Biodiversity Risk Assessment

IRPC

1. Objectives

- Biodiversity risk assessment for assess risk of biodiversity from project in area and for set mitigation plan for reduce risk from operation in future.

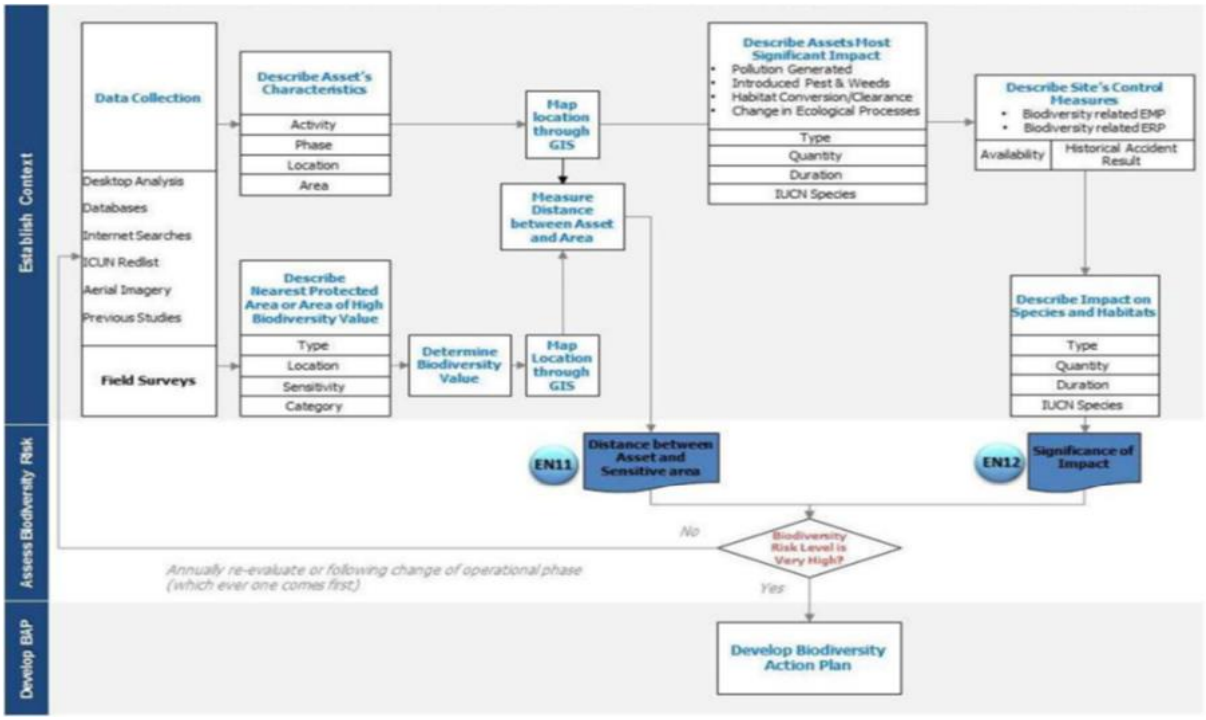
2. Scope of report

- IRPC Plant
- Biodiversity Risk Assessment reference by Standards GRI standards EN 11 and EN12

3. Method

- Use GRI standards EN 11 and EN12 method to collect data and describe source by Biodiversity and Ecosystem Services (BES) and the relation of risk assessment and revision of biodiversity for develop biodiversity action plan for high-risk area. Show in picture 1. Below.

Picture 1. Biodiversity and Ecosystem Services (BES)



3.1 Indicator for Biodiversity risk assessment EN11

EN11 indicator help IRPC to identify impact of asset be locate in or near national park or other area that high biodiversity.

High biodiversity area value are area that have living thing habitat in this area. Indicator for biodiversity risk assessment descried in Table 1.

TABLE 1. Indicator

Indicator	Description
EN11	Location and size of land owned, leased, managed in or adjacent to protected areas and areas of high biodiversity value outside of protected areas.

Risk Assessment

In Table 2 show parameter and data source for IRPC area biodiversity assessment for EN11 indicator.

