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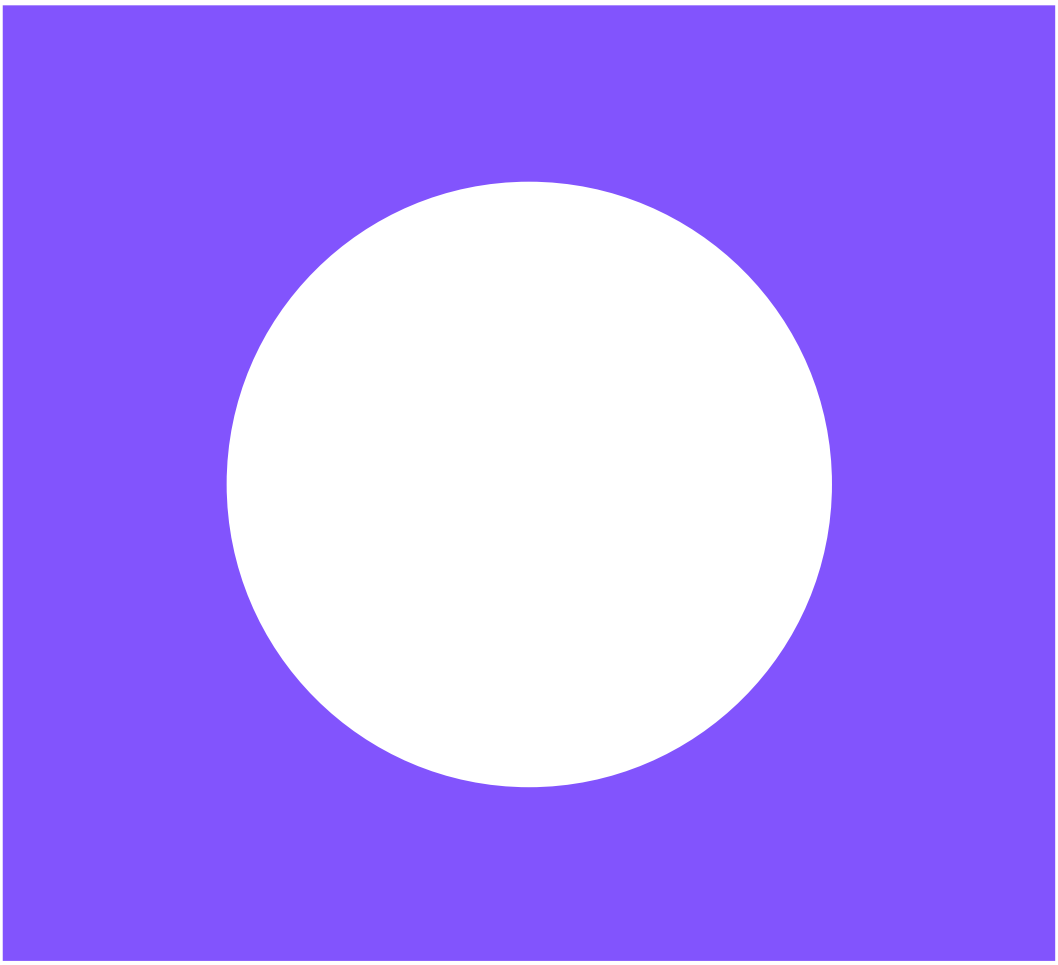

Greater Changhua Southwest Offshore Windfarm in Taiwan

Biodiversity Action Plan

June 2025

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Biodiversity Action Plan

June 2025

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	25 Sep 2024	S Toh K Cheung SC See	J Tham	B Lim	First draft for Ørsted review
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C	10 Jan 2025	YUTCH	YUTCH	YUTCH	Final report for LESA's review
D	7 February 2025	S Toh SC See	J Tham	B Lim	Final report for LESA's review
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F	13 June 2025	S Toh S Lee	SC See	B Lim	Revised final addressing Ørsted's comments, for LESA's review

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Executive summary

The Greater Changhua Offshore Windfarm SW Ltd. is a special purpose vehicle established by Ørsted Wind Power TW Holdings A/S (Ørsted) to develop the proposed Greater Changhua Southwest (SW) Offshore Wind Farm in Taiwan (herein referred to as the "Project"). The Project is located approximately 50km offshore from the coast of Changhua County, Taiwan.

The Project is located in Taiwan, off the coast of Changhua County. The offshore wind farm area selected was zone #14 of the list of proposed offshore wind farm sites in Taiwan, defined by the Bureau of Energy (BOE). the Project comprises of two phases, namely:

- Phase 2a consists of 36 wind turbine generators (WTGs), each of 8MW capacity. All Phase 2a WTGs are in operational phase, having received an updated EBL for all its WTGs on 6 February 2024. The EBL expires on 9 May 2043.
- Phase 2b is currently under planning to commence the construction phase for its OWF components. The offshore construction is expected to commence in Q1 of 2025, alongside Greater Changhua 4. This phase will comprise of 24 WTGs, each of 14MW capacity.

As part of the requirements for obtaining project financing, the Project may be required to demonstrate adherence to the Equator Principles (EP). Mott MacDonald has been commissioned by Ørsted to undertake a Biodiversity Action Plan (BAP), alongside other environmental and social documents.

This report presents a BAP which incorporates the outcomes of a Critical Habitat Assessment (CHA) (Mott MacDonald, 2024a) and Cumulative Impact Assessment (CIA) (Mott MacDonald, 2024b), both carried out in 2024. The aim of this BAP is to ensure that the Project implements the mitigations presented in the CHA and CIA, complies with national legislation and regulations and international standards including the EPs, the International Finance Corporation Performance Standards (IFC PSs), the World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines and good international industry practice (GIIP) pertaining to biodiversity. The overall goal is to achieve a net gain for species for which critical habitat has been determined as defined by the IFC PS6 assessment process as well as no net loss of natural habitats and species groups with significant residual impacts (such as migratory bird from land based important bird and biodiversity areas).

A CHA has been undertaken by Mott MacDonald following IFC PS6 criteria. The Project was found to trigger critical habitat for the following biodiversity values:

- Marine flora and fauna:
  - Taiwanese humpback dolphin (*Sousa chinensis ssp. Taiwanensis*) (C1a and C2)
  - Taiwanese Wedgefish (*Rhynchobatus immaculatus*) (C1a)
  - Taiwan Picnic Seabream (*Acanthopagrus taiwanensis*) (C2)
- Migratory birds (including seabirds at sea):
  - Black-faced spoonbill (*Platalea minor*) (C1a and C3)
  - Saunders's Gull (*Saundersilarus saundersi*) (C1c and C3)
  - Oriental stork (*Ciconia boyciana*) (C1a, C1c and C3)
  - Chinese crested tern (*Thalasseus bernsteini*) (C1a, C1c and C3)
  - Kentish Plover (Charadrius alexandrinus) (C3)
- Ecologically appropriate area of analysis (EAAA) for marine fauna and flora (C5)

A total of six BAP actions are outlined in this document as per the final stage of the mitigation hierarchy to achieve no net loss in natural habitats and net gain of critical habitat features in accordance with IFC PS6 guidance. The losses and gains of marine fauna are measured qualitatively, while migratory birds, including seabirds at sea are assessed both qualitatively and quantitatively.

Actions for marine fauna include the following additional conservation actions:

- Action 1: Collaboration between other windfarm developers, researchers, NGOs, regulators and cross sector partners to monitor and evaluate cumulative biodiversity impacts on marine fauna, especially Taiwanese Humpback Dolphin and Taiwan picnic seabream to identify if additional management measures are required.
- Action 2: Establish, implement, and support educational activities and stakeholder engagement related to conservation of marine habitat and species in the wider area of the Project.
- Action 3: Support academic research on critical habitat trigger species

Actions for migratory birds (including seabirds at sea) include the following additional conservation actions and offsets:

- Action 4: Collaborate with other Taiwanese offshore windfarm developers, researchers, NGOs regulators and cross sector partners to monitor and evaluate cumulative biodiversity impacts on migratory seabirds and bird species with significant collision risks to identify if additional management measures are required.
- Action 5: Restoration and enhancement of wading bird habitat for the critical habitat bird species and non-critical habitat trigger species with significant collision risks
- Action 6: Restoration and enhancement of seabird habitats for the critical habitat bird species and non-critical habitat species with significant collision risks

1 Introduction

1.1 Overview

The Greater Changhua Offshore Wind Farm SW Ltd. (herein referred to as “Project Company”) is a special purpose vehicle established by Ørsted Wind Power TW Holdings A/S (Ørsted) to develop the proposed Greater Changhua Southwest (SW) Offshore Wind Farm in Taiwan (herein referred to as the “Project” or “CHW02”). The Project is located approximately 50km offshore from the coast of Changhua County, Taiwan.

The Project is planned in compliance with the “Offshore Wind Farm Site Application Regulation”, stipulated by the Energy Administration[1], Ministry of Economic Affair (EA, MoEA) on 2 July 2015. The regulation gives endorsement to offshore wind energy development for developers to promote nuclear-free homeland by the year of 2025.

In 2022, the National Development Council (NDC) published Taiwan’s Pathway to Net-Zero Emissions by 2050. The plan is to decarbonise the electrical sector and targeted 60% renewable energy come 2050[2]. As of 2023, the electricity generation comprised of 42.2% coal-fired, 39.5% liquefied natural gas (LNG)-fired, 6.3% nuclear, 9.5% renewable energy and 2.4% of other types of energy.

As part of the Project’s project financing approach, the Project potentially needs Equator Principles (EP) compliance. Therefore, Mott MacDonald have been commissioned by Ørsted to undertake the Biodiversity Action Plan(BAP), alongside other environmental and social services.

1.2 Aims and objectives

The BAP is a plan which includes a set of actions that lead to the conservation and enhancement of biodiversity for a specific site or project. Specifically, the BAP is needed to ensure that the Project:

- Consolidates the Project’s biodiversity related actions and mitigations within the following documents:
  - Greater Changhua SW Offshore Windfarm environmental impact statement (EIA) and its appendices (大彰化西南離岸風力發電計畫 環境影響說明書) (Unitech, 2018)
  - Greater Changhua SW Offshore Windfarm EIA addendum and its appendices (大彰化西南離岸風力發電計畫 環境影響差異分析報告) (Unitech, 2021)
  - Critical Habitat Assessment (CHA) (Mott MacDonald, 2024a)
  - Cumulative Impact Assessment (CIA) (Mott MacDonald, 2024b)
- Complies with national legislation/policy requirements
- Complies with international standards such as the Equator Principles (EP), International Finance Corporation Performance Standards (IFC PSs), World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines and good international industry practice (GIIP) pertaining to biodiversity.

[1] Formerly known as Bureau of Energy (能源署); renamed the Energy Administration on 26 September 2023.

[2] Lau, Hon Chung and Steve C. Tsai (9 July 2022). A Decarbonization Roadmap for Taiwan and Its Energy Policy Implications. *Sustainability*. Sustainability | A Decarbonization Roadmap for Taiwan and Its Energy Policy Implications (mdpi.com). Retrieved 30 July 2024.

This BAP describes the Project's strategy that is designed to achieve net gains of those biodiversity values for which critical habitat was identified as well as no net loss in natural habitats and for other priority species groups described in Section 4.4. Regarding critical habitat, the Project must meet the following requirements as per Paragraph 17 of the IFC PS6 (IFC, 2012a):

- 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 throughout the project lifecycle.
- The Project's management program includes a robust, appropriately designed, and long-term biodiversity monitoring and evaluation program.

1.2.1 Applicability

The biodiversity management and mitigation measures documented in this BAP is applicable to the design, construction and operational phase (throughout the project lifecycle) of the Project. Decommissioning will occur after 20 to 25 years and is considered to be the reverse process of construction.

The impacts of construction are considered to be similar for decommissioning in this BAP. However, these impacts should be re-assessed before decommissioning and this BAP to be updated if necessary. The Project does not have any plan for repowering at the time of writing. Should there be plans for repowering in the future, the impacts should be assessed at that time and this BAP updated whenever necessary.

The aim of this document is to ensure that a consistent approach is taken towards the identification, control, management and reduction of biodiversity risks and impacts associated with the construction and operation activities of the wind turbine generators (WTGs), submarine cables, offshore substation and the onshore components. The proposed biodiversity actions in this BAP will include possible synergies with other windfarm developments for achieving net gains of the biodiversity values for which critical habitat was identified. However, the success of applying such measures will also rely on the commitment of other windfarm developers in the same area. This BAP is intended to be a live document and is subjected to reviews and updates as the Project progresses.

1.3 Project background

The Project is being developed on the 14th Zone of Potential in Changhua County (彰化縣) according to the Offshore Wind Farm Site Application Regulations announced by the Bureau of Energy, Ministry of Economic Affairs (MOEA) on 2 July 2015[3]. The Project's offshore windfarm area will be approximately 126.3km^2 in size and located 50km offshore from Xianxi Township (線西鄉), Changhua County, on the western coast of Taiwan (see Figure 1.1).

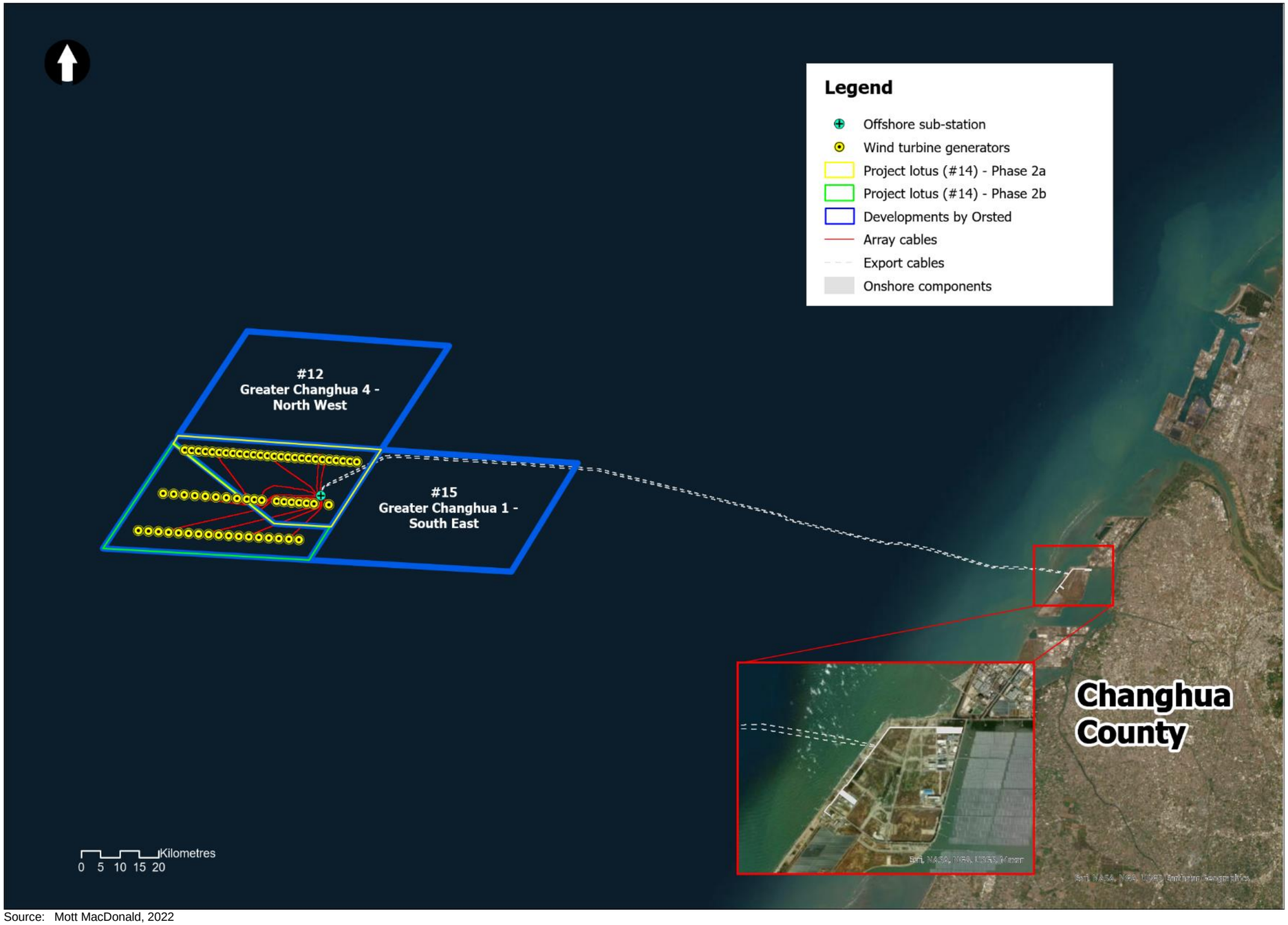
The Project is adjacent to other OWF developments which are also owned by Ørsted. These OWFs are namely:

- East of the Project – Greater Changhua South East, comprising of 75 WTGs, with a capacity of 605.2MW. This OWF development is known as "Greater Changhua 1". Greater Changhua 1 is currently operational, having obtained its electricity business license (EBL) covering all WTGs with the last batch obtained in Q3 2024.

