ha (16 ha for Area 1 and 20 ha for Area 5).

The key mitigation goals that apply to this Project are No Net Loss for the areas of Natural Habitat directly impacted (Areas 1 and 5 in Figure 4.1). For the area of Critical Habitat shown in Figure 4.2 which will be impacted by the footprint of the Project net gain goal applies.

4.2 Stakeholder Engagement

Table 4.1 below provides a summary of stakeholder engagement undertaken to date in relation to biodiversity.

Table 4.1: Stakeholder Engagement Undertaken to Date

Organisation	Name, Title	Topics / Issues
Research Centre for Biology – Indonesian Institute of Sciences	Professor Gono Semiadi	Provision of information on sunda pangolin and agile gibbon
PT Nusa Buana Cipta (NBC)	Guritno Djanubudiman (mammal specialist)	Undertook terrestrial ecology surveys. Provision of further information on sunda pangolin and agile gibbon
PT Nusa Buana Cipta (NBC)	Suprayogo Soemarno (plant specialist)	Undertook terrestrial ecology surveys. Provision of further information on *Anisoptera marginata*
-	Alwi (local sunda pangolin specialist)	Advice on occurrence and distribution of sunda pangolin in the Project area.
School of Biological Sciences and Centre for Conservation Science & Technology at the University of Adelaide	Sarah Heinrich. PhD student studying sunda pangolin	*"Unfortunately, there are no studies on exact population numbers/locations in Sumatra yet, but we are currently working on an updated IUCN Redlist assessment, which will be published later this year or early 2019.* *As for home ranges, there are studies suggesting quite a big home range for male Sunda pangolins (~40 ha), and ~7 ha for females. Female home ranges are also probably dependant on natal dens (i.e. trees and tree hollows). Sunda pangolins are semi-arboreal and are usually found in lowland areas, and here typically forests, but there is anecdotal evidence that they use wetland and riverine ecosystems as well. They have also been observed living in modified habitats (e.g., plantations), although it's unclear at the moment if they can actually thrive in plantations, or whether they are simply losing habitat and trying to cope with it somehow by moving into these plantations. It is believed that they can generally adapt to different habitat types, provided they have enough prey and resting places (e.g., fallen tree logs, hollows, burrows etc). There aren't many ecological studies yet on pangolins…"*
Oxford Martin Programme on the Illegal Wildlife Trade, University of Oxford. Chair, IUCN SSC Pangolin Specialist Group	Dan Challender - Postdoctoral Research Associate	*…"The Sunda pangolin M. javanica does appear to be something of a habitat generalist. It occurs in tropical and sub-tropical forests but also appears in artificial and degraded landscapes including oil palm and rubber plantations as well as gardens. The extent to which there is any habitat preference has not really been tested in any meaningful manner. It could have some preferences, but we don't really know at the moment…. in Singapore they are known to use water culverts to move around sometimes and ledges in underpasses etc so if you're thinking about connectivity or ability to move between suitable habitat that could be one option.* *Home range size estimates are below:* • 36.4 – 90.7 ha, ♂ (n = 4), Singapore • 6.97 ha, ♀ (n = 1), Singapore"
Oxford Brookes University. Co-director of the Borneo Nature Foundation. Vice-chair of the IUCN Primate Specialist Group Section on Small Apes	Dr Susan Cheyne - Associate Lecturer MSc Primate Conservation	*"Average home range for 1 family group is 35-45 ha. Large canopy gaps will mean the area needed for the gibbon group will be larger. Group home ranges will overlap by ~10%.* *Actual size of forest needed to maintain a viable population of gibbons over 50 years into the future for this species is ~ 60 km2 minimum with connectivity/corridor to other forests.*

Organisation	Name, Title	Topics / Issues
		Large canopy gaps (roads etc) can be mitigated by canopy bridges (not just a single rope, I can send designs if needed). Power lines should be insulated as gibbons can use them to travel and may get electrocuted. Gibbons will very rarely come to the ground so the key is to avoid isolating them. Translocation would be a last (and expensive) option." Based on consultation discussion, agile gibbon population is not viable with young likely to be resilient. With so many individuals and family groups in one place, this may lead to aggression and conflict and potentially dispersion of individuals to outside the habitat area.

