# Biodiversity Commitment, Biodiversity Exposure & Assessment

RATCH has outlined the operational guidelines for the development and construction of new projects or acquisitions. Under the Environmental and Social Management System (ESMS), it is compulsory to have all aspects of risks to biodiversity assessed as required by law and universal standards. In addition, RATCH has the policy not to invest in projects in areas that may pose adverse risks on World Heritage Site, historical sites, or areas that boast high biodiversity and habitats of endangered species, endemic species or near-extinction species, based on the International Union for Conservation of Nature (IUCN)'s Red Lists.

The following is the ESMS's biodiversity management procedure in the project development and construction stage:

| Steps | Procedure |
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| ❶ **Biodiversity screening** | • Business development unit integrate biodiversity risk assessment into the project's environmental and social impact assessment (ESIA).<br>• Gathering data for the analysis of biodiversity sensitivity at the site including location, project size, and baseline biodiversity or existing species of living beings.<br>• Seeking legal advice if the location is a biodiversity-sensitive areas or the habitats of species on IUCN's Red Lists. |
| ❷ **Biodiversity baseline study** | • Business development unit appoints ecologists or ecology experts to prepare the biodiversity baseline study at the site: to obtain data on ecological characteristics, meteorological geographical features and others.<br>• Experts prepare the list of species significant to biodiversity in consultation with stakeholders like local community and local experts.<br>• Scheduling seasonal surveys at areas with high risks to biodiversity to monitor changes that may be subjected to seasonal changes or climate change while areas with medium risks may require an annual survey or a single season survey, to obtain baseline data for comparison.<br>• Applying data from previous ESIA as biodiversity baseline, to identify the risks from current operations. |
| ❸ **Assessment of biodiversity impacts** | • Assessing direct and indirect impacts from the project: e.g. dust; air/water pollution; and noise and vibration that may affect food sources and habitats or cause migration or a decrease in species or population density. |

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| | • Assessing the severity of impacts on each type of living organisms in the affected area, periods of time when impacts are felt, and restorability.<br>• Assessing the impacts and determining if the project requires the Biodiversity Action Plan (BAP), prepared with universally-accepted and reliable tools or approaches like TNFD's LEAP, IBAT and WWF Biodiversity Risk Filter. |
| ❹ **Biodiversity Action Plan (BAP)** | • BAP is prepared for a project with high and possibly-uncontrollable impacts on biodiversity or when required by law or the licensing authority.<br>• BAP outlines the boundary of operations, work plans, objectives, targets and responsible persons. The plan requires the engagement of relevant stakeholders for suitability and completeness to encompass, for example, species, habitats or ecosystems to be preserved, species with possible population decrease, the emergence of invasive species, change/loss of habitats, and factors that may permanently damage the ecosystem and biodiversity.<br>• Identifying details of the operations and performance indicators for impact-mitigating measures and positive impacts based on the Mitigation Hierarchy's framework (Avoid, Reduce, Regenerate, Restore and Transform). The goals are to achieve No Net Loss (NNL) or Net Gain (NG) in biodiversity.<br>• Informing stakeholders and relevant parties of the results of biodiversity impact mitigation and conservation actions under BAP. |

## Monitoring of biodiversity management

The 19 power plants under RATCH's operational control (contributing 83.08% of annualized revenue) conducted the biodiversity impact assessment and found 8 projects showing biodiversity risks. Action plans have been prepared for implementation at the projects and neighboring areas.

Three projects were included in the scope of biodiversity reporting in 2024: 1) 770 MW Hin Kong Power Plant (Unit 1) in Ratchaburi province, located on a 188-rai or 30.2-hectare area; 2) Lincoln Gap Wind Farm in Australia covering 6,800 hectares; and 3) Snapper Point Power Station on a 27.3-hectare area in Australia. They were assessed for impacts on biodiversity and actions have been in place to monitor the impacts on aquatic and terrestrial beings as required by law.

The monitoring results in 2024 at all power plants yielded insignificant changes as all have fully complied with the rules and measures specified in EIA/EHIA and Biodiversity Action Plan (BAP).

| Details | No. of plants (Site) | Area (hectare) |
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| Combined operating area | 19 | 31,866.7 |
| Assessment of impacts on biodiversity | 18 | 31,861.9 |
| Areas showing impacts on biodiversity | 8 | 30,768.1 |
| Areas with biodiversity management plans | 8 | 30,768.1 |