[3] Energy Administration, Ministry of Economic Affairs (2 July 2015). Offshore Wind Farm Site Application Regulations (離岸風力發電規劃場址申請作業要點). Retrieved 30 July 2024.

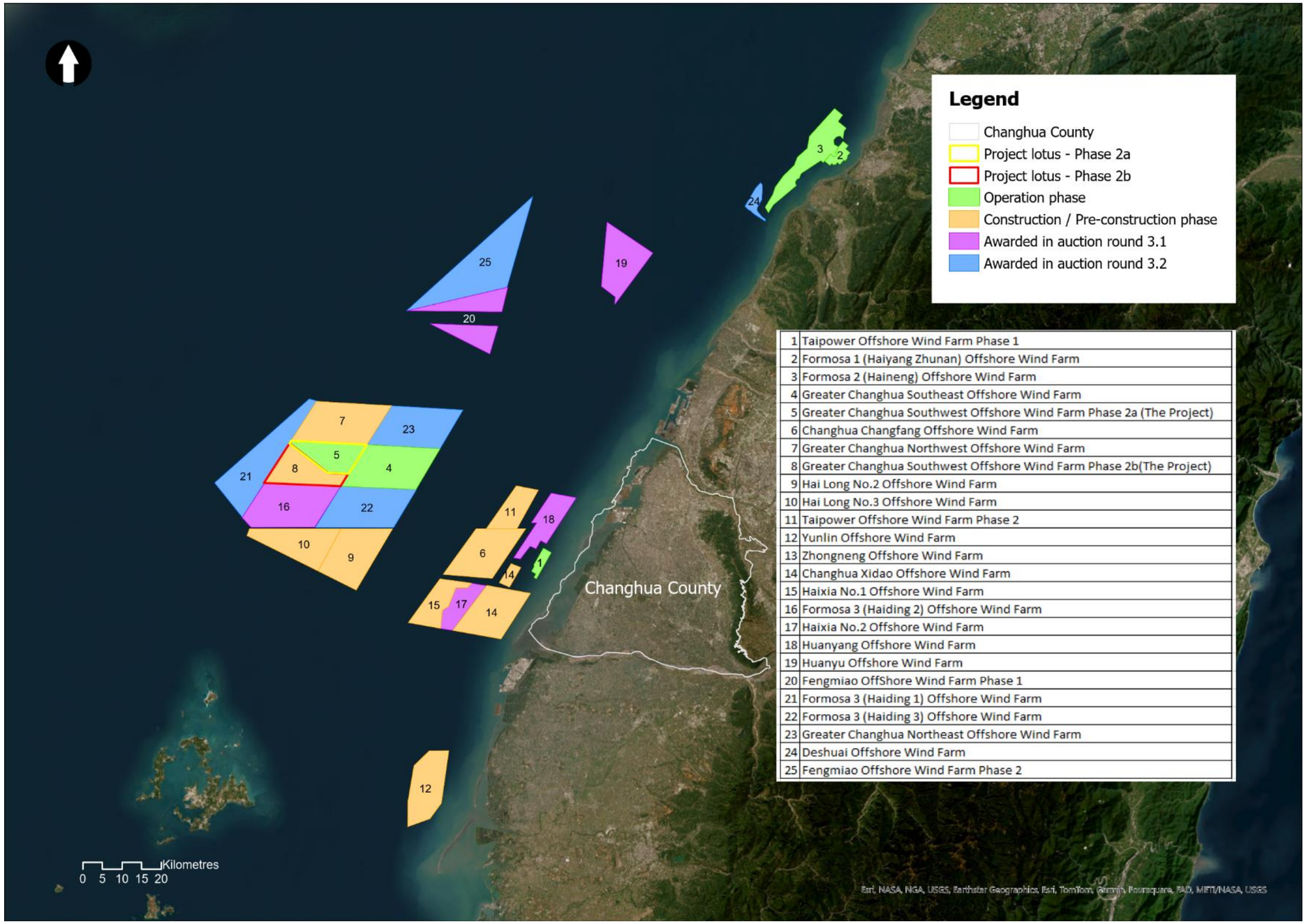
- North of the Project – Greater Changhua North West, comprising of around 42 WTGs, with a capacity of 582.9MW. This OWF development is known as “Greater Changhua 4”. Greater Changhua 4 is currently planning construction of its OWF components. The offshore construction is expected to commence in Q1 of 2025.

Figure 1.1: Location of Greater Changhua 2 and proximity to Greater Changhua 1 and Greater Changhua 4



Source: Mott MacDonald, 2022

Figure 1.2: Proximity of Greater Changhua Offshore Wind Farm Northwest and surrounding windfarms



Source: Mott MacDonald, 2024

As seen in Figure 1.1, the Project comprises of two phases, namely:

- Phase 2a consists of 36 wind turbine generators (WTGs), each of 8MW capacity. All Phase 2a WTGs are in operational phase, having received an updated EBL for all its WTGs on 6 February 2024. The EBL expires on 9 May 2043.
- Phase 2b is currently under planning to commence the construction phase for its OWF components. The offshore construction is expected to commence in Q1 of 2025, alongside Greater Changhua 4. This phase will comprise of 24 WTGs, each of 14MW capacity.

The Project had successfully obtained regulatory approval for its EIA report (ie covering both phases) on 23 March 2018.

The planned aggregated capacity for the Project is 632MW (ie from a total of 60 WTGs), with Phase 2a generating 294.8MW and Phase 2b aiming to generate 337.1MW. The WTGs will be located at water depths approximately 23.8m to 42.2m below mean sea water level (MSWL). Each phase has its own grid connection point, connecting to two different OnSS then two different Taiwan Power Company (TPC) onshore substations (OnSS).

Other project components include inter-array and export transmission cabling to connect to TPC's electrical grid, as well as various operational support vessels and ancillary facilities. The operation period is planned for 35 years, based on the asset life.

1.4 Document structure

The BAP is structured as follows:

- **Section 1** (ie this section) outlines the aims and objectives of the BAP and background of the Project.
- **Section 2** of this document describes the methodology and processes required for undertaking this BAP, including the spatial and temporal scope of the BAP, applicability of the mitigation hierarchy and consultation undertaken with stakeholders.
- **Section 3** presents a summary of applicable national legislation and international standards.
- **Section 4** presents a summary of the biodiversity baseline, including internationally recognised and legally protected areas, natural/modified habitats, and flora and fauna species of conservation importance.
- **Section 5** provides a summary of impacts and mitigations of the Project on critical habitat trigger species.
- **Section 6** presents the BAP actions to be undertaken by the Project.
- **Section 7** presents the biodiversity monitoring and evaluation plan.
- **Section 8** provides the staff roles and responsibilities to implement the BAP.
- **Section 9** presents the reporting and evaluation of the BAP implementation.

2 Approach and methodology

2.1 BAP methodology

The production of this BAP is based on recommendations and findings from both the Project's Critical Habitat Assessment (CHA) (Mott MacDonald, 2024a) and Cumulative Impact Assessment (CIA) (Mott MacDonald, 2024b) which have been consolidated and reflected as an action plan within the BAP.

The BAP is an overarching document that is intended to be used by Ørsted and Contractors' environmental managers. Some mitigation actions in the BAP will be translated into more detailed plans, or more specific method statements for different construction activities and integrated into a project's environmental and social management system (ESMS), which defines parties responsible for an action, monitoring and/or verification requirements of an action, and an implementation schedule or frequency for an action. A summary of the Project's impacts and mitigation measures can be referred to in Section 5.

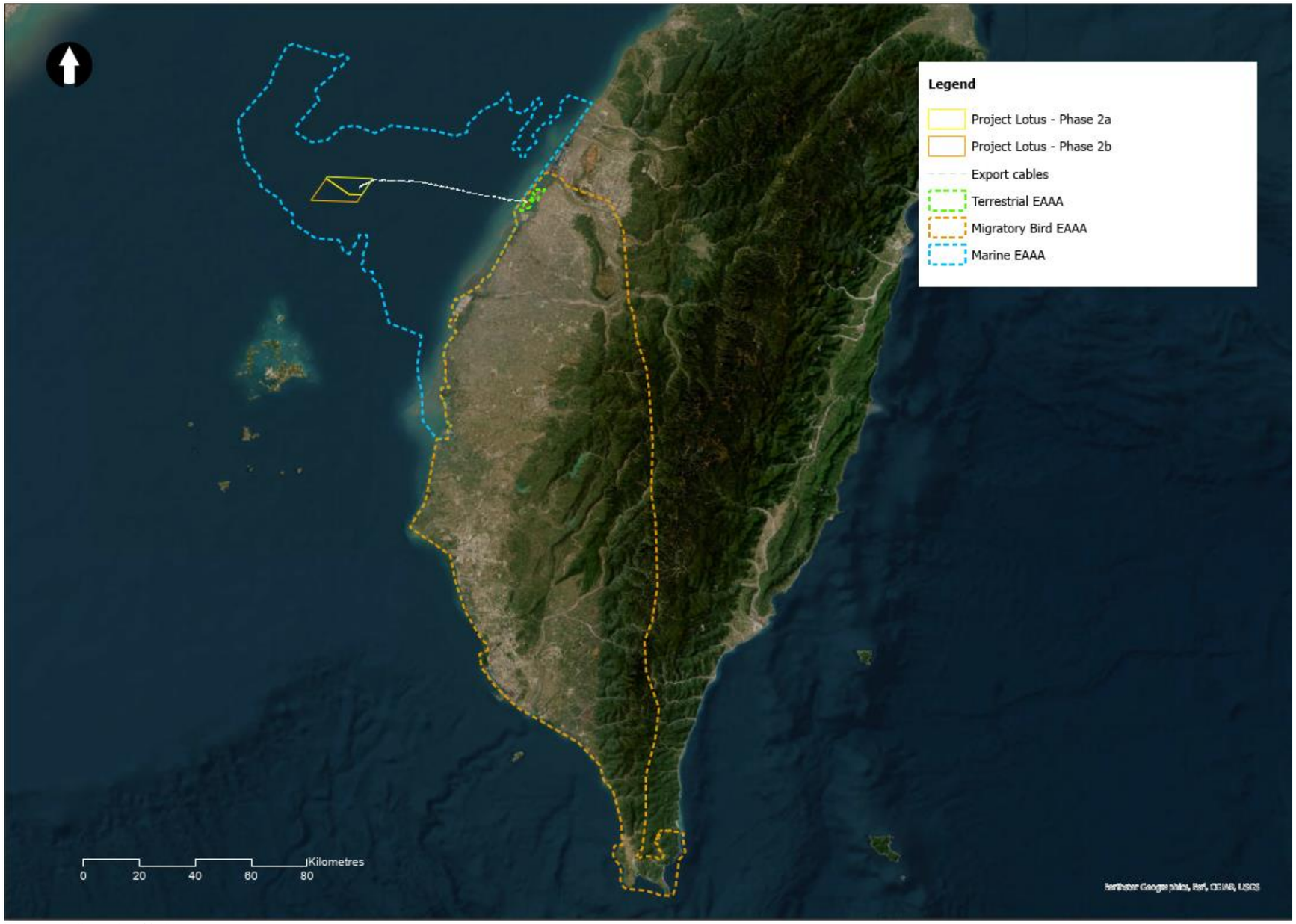
The implementation of the BAP will ensure that the management of biodiversity issues relevant to the Project is in accordance with the applicable standards of the Project, which includes national legislation and regulations, as well as international standards such as the Equator Principles (EPs), the International Finance Corporation's (IFC) Performance Standards (PSs), the World Bank Group (WBG) Environmental, Health and Safety Guidelines (EHS) Guidelines and good international industry practice (GIIP) pertaining to biodiversity.

2.2 Spatial and temporal scope of the BAP

The general location of the Project and the main Project components are shown in Figure 1.1. The Study Area for this BAP is illustrated in Figure 2.1 and represents the combined area (approximately 17,758.42 km^2) of the three Ecologically Appropriate Areas of Analysis (EAAAs) defined in the CHA for this Project. As such, this BAP covers both Phases 2a and Phase 2b of this Project. To comply with the IFC PS6 requirements (IFC, 2012a), the BAP Study Area is larger than the Area of Influence (AoI) of the Project. The temporal scope of this BAP is for 25 years overall (in line with the Project's planned operation period) but individual actions have separate timescales (see Section 6).

Although this BAP is exclusive for CHW02, it should be noted that the measures for this Project are developed in collaboration with those of CHW04 to maximise resources and impact. However, the inputs and outputs are distinguished based on each wind farm's aggregated capacity.

Figure 2.1: BAP study area (including three EAAAs) and project components



Source: Mott MacDonald, 2024

2.3 Process of the BAP

It is important to recognise that a BAP is not just the production of a single document which details what actions are needed for the conservation and management of biodiversity, but a process from which the document is formulated through the review of previous studies and from consultation with local stakeholders. The local EIA is part of this process whereby the BAP objectives and conservation priorities draw references from the ecological baseline gathered during the EIA process.

Table 2.1 below details the various tasks/components in this BAP as well as references to relevant external documents. This BAP was informed by findings of the Project's CHA and CIA.