5. Corporate Framework and Roles and Responsibilities

MRPR is committed to the protection of biodiversity and has in place a Biodiversity Policy that will be in effect for the assets MRPR own up until the end of the 20-year Power Purchase Agreement (PPA) term. This section outlines MRPRs Biodiversity Policy which sets the corporate framework for the successful implementation of this BAP. The section also outlines the role of those who will be responsible for implementing the BAP and the mitigation actions detailed within and their responsibilities.

5.1 Biodiversity Policy

The purpose of MRPR's Biodiversity Policy is to outline practical steps to assist MRPR to meet obligations required by the IFC Performance Standards and associated Environmental and Social Action Plan (ESAP). The policy outlines the associated procedures and actions for biodiversity management at MRPR's sites.

The following commitments are made by MRPR in relation to the management of biodiversity and ecosystem services:

- Assess and manage biodiversity and ecosystem service values in accordance with IFC's Performance Standard 6 on biodiversity conservation and sustainable management of living natural resources;
- Address negative impacts of our activities on biodiversity values by first avoiding, second minimizing, and third restoring biodiversity with regards to those impacts. Offsets will only be considered as a last resort and may be considered for significant residual impacts;
- Raise awareness of biodiversity and ecosystem service values with all staff, contractors and clients;
- Manage biodiversity and ecosystem services in collaboration with local communities and other stakeholders;
- Respect legal requirements related to biodiversity and ecosystem services, with special attention to requirements for legally protected areas;
- Prohibit all staff and contractors from the possession, purchase, trade or collection of wildlife or living natural resources that are nationally legally protected, CITES listed, or classed as threatened by the IUCN Red List; and
- Encourage use of indigenous species in all site landscaping, and control or eradication of invasive alien species.

5.1.1 Scope of Policy

This Policy shall apply to:

- all MRPR's sites across the project life cycle, including existing and future developments; and
- all MRPR's employees, contractors and consultants undertaking work for or on behalf of MRPR.

5.1.2 Policy Requirements

With a focus on continual improvement for management of biodiversity and ecosystem services values, all sites must:

- Develop site-specific biodiversity objectives and performance targets;
- Develop and implement a practical monitoring system appropriate for the site-specific management of biodiversity values; and
- Review annually all site-specific biodiversity objectives and performance targets.

5.2 Roles and Responsibilities

MRPR and their EPC Contractors will have in place an HSE Manager and Environmental Officers that will ensure that the mitigation actions outlined in this BAP and the biodiversity policies of MRPR are upheld. An overview of the roles and responsibilities that will be in place for this Project are shown in Table 5.1 below. Further details can be found in the Framework ESMS in ESIA Volume 4. The specific role titles and responsibilities may be subject to change during the development of the Overarching ESMS and therefore the details of Table 5.1 are indicative at this stage.

Table 5 1 : Roles and Responsibilities

Role	Responsibilities

General Manager	• Approve the Project ESMS and procedures relating to Biodiversity.
	• Define roles, responsibilities and provide resources for ensuring that environmental requirements relating to biodiversity are implemented and maintained in all areas of Project activities.
	• Overall responsibility to ensure the following:
	  ○ Compliance with Contract and MRPR Standards relating to biodiversity.
	  ○ Compliance with all regulations relevant to biodiversity.
	• Represent MRPR for all stakeholders.
	• Ensure the implementation of the zero-tolerance policy regarding the collection, possession or transport of any flora or fauna on site.