TABLE 2. Parameter for assessment and source of data for EN11 indicator

Measurement	Information Source
• Geographic location; • Type of asset; • Size of operational asset in km²; • Description of land that owned, leased, or managed by PTT; • Position (distance) in relation to protected area and high biodiversity value area outside protected area; • Biodiversity value characterized by the attribute of the protected area and high biodiversity value area outside of the protected area (terrestrial, freshwater, or maritime ecosystem); & the listing of protected status (e.g., IUCN Protected Area	• IUCN category reserves (Google Maps); • RAMSAR Convention; • UNESCO World Heritage Assets; • UN Biosphere; • Thailand National Biodiversity Strategy; • WWF Wildfinder; • Bird Life International; and • IUCN Centres for Plant Diversity.

Measurement	Information Source
Management Category, Ramsar Convention, national legislation).	

Category of Protect Area (ICUN 2008)

Objective of Category of Protect Area (ICUN 2008) describe in Table 3.

TABLE 3. Category of Protect Area (ICUN 2008)

Category	Description
Category Ia	Category 1a are strictly protected areas set aside to protect biodiversity and also possibly geological and geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.
Category Ib	Category Ib protected areas will generally be larger and less strictly protected from human visitation than category Ia: although not usually subject to mass tourism they may be open to limited numbers of people prepared for self-reliant travel such as on foot or by boat, which is not always the case in Ia.
Category II	Category II protected areas usually combine ecosystem protection with recreation, subject to zoning, on a scale not suitable for category I.
Category III	Category III protected areas are generally centred on a particular natural feature, so that the primary focus of management is on maintaining this feature, whereas objectives of Ia are generally aimed at a whole ecosystem and ecosystem processes.
Category IV	Category IV protected areas protect fragments of ecosystems or habitats, which often require continual management intervention to maintain. Category Ia areas on the other hand should be largely self-sustaining and their objectives preclude such management activity or the rate of visitation common in category IV. Category IV protected areas are also often established to protect particular species or habitats rather than the specific ecological aims of category Ia.
Category V	Category V protected areas are generally cultural landscapes or seascapes that have been altered by humans over hundreds or even thousands of years and that rely on continuing intervention to maintain their qualities including biodiversity. Many category V protected areas contain permanent human settlements. All the above are incompatible with category Ia.
Category VI	Category VI protected areas contain natural areas where biodiversity conservation is linked with sustainable use of natural resources, which is incompatible with category Ia. However large category VI protected areas may contain category Ia areas within their boundaries as part of management zoning.

Distance Criteria for Biodiversity Risk assessment

For EN11 indicator set criteria for Risk assessment in Picture 2.

Picture 2. Distance Criteria for Biodiversity Risk assessment

Proximity to Protected Area	Risk Criteria
Insufficient data to assess the location of the asset in relation to protected areas or areas of high biodiversity value	Insufficient Data
Protected area or area of high biodiversity value is greater than 5km from the asset.	Low
Protected area or area of high biodiversity value is greater than 2km or less than 5km of the asset.	Moderate
Protected area or area of high biodiversity value is immediately adjacent to or within 2km of the asset.	High
Asset is located *within* the Protected area or area of high biodiversity value.	Very High

3.2 Indicator for Biodiversity risk assessment EN12

EN12 indicator show results of assessment in direct impact or non-direct impact of IRPC area to protected area or high biodiversity value area. And use for database to study, understanding and develop to avoid and reduce impact for biodiversity. EN12 indicator describe in Table 4.

TABLE 4. Indicator

Indicator	Description
EN12	Description of significant impacts of activities, products and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.

Measurement

Parameter for measurement and source of data for EN12 indicator describe in Table 5.

TABLE 5. Parameter for measurement and source of data for EN12 indicator

Measurement	Information Source
Characterisation of impact: • Use of PTT assets; • Pollution from asset; • Introduction of invasive species, pests, and pathogens; • Reduction of species; • Habitat conversion; and • Changes in ecological processes outside the natural range of variation (e.g., salinity or changes in groundwater level). Impact description: • Species affected; • Extent of areas impacted;	• Characterisation of the potential types of significant impacts from asset types; • Information from PTT on threats (pollution, invasive species, habitat conversion, ecological processes) for each asset; • Readily available information from internet; and • ESIA undertaken for assets.