Table 2.1: Summary of BAP tasks

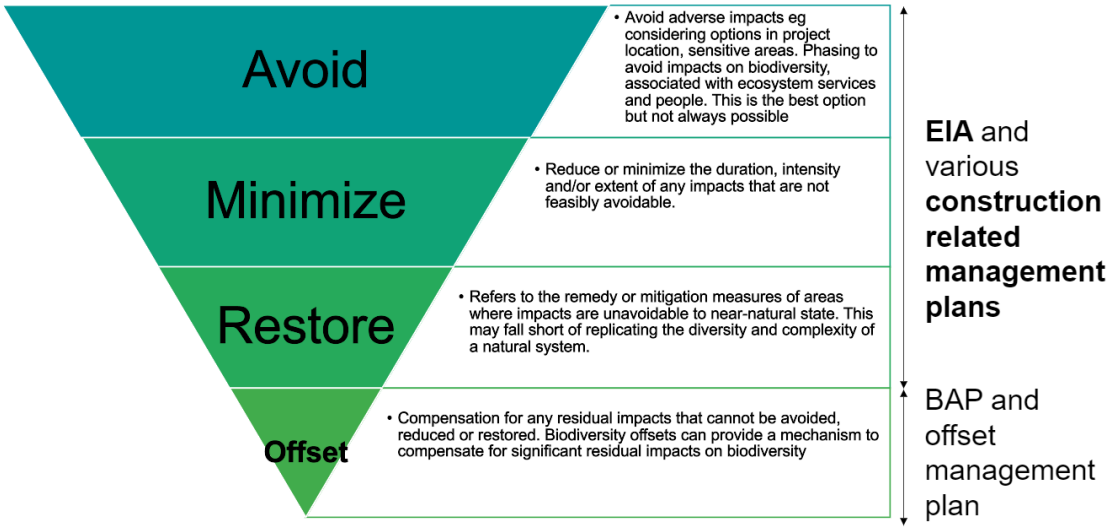
Task	Section within this document
Determination of the legal, regulatory, planning, permitting and third-party requirements	This is summarised in Section 4 of this report
Biodiversity baseline data collection ● Desktop assessment ● Biodiversity surveys	This is summarised in Section 5 of this report. Full details are available in the Project's EIA and CHA
Summary of biodiversity impacts	This is summarised in Section 6 of this report. Full details are available in the Project's EIA and CHA
BAP actions ● Establishment of priorities for conservation ● Identification of conservation actions	● Priorities of conservation as well as critical habitat trigger species have been laid out in Section 4.4 of this report ● Identification of conservation actions and its action plans for habitats and species of conservation concern is reflected in BAP actions as per Section 6
Implementation of the BAP	Relevant sections are as below: ● Action plans and schedules as per Section 6 ● Implementation and monitoring actions as per Section 7 ● Organisational responsibility and capacity for implementation as per Section 8
Monitoring, evaluation and improvement	Relevant sections are as below: ● Biodiversity monitoring and reporting as per Section 7 ● BAP actions monitoring and reporting as per Section 9
Reporting, communication and verification	Relevant sections are as below: ● Reporting of biodiversity monitoring as per Section 7 ● Staff requirements and responsibilities as per Section 8 ● Reporting of BAP actions as per Section 9

Source: Mott MacDonald, 2023

2.4 Mitigation hierarchy

The aims of the BAP will be achieved by reviewing the existing biodiversity related mitigation measures against project impacts on those biodiversity values for which the critical habitat was designated (see Section 5.1), thereby determining the significance of residual project impacts after application of these measures (Section 5.2). Additional actions that are aligned with the concept of mitigation hierarchy (see Figure 2.2) are included in this BAP.

Figure 2.2: Mitigation hierarchy



Source: Mott MacDonald, 2023

The biodiversity offsets and additional conservation actions have been established with the aim of achieving ‘net gain’ in critical habitat and ‘no net loss’ for natural habitat in accordance with IFC PS6. There are various forms of biodiversity offset possible such as habitat compensation, stopping biodiversity degradation and loss in designated sites and ‘like-for-like or better’ habitat basis. Additional conservation measures are also considered, and these can include provision of support to the conservation of biodiversity in the local area, or biodiversity awareness raising programme for the local population.

It is important to recognise that a BAP is not just the production of a single document which details the actions needed for the conservation and management of biodiversity. A BAP is a planning process from which a document is formulated through the review of previous studies.

2.5 Consultation with stakeholders

2.5.1 EIA consultation

Stakeholder consultation is an integral component in the formulation of a BAP. It is essential to engage with stakeholders to gather opinions on how to define, implement and coordinate actions.

A series of stakeholder and public consultations as well as EIA appraisals and reviews were conducted during the preparation and review of the local EIA report approved in 2018 (Unitech, 2018). Details are provided in Table 2.2 and Table 2.3. Ecology and biodiversity were one of the main topics included in these consultations. Specific feedback on marine mammals, migratory birds and seabirds at sea was received from relevant stakeholders including concerns on flight corridors, underwater noise level and monitoring of cetaceans, fishes and birds during construction. These comments were incorporated into the final EIA (Unitech, 2021).

In addition, the Project has continued engagements and consultations in compliance with international standards between 2018 to September 2024, which may be found in Table 5.3 of CHW02’s stakeholder engagement plan (SEP) (Ørsted, 2024b). The stakeholders engaged since the EIA stages up until September 2024 are outlined in Table 2.3. A brief summary of the environmental and social concerns raised during these stakeholder engagement activities is provided in Table 2.4.

Table 2.2: Stakeholder and public consultation meetings undertaken for the Project's EIA

Meeting	Date
Online publication of Project information on the Environmental Protection Administration (EPA) website for 15 days	9 January 2016
Four meetings/visits with the Changhua Fishermen Association	10 February 2016 – 6 April 2017
Online publication of project development information and EIA survey aspects on the EPA website for 20 days	21 September – 12 October 2016
Public seminar for EIA report at drafting stage	21 & 24 October 2016
Public opinion survey of the Project (750 local community members, 209 fishermen and 67 local leaders)	19 November – 11 December 2016
Online publication of major EIA chapters on the EPA website for 20 days	24 January – 14 February 2017
Opinion Presentation Meeting	20 June 2017
The 1st EIA Review Meeting	30 June 2017
The 2nd EIA Review Meeting	11 September 2017
The 3rd EIA Review Meeting	27 November 2017
EPA EIA Vetting Committee Meeting on the Project (327th meeting)	9 February 2018
Eight meetings with the Changhua Fishermen Association	17 July 2018 – 16 October 2018
Review meeting on EIA report deviation comparison	20 November 2018
CZMA Public Hearing	22 May 2019
EP On-site Audit Meeting	29 October 2019
1st environmental deviation assessment (EDA) Review Meeting	21 October 2021
2nd EDA Review Meeting	22 December 2021
EPA Vetting Committee (414th meeting)	2 March 2022
Pre-construction EIA Public Hearing CHW02	26 September 2022
Pre-construction permit (CP) Application Public Hearing of CHW02	16 December 2022
1st EIA Supervisory Committee Meeting	26 November 2019
2nd EIA Supervisory Committee Meeting	1 June 2020
3rd EIA Supervisory Committee Meeting	14 December 2020
4th EIA Supervisory Committee Meeting	29 July 2021
5th EIA Supervisory Committee Meeting	17 January 2022
6th EIA Supervisory Committee Meeting	14 July 2022
7th EIA Supervisory Committee Meeting	23 December 2022
8th EIA Supervisory Committee Meeting	30 June 2023
9th EIA Supervisory Committee Meeting	15 December 2023
10th EIA Supervisory Committee Meeting	12 June 2024

Source: Project Company; Unitech, 2018; Unitech, 2022; Ørsted, 2024b

Table 2.3: Stakeholders consulted during the Project's EIA preparation and review stages

Government authorities	Stakeholders in Changhua County	Non-governmental organizations
• Executive Yuan • Ministry of Environment • Office of Energy and Carbon Reduction • Fisheries Agency • Coast Guard Administration • Ministry of National Defense • Ministry of Labour	• Legislator of Changhua County • Changhua County Council • Changhua Fishermen's Association • Xianxi, Lukang and Fuxing Township Offices • Village heads and residents in Xianxi, Lukang and Fuxing Township • Community Development Associations • Community representatives of Changhua County • Show Chwan Memorial Hospital • Changhua Christian Hospital	• Changhua Environmental Protection Union • Wild Bird Society of Changhua • Matsu Fish Conservation Union, Taiwan • Taiwan Cetacean Society • Taiwan Environmental Information Association • Wild at Heart Legal Defense Association, Taiwan • Industrial Development & Investment Promotion Committee of Changhua County (IDIPC) • Changhua Fund for Children and Families, Changhua residents • Taiwan Ocean and Environmental Sustainability Law Centre (TOESLC)
• Ministry of Economic Affairs • Energy Administration • Geological Survey and Mining Management Agency • Industrial Development Administration • Changhua Coastal Park Service Centre • Taipower Company		
• Ministry of Transportation and Communications • Maritime and Port Bureau • Civil Aviation Administration • Tourism Administration		
• Ministry of the Interior • Construction and Planning Agency	• Local academia • National Changhua University of Education (NCUE) • Da-Yeh University • Chienkuo Technology University • Chungchou University of Science and Technology • Xianxi Elementary School and Junior High School	
• Ministry of Culture • Bureau of Cultural Heritage		
• Ministry of Justice • Investigation Bureau		
• Office of the President • National Climate Change Committee		
• Ocean Affairs Council • Ocean Conservation Agency		
• Changhua County Government • Environmental Protection Bureau Changhua County • Cultural Affairs Bureau		
• Taichung City Government • Taichung City Government		

Source: Greater Changhua Southwest Offshore Wind Farm Project EIA Report, 2018 and SEP, 2024

Table 2.4: Brief summary of environmental and social concerns raised during stakeholder engagement activities from the Project's EIA stage

Environmental / Social Concern	Stakeholder
Impact on marine ecology, marine mammals and water quality	• Local community members, fisher folk and opinion leaders interviewed in the public opinion survey • Changhua Environmental Protection Union • Matsu Fish Conservation Union • Wild at Heart Legal Defense Association
Safety and maintenance	Local community members, fishermen and opinion leaders interviewed in the public opinion survey
Impact on fisheries and fishing production	• Local community members, fishermen and opinion leaders interviewed in the public opinion survey • Xianxi Township office
Noise and vibration	Local community members, fishermen and opinion leaders interviewed in the public opinion survey
Impact on fishing boat operation, fisheries activities/area, fishing ground and compensation for fishermen	Fishermen interviewed in the public opinion survey
Benefits of green energy from wind power generation	Local community members interviewed in the public opinion survey
Communication with fishermen	• Changhua District Fishermen's Association • Xianxi Township Office
Impact of offshore wind turbine on local livelihood, social economic, landscape and recreation, and impact of onshore facilities on traffic, noise, environmental hygiene and handling of dredged materials	Xianxi Township Office
Impact of transportation, environmental hygiene, noise and interference of electromagnetic waves	Xianxi Township Office
Bird collision and flight corridor for migratory birds	• Environmental Protection Bureau, Changhua County • Changhua Environmental Protection Union • Matsu Fish Conservation Union • Taiwan Environmental Information Association • Wild Bird Society of Changhua
Underwater cultural heritage	Bureau of Cultural Heritage, Ministry of Culture
Decommissioning activities of windfarm	Changhua Environmental Protection Union
Impact of Project components and activities with surrounding developments	• South Natural Gas Division of CPC Corporation, Taiwan • CPC Corporation – Exploration and production division

Source: Section 6.5.5-3, Table 6.5.5-1 and Appendix 17 of the Project EIA Report, 2018 and Table 5.4 of the Project SEP, 2024

2.5.1.1 Government supervisory committee

There is a government supervisory committee that reviews and provides feedback on EIA conditions twice a year throughout the lifetime of the Project. This supervisory committee consists of the Taiwan EPA, non-governmental organisations (NGOs) and university professors. Continued meetings and consultations for the Project have also been taking place, though not specifically covering environmental aspects. The Project will present updates on general biodiversity works undertaken by the Project to date.

It is recognised that the discussions with the government supervisory committee may not be framed in the perspective of the critical habitat species or features identified within the CHA (Mott MacDonald, 2024a), as based on IFC PS6 definition. It is important to note that several

identified critical habitat trigger species, such as the black-faced spoonbill and Taiwanese humpback dolphin, are also fauna species of high conservation value within the local regulatory context. These species (and their associated habitats) will thus be a common topic of discussion with the supervisory committee, that would materially overlap with relevant elements of the BAP. Therefore, where applicable, the Project will emphasise BAP actions as positive efforts aimed at conserving or achieving net gain of these species. This approach will further demonstrate the Project's commitment to the preservation and conservation of significant biological features.

2.5.2 Marine biodiversity enhancement consultation

Ørsted's preliminary study for demonstrated conservation action (Ørsted, 2022) indicates an aim to explore innovative business applications related to marine biodiversity. As part of the research methodology, consultations were conducted in Q1 2022 with Dr. Shao Kwang-Tsao (Adjunct Research Fellow of Biodiversity Research Center, Academia Sinica, specialising in fish biodiversity and biodiversity informatics) to gather expert opinion on future project development. Topics discussed consisted of the following:

- Promoting marine biodiversity through projects focusing on long-term environmental restoration monitoring and management
- Establishment and management of marine ecological protection areas or quasi-protected areas including offshore wind farms
- Planning and construction of artificial reefs for conservation and restoration
- Initiating action plans relevant to the concept of marine litter

Early stage stakeholder mapping within Ørsted's implementation proposal (Ørsted, 2024) has identified the specific individuals or groups, which are likely to beimportant for future marine biodiversity enhancement projects. Stakeholders who might be involved with and/or affected by these projects should be closely involved for collaboration opportunities. This includes developers, academia and NGOs, such as :

- Developers
  - Developers of projects in execution and awarded for grid capacity in Round 3.1 and 3.2
- Academia
  - Prof. Su Nan-jay, Department of Environmental Biology and Fisheries Science, National Taiwan Ocean University
    - Specialises in resource assessment of fisheries and oceans
  - Dr. Shao Kwang-tsao, Adjunct Research Fellow of Biodiversity Research Center, Academia Sinica
    - Specialises in fish biodiversity and biodiversity informatics
  - Prof. Yang Wei-cheng, Institute of Ecology and Evolutionary Biology, National Taiwan University
    - Specialises in whale and dolphin conservation medicine
- NGOs
  - Taiwan Cetacean Society (中華鯨豚協會)

Further engagement with some or all of the above stakeholders will be conducted to progress the development and finalisation of the BAP programmes. Further details of the stakeholder engagements mentioned within Ørsted's implementation proposal (Ørsted, 2024) astailored to each BAP action are further detailed in Section 6.2.

2.5.3 Bird habitat enhancement consultation

Ørsted has formulated a BAP implementation programme proposal, which serves as part of their environmental and social (E&S) commitment for CHW02 (Ørsted, 2024a). Ørsted previously conducted two preliminary studies on promoting biodiversity. Firstly, they conducted a preliminary study for demonstrated conservation action for promoting biodiversity in 2022 (Ørsted, 2022). Secondly, Ørsted commissioned NIRAS Taiwan to undertake preliminary research into bird habitat restoration opportunities on the west coast of Taiwan (NIRAS Taiwan Ltd, 2023). As part of the research methodology, consultations were conducted with key stakeholders to gather expert opinion on the methodology used for selecting target bird species, the bird species selected, and potential habitat restoration sites.