MRPR HSE Manager	• Ensure that the environmental requirements relating to biodiversity are established, implemented and maintained across the Project site activities. • Develop and maintain environmental documents relating to biodiversity and records. • Monitor adherence to the Project environmental policy & objectives, alerting management of non-compliance, and providing advice on remedial actions, through environmental audits, reviews, inspections etc. • Monitor and verify closeout of actions arising from environmental audits.
Environmental Specialist	• Conduct daily and weekly environmental biodiversity inspections of site and routine (at least every three months) audits. • Report results of inspections and documentation reviews to the MRPR HSE Manager. • Assist the EPC Contractor to define appropriate corrective actions to be implemented as a result of any identified non-compliances and providing project-wide advice to ensure consistent approach and outcomes are achieved. • Ensure on an on-going basis, that environmental requirements are communicated via formal training programs to all personnel engaged in work on behalf of MRPR. • Assist in ensure the implementation and continued adherence of the zero-tolerance policy regarding the collection, possession or transport of any flora or fauna on site. • Conduct regular tool box talks with EPC Contractors to ensure they are aware of sensitive flora and fauna species in the area and actions should a sighting or evidence of presence of these species are found on site.
EPC Project Manager/ Project Director	The Project Manager has overall responsibility for the construction of the Project and associated infrastructure. In particular, the Project Manager will: • Maintain an awareness of the applicable Indonesian legal requirements in relation to biodiversity. • Manage implementation of standard operational procedures for implementing the ESMS and procedures relating to biodiversity including the BAP. • Ensure the ESMS and aspects relating to biodiversity are communicated, implemented, and maintained by the Operations Contractor and any Subcontractors.
EPC HSE Manager	• The HSE Manager has an overarching responsibility for the management, monitoring, inspection, and reporting of HSE aspects during operation. • The HSE Manager will have the knowledge, skills, and experience necessary to perform their work, including up-to-date knowledge of Indonesian legislation and the international requirements as listed in Legal Requirements Register. • The HSE Manager will also possess the knowledge, skills, and experience to implement the specific measures and actions required under the ESMS including the BAP.

Role	Responsibilities
All other employees	All personnel employed for the operation of the Project are responsible for carrying out their roles in accordance with the ESMS and the requirements of the BAP.

6. Project Mitigation / Management Measures

This section outlines the mitigation and management measures that will be put in place to ensure impacts to biodiversity are avoided / minimised, no net loss and net gain goals are achieved and the ADB and IFC criteria for Projects in Natural and Critical Habitat are met. The mitigation and management measures set out in Table 6.1 and 6.2 below and are consistent with those detailed in the Environmental and Social Management Plan (ESMP) in Volume 4 of the ESIA.

Table 6.1: Mitigation / Management Measures

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Timescales	Budget for Implementation	Responsibility of mitigation
Terrestrial Ecology	All project construction works	• Pre-construction ecological survey prior to vegetation clearance of the Project area by suitable member of staff trained to identify the sensitive species found in the area including: o IUCN Vulnerable: legume/tree species (*Afzelia rhomboidea*), black partridge (*Melanoperdix niger*), sunda blue flycatcher (*Cyornis caerulatus*), sambar deer (*Rusa unicolor*), sun bear (*Helarctos malayanus*) and southern pig-tailed macaque (*Macaca nemestrina*); o IUCN Endangered: *Anisoptera marginata korth* and agile gibbon; and o IUCN Critically Endangered: sunda pangolin. If any sensitive species are found further consideration of the species context will be factored into decision planning. For example, if the species is foraging then waiting until it moves out of the area prior to work commencing. If a nest is observed then looking at options to re-route around the nest incorporating sufficient distance to avoid disturbance and/or seeking a species specialist advice.	Prior to vegetation clearance	To be confirmed	CPM to implement mitigation and MRPR to review performance
Terrestrial Ecology	Gas pipeline	• The vegetation clearance required should be kept to a minimum • The felling of mature trees (except oil palm), and large areas of scrub/immature vegetation should be avoided. • Clear demarcation of the pipeline construction area limits should occur to avoid any accidental incursion in to the adjacent habitats. • Temporary working areas should be replanted, if possible by using saplings salvaged from the site clearance phase. • Excavations should be covered or fenced at the end of the working day to avoid incursion by species. Fencing or tape will be used to demarcate the trenches. • Exit points using branches or planks of wood in the excavations should be provided to allow any animals which enter the pipeline trench to escape. • Tool box talks should be undertaken with construction staff, to highlight the presence of local wildlife and behaviour towards it.	During gas pipeline construction	To be confirmed	CPM to implement mitigation and MRPR to review performance