Measurement	Information Source
• Duration of impacts; • Reversibility or irreversibility of the impacts; and • Accident History.	

Assessment

For EN12 indicator assessment for indicated potential impact of biodiversity for example

- Trend of impact of biodiversity from IRPC plant
- Permanent or temporarily impact
- Stage of IRPC plant operation (Construction/operation phase or business closure)?
- Distance of Protected area or High biodiversity value area
- Mitigation for avoid or reduce impact

Method, Data for biodiversity risk assessment for EN12 describe in Picture 3.

Picture 3. Criteria for Biodiversity Risk assessment for EN12

Risk Associated with Size and Type of Asset		Proximity to nearest Protected area or area of High Biodiversity Value (EN11 Results)			
		Insufficient Data	EN11 Low > 5 km	EN11 Moderate 2 - 5 km	EN11 High or Very High < 2km
	Insufficient data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Low	Characterization of impacts from the asset indicates that the risk of significant impact is low	Insufficient Data	Low	Low	Moderate
Moderate	Characterization of impacts from the asset indicates that the risk of significant impacts is moderate	Insufficient Data	Low	Moderate	High
High	Characterization of impacts from the asset indicates that the risk of significant impacts is high.	Insufficient Data	Moderate	High	Very High

TABLE 6. Matrix important impact of Biodiversity

	Phase	Impact Type	Quantify	Duration	Reversibility/ irreversibility	Controls in Place	Accident History	Species Identified	*Asset Risk Ranking*
Pollution	Construction Operation Closure	None Air Soil Water Noise Waste Visual	No Data None Small Medium Large	No Data None Short Medium Long Permanent	No Data Yes No	No Data Emergency Yes No	No Data None Small Medium Large	No Data None Low Moderate High Very High	*Insufficient Data* *Low* *Moderate* *High* *Very High*
Pests and weeds introduced	Construction Operation Closure	None Invasive Native Species Pathogens Vertebrates Weeds Insects Parasites	No Data None Small Medium Large	No Data None Short Medium Long Permanent	No Data Yes No				*Insufficient Data* *Low* *Moderate* *High* *Very High*
Habitat Impact (clearing of vegetation)	Construction Operation Closure	None Broad scale Clearing Linear Clearing Patch Clearing Plantation Establishment Slash and Burn Agriculture Modified Habitat	No Data None Small Medium Large	No Data None Short Medium Long Permanent	No Data Yes No				*Insufficient Data* *Low* *Moderate* *High* *Very High*
Change in ecological process	Construction Operation Closure	None Salinity Groundwater Level Soil Contamination Vegetation Clearance Fire Forestry Agriculture	No Data None Small Medium Large	No Data None Short Medium Long Permanent	No Data Yes No				*Insufficient Data* *Low* *Moderate* *High* *Very High*