Between Q1 2022 and Q1 2024, the following stakeholders were consulted:

- Academia
  - Prof. Sun Yuan-hsun, National Pingtung University of Science and Technology
    - Specialises in rare bird ecology and management
  - Prof. Yuan Xiao-wei, School of Forestry and Resource Conservation, National Taiwan University
    - Specialises in little tern ecology
  - Dr. Hung Chung-hang, School of Forestry and Resource Conservation, National Taiwan University
    - Specialises in little tern ecology
  - Dr. Tsai Chia-yang, Chairman of Changhua Environmental Protection Union
    - Specialises in Eurasian curlew ecology
  - Dr. Chiang Chung-yu, Research Fellow, Department of Environmental Science and Engineering, Tunghai University
    - Specialises in Eurasian curlew ecology
  - National Taiwan Ocean University (NTOU)
  - National Taiwan University
  - National Changhua University of Education
- Non-governmental organisations (NGOs)
  - Philip Kuo, founder of Wild Bird Society of Tainan and former Executive Director of Taiwan Wild Bird Federation
    - Specialises in black-faced spoonbill ecology

Early stage stakeholder mapping within Ørsted's implementation proposal (Ørsted, 2024a) and NIRAS' preliminary report (NIRAS Taiwan Ltd, 2023) has identified specific individuals or groups that should be engaged moving forward, in order to understand their importance for future restoration initiative projects (Figure 2.3). Stakeholders who might be affected by these restoration projects should be closely involved for collaboration opportunities. This includes the government, academia, NGOs, industry and local communities, as follows:

- Government
  - The Construction and Planning Agency, Ministry of the Interior (MOI)
  - The Forestry and Nature Conservation Agency, Ministry of Agriculture, Executive Yuan
  - Local Department of Agriculture
- Academia
  - Prof. Sun Yuan-hsun, National Pingtung University of Science and Technology
    - Specialises in rare bird ecology and management

  - Professor Yuan Xiao-wei, School of Forestry and Resource Conservation, National Taiwan University
    - Specialises in little tern ecology
  - Dr. Hung Chung-hang, School of Forestry and Resource Conservation, National Taiwan University
    - Specialises in little tern ecology
  - Dr. Tsai Chia-yang, Chairman of Changhua Environmental Protection Union
    - Specialises in Eurasian Curlew ecology
  - Dr. Chiang Chung-yu, Research Fellow, Department of Environmental Science and Engineering, Tunghai University
    - Specialises in Eurasian Curlew ecology
- NGOs
  - Taiwan Wild Bird Federation (中華民國野鳥學會)
  - Miaoli Nature Ecology Society (苗栗縣自然生態學會)
  - Wild Bird Association of Taiwan (社團法人台灣野鳥協會)
  - Taichung City Wildlife Conservation Society (台中市野生動物保育學會)
  - Wild Bird Society of Changhua (彰化縣野鳥學會)
  - Black-faced Spoonbill Conservation Association (黑面琵鷺保育學會)
- Industry and local communities
  - Aquaculture Development Association (社團法人中華民國養殖漁業發展協會)
  - Taichung Fishermen's Association (台中區漁會)
  - Changhua Fisheries Association (彰化區漁會)

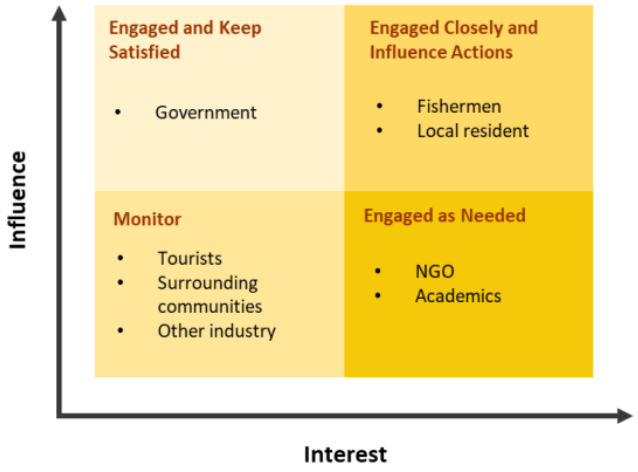
Further engagement with some or all of the above stakeholders will be conducted to progress the development and finalisation of the BAP programmes. In particular, habitat restoration and enhancement recommendations for the black-faced spoonbill, oriental stork and Chinese crested tern are being discussed. These measures could include collaborations with fishermen for bird-friendly aquaculture, establishment of conservation zones and feeding grounds, setting up decoy model birds, nest towers, and creation of additional artificial habitats with connectivity to existing overwintering habitats (NIRAS Taiwan Ltd, 2023).

Ørsted is currently in discussions with experts and scholars regarding the habitat restoration locations for migratory bird species. Preliminary assessments suggest several potential locations, including:

- Da'an River, Taichung
- East Lunwei Bay, Changhua / Yunlin
- Zhuoshui River estuary, Changhua
- Mianhua Islet, Keelung the Da-an river mouth in Taichung, Changhua county, based on target species and key habitat screening study.

Further details of the stakeholder engagement mentioned within NIRAS' report in the context of the BAP actions are detailed in Section 6.2, as well as Appendix.

Figure 2.3: Stakeholder mapping for bird habitat restoration programmes



Source: NIRAS Taiwan, 2023

2.5.4 Additional BAP consultation

Key stakeholders will be engaged as part of the consultation process for this BAP. Consultation is an ongoing process, and additional engagement must be undertaken throughout progression of the Project.

A stakeholder power/interest analysis has been carried out to identify the most important (key) stakeholders who can potentially be partners for or influence the BAP actions, or stakeholders who have strong interest in these actions. Key stakeholders will involve national and local agencies in charge of nature conservation and biodiversity, international and national NGOs, biodiversity experts and local communities (Figure 2.4).

Further one-on-one stakeholder engagement will be undertaken to develop the BAP actions in detail to assess the feasibility of the drafted actions as well as develop tangible outcomes to ensure biodiversity net gain. Stakeholder engagement activities are planned and updated on an on-going basis. Hence, appropriately, the details of executed and planned stakeholder engagements will be presented and updated within the Project Company's Stakeholder Engagement Plan (SEP) (Ørsted, 2024b). The site/programme identification, selection and evaluation are expected derived and referenced from stakeholder engagement/consultation with local academia and/or species experts.

The currently expected date to complete key stakeholder engagements (ie with regard to defining the programs) for the BAP is by the end of Q3 2024. The implementation of the selected BAP actions will then commence by end-Q4 2024.

Indicatively, for BAP actions 1-4, the current planning activities will include the following:

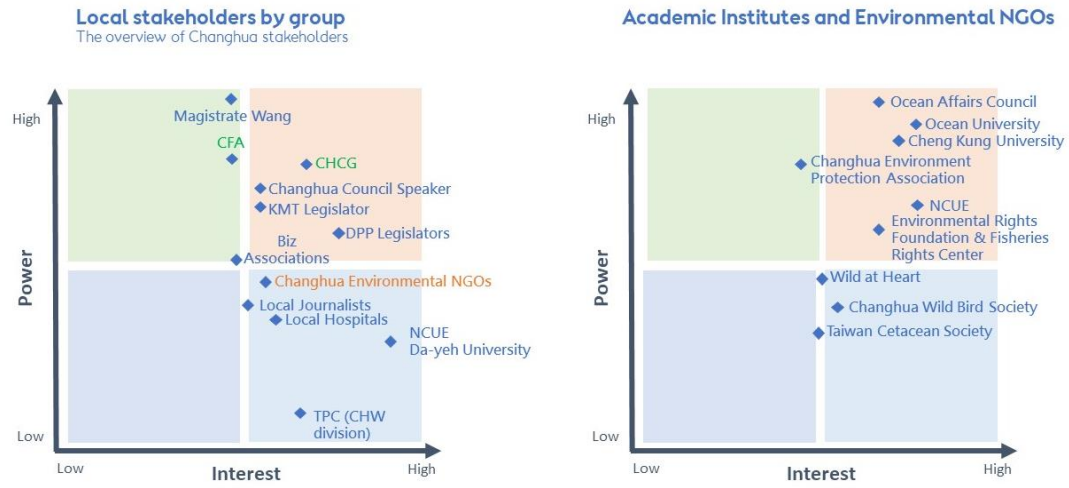
- Regular Offshore Wind Environmental Topics Opinion Exchange Platform (OWEEP) meetings
- Meetings with stakeholders and discussions on possible workshops to be organised
- Discussions with researchers for potential research collaborations.

For BAP actions 5-6, the pre-implementation activities will include meetings, workshops, and preliminary bird surveys which is expected to be by Q4 2024. The actual on-site activities of habitat restoration are targeted for 2025.

Further details of the actions and implementation timeline are provided in Section 6.2.

A summary of the relevant stakeholder engagements is provided below.

Figure 2.4: Stakeholder power/interest analysis



Source: Ørsted, 2023

2.5.4.1 National Changhua University of Education (NCUE)

Other stakeholder engagement activities included a series of biodiversity forums which have been co-organised together with Professor Lu Wei-wen from the Department of Geography of National Changhua University of Education (NCUE). For these forums, speakers from Ørsted, as well as local and national environmental NGOs were invited each month to conduct in-depth presentations with students and the public. Lectures will be conducted on different environmental and social topics surrounding Taiwan's offshore wind industry, including environmental impact, biodiversity, ocean spatial regulation, local values and fisheries coexistence.

For the biodiversity forums, invited speakers included Professor Lai Yu-Chen from Feng-Jia University, Wu Fei-Chun from Taiwan Ocean and Environmental Sustainability Law Centre, and Hsieh Meng-lin from the Changhua Wild Bird Society (Figure 2.5).

The biodiversity forums took place from 29 August 2023 to 15 December 2023.

Figure 2.5: Stakeholder engagements – Biodiversity forums

Source: Ørsted, 2023

2.5.4.2 Metal Industries Research & Development Centre (MIRDC)

Ørsted also partnered with the Metal Industries Research & Development Centre (MIRDC) to launch the Green Energy Scholarship Program 2.0: Sustainable Innovation Accelerator (SIA). This innovation contest called for students and innovative new businesses to team up and submit proposals to make various phases of wind farms more sustainable. There were mentors from Ørsted to guide shortlisted teams and refine their proposals, and experts from academia joined the board of judges. Winning teams were awarded with prizes and resources from MIRDC to incubate their ideas.

This collaboration with MIRDC therefore helped to drive innovation, synergy amongst academic and corporate stakeholders, and future optimisation of wind farm design and operational sustainability. The collaboration took place from 26 February 2024 to 19 March 2024.

2.5.4.3 Academia

Ørsted has also been in engagement with the following academic stakeholders at a company level, and will continue to do so moving forward:

- Dr. Allen Chen Zhao-luen, Research Fellow at the Biodiversity Research Center, Academia Sinica
  - Specialises in coral reef evolution, ecosystem and environmental change, and symbiosis
  - Ørsted has been in collaboration with the Penghu Marine Biology Research centre to study whether offshore wind turbine foundations could provide new homes where corals have the potential to flourish (ReCoral)
- Dr. Tang Sen-lin, Research Fellow at the Biodiversity Research Center, Academia Sinica
  - Specialises in microbial ecology, metagenomics and metagenomes-derived bioinformatics, and environmental virology.
- Prof. Sun Yuan-hsun, National Pingtung University of Science and Technology
  - Specialises in rare bird ecology and management

3 National legislation and international standards

3.1 Statutory framework

The Project shall comply with the requirements of the laws and regulations of Taiwan and the requirements of the approved EIA (Unitech, 2018) as well as the international standards and guidelines provided in Section 3.2 to 3.4.

3.2 Relevant international law

Taiwan has not ratified any international laws and conventions in relation to biodiversity that is of relevance to this BAP. The applicable national legislations and permitting requirements as well as third party requirements are described in the following sections.

3.3 National legislation and policy framework

Taiwan's EIA Act (環境影響評估法), which was promulgated on 30 December 1994 and amended on 8 January 2009, governs the EIA process in Taiwan which requires a project proponent to undertake an EIA when it is likely to have the potential to cause potentially significant environmental and social impacts. The administration of the EIA approval and related matters are under the purview of the Environmental Protection Administration, Executive Yuan, R.O.C (Taiwan) (Taiwan EPA). Detailed Environmental Protection Administration (EPA) procedures and implementation guidelines include:

- Implementation Rules for the EIA Act (環境影響評估法施行細則) (amended on 11 April 2018)
- Environmental Impact Assessment Items and Screening Criteria for Development Activities (開發行為應實施環境影響評估細目及範圍認定標準) (amended on 18 August 2020)
- Guidelines for Conducting Environmental Impact Assessment for Development Activities (開發行為環境影響評估作業準則) (amended 2 February 2021)

Under the screening criteria mentioned above, in terms of development type, offshore windfarm (風力發電離岸系統) is listed as an activity which requires the preparation and submission of an EIA. The Project shall comply with the requirements of the laws and regulations of Taiwan and the requirements of the approved EIA. The ecological surveys and assessment within the EIA were conducted in accordance with the below listed specifications as published by the Taiwan EPA:

- Technical Specifications for Animal Ecology Assessment (動物生態評估技術規範)
- Technical Specifications for Plant Ecology Assessment (植物生態評估技術規範)
- Technical Specifications for Marine Ecology Assessment (海洋生態評估技術規範)

In addition to the overarching EIA Act, national legislation in relation to biodiversity applicable to the purpose of this BAP includes the following key laws and regulations:

- Wetland Conservation Act of Taiwan (濕地保育法) (promulgated on 3 July 2013)
  - Classifies wetlands of importance into three levels and prescribes wetland management systems accordingly:
    - International level (國際級)
    - National level (國家級)
    - Regional level (地方級).
- Wildlife Conservation Act of Taiwan (野生動物保育法) (amended on 23 January 2013)
  - Classifies endangered and vulnerable species into three categories and prescribes wildlife management systems accordingly:
    - I - Endangered species (瀕臨絕種保育類)
    - II - Rare and valuable species (珍貴稀有保育類)
    - III - Other conservation-deserving species (其他應予保育類)
  - Defines and governs the management of Wildlife Refuge (野生動物保護區) and Major Wildlife Habitat (野生動物重要棲息環境)
- Forestry Act (森林法) (amended on 5 May 2021)
  - Defines and governs the management of Nature Reserve (自然保護區)
- National Park Act (國家公園法) (amended on 8 December 2010)
  - Defines and governs the management of National Park (國家公園) and National Nature Park (國家自然公園).

3.4 International standards and guidelines

The Project is committed to complying with the following applicable standards:

- EP 4 (2020)
- IFC PS6 (2012a) and Guidance Note (GN) 6 (IFC, 2019) on Biodiversity Conservation and Sustainable Management of Living Natural Resources
- WBG EHS Guidelines:
  - WBG General EHS Guidelines (2007)
  - WBG EHS Guidelines for Electric Power Transmission and Distribution (2007)
  - WBG EHS Guidelines for Wind Energy (2015)

The Project has undertaken CHA and CIA in accordance with IFC PS1 (IFC, 2012b) and PS6 (IFC, 2012a), IFC GN6 requirements (IFC, 2019) and the IFC's guidance document on cumulative impact assessment (IFC, 2013). A comparative analysis of biodiversity values against the critical habitat criteria and stipulated thresholds was carried out and an assessment on the Project's potential to contribute to cumulative impacts on valued environmental and social components was completed. Findings and recommendations from both assessments were used to inform the production of this BAP.

3.5 Interaction with other management plans

In addition to this BAP, the management and monitoring requirements set in the following documents are applicable to the construction and operation phase of the Project:

- Greater Changhua SW Offshore Windfarm environmental impact statement (EIA) and its appendices (大彰化西南離岸風力發電計畫 環境影響說明書) (Unitech, 2018)
- Greater Changhua SW Offshore Windfarm EIA addendum and its appendices (大彰化西南離岸風力發電計畫 環境影響差異分析報告) (Unitech, 2021)

4 Biodiversity baseline

4.1 Overview

The baseline ecological conditions summarised here are based upon the information contained within the EIA and CHA reports conducted for the Project. Additional literature review has been undertaken to inform this BAP.

Desktop studies and various ecological surveys (ie terrestrial flora and fauna, marine flora and fauna and birds) were conducted between 2016 and 2017 to inform the EIA.

4.2 Legally protected and internationally recognised areas within 10km of the Project

The Project is not situated within any area gazetted as national important wetland, forest or Marine Protected Areas (MPAs, including Fisheries Resources Conservation Areas) (Ocean Conservation Administration, 2018), or any important wildlife habitat. However, about 4km of the 57km-long submarine cables of the Project traverses the Taiwanese Humpback Dolphin Major Wildlife Habitat (MWH). The Project's export cables, landing point and Changkong grid connection point are also within 10km of the Dadu Estuary Important Wetland /, Shengang mud shrimp breeding conservation areas, and five protection reefs (ie Dadu, Shengang, Xianxi, Lunwei and Lukang).

With regards to international recognised areas, the Project is also located around 4km south of Dadu Estuary Important Wetland and Dadu Rivermouth Wildlife Refuge Important Bird Area (IBA) and Key Biodiversity Area (KBA) (大肚溪口野生動物保護區), and around 9km north of Hanbao wetlands IBA and KBA (漢寶濕地) (Figure 4.1).