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Timescales	Budget for Implementation	Responsibility of mitigation
		• The planned vegetation clearance area for the construction works shall be clearly identified and marked to avoid accidental clearing of additional vegetation. • MRPR shall provide training to staff and workers on all rules, regulations and information concerning restrictions related to flora and fauna that are present in the project area and particularly highlighting those that are ecologically significant e.g. sunda pangolin and agile gibbon.			
	All project construction works	• The vegetation clearance required should be kept to a minimum with felling of mature trees (except oil palm), and large areas of scrub/immature vegetation avoided. • Site management measures will include: • Clear demarcation of site limits; • Directional site lighting; • Tool box talks with construction staff to highlight the presence of local wildlife and behaviour towards it. • Temporary working areas should be replanted, if possible by using saplings salvaged from the site clearance phase. • Excavations should be covered or fenced at the end of the working day to avoid incursion by species. • Noisy night time construction activities such as use of excavators will be avoided when working near or within any areas of Natural Habitat. Working hours when near or within areas of Natural Habitat will be not commence two hours after sunrise and will be completed two hours before sunset. • Adhere to the Soil and Erosion Control and Pest and Weed Procedures set out in the MRPR Overarching ESMS and EPC Contractors Construction ESMS • All vegetation cleared will be chipped and re-used for any construction site revegetation post construction. In particular at the power plant site. • Replant the temporary working areas, if possible by using saplings salvaged from the site clearance and chippings from vegetation clearance phase and/or by native endemic species.	During construction	To be confirmed	LEC and CPM to implement mitigation and MRPR to review performance
		• MRPR and the EPC Contractors shall provide training to staff and workers on all rules, regulations and information concerning restrictions related to flora and fauna that are present in the project area and particularly highlighting those that are ecologically significant e.g. sunda pangolin and agile gibbon. Should a sensitive species be found on site, work will stop until it moves off site. If the species is more permanently located due to nesting, then alternative options such as re-routing the pipeline or seeking specialist advice will be taken. • MRPR and the EPC Contractors will enforce a no tolerance policy towards the poaching or illegal trafficking of any flora or fauna. This will be enforced through the following:	During construction and operation	To be confirmed	MRPR and EPC Contractors

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Timescales	Budget for Implementation	Responsibility of mitigation
		○ Employment contracts ○ unannounced random vehicle checks to be conducted on a weekly basis: ○ through on-site posters for staff: and ○ tool-box talks held for any new staff brought on site and on a quarterly basis for all MRPR and EPC Contractor staff.			
Terrestrial Ecology	All Project locations	• Ongoing community consultation through MRPRs Community Liaison Officer (CLO). Any grievances in relation to biodiversity will be recorded and addressed through the Grievance Redress Mechanism that is in place.	Construction and Operation	To be confirmed	MRPR CLO
Terrestrial Ecology	Power plant	• There should be provision of wetland areas and swamp forest within the green zones of the CCPP. This could be up to 3.7 ha of habitat provided on completion of the construction phase. Biodiversity goals for this will be linked to Natural Habitat values and biodiversity offsetting requirements discussed further in Table 6.2 below. • On-site revegetation requirements will be outlined in a specific Habitat Restoration Procedure produced by MRPR and adhered to by the EPC Contractor or Subcontractor undertaking this work.	Post construction	To be confirmed	EPC Contractor to implement mitigation and MRPR to review performance