## Biodiversity conservation at Thailand-based IPPs

Two independent power producer (IPP) power plants – Ratchaburi Power Plant and Hin Kong Power Plant which cover 2,015 rai (322.4 hectare) and 188 rai (30.2 hectare), respectively – have assessed the impacts in the construction and operational stages and devised prevention/mitigation measures. Details are as follows:

| Ratchaburi Power Plant (322.4 hectare) | |
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| Impact assessment | The operation affects wildlife's habitat and food sources, the ecosystem and aquatic living organisms. That concern six groups of living beings – birds, mammals, amphibians, reptiles, plankton (phytoplankton and zooplankton) and benthos. |
| Monitoring measures | Biannual surveys of wildlife population and species as well as the diversity index of living organisms in wastewater ponds. |
| Monitoring results in 2024 | Wildlife<br>The surveys found 109 species of wild animals and none of them was considered endangered species under the Wildlife Reservation and Protection Act B.E. 2562 (2019). Of total, 87 species were protected under the law. Details are as follows:<br>➢ 6 mammal species<br>➢ 87 bird species, with 84 being protected mostly because of their natural beauty or their help in attacking agricultural pests. The protected species included *Dendrocygna javanica, Cypsiurus balasiensis*, *Acridotheres tristis*, *Dicaeum cruentatum, Ploceus philippinus,* and *Lonchura punctulate.*<br>➢ 9 reptile species, with 3 being protected (*Calotes versicolor, Varanus salvator, and Ptyas korrs).*<br>➢ 7 amphibian species |

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| | Changes<br><br>In the year, wildlife species increased by 1 and bird species increased by 2, while amphibian species decreased by 1. In the 27-year monitoring period, few changes have been recorded. The wildlife still find the ecology desirable for their habitats, breeding, nesting and as a food source. Wildlife species was numbered in the range of 61-118 in the years, being visible at the site and surrounding areas when the conditions – like weather, season, land use pattern, quality and quantity of food, human interference - were favorable.<br><br>**Wildlife classification by conservation status**<br><br>➢ **By status of threatened wildlife in Thailand in 2020:** 109 species were classified threatened species.<br>- **Near Threatened (NT):** 2 bird species which are *Athene brama* and *Ploceus manyar.*<br>- **Vulnerable (VU):** 1 bird species (*Ardea purpurea*) and 1 mammal species (*Pteropus lylei*)<br>- **Least Concern (LC):** 105 species are least concern species due to abundance in the wild and low risk of extinction (7 amphibian species, 9 reptile species, 84 bird species, and 5 mammal species).<br>- None is considered endangered (EN) species.<br><br>➢ **International Union Conservation of Nature; IUCN (2024):** 109 species were classified<br>○ Near Threatened (NT): 1 species (*Ptyas korros*)<br>○ Vulnerable (VU): 1 species (*Pteropus lylei*)<br>○ Least Concern: 107 species (7 amphibian species, 8 reptile species, 87 bird species, and 5 mammal species) |
| | Aquatic living beings<br><br>The 2 surveys on phytoplankton, zooplankton and benthos in Khlong Bang Pa (a point of Ratchaburi Power Plant's discharge) in January and July 2024 showed the diversity index of phytoplankton in the range of 2.55-2.70, zooplankton 1.45-1.74 and benthos 0.99-1.22. Compared with the Wilhm and Dorris biological parameters, this showed the water quality at the power plant's discharge point remained liveable. The only change concerned the diversity and density, which was unstable due to the unstable conditions of the waterways. The diversity and density also varies in different seasons. |

| Hin Kong Power Plant (30.21 hectare) | |
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| Impact assessment | **- Terrestrial biological resources**<br><br>The operations will not cause loss of forest areas as the project is surrounded by agricultural land, urban areas and the military forest zone. During the construction stage, wildlife may be affected by noise and air pollution but in the operational stage, they can return to the surrounding areas for their habitats and a food source.<br><br>**– Aquatic biological resources**<br><br>As the construction may lead to sediment discharge to waterways, earth bunds were constructed around the site to prevent the impact. In the operational stage, the quality of water discharge may affect aquatic biological resources like phytoplankton, zooplankton, benthos, aquatic animals and aquatic plants. |
| Monitoring measures | The sum of species, density and diversity index of aquatic biological resources – phytoplankton, zooplankton, benthos, aquatic animals and aquatic plants – are monitored at the point of discharge, and 500 meters up and down, twice a year (during rainy and drought seasons). |
| Monitoring results | Aquatic animals<br><br>The diversity index of phytoplankton, zooplankton, benthos, and aquatic animals was quite similar. Compared with the Wilhm and Dorris biological parameters (1968), it showed the point of discharge remained liveable. An exception concerned benthos at the point of discharge, where the water quality was not liveable in some seasons (with diversity index below 1.0). |