4.2.1 Taiwanese Humpback Dolphin Major Wildlife Habitat

The Taiwanese Humpback Dolphin MWH was first proposed on 21 April 2014 and was formally gazetted by the Ocean Affairs Council with effect from 1 September 2020 (The Executive Yuan Gazette Online, 2020). It was identified that the Taiwanese humpback dolphin (*Sousa chinensis ssp. taiwanensis*), an Endangered species (ie under category I) in Taiwan and considered Critically Endangered under the IUCN Red List of Threatened Species, exists in the Eastern Taiwan Strait (ETS) (Reeves, et al., 2008). The Taiwanese humpback dolphin inhabits a narrow strip of waters off the western coast of Taiwan, between Miaoli County and Jiangjun fishing port of southern Taiwan. The species distribution comprises shallow coastal waters at depths up to 30m, that is between 2 and 2.5km from the coast (Wang *et al.*, 2017). The range of the Taiwanese humpback dolphin is situated outside of the Project's wind farm array but overlaps with the export cable route as well as construction and operational vessel routes.

4.2.2 Dadu Estuary Important Wetland / Dadu Rivermouth Wildlife Refuge IBA and KBA

The Dadu Estuary Important Wetland / Dadu Rivermouth Wildlife Refuge / Important Bird Area (IBA) and Key Biodiversity Area (KBA) are located between Taichung City and Changhua County of Taiwan. The Dadu Estuary Important Wetland / Dadu Rivermouth Wildlife Refuge / IBA and KBA have overlapping boundaries and together provide the largest waterbird habitat in central Taiwan.

The Dadu Estuary Wildlife Refuge is approximately 31.5 km² and encompasses the majority of Dadu Rivermouth IBA and KBA which is approximately 27 km². Dadu Estuary Wildlife Refuge was designated in 1998 and is also a Wetland of National Importance and Major Wildlife Habitat.

Dadu Estuary Wildlife Refuge has been assigned an IUCN management category IV[4], however there is no management plan in place for this protected area. Dadu Rivermouth Wildlife Refuge IBA and KBA has been identified as such based on the presence of significant populations of black-faced spoonbill (*Platalea minor*) (IUCN Endangered) and significant congregations of Saunders's gull (*Saundersilarus saundersi*) (IUCN Vulnerable) (BirdLife International, 2023)

A variety of habitats are present in this area, including marine waters, intertidal zone, river, swamp, sand bar, reclaimed land, agricultural land and fish farms. The rich abundance of benthic organisms in diverse habitats attracts thousands of migratory birds in winter for roosting.

More than 200 bird species comprised of 70% water birds and 30% terrestrial birds have been recorded, including 22 protected species (Ramsar Citizen, 2020).

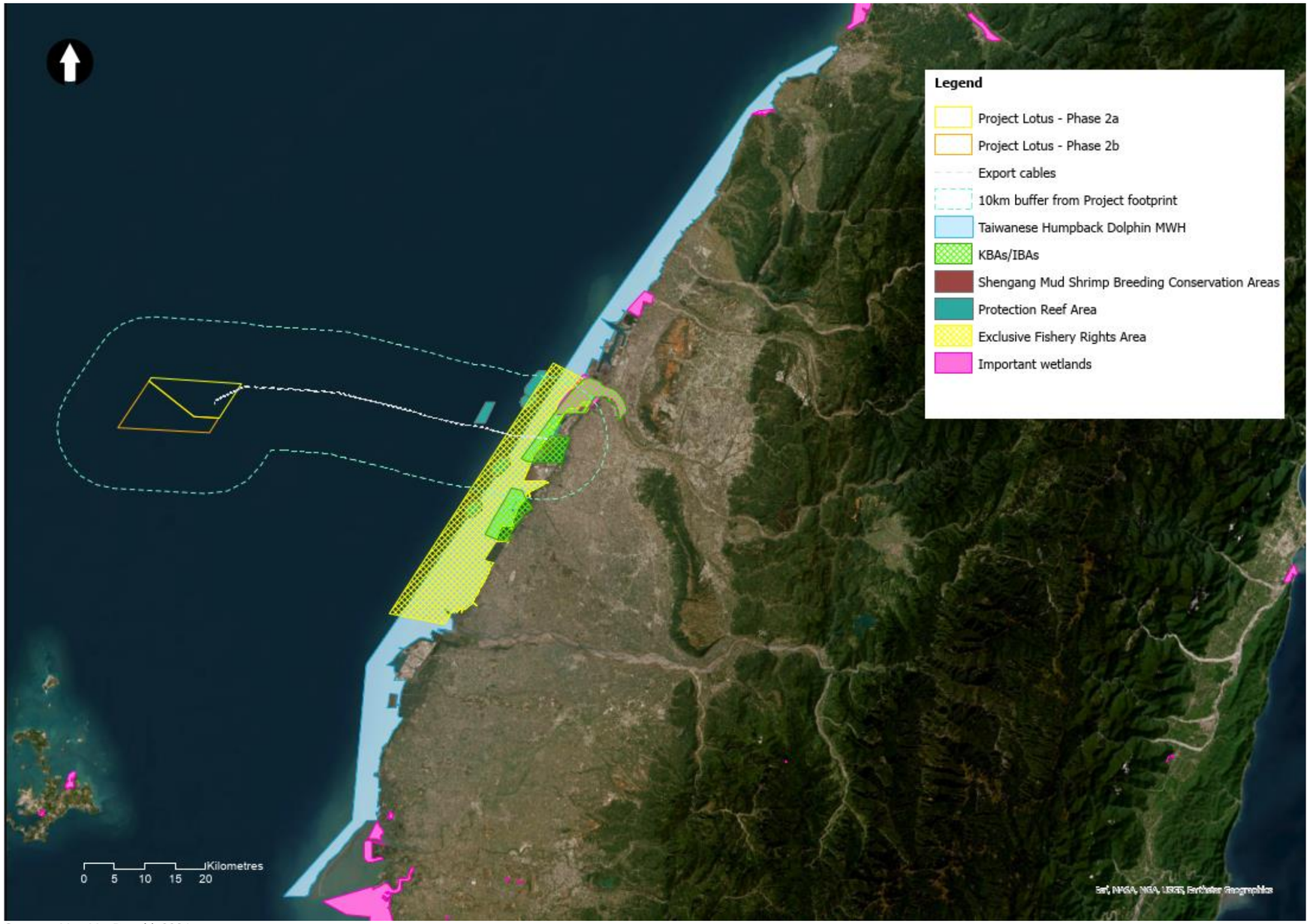
4.2.3 Hanbao Wetlands IBA and KBA

The Hanbao Wetlands, which is located at Fangyuan Township, Changhua County of Taiwan, is an IBA and KBA with a total area of approximately 24km². It is bounded by the edge of the Taiwan Strait to the north-west, the Dadu River Estuary to the north, and the Zhuoshui River Estuary to the south, so this site sits at the middle of the sensitive coastal wetlands on Taiwan's west coast. Migratory birds congregate at the centre of this ecologically sensitive area. The Hanbao wetlands hosts a myriad of habitats creating excellent bird roosting environments including model aquaculture farms, fish ponds, beaches, marshes, paddy fields, dry land, grassy scrub, wind-protection forests, rivers, and the sea. Economic activities in the Hanbao area consist mostly of oyster culture, fisheries, and agriculture; within the levee, the lands are under low-level development, including numerous fishponds and paddy fields (Key Biodiversity Areas, 2023). A total of 196 bird species, some of which are nationally protected species, have been recorded (BirdLife International, 2023)[5]. This area has been identified as an IBA based on the presence of significant populations of the black-faced spoonbill (*Platalea minor*) (IUCN Endangered) and significant congregations of the Saunders's gull (*Saundersilarus saundersi*) (IUCN Vulnerable).

[4] Protected areas aiming to protect particular species or habitats, their management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

[5] BirdLife International (2023) Important Bird Areas factsheet: Hanbao Wetlands. Downloaded from http://www.birdlife.org on 10/01/2023.

Figure 4.1: Map of legally protected and internationally recognised areas



Source: Mott MacDonald, 2024

4.3 Biodiversity baseline surveys

A detailed biodiversity impact assessment was completed for the Project as part of the approved EIA Report. The documents provided the Project's ecological baseline within the Project's AoI.

Baseline field surveys conducted include terrestrial ecology, intertidal ecology and marine ecology with its findings summarized in Appendix A.

Some species of marine fauna and migratory birds (including seabirds at sea) were identified to be significant biodiversity values as per PS6 and these include the species that trigger critical habitat. Baseline bird survey results indicate that a variety of migratory bird and seabird species was observed within the offshore windfarm footprint. Migratory birds (including seabirds at sea) have been identified to be vulnerable to collision with WTG blades due to overlap of average flight altitudes with the height of rotating blades of WTGs.

The Taiwanese Humpback Dolphin has a confined habitat distribution east of the Project close to the coastline. The western waters of Taiwan have rich marine biodiversity, including many species of conservation concern. Further details of marine fauna and flora and migratory birds and seabirds at sea are provided in the following sections.

4.4 Species of conservation concern

4.4.1 Identified critical habitat triggered species and habitat

The critical habitat trigger species and habitats were assessed within the Project's CHA (Mott MacDonald, 2024a). Identification and description of conservation actions for habitats and species of conservation concern are presented in Section 6 of this document. Critical habitat is broadly defined in paragraph 17 of IFC GN6 (IFC, 2019) as "areas with high biodiversity value" that includes:

- Criterion 1 (C1): habitat of significant importance to species listed as Critically Endangered and/or Endangered on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species or a national/region red list assessment corresponding to the IUCN Red List guidance.
- Criterion 2 (C2): habitat of significant importance to restricted-range species (ie a terrestrial species with an extent of occurrence (EOO) less than 50,000km^2 or a marine species with an EOO less than 100,000km^2)
- Criterion 3 (C3): habitat supporting globally significant concentrations of migratory species and/or congregatory species.
- Criterion 4 (C4): highly threatened and/or unique ecosystems
- Criterion 5 (C5): areas associated with key evolutionary processes.

Two main species groups – marine fauna and migratory birds (including seabirds at sea) and one habitat – marine flora and fauna EAAA, were determined to trigger critical habitat as per the Project's CHA. Table 4.1 below lists the marine fauna, migratory bird species and habitat determined to trigger critical habitat.

Table 4.1: Biodiversity features which meet the criteria and thresholds for critical habitat

Scientific Name	Common Name	IUCN Status	C1	C2	C3	C4	C5	Justification critical habitat determination
Marine fauna								
Sousa chinensis ssp. taiwanesis	Taiwanese Humpback Dolphin	CR	✓	✓	-	-	-	The Taiwanese Humpback Dolphin (*Sousa chinensis ssp. taiwanesis*) is listed as Critically Endangered under the IUCN Red List and was recognised by Taiwan's Coast Guard Administration, Executive Yuan via public notice No. 10800000721, dated 9 January 2019, as a Category I Endangered species (ie the most critical species). The population of the subspecies is considered to be 37– 44 mature individuals and its known range is largely within the EAAA. The population in the EAAA therefore exceeds the threshold for C1(a) and C2 in respect of the Taiwanese Humpback Dolphin.
Acanthopagrus taiwanensis	Taiwan Picnic Seabream	DD	-	✓	-	-	-	The marine fish, ie Taiwan Picnic Seabream (*Acanthopagrus taiwanensis*), is listed as Data Deficient in the IUCN Red List. It is a demersal fish while there is little information on the depth range of the species. The known geographic ranges are restricted to the Taiwan waters and the whole EAAA overlaps with their geographic ranges. Taiwan Picnic Seabream was not collected during the EIA baseline surveys, however it was recorded in the Greater Changhua SE EIA (Unitech, 2018c). This species is therefore considered critical habitat species under C2
Rhynchobatus immaculatus	Taiwanese Wedgefish	CR	✓	-	-	-	-	Taiwanese Wedgefish (*Rhynchobatus immaculatus*) which is Critically Endangered. It is a poorly known shark-like ray with a restricted distribution around northern Taiwan in the Northwest Pacific. There is a high level of fisheries resource use and increasing fishing pressure across the range of wedgefishes, and as a result, targeted and incidental fishing effort is placing significant pressure on the wedgefish species in the Indo-West Pacific. While there is no specific population data available, its known range has a significant 4.21% overlap with the marine EAAA. Given these conditions, the Taiwanese wedgefish is considered likely to be a critical habitat species under C1(a).
Migratory birds								
Platalea minor	Black-faced Spoonbill	EN	✓	-	✓	-	-	Black-faced Spoonbill is listed as Endangered under the IUCN Red List, and Near Threatened under the National Red List. It is also listed in Appendix I of the CMS. This species currently breeds only on a few small rocky islands off the west coast of

Scientific Name	Common Name	IUCN Status	C1	C2	C3	C4	C5	Justification critical habitat determination
Marine fauna								
								North Korea, with four wintering sites at Macau, Hong Kong, Taiwan and Vietnam, as well as other places where they have been observed in migration. In the 2024 global census, the black-faced spoonbill population was recorded at 6988 individuals, of which 4135 were recorded in Taiwan, accounting for 59.2% of the population worldwide. 61 individuals of Black-faced Spoonbill were recorded during the baseline surveys of the EIA report. This exceeds the threshold for C1a (ie. 0.5% of the global population AND ⩾5 reproductive units of a CR or EN species) and C3 (ie 1% of the global population of a migratory or congregatory species).
Saundersilarus saundersi	Saunders's Gull	VU	✓	-	✓	-	-	Saunders's Gull is listed as Vulnerable under the IUCN Red List and Critically Endangered under the National Red List. It is also listed in Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), which means it is a threatened migratory species. This species is found in Taiwan, China, Hong Kong, Macao, Korea, Japan, Vietnam and Russia. Its natural habitats are saltmarsh habitats and estuarine tidal flats (IUCN, 2023a). However, this species was not recorded during the baseline surveys of the EIA reports (Unitech, 2018a; Unitech, 2021). Taking a precautionary approach using spatial data, the global range of the Saunders's Gull overlaps with the EAAA by 1.62%. Thus, the migratory bird EAAA may support a globally important population of this species under Criterion 1c (ie areas containing important concentrations of a nationally or regionally listed CR/EN species) and C3 (ie 1% of the global population of a migratory or congregatory species).
Charadrius alexandrines	Kentish Plover	LC	-	-	✓	-	-	The Kentish Plover is an IBA qualifying species for multiple IBAs within the migratory bird EAAA. This includes the Pohtzi River Estuary IBA, Hsinchu City Coastal Area IBA, Kaomei Wetlands IBA, Dadu Rivermouth Wildlife Refuge IBA, Hanbao Wetlands IBA, Tacheng Wetlands IBA, Aogu Wetlands IBA, Budai Wetlands IBA, Chiku IBA, Sitsao Wildlife Refuge IBA, Yungan IBA and Qieding Wetland IBA. In addition, the Kentish Plover was observed (peak count 1535) during bird surveys conducted to inform the EIA. In 2014, 5752 Kentish Plovers were observed in Hanbao Wetlands and 1520 Kentish Plovers were observed in Dadu River Estuary Wetland Rivermouth Wildlife Refuge . Considering that the global poplulation of Kentish Plovers is

Scientific Name	Common Name	IUCN Status	C1	C2	C3	C4	C5	Justification critical habitat determination
Marine fauna								
								100,000-499,999 mature individuals, it is likely that >1% of global population of Kentish Plovers could be present within this area. Therefore, this species is considered a critical habitat species under C3 (ie 1% of the global population of a migratory or congregatory species)..
Ciconia boyciana	Oriental Stork	EN	✓	-	✓	-	-	Oriental Stork is listed as Endangered under both the IUCN Red List and National Red List. It is also listed in Appendix I of the CMS. It is an IBA trigger species (A1) for Zhuoshui River Estuary Wetland IBA (also known as Tacheng Wetland IBA), whereby the site is known or thought regularly to hold significant numbers of Oriental Storks. In recent years, the Oriental Stork has been recorded regularly, numbering approximately 1-2 individuals at the Zhuoshui River Estuary Wetland IBA. According to eBird, there was a peak sighting of 13 individuals at the Zhuoshui River estuary (within the migratory bird EAAA) in 2023. Considering that the number of mature individuals globally are estimated to be 1000-2499 individuals, it is likely to result in the migratory bird EAAA supporting a globally important concentration of this species. Thus, this meets critical habitat thresholds under C1(a) (ie 0.5% of the global population), C1(c) (ie areas containing important concentrations of a nationally or regionally listed CR/EN species) and C3 (ie 1% of the global population of a migratory or congregatory species).
Thalasseus bernsteini	Chinese Crested Tern	CR	✓	-	✓	-	-	The Chinese Crested Tern is listed as Critically Endangered under the IUCN Red List and National Red List. The global population of the Chinese Crested Tern is approximately 30 to 49 mature individuals. The IUCN does not present the Chinese crested tern global range. However, according to eBird, the species has been spotted several times in 2023 just south of Chiayi county (within the migratory bird EAAA), numbering between 1-2 individuals each time (eBird, 2024b). As this already constitutes >1% of the global population given its small population size (ie approximately 30 to 49 mature individuals), this species meets critical habitat thresholds under C1(a), C1(c) (ie. 0.5% of the global population and areas containing important concentrations of a nationally or regionally listed CR/EN species) and C3 (ie 1% of the global population of a migratory or congregatory species)..