Table 6.2 : Mitigation Measures for Net Gain and No Net Loss

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Timescale	Budget for Implementation	Responsibility of mitigation
Terrestrial Ecology	No Net Loss action for 0.29 ha of Natural Habitat temporarily directly impacted*	• Pre-construction ecological survey of the Natural Habitat areas temporarily directly impacted by a suitable member of staff trained / qualified to identify the sensitive species found in the area. Surveys should be conducted immediately prior to vegetation clearance. If any sensitive species including the sunda pangolin are found, further consideration of the species context will be factored into decision planning. For example, if the species is foraging then waiting until it moves out of the area prior to work commencing. If a nest is observed then looking at options to re-route around the nest incorporating sufficient distance to avoid disturbance and/or seeking a species specialist advice.	Pre-Construction of the gas pipeline	To be confirmed	EPC Contractor to implement mitigation and MRPR to review performance
		• Biodiversity offsetting options will be identified and carried out in accordance with and ADB Safeguards. • Any direct or indirect sightings of the sunda pangolin will be recorded including co-ordinates. A database of recorded sightings will be maintained and shared with the Government and sunda pangolin NGOs to support any ongoing efforts to monitor the number and distribution of sunda pangolin in the region.			MRPR

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Timescale	Budget for Implementation	Responsibility of mitigation
		• All other mitigation detailed in Table 6.1 are also applicable during construction works in Natural Habitat. • Full time site supervision by a suitably qualified / trained member of staff able to identify the species of concern e.g. sunda pangolin, agile gibbon etc.	During construction of the gas pipeline		EPC Contractor to implement mitigation and MRPR to review performance
		• Biodiversity offsetting for the 0.29 ha of Natural Habitat that will be impacted ensuring like for like replacement or better for habitat values being impacted. Options for biodiversity offsetting will include use of 3.7 ha of the power plant site that will require re-planting / landscaping following completion of construction and/or alternatively funding support to a local NGO undergoing reforestation activities.	Following completion of construction activities for the Project		
	Net Gain action for area of Critical Habitat impacted by the Project 33.105 ha.	In accordance with IFC Performance Standard 6, the Project is required to achieve net gains for the biodiversity for which the Critical Habitat was designated, which in this case is in relation to the sunda pangolin. The net gains proposed to be delivered for this is Project are via additional net gain actions type activities which may include for example the following: • Identify and engage with relevant civil society organisations or NGOs involved in sunda pangolin conservation programs such as the Wildlife Conservation Society and the IUCN SSC Pangolin Specialist Group; • Running local educational programs on sunda pangolin conservation at local schools, NGOs, academic institutes or community centres; • Donation / funding to sunda pangolin conservation groups such as the Wildlife Conservation Society and the IUCN SSC Pangolin Specialist Group; • Optimising community channels to conduct socialisations in order to increase sunda pangolin awareness to the community; and • Install educational banners and boards in local communities on the sunda pangolin including messages regarding the status of the sunda pangolin and stopping hunting and pet trade activities. The activities to be conducted will be further evaluated and incorporated into construction / operation planning. Net gain activities to be started prior to construction and will carried out throughout construction.	Prior to and throughout construction and operation	To be confirmed	MRPR to implement

*For the Natural Habitat areas which will be directly impacted, following implementation of mitigation measures outlined in Table 6.1, the area is not determined to lead to significant residual impacts and therefore there are no requirements for no net loss under IFC Performance Standard 6. However, for ADB no net loss goals are required and therefore additional mitigation has been outlined in Table 6.2.

6.1 Biodiversity Monitoring

This section focusses on and outlines biodiversity monitoring and evaluation of Critical Habitat and Natural Habitat values. A summary of monitoring activities, frequency and responsibility for undertaking the activity is detailed in Table 6.3 below.