TABLE 7. Quantity of Biodiversity impact

Impact Type	Quantification	Information Source		Thresholds
Pollution	Determine the volume and type (Air, water, noise, waste, visual) of discharge/impact to the environment from pollution during the current phase of the asset's lifecycle. The pollution most likely to affect species and habitats should be assessed in the matrix. Where more than one discharge/impact occurs, the discharge of the greatest likely impact to species and habitats should be assessed. For example, effluent/water discharges to the marine or freshwater environment that is habitat for IUCN red list species would be of greatest likely impact.	Relevant licences or permits from the asset Discharge monitoring from the asset Proximity of adjacent protected areas and areas of high biodiversity value. Proximity of IUCN red list species records.	No Data	There is insufficient data available to determine the pollution from the asset and the likely effect on biodiversity values.
			None	No identified pollution from the asset
			Small	Pollution is within acceptable environmental standards*
			Medium	Pollution on occasion exceeds environmental standards*
			Large	Pollution exceeding acceptable environmental standards* on a regular basis
Pests and weeds introduced	Determine the distribution of the pests and weeds within and outside of the asset during the current phase of the asset's lifecycle. The pests or weeds introduced that are most likely to affect species and their habitats of concern should be assessed in the matrix. Where more than one pest or weeds are present, the pest or weed of greatest impact/distribution within and outside of the asset should be assessed. For example, weeds that have been introduced that have invaded a nearby protected area or area of high biodiversity value would be considered to be of greatest impact/distribution.	ESIA of the asset Information from asset managers Information from local or regional governments Proximity of adjacent protected areas and areas of high biodiversity value. Proximity of IUCN red list species records.	No Data	There is insufficient data on the number of pests and weeds introduced and/or their distribution.
			None	No pests or weeds introduced.
			Small	Pests or weeds introduced are restricted in its distribution within the asset boundary.
			Medium	Pests or weeds are distributed across all of the asset site area but within the boundary.
			Large	Pests or weeds are distributed within and outside the boundary of the asset.
Habitat Impact (clearing of vegetation)	Determine the area and type of vegetation cleared during the current phase of the asset's lifecycle. This should relate only to habitat cleared for the asset during the ownership of PTT. The clearing of habitat that is most likely to affect species and their habitats of concern should be assessed in the matrix. For example, clearing of habitat for critical or endangered IUCN red list species would be considered to be of most concern. Clearing that occurred prior to the procurement or establishment/construction of the asset by PTT should not be considered.	ESIA of the asset. Information from asset managers. Proximity of adjacent protected areas and areas of high biodiversity value. Proximity of IUCN red list species records.	No Data	There is insufficient data available on the clearing of habitat at the asset.
			None	No clearing of habitat.
			Small	Less than 1 ha of natural vegetation cleared
			Medium	Greater than 1ha but less than 5ha of vegetation
			Large	Greater than 5ha of vegetation cleared
Change in ecological process	Determine the change in ecological process that has occurred during the current phase of the asset's lifecycle. The changes in ecological processes that are most likely to affect species and habitats should be assessed in the matrix. Where more than one change in ecological processes is determined, the change in ecological processes of greatest impact should be assessed. For example, changes to groundwater levels that impact an adjacent waterway or wetland habitat would be considered of concern. The assessment should relate to the boundary of the asset and the scale of the impact outside of the boundary at a district or regional scale.	ESIA for the asset Information from asset managers. Proximity of adjacent protected areas and areas of high biodiversity value. Proximity of IUCN red list species records.	No Data	There is insufficient data on the likely change in ecological processes for the asset.
			None	No changes in ecological processes
			Small	Localized impact within the boundary of the asset
			Medium	Impact outside the boundary of the asset
			Large	Impact on a district/regional scale

* *"Environmental standards" means regulatory standards required to limit impacts on human health and/or the environment.*

Species Identification

Species Identification for 2 kilometers of IPRC plant for Protected area or high biodiversity value if more than one species should identify by high matrix of ICUN in Table 8.

TABLE 8. Species Identification

IUCN Category	Thresholds
Critically Endangered	Very High
Endangered	High
Vulnerable	Moderate
Near Threatened	Low
Least concern	Low
No species of concern likely to be detected*	Low
No species of concern detected	None
Insufficient information is available to make an assessment	No Data

**Determined by the proximity of the asset to habitats (protected areas and areas of high biodiversity value) indicating that no species are likely to be present; results from ecological studies and/or results from desktop searches using WWF Wildfinder and/or IBAT indicating that species are not likely to be present.*

Duration of impact

Duration of impact for evaluate time of impact show in Table 9.

Table 9. Duration of impact

Duration	Thresholds
Permanent	Greater than 2 years
Long	Greater than 6 months but less than 2 years
Medium	Greater than 3 months but less than 6 months
Short	Greater than one week but less than 3 months
None	No impact detected
Insufficient information is available to make an assessment	No Data

Reversibility of impact

Reversibility of impact in operation phase show in Table 10.