Scientific Name	Common Name	IUCN Status	C1	C2	C3	C4	C5	Justification critical habitat determination
Marine fauna								
Biodiversity value								
EAAA for marine fauna and flora			-	-	-	-	✓	Various project documents and published literature reviewed has highlighted that the marine flora and fauna EAAA is part of the Kuroshio Triangle, the coral ecosystems influenced by an ocean current from the tropical Philippines, subtropical Taiwan and Okinawa, and the high latitudinal coral communities off Shikoku Island, Japan (Chen & Shashank, 2009). Taiwan is a steppingstone situated in the midway corridor of the Kuroshio Triangle and provides connectivity between distant coral ecosystems. There is limited evidence as to the overall importance of Taiwanese reefs in terms of gene flow and climate change adaptation and further research is needed (Chen & Shashank, 2009). On a conservative approach it is considered that the marine flora and fauna EAAA meets the requirements of Criterion 5.

Source: Mott MacDonald, 2024

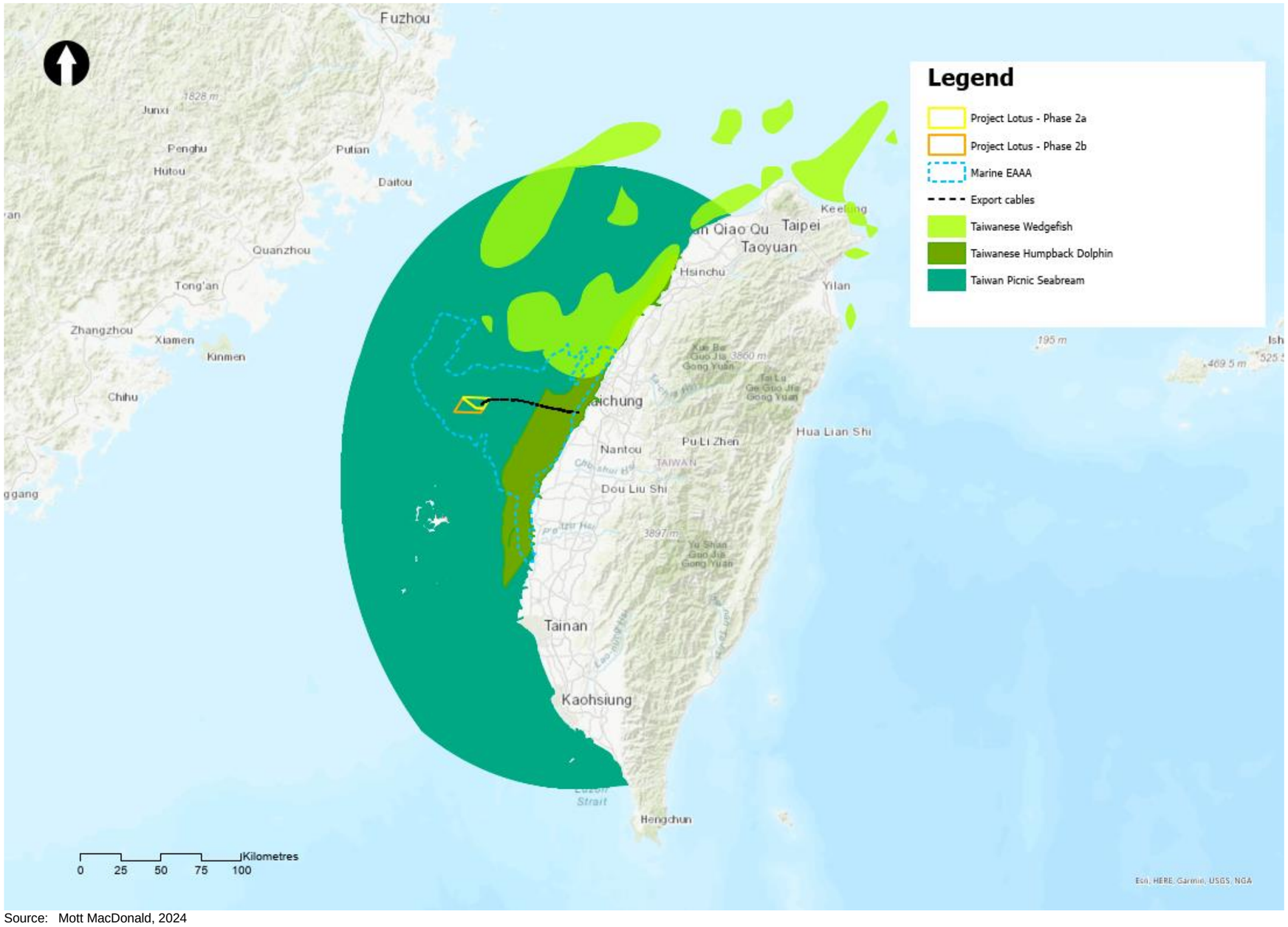
Note: CR – Critically Endangered, EN – Endangered, VU – Vulnerable, NT – Near Threatened, LC – Least Concern, DD – Data deficient

Critical habitat areas for marine fauna species and migratory birds (including seabirds) are shown in Figure 4.2 and Figure 4.3 respectively. These critical habitat maps delineate the critical habitats for each biodiversity feature identified in Table 4.1 above.

Figure 4.2 shows the critical habitats for marine fauna critical habitat features, which include the extent of the distribution of each marine fauna species off the west coast of Taiwan. Figure 4.3 shows the critical habitats for migratory bird critical habitat features, defined by the IBAs for which each of the migratory birds are qualifying species.

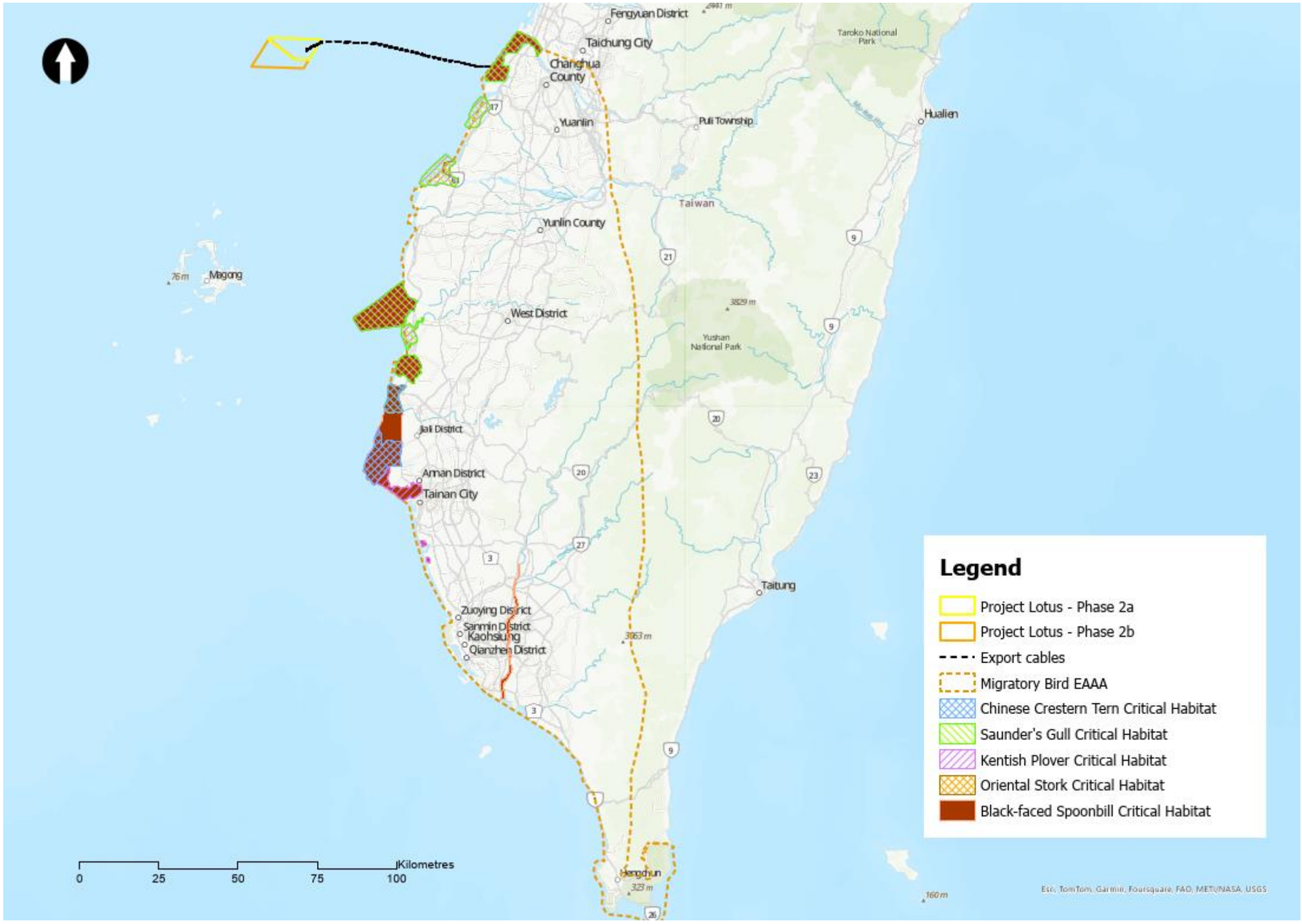
It is noted that Figure 4.2 and Figure 4.3 differ from the EAAAs presented in Figure C.1 of this report / Figure 2.2 of the CHA (Mott MacDonald, 2024a). The figure in the CHA presents the initial study area (ie the EAAAs) for the CHA (Mott MacDonald, 2024a), while Figure 4.2 and Figure 4.3 present the critical habitat areas for the critical habitat features that have been identified as a result of the CHA. In the process of developing this BAP, the initial study area used in the CHA (ie the EAAAs) has been refined to identify more specific critical habitat areas for the critical habitat features identified, with results presented in Figure 4.2 and Figure 4.3. The critical habitat areas have been determined based on Mott MacDonald's methodology.

Figure 4.2: Critical habitat for marine fauna and flora



Source: Mott MacDonald, 2024

Figure 4.3: Critical habitat for migratory birds (including seabirds at sea)



Source: Mott MacDonald, 2024

4.4.2 Marine flora and fauna

A total of 334 species were recorded during baseline surveys for the EIA (Unitech, 2018; Unitech, 2021). Given the relatively broad seascape and the wide-ranging behaviour of many marine species, it was considered that 2481 species of marine fauna and flora were likely to be present within the EAAA. Marine flora and fauna within the EAAA are assigned to the following IUCN conservation status categories:

- Critically Endangered: 19
- Endangered: 54
- Vulnerable: 81
- Near Threatened: 81
- Least Concern: 2082
- Data Deficient: 164

Among the 2481 marine species, three of them were determined to have triggered critical habitat (refer to the CHA for the full list of species).

The Taiwanese humpback dolphin (*Sousa chinensis ssp. taiwanesis*) is listed as Critically Endangered under the IUCN Red List and a nationally protected species, Category I Endangered species (ie the most critical species). The population of the subspecies is considered to be 37–44 mature individuals (IUCN, 2022) and its known range is largely within the EAAA. The population in the EAAA therefore exceeds the threshold for C1(a) in respect of the Taiwanese humpback dolphin. It also meets the threshold for C2 being defined as of restricted range.

The Taiwan picnic seabream (*Acanthopagrus taiwanensis*) is considered to have met the threshold of C2, which is listed as Data Deficient in the IUCN Red List. It is a demersal fish[6] (Froese & Pauly, 2022) while there is no information on the depth range of the species. The known geographic ranges are restricted to the Taiwan waters and the whole EAAA overlaps with their geographic ranges. The Taiwan picnic seabream was not collected during the EIA baseline surveys, however it was recorded in the Greater Changhua Offshore Wind Farm Southeast (CHW01) EIA.

Another marine fish, Taiwanese wedgefish (*Rhynchobatus immaculatus*), is listed as Critically Endangered in the IUCN Red List. It is a poorly known shark-like ray with a restricted distribution around northern Taiwan in the Northwest Pacific. There is a high level of fisheries resource use and increasing fishing pressure across the range of wedgefishes, and as a result, targeted and incidental fishing effort is placing significant pressure on the wedgefish species in the Indo-West Pacific. Given these conditions, the Taiwanese wedgefish is likely to meet the thresholds for C1(a) and C2.

4.4.3 Migratory birds (including seabirds at sea)

A total of 65 species were recorded during baseline surveys for the EIA reports (Unitech, 2018; Unitech, 2021). Given the wide-ranging behaviour of migratory birds and seabirds at sea, it was considered that 17 internationally threatened (i.e. CR, EN and VU) species and a total of 228 species were likely to be present within the migratory bird EAAA. Migratory birds and seabirds at sea within the EAAA are assigned to the following IUCN conservation status categories:

- Critically Endangered: 2
- Endangered: 5

[6] Demersal fish live and feed on or near the bottom of seas or lakes which usually consist of mud, sand, gravel or rocks.

- Vulnerable: 10
- Near Threatened: 11
- Least Concern: 200

Among the 228 species mentioned in the list above, five of them were determined to have triggered critical habitat (refer to the CHA (Mott MacDonald, 2024a) for the full list of species).

Saunders's gull is listed as Vulnerable under the IUCN Red List and Critically Endangered under the National Red List. It is also listed in Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) (CMS, 2020) (CMS, 2020), which means it is a threatened migratory species. This species is found in Taiwan, China, Hong Kong, Macao, Korea, Japan, Vietnam and Russia. Its natural habitats are saltmarsh habitats and estuarine tidal flats (IUCN, 2023). However, this species was not recorded during the baseline surveys of the EIA reports (Unitech, 2018; Unitech, 2021)

The black-faced spoonbill is listed as Endangered under the IUCN Red List, and Near Threatened under the National Red List. It is also listed in Appendix I of the CMS (CMS, 2020). This species currently breeds only on a few small rocky islands off the west coast of North Korea, with four wintering sites at Macau, Hong Kong, Taiwan and Vietnam, as well as other places where they have been observed in migration. In the 2023 global census, the black-faced spoonbill population was recorded at 6988 individuals, of which 4135 were recorded in Taiwan, accounting for 59.2% of the population worldwide. 61 individuals of black-faced spoonbill were recorded during the baseline surveys of the EIA report. It also meets the threshold for C3 being defined as a migratory species.