Table 6.3 : Summary of Monitoring Activities

Monitoring Activity	Monitoring Description	Frequency	Responsibility	Budget for Implementation
Implementation of mitigation measures outlined in Table 6.1	Inspection and auditing of implementation of mitigation measures, ensuring any corrective actions are identified where non-compliance is observed. Information collected from inspections and audits will be recorded and reports shared shared with MRPR HSE Manager, General Manager, Executive Management team if required and Lenders on an annual basis.	To be undertaken on a weekly basis	MRPR Environmental Specialist	To be Confirmed
Implementation of mitigation measures outlined in Table 6.2	Inspection and auditing of Critical Habitat values on site e.g. any observations (direct or indirect) or sunda pangolin on site. This includes checking of records noted by any member of the workforce on sightings and undertaking inspections particularly in areas where construction is currently ongoing. Information collected from inspections and audits will be recorded and reports shared with MRPR HSE Manager, General Manager, Executive Management team if required and Lenders on an annual basis	To be undertaken on a weekly basis	MRPR Environmental Specialist	To be Confirmed

Monitoring Activity	Monitoring Description	Frequency	Responsibility	Budget for Implementation
Pre-Construction Terrestrial Ecology Survey	A terrestrial ecology survey should be conducted for the Project area in order to identify any IUCN Red Listed Threatened species (Vulnerable, Endangered or Critically Endangered) within or directly adjacent to the construction area.	Prior to construction and in particular prior to each section of the gas and water pipeline.	EPC Contractor – Staff trained in identifying sensitive species of note	To be Confirmed
Additional Net Gain Actions	All additional net gain actions undertaken in relation to the sunda pangolin will be recorded. The success of these actions will be evaluated by setting a series of initial goals and evaluating against this throughout construction and operation of the Project.	To be undertaken on a quarterly basis	MRPR HSE Manager	

7. Reporting, Auditing, Performance Indicators and Non-Compliance Management

7.1 Auditing

The BAP will remain in place for the life of the Project (20 year PPA term).

Audits will be conducted every three months by MRPR HSE Manager in relation to implementation of the BAP by the EPC Contractor during construction and throughout operation.

A review of the BAP will be undertaken on an annual basis for the first three years and on a five year cycle thereafter. Any corrective actions identified to be implemented immediately with revised BAPs issued to all relevant parties in the MRPR and EPC Contractor project teams.

7.2 Performance Indicators

Performance indicators that will be used to assess the success of the BAP mitigation / management measures and monitoring include the following:

- No reported disturbance, injury or mortality to species of concern noted, in particular the sunda pangolin and agile gibbon during construction of the gas pipeline..
- Biodiversity offsetting achieved for the 0.29 ha of Natural Habitat directly impacted either through on-site or offsite replanting or through funding to NGOs undertaking re-forestation programmes.
- No workers or members of the local community are caught poaching sunda pangolin during the construction phase.
- Improved general awareness of the local community in regards to conservation status and importance of the agile gibbon and sunda pangolin.

7.3 Non-Compliance Management

In the event that the implementation of the BAP is found to be a problem, the MRPR General Manager and/or EPC Project Manager will conduct an investigation into the issue.

In the event investigations conclude there were no external influences and the non-compliance was solely due to construction activities, a review of appropriate remedial actions e.g. further training, changes to procedure will be investigated.

Details of all non-compliances and corrective actions taken will be included in the monthly HSE reports as issued to MRPR and the Lenders.

7.4 Reporting

7.4.1 Internal

MRPR's HSE Manager with the support of EPC HSE Manager is responsible for the following HSE reporting requirements to be reported to MRPR management as required:

- Summary of any species identified on site, procedure implemented, and performance of actions taken.
- Summary of any issues from site inspection reports and or complaints (if any) received from local community relevant to this procedure.

7.4.2 External

MRPR will be responsible for commenting on the BAP performance, the additional net gain actions undertaken and progress of no net loss actions in their six monthly and annual environmental and social monitoring reports to the Project Lenders.