Table 10. Reversibility of impact

Criteria	Thresholds
The likely impact on species and habitats is likely to be irreversible within the lifecycle of the asset.	No
The likely impact to species and/or habitats is likely to be reversible within the lifecycle of the asset.	Yes
Insufficient information is available to make an assessment.	No Data

Likely impact on primary species

Likely impact on primary species in area from assessment show in Table 11.

Table 11. Likely impact on primary species

Criteria	Thresholds
An impact on a species is not likely during the species lifecycle based on the impact type (Refer to *Table 2.8*)	No
An impact on a species is likely during the species lifecycle based on the impact type (Refer to *Table 2.8*)	Yes
Insufficient information is available to make an assessment.	Uncertain

Controls in Place

Controls in Place mean standard or emergency plan for control risk for biodiversity describe in Table 12.

Table 12. Controls in Place

Criteria	Thresholds
No procedures in place to manage impacts on habitats or species.	No
Procedures and management standards/guidelines are in place to manage impacts on habitats or species	Yes
Insufficient information is available to make an assessment	Uncertain

Emergency Procedures

Emergency Procedures for emergency situation to reduce impact of Biodiversity show in Table 13.

Table 13. Emergency Procedures

Criteria	Thresholds
Satisfactory emergency procedures are current and in place that consider biodiversity values.	Yes
No emergency procedures are in place	No
Insufficient information is available regarding the emergency procedures.	Uncertain

Accident History

Accident History show accidents or emergencies situation occurs in area from past to present that impact to environment or biodiversity whether old or not, is very dangerous for the environment, whether at the local or regional level. Show in Table 14.

Table 14. Accident History

Criteria	Thresholds
One or more accidents that have not been contained within the asset site have caused harm to the environment and have ongoing environmental effects.	Large
One or more accidents that have not been contained on-asset and have caused harm to the environment since the establishment of the asset.	Medium
One or more accidents have occurred on the asset but these have been contained on-asset and have not impacted on the surrounding environment since the establishment of the asset.	Small
No history of accidents	None
Insufficient information is available to make an assessment	No Data

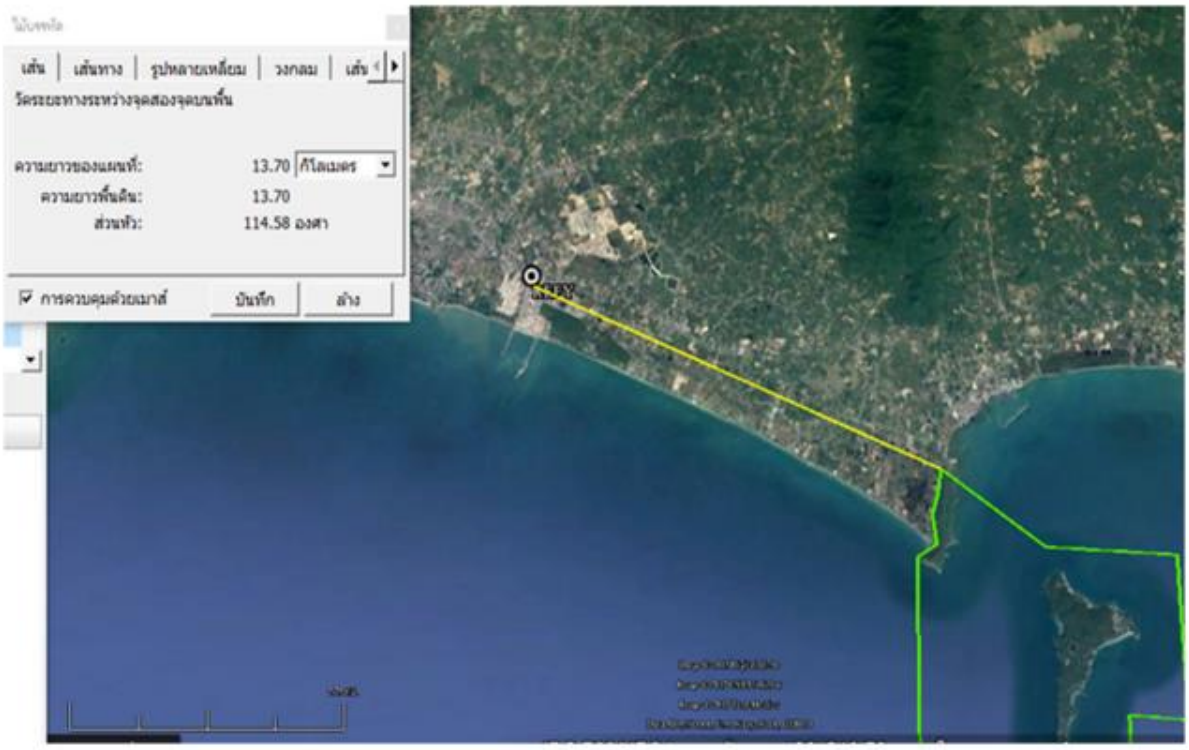
Example of Biodiversity risk assessment Report