The Kentish plover is listed as Least Concern under the IUCN Red List. Although the global range of the Kentish plover overlaps with the EAAA by only 0.01%, count surveys conducted in qualifying IBAs of the Kentish Plover show that the area is known to sustain significant concentrations of the global population. Considering that the global population of Kentish plovers is 100,000-499,999 mature individuals, it is likely that >1% of global population of Kentish plovers could be present within this area. In addition, this species was recorded along the coast during the baseline surveys of the EIA report. Thus, the Kentish plover triggers critical habitat under C3.

The oriental stork is listed as Endangered under both the IUCN Red List and National Red List. It is also listed in Appendix I of the CMS. It is an IBA trigger species (A1) for Tacheng Wetlands IBA (also known as Zhuoshui River Estuary Wetland IBA), whereby the site is known or thought regularly to hold significant numbers of Oriental Storks. According to eBird, there was a sighting of 13 individuals at the Zhuoshui River estuary (within the migratory bird EAAA) in 2023. Considering that the number of mature individuals globally are estimated to be 1000-2499 individuals, it is likely to result in the migratory bird EAAA supporting a globally important concentration of this species. Thus, this meets critical habitat thresholds under C1(a), C1(c) and C3.

The Chinese crested tern is listed as Critically Endangered under the IUCN Red List and National Red List. The global population of the Chinese crested tern is approximately 30 to 49 mature individuals. The IUCN does not present the Chinese crested tern global range. However, according to eBird, the species has been spotted several times in 2023 just south of Chiayi county (within the migratory bird EAAA), numbering between 1-2 individuals each time (eBird, 2024b). As this already constitutes >1% of the global population given its small population size (ie approximately 30 to 49 mature individuals), this species meets critical habitat thresholds under C1(a), C1(c) and C3.

4.4.4 Terrestrial flora and fauna

The EIA report baseline (Unitech, 2018; Unitech, 2021) identified approximately up to 270 terrestrial species. In addition to the Project's baseline surveys, it was considered that a total of 474 species of terrestrial flora and fauna were likely to be present within the EAAA. Terrestrial flora and fauna within the EAAA are assigned to the following IUCN conservation status categories:

- Critically Endangered: 4
- Endangered: 6
- Vulnerable: 17
- Near Threatened: 15
- Least Concern: 434
- Data Deficient: 3

None of the terrestrial flora or fauna species meet the threshold for any of the critical habitat criteria, and therefore there are no terrestrial species that have triggered critical habitat.

5 Project impacts and embedded mitigation

5.1 Summary of project impacts on critical habitat triggers

Impact significance used in the assessment which aligned with the requirements of IFC PS6 are defined in Table 5.1 below.

Table 5.1: Impact significance definitions

Project impact significance	Definition of impact significance
Adverse significant	• A measurable adverse impact on those biodiversity values for which the critical habitat was designated and on the ecological processes supporting those biodiversity values. • A net reduction in the global and/or national/regional population of any Critically Endangered or Endangered species over a reasonable period of time.
Adverse not significant	No measurable adverse impact on those biodiversity values for which the critical habitat was designated, and on the ecological processes supporting those biodiversity values.
No adverse impact	No adverse impact on those biodiversity values for which the critical habitat was designated, and on the ecological processes supporting those biodiversity values.

Source: Mott MacDonald, 2024

Table 5.2 summarises the Project impacts on the identified critical habitat trigger species. Full details can be found in the Project's EIA, EIS and CHA.

Table 5.2: Summary of project impacts (before mitigation) on critical habitat triggers

Project impact	Impact duration	Impact significance before mitigation
Marine ecology (Construction phase)		
Habitat loss Footprint of WTGs foundations underwater will result in the loss of benthic habitats.	Permanent	Adverse not significant
Habitat change and loss Laying and burying of submarine cables will result in loss of habitat within the nearshore environment, which is within the proposed Taiwanese Humpback Dolphin MWH and the critical habitat of the Taiwanese picnic seabream.	Temporary	Adverse significant
Underwater noise Offshore trenching, dredging, filling and piling activities and the use of construction vessels would generate underwater noise and sound pressure which can impact marine fauna (especially marine mammals) in the following ways: • Temporary/ permanent hearing loss • Behavioural change / reactions, eg temporary loss of feeding / breeding habitats resulting in habitat displacement • Interference with communication between individuals due to masking effects (ie in terms of audibility and frequency).	Temporary	Adverse significant
Vessel strikes Use of construction vessels may increase potential collision risks with marine mammals leading to injury or death. In addition, marine species which are unable to swim or crawl would be less able to escape collision from vessels, increasing risks of injury or death.	Temporary	Adverse significant
Decreased water quality Piling works and laying of submarine cables will result in an increase of suspended solids, and as such increased turbidity levels in the water column. This will adversely affect water quality, thereby indirectly impacting the marine organisms. However, concentration of the suspended solids will not be high, and suspension will be of a short duration.	Temporary	Adverse not significant
Physical processes from the presence of new structures The presence of new subsurface structures may affect local water movements which may in turn influence sediment transport and behaviour of some aquatic species.	Temporary	Adverse not significant
Accidental pollution events/ contaminant release Pollutants may be unintentionally released into the environment as a result accidents or natural disasters.	Temporary	Adverse significant
Marine ecology (Operation phase)		
Underwater noise Operational wind turbines will generate a constant, low, basalt level of underwater noise which may affect the behaviour of marine fauna.	Permanent	Adverse not significant
Vessel strikes Use of maintenance vessels may increase potential collision risks with marine mammals leading to injury or death. In addition, marine species which are unable to swim, or crawl would be less able to escape collision from vessels, increasing risks of injury or death.	Temporary	Adverse not significant
Electromagnetic field (EMF) Electric currents in the inter-array submarine cables and submarine cables connecting the WTGs to the cable landing point	Permanent	Adverse not significant

Project impact	Impact duration	Impact significance before mitigation
may induce electromagnetic fields, influencing the behaviour of marine ecology.		
Barrier effect The presence of marine structures may initiate avoidance behaviour and result in marine mammals having to swim around the WTG area.	Permanent	Adverse not significant
Accidental pollution events/ contaminant release Pollutants may be unintentionally released into the environment as a result of accidents or natural disasters.	Permanent	Adverse not significant
Reef effect The presence of turbine foundations and rock armour in marine waters will result in the development of a reef community. This includes an increase of reef-dwelling fishes surrounding the Project.	Permanent	No adverse impact; (positive impact)
Migratory birds – including seabirds at sea (Construction phase)		
Habitat loss, disturbance and displacement Laying of submarine cables and above-ground cables would result in the temporary loss of habitat within the nearshore environment and intertidal environment. This may potentially affect the behaviour of birds (eg daily movement and loss of feeding/foraging grounds).	Temporary	Adverse significant
Migratory birds – including seabirds at sea (Operation phase)		
Collision with wind turbine blades Bird injury and fatalities may result due to collision with rotating wind turbine. Frequency and likelihood of such events is dependent on the bird species and their flight altitude. Migratory waterbirds and breeding seabirds are most likely to collide with the wind turbines.	Permanent	Adverse significant
Barrier effect The presence of WTG may initiate avoidance behaviour and result in birds having to fly around the array area.	Permanent	Adverse not significant

Source: Mott MacDonald, 2023

5.1.1 Summary of mitigation measures

Table 5.3 summarises the avoidance and minimisation mitigation measures included in the local EIA reports for implementation throughout the Project lifecycle. Full details can be found in the Project's CHA.

Table 5.3: Summary of mitigation measures for critical habitat triggers

Type of measures	Mitigation hierarchy classification	Description of measure	Adaptive management threshold	Corrective action	Responsible party / parties
Pre-construction Phase					
Project siting	Avoid	● The Project's offshore footprint (for WTG) is located approximately 50.5km outside the Taiwanese Humpback Dolphins MWH to avoid direct impacts. ● The WTGs are to be located approximately 57 km from the coast and at depths of 23.8m to 42.2m. ● An interval of 500m to be kept between turbines to allow for sufficient space for birds to fly through	Change the cable route layout prior to, or during cable laying that overlaps with the legally protected and internationally recognised areas.	Revise impact assessment in relation to submarine cable laying and apply effective mitigation to avoid and minimise significant effects.	Developer
	Minimise	● The submarine cable route from WTG to landfall shall take the shortest distance feasible. The cable will be laid within the Changhua Northern Common Corridor (ie as designated by TPC and the government) to connect the Project's offshore windfarm and its landing point. The usage of the Common Corridor by the Project is to minimise overall environmental impacts (ie minimise spatial footprint by avoiding export). ● The submarine cable will be buried 1 to 2m (2m within the nearshore area) to reduce electromagnetic field (EMF) effects.			
Construction phase					

Type of measures	Mitigation hierarchy classification	Description of measure	Adaptive management threshold	Corrective action	Responsible party / parties
Awareness training to identify marine mammals during installation of submarine cables	Minimise	• For submarine cable installation, the cable laying contractor and associated crew members will be socialised to identify marine mammals while works are ongoing (eg providing pictures of the marine mammals as a fieldkey for contractors and crew members to easily identify them). • Stop-work or delay/postponement of work will be considered where marine mammals are spotted.	Potential to re-evaluate the provisions of the protocol, if sightings (of marine mammals) are noted to be frequent.	An emergency response plan in the event of marine mammal sightings during submarine cable installation will be formulated.	Developer and contractor Training provider (if applicable)
Construction methodology	Minimise	**Noise reduction** • Adoption of suction bucket jacket (SBJ) technology for foundation installation works to be used to reduce underwater noise. SBJ technology uses suction which generates a pressure difference, allowing the structure to be installed without mechanical force, as opposed to percussive hammer piling which generates underwater noise via use of mechanical force (Ørsted, n.d.). • Progressive construction method to be used for foundation installation. Gradual increase of installation from low strength to full strength. Four passive acoustic monitoring (PAM) noise monitoring stations will be set up within a 750m radius from the centre of piling activities. • Developer to only conduct at most one foundation installation at a time. • Offshore construction activities will be coordinated between the windfarms of the Project Company to mitigate cumulative impacts of underwater noise from	Change in planned noise reduction measures or exceedance of underwater noise threshold (160 dB [(dB) re. 1µPa2s at 750m distance] and 190 dB for SPLpeak value).	Stop work until effective noise reduction measures are in place	Developer and contractor
			Report of concurrent piling.	Stop work until concurrent piling is avoided.	Developer and contractor

Type of measures	Mitigation hierarchy classification	Description of measure	Adaptive management threshold	Corrective action	Responsible party / parties
		foundation installation. Installation activities are to be coordinated to ensure piling activity of only one WTG at a time.			
	Minimise	**Vessel speed and navigation** ● Vessels within 1500m radius of the Taiwanese Humpback Dolphin Major Wildlife Habitat (MWH) and its borders are to maintain a speed of 6 knots or lower. ● Construction vessels are to avoid entering the hot spots during the dolphin's peak activity periods as far as practicable. ● Navigation route of vessels will be designed to avoid sensitive areas. ● Construction vessels will be sourced and based from the nearest port and to minimise transit routes.	Vessel speed exceeding 6 knots within 1500m from the Taiwanese Humpback Dolphin MWH	Notice of infringement to be issued to vessel captain with subsequent contractual/financial penalties.	Developer and contractor
	Minimise	**Pollution reduction** ● Construction vessels' wastewater (and sewage), oil, scrap or other pollutants are to be retained on board or excreted at onshore facilities. ● Construction areas are noted with warning signs to reduce non-working vessels entering and causing collisions, which would result in leakage of oil or other pollutants. ● Regular maintenance to be undertaken for construction equipment and vessels to reduce concentrations of pollutants emitted.	Accidents causing marine pollution or danger of potential pollution	● Notify local shipping administration authorities, port authorities and local government authorities. ● Undertake measures to prevent, eliminate or reduce pollution, following the major marine oil pollution emergency contingency plan and operation rules of water pollution incident emergency response prevention system.	Developer and contractor

Type of measures	Mitigation hierarchy classification	Description of measure	Adaptive management threshold	Corrective action	Responsible party / parties
		• Vessels to ensure sufficient storage capacity of wastewater tanks within the vessels to collect wastewater generated by the crew when offshore. The wastewater is to be disposed onshore. • Anti-pollution turbidity curtains are to be used during the construction and laying of cables within the intertidal zone (ie within 5m from sea). • All working vessels are to use gasoline with sulfur content lower than 0.5%. • Seabed scour protection work will be carried out using stone carrier fallpipe vessel to reduce impact on marine water quality. • During installation of jacket foundations, a remotely operated vehicle (ROV) will be used to monitor seabed sediment disturbance through underwater imaging.			
	Avoid	• No excavation activities are to be carried out at intertidal areas. • Horizontal directional drilling (HDD) and sub-surface tunnelling for cable laying will be used at the intertidal area and will avoid peak migratory bird season between November and March. • Although the HDD operations take place within intertidal and subtidal habitats, the Project has abided by the Changhua Offshore Wind Power Submarine Cable Common Corridor government regulation promulgated on 2 August 2017 (Ministry of Economic Affairs, 2024) for cable laying areas, in order to minimise impact on the intertidal and subtidal areas	Change of construction programme	Revise impact assessment related to disturbance with subsequent consideration of mitigation measures to avoid or minimise significant effects	Developer and contractor

Type of measures	Mitigation hierarchy classification	Description of measure	Adaptive management threshold	Corrective action	Responsible party / parties
		• Above-ground cable laying within the intertidal area will avoid peak migratory bird season between November and March. • A Marine and Helicopter Coordination centre (MHCC) is set up to monitor locations of working and non-working vessels to prevent collisions from occurring and take command of any emergency situations.			
Operation phase					
Project design	Minimise	**Bird collision reduction** • Warning lights are to be installed on the blades of the WTG, in accordance with the Aviation obstacle sign and obstacle light setting standard (航空障礙物標誌與障礙燈設置標準) to reduce the likelihood of bird collision at night. Its implementing methods should follow horizontal direction intervals not exceeding 900m and be implemented on the corners or most outer row. • The Project EIA mentions that if large flocks of protected species or large sized birds are passing through the wind farm, the operator shall commit to the implementation of a feasible speed reduction mechanism. The necessity for this shall be assessed during the operations phase as more understanding of avian behaviour (eg via monitoring) within the vicinity of the Project. • Implement recording devices to record bird images so as to monitor offshore	Change in proposed lighting design or Project design during the operation phase	Revise impact assessment related to collision risk with subsequent consideration or mitigation measures to avoid or minimise significant effects.	Developer and operator

Type of measures	Mitigation hierarchy classification	Description of measure	Adaptive management threshold	Corrective action	Responsible party / parties
		birds. This can be set up as a joint bird monitoring system between greater Changhua, Hailong and Haiding projects. The monitoring system is to support detection of possible bird collision, flying route and assessment of barrier effect.			

Source: Mott MacDonald, 2024

On-site restoration of temporarily affected terrestrial areas (non-critical) affected by construction (eg cable/ buried transmission line/ construction compounds/laydown areas) will be undertaken as part of the onshore lease following the Landscaping Plan that will be prepared. Natural regeneration of temporarily affected marine areas will occur following cable laying due to the dynamic nature of the marine environment.

5.2 Residual impact assessment

The significance of residual impacts has been determined in the Project's CHA by considering the biodiversity impact assessment in the local EIA report. Focus was put on the project impacts on those biodiversity features for which the critical habitat was designated. Mitigation measures have been proposed as part of the EIA and EIA Addendum (refer to Section 5.1.1). These mitigation measures were evaluated against the associated impacts and thereby residual project impacts were identified through desktop analyses.

The residual impact for the species groups that meet critical habitat thresholds (ie marine fauna and migratory birds (including seabirds at sea)) are summarized in Table 5.4. Please refer to the Project's CHA for the detailed assessment of residual impact significance (Mott MacDonald, 2024a).