## Biodiversity conservation by Thailand-based SPPs

| Power Plant | Significant impacts | Monitoring measures | Monitoring results in 2024 |
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| **Berkprai Cogeneration Power Plant (Area: 8.6 hectare)** | The release of wastewater from the production process to Mae Klong River may affect the ecosystem and living organisms in water – phytoplankton, Zooplankton, benthos and aquatic plants. | Tracking biannually, in rainy and drought seasons, the sum of species, abundance, and density to calculate the biodiversity index of living organisms in water – phytoplankton, Zooplankton, benthos, baby aquatic animals and fish eggs at the point of | - In May and October, surveys were conducted to find the sum of species, abundance, and the diversity index of phytoplankton, zooplankton, benthos, baby aquatic animals and fish eggs at points of water withdrawal and discharge. |

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| | | water withdrawal and discharge- 500 meters above the point of discharge, and 50, 500, 1000 meters below the point of discharge. | - The surveys showed quite similar diversity index of phytoplankton, zooplankton, and benthos and low density of baby fish. Fish eggs were not found. |
| **NNEG Power Plant and the Expansion (Area: 6.9 hectare)** | The release of wastewater from the production process to Khlong Chiang Rak Noi may affect the ecosystem and living organisms in water – phytoplankton, zooplankton, benthos, fish eggs and baby fish, if the water treatment does not meet required standards. | Tracking biannually the sum of species, abundance, and density to calculate the biodiversity index of living organisms in Khlong Chiang Rak Noi. As additional measures, the power plant has dredged and collected waste in the canal, to restore the water quality; and released fish to increase the varieties in collaboration with communities and relevant offices since 2017. | - In April and November, surveys were conducted to find the diversity index of phytoplankton, zooplankton, and benthos and the density of fish eggs and baby fish in Khlong Chiang Rak Noi, a wastewater receiving area of Nava Nakorn Industrial Zone, at the point of discharge, above and below.<br>- The surveys found the diversity index of phytoplankton, zooplankton, and benthos and the density of fish eggs and baby fish was similar at all points, depending on water quality in each season. |
| **RATCH Cogeneration Power Plant (Area: 8.1 hectare)** | The operation does not cause impacts on the ecosystem and biodiversity as the project is located in a city area and treated wastewater is transported to other organizations for reuse. | Not specified | Not specified |

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| **RATCH Energy Rayong Power Plant (Area: 4.6 hectare)** | The assessment of impacts on the environment and biodiversity showed no risks or impacts on living beings. | Not specified | Not specified |

**Biodiversity conservation at renewable power plants abroad**

| Power Plant | Significant impacts | Points to monitor | Monitoring results |
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| **Collinsville Solar Farm (Area: 70.9 hectare)** | The impact assessment on environment and biodiversity caused of its operation showed no risks or impact on living beings. | Not specified | Not specified |
| **Mt. Emerald Wind Farm (Area: 2,400 hectare)** | The construction and operational phases can affect the animal habitats, abundance and species. | Tracking the sum and variety of native animals, once a year for birds and bats and twice a year for quolls, at 5 sampling locations (including 2 locations at the project site) | The surveys in 2024 showed the number of birds, bats and quolls was similar and unaffected by the operations. |
| **Yandin Wind Farm (Area: 15,000 hectare)** | The construction and operation cause impacts on living beings, such as native fauna or birds that may collide with wind turbines, cables or maintenance vehicles. | Tracking the sum of species and variety of native birds and plants every 2 years. | The survey found no carcasses and no incident of birds colliding with wind turbines. |
| **Collector Wind Farm (Area: 6,200 hectare)** | The construction and operations cause impacts on plants, animals, forest land and pastures. | Tracking the sum and species of birds and bats annually and surveying animal carcasses on a monthly basis. | The survey found carcasses of birds at the sampling locations, but they are not protected or rare species. |

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| **Lincoln Gap Wind Farm (1-2-3) (Area: 6,800 hectare)** | The construction and operations cause impacts on plants, animals, forest land and pastures. | Tracking the sum and species of birds and bats annually. | The survey results in 2024 were similar to those in 2023, and birds and bats were unaffected by the operations. |
| **Snapper Point Power Station (Area: 27.3 hectare)** | The assessment of impacts from the operations showed no risks or impacts on living beings. | Not specified | Not specified |
| **Asahan-1 Hydroelectric Power Plant (Area: 40.9 hectare)** | The construction and operations cause impacts on plants, forest land and wildlife habitats. | The project does not specify the points for monitoring but rather sets to restore forest land to substitute the loss of forests due to the project development. | In 2024, trees were planted around the Lake Toba catchment area in Toba, North Sumatra, to restore forests and ecosystem affected by the project development. |