Biodiversity risk assessment of Refinery Plant

1. **Biodiversity risk assessment for EN11 indicator**

1.1. Refinery plant location

1.2 National Park near of Refinery plant is Auttayan-Kao-Lham-Ya. The distance of two area are13.70 Km so from EN11 distance criteria for biodiversity risk assessment are more than 5 Km. Show in picture below.



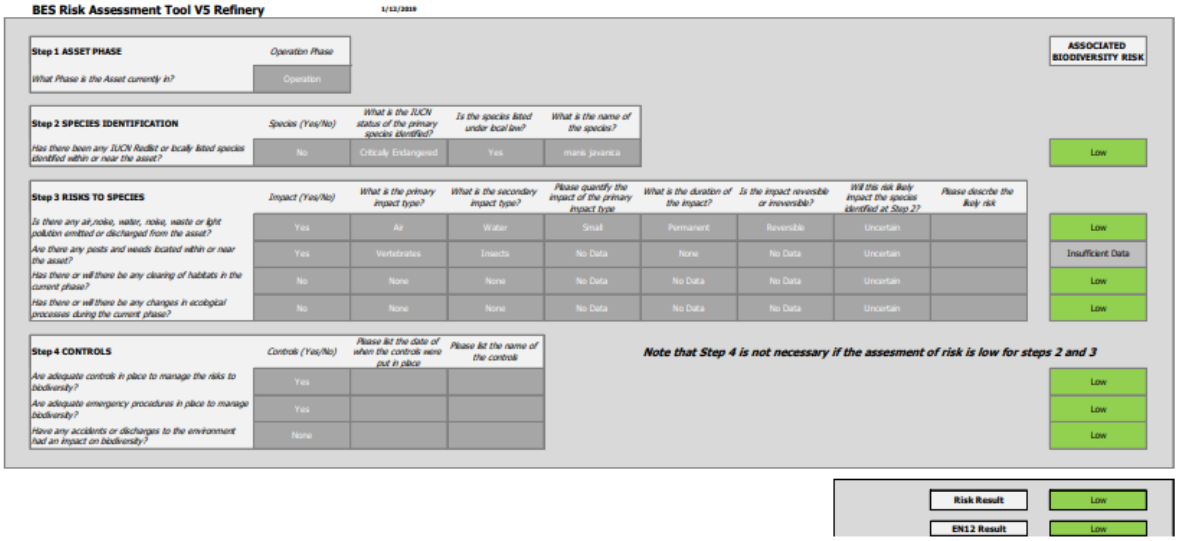
So from Distance Criteria for Biodiversity Risk assessment calculation by BES risk assessment tool V5 refinery. Risk assessment results are low.

BES Risk Assessment Tool V5 Refinery 1/12/2019

Distance to Protected Area	Name of Protected Area	IUCN Category	EN 11 Result
> 5 km	Khao Laem Ya	Category II	Low

2. Biodiversity risk assessment for EN12 indicator

From criteria for Biodiversity risk assessment for EN12 and calculation by BES risk assessment tool V5 refinery. Risk assessment results are low.



3. **Results of Biodiversity risk assessment for Refinery plant**

BES Risk Assessment Tool V5 Refinery

GRI Risk Assessment Result

EN11	Low
EN12	Low