Bird collisions with wind turbine blades during the operation phase is considered to pose a significant residual impact after the application of mitigation measures. This is because the collision risk modelling (CRM) results (Appendix B) indicate a total of 31.7 birds per year (based on 2019 results) and 58.5 birds per year (based on 2019-2020 results) for 16MW turbines. Although there are uncertainties in the collision risk modelling undertaken (including, but not limited to, assumptions about avoidance rates), precautionary assumptions have been taken. Without application of methods such as Population Viability Analysis (PVA) it is not known to what extent the populations of the target species (including critical habitat features: black-faced spoonbill, Saunders's gull and Kentish plover) can sustain additional levels of mortality. Therefore, due to these uncertainties, a precautionary approach has been taken and this will be monitoring and evaluated on an ongoing basis during the operation phase.

The BAP has been designed to offset the residual impacts of collision risks and achieve net gain for the critical habitat features identified in the CHA. This is because, if successfully implemented, the BAP actions will lead to an increase in quality and extent of viable habitat for bird species with significant collision risks. The successful implementation of BAP actions will also lead to a net gain of critical habitat species by increasing the robustness and survivability of the population (and its ability for breeding). This increase will suitably offset against the adverse impacts of collision risk (ie decrease in population). This implies that the overall residual impact (ie decrease in population) will decrease to a level that is not significant. Further description and details of the BAP actions are provided in Section 6.2.

Although the vast majority of the residual impacts are not significant, compensation/offsetting and additional conservation actions are still needed to demonstrate net gain. These actions are presented in Section 6.

Table 5.4: Residual impact significance

Project impact	Residual impact significance
Marine fauna	
Construction phase	
Habitat loss	**Adverse not significant** The Project's total seabed footprint is approximately 0.003% (0.37 km^2) of the marine environment available within the EAAA.

Project impact	Residual impact significance
Habitat change and loss	**Adverse not significant** Mitigation measures are proposed to avoid intertidal habitats and minimise the total and cumulative subtidal habitat footprint and recovery time. The total area affected is not considered to be a significant proportion of the total habitat available**.**
Underwater noise	**Adverse not significant** Suction bucket jacket and other noise reduction mitigation techniques, as opposed to percussive hammer piling, are expected to reduce piling sound pressure level to SEL 160dB at 750m from the piling location. Measures are also in place to monitor underwater noise levels so that adaptive management strategies can be employed if required.
Vessel strikes	**Adverse not significant** Limitation of vessel speeds to 6 knots, proper design of navigation routes and minimising transit routes are expected to reduce the risk of collisions with marine mammals. Measures are also in place to monitor the presence of marine mammals during construction.
Decreased water quality	**Adverse not significant** Increase in turbidity levels are expected to be minimized with the implementation of good practice construction procedures. In any event, increased suspended sediment levels are likely to fall within natural variations due to waves and tides for shallow water sites (Cooper et al., 2008).
Physical processes from the presence of new structure	**Adverse not significant** Measures are in place to monitor marine mammal activity during construction so that adaptive management strategies can be employed if required.
Accidental pollution events/ contaminant release	**Adverse not significant** The EPRP will have to be developed with Project specific details. Emergency preparedness drills will have to be conducted to ensure that the Project team is trained to react in the event of an emergency. Equipment to handle accidental pollution events (eg spill response kit) will also need to be provided as part of the EPRP
Operation phase	
Underwater noise	**Adverse not significant** Measures are in place to monitor any potential underwater noise impacts to marine fauna and enable adaptive management strategies if required.
Vessel strikes	**Adverse not significant** No specific measures on reducing vessel collision with marine mammals have been proposed. In order to reduce the impact, it is recommended that project vessels should be sourced and based on the nearest port to minimise transit routes. If recommendations for mitigation are applied, then the impact would be considered not significant.
Electromagnetic field (EMF)	**Adverse not significant** There have been no conclusive assessments to date to show that EMF affects marine fishes, and it is unlikely that EMF would affect larger marine mammals. Measures are in place to monitor marine mammal activity during operation so that adaptive management strategies can be employed if required.

Project impact	Residual impact significance
Accidental pollution events/ contaminant release	**No adverse impact** Impacts to sea water quality is envisaged to be minor or negligible during operations of a offshore wind farm due to the nature of the development. The EPRP will have to be updated with Project specific details (eg names of the EPRP team), and emergency preparedness drills will have to be conducted to ensure that the Project team is trained to react in the event of an emergency. Equipment to handle accidental pollution events (eg spill response kit) will also need to be provided as part of the EPRP.
Barrier effect	**Adverse not significant** The total footprint of the WTG bases is approximately 0.0005% of the marine environment available within the EAAA.
Reef effect	**No adverse impact** The development of artificial reefs is considered to represent a positive contribution to biodiversity and ecosystem function.
Migratory birds and seabirds at sea	
Construction phase	
Habitat loss, disturbance and displacement from cable laying	**Adverse not significant** Mitigation measures are in place to limit the temporary habitat loss during construction phase
Operation phase	
Collision with wind turbine blades	**Adverse significant** Various design considerations have been incorporated to minimize risk of bird collusions. Measures are also in place to monitor any potential bird mortalities and enable adaptive management strategies if required. Through successful implementation of the BAP actions, a net gain in species populations is anticipated, with overall collision risk impact reduced to adverse not significant.
Barrier effect	**Adverse not significant** Project design and monitoring are in place to minimise avoidance behaviour and the distance required for birds to fly around the array area.

Source: Mott MacDonald, 2023

5.3 Assessment of losses and gains

5.3.1 Marine fauna

It is difficult to identify or use a metric to measure losses in the marine environment, and to quantify offset gains across the large spatial and temporal scales needed to encompass marine species' ecology and life history (Jacob, et al., 2020). The highly dynamic and diffuse nature of the marine environment makes it difficult to distinguish impacts and offset gains from ambient condition or background noise.

In addition, based on the EIA amendment report (Unitech, 2021), the overall footprint from the scour protection on the seabed was estimated to be 0.48 km^2, which amounts to only 0.009% of the marine EAAA (approximate area 5535.38 km^2). The amendment report also states that the seabed and substrate is predominantly sandy and the Project components are not located near

any sensitive coral reefs, wetlands, mangroves or other ecologically sensitive areas. Impact on marine fauna was therefore assessed to be adverse not significant or no adverse impact.

Based on the mitigation hierarchy, the Project will undertake additional conservation actions and qualitative evidence will be provided.

5.3.2 Migratory birds and seabirds at sea

The loss of critical habitat trigger species has been measured by using the assessment of bird collision with wind turbine blades conducted in the local EIA and EIS Report (refer to Appendix B for the CRM results). The vulnerability of different bird groups in collision were qualitatively assessed by considering the overlap of average bird flight altitude with the rotation range of wind turbine blade, flexibility in habitat use, survival rate of adult and national conservation status (Garthe & Huppop, 2004) (Table 5.5).

For the critical habitat species, it was noted that the Saunders's gull and Kentish plover were simulated to have a collision risk of less than one collision (Unitech, 2021). The black-faced spoonbill was estimated as part of the cumulative collision risk assessment undertaken for all windfarms along the western coast of Taiwan. It was noted that the black-faced spoonbill was estimated to have a collision risk of one collision annually across 670 WTGs situated within the greater Changhua outer seas (Unitech, 2020a).

The Saunders's gull breeding grounds are situated at a few localities on the Yellow Sea Coast and spends its non-breeding period along the coastlines of mainland China, Taiwan, Vietnam, the west and south Korean Peninsula and south-western Japan (Cao, Barter, & Wang, 2008). Thus, the Saunders's gull is considered to be a non-breeding seabird that winters in Taiwan. However, it is also a migratory waterbird as it travels to breed and winter. Migratory waterbirds are classified as having medium collision vulnerability. Therefore, adopting a precautionary approach, loss from collision could pose a significant impact on the Saunders's gull population (Table 5.5).

Likewise, the Chinese crested tern is considered to be a non-breeding seabird that winters in Taiwan. The Chinese crested tern breeding grounds are limited to only five confirmed locations along the China coastline and South Korea, thus breeding grounds in Taiwan are unlikely to be present. Based on Table 5.5, the collision vulnerability of Chinese crested tern is deemed to be low. However, given the low global population numbers of the Chinese crested tern, a precautionary approach is favoured and this species is thus deemed to have significant residual impacts.

The black-faced spoonbill, Kentish plover and oriental stork are categorised to be migratory waterbirds. The collision vulnerability of migratory waterbirds is evaluated to be medium as the likelihood of adjustments in their migration routes to avoid wind farms is limited by the lack of suitable transit locations (Table 5.5).

Specifically, the oriental stork is considered to be a non-breeding wading bird that winters in Taiwan. The oriental stork breeding grounds are mainly along the border of Russia and mainland China (IUCN, 2018b), thus breeding grounds in Taiwan are unlikely to be present. Based on Table 5.5, the collision vulnerability of the oriental stork is deemed to be low. However, based on a study on collision risks, the oriental stork and other members of the order Ciconiformes are deemed to have significant collision risks (Thaxter, et al., 2017). Therefore, the oriental stork is deemed to have high collision vulnerability and significant residual impacts.

Table 5.5: Vulnerability of different bird groups to collision

Bird group	Flight altitude	Flexibility in habitat use	Adult survival rate[7]	Collision Vulnerability
Breeding seabirds	Medium	Low; Their foraging grounds are linked with few specific breeding grounds	High	High
Non-breeding seabirds	Low	High; These are mostly oceanic birds	High	Low
Migratory waterbirds	Low-High	Medium; They may adjust their migration route to avoid the entrance to windfarm, yet it depends on whether there are suitable transit locations	Medium	Medium*
Migratory landbirds	Low	Medium; They may adjust their migration route to avoid the entrance to windfarm, yet it depends on whether there are suitable transit locations	Low	Low

*Oriental stork considered to have high collision vulnerability according to external collision risk study (Thaxter, et al., 2017).

Source: Unitech, 2018

[7] The average proportion of adult birds (ie of at least breeding age) which survive each year.

6 BAP actions

6.1 Priorities for biodiversity conservation

This BAP focuses on species and habitats that require special management rather than considering all biodiversity in the BAP Study Area. The priorities for biodiversity conservation were selected based on critical habitat trigger species, species with significant residual impacts and habitats within the EAAAs which are adversely affected by the Project. The biodiversity priorities that are the focus of the actions and monitoring in this BAP are presented in Table 6.1 below. All these features are likely to be adversely affected by the Project but impacts are not significant in the vast majority of cases (see Table 5.3). Following the stakeholder engagements, these priorities may be revised in the next version of the BAP, based on the feedback provided by biodiversity experts, stakeholders, and lenders.

Table 6.1: Priority biodiversity features and proposed BAP actions

Priority features	Critical habitat criterion	Residual impact	BAP action	Justification
Taiwanese humpback dolphin (Sousa chinensis ssp. taiwanesis)	C1a, C2	Not significant	Additional conservation action (ACA) – refer to actions 1 and 2 below	As commensurate with the likelihood that the residual impact is potentially not significant, net gain that are more qualitative in nature (ie through ACAs) is proposed.
Taiwan picnic seabream (Acanthopagrus taiwanensis)	C2	Not significant	Additional conservation action (ACA) – refer to actions 1, 2 and 3 below	As commensurate with the likelihood that the residual impact is potentially not significant, net gain that are more qualitative in nature (ie through ACAs) is proposed.
Taiwanese Wedgefish (Rhynchobatus immaculatus)	C1a, C2	Not significant	Additional conservation action (ACA) – refer to actions 1 and 2 below	As commensurate with the likelihood that the residual impact is potentially not significant, net gain that are more qualitative in nature (ie through ACAs) is proposed.
Black-faced spoonbill (*Platalea minor*)	C1a, C1c, C3a	Significant	Offset that clearly demonstrates net gain – refer to actions 4 and 5 below	This feature is a critical habitat feature species with a potential for significant residual impact. Hence, net gain is targeted to be achieved through clearly demonstrable offset actions.
Saunders's gull (Saundersilarus saundersi)	C1a, C1c, C3a	Significant	Offset that clearly demonstrates net gain – refer to actions 4 and 6 below	This feature is a critical habitat feature species with a potential for significant residual impact. Hence, net gain is targeted to be achieved through clearly demonstrable offset actions.
Kentish plover (Charadrius alexandrinus)	C3a	Significant	Offset that clearly demonstrates net gain – refer to actions 4 and 5 below	This feature is a critical habitat feature species with a potential for significant residual impact. Hence, net gain is targeted to be achieved through clearly demonstrable offset actions.
Oriental stork (*Ciconia boyciana*)	C1a, C1c, C3a	Significant	Offset that clearly demonstrates net gain – refer to actions 4 and 5 below	This feature is a critical habitat feature species with a potential for significant residual impact. Hence, net gain is targeted to be achieved through clearly demonstrable offset actions.

Priority features	Critical habitat criterion	Residual impact	BAP action	Justification
Chinese crested tern (*Thalasseus bernsteini*)	C1a, C1c, C3a	Significant	Offset that clearly demonstrates net gain. However, net gain that are more qualitative in nature (ie through ACAs) is proposed – refer to action 4	This feature is a critical habitat feature species with a potential for significant residual impact. Hence, achieving net gain should be targeted through clearly demonstrable offset actions. However, as based on investigations by Orsted, it reported as challenging for the Project to implement any meaningful offset actions for this species. This is due to known observations of the Chinese crested tern habitat mainly concentrating in Matsu island. Currently, the Lienchiang County Government, in collaboration with its partners, has implemented various conservation measures on Beigan Island in Matsu. This includes regular habitat maintenance, patrolling, and monitoring. However, the Lienchiang County Government does not intend to involve additional partners in these efforts, as all possible actions are deemed to be implemented or are currently in progress. In addition, the Project would likely face major challenges in accessing the island due to heightened regulations by the Taiwanese government. As such, net gain that are more qualitative in nature (ie through ACAs) is proposed as an alternative. Specifically, CHW04 is to collaborate with local birdwatching networks to collect records of the Chinese crested tern's stopover on Taiwan main island. The initiative's aim is to increase available information on the distribution, ecology and duration of their passage through Taiwan main island. If a significant number of Chinese crested terns are observed during the monitoring phase or if evidence strongly indicates that this species occurs regularly on the Taiwan main island, this BAP action may be subjected to review and change. Specifically, this ACA may potentially be further developed to encompass additional measures for the Chinese crested tern.
Non-critical habitat bird species with high and medium collision vulnerability	Not applicable	Significant	Offset that clearly demonstrates net gain – refer to actions 4, 5 and 6 below	These features are not related to critical habitat criteria, however, there is a potentially significant residual impact to breeding seabirds and migratory waterbirds. Hence, on a conservative and voluntary basis, net gain is targeted as required.
EAAA for marine fauna and flora	C5	Not significant	Not applicable	This feature has been included as a critical habitat trigger as the marine EAAA is part of the Kuroshio Triangle. However, there are no corals near the project site and the impacts of the

Priority features	Critical habitat criterion	Residual impact	BAP action	Justification
				project is unlikely to affect any corals. This feature has been included as a CH trigger on a precautionary approach. Hence, no BAP action has been specifically proposed for it.

Source: Mott MacDonald, 2024

6.2 Description of biodiversity actions

By considering the assessment of Project impacts (see Section 5.1) and the Project's CHA, mitigation measures that focus on the "Avoid" and "Minimise" steps of the mitigation hierarchy are presented in Section 5.1.1. If appropriate, plans or measures focusing on habitat removal and restoration should be produced before the start of construction. The biodiversity actions, hereinafter referred to as "BAP actions", described in this section have been developed for each priority biodiversity feature (or groups of features) to attempt to achieve net gain (see Section 6.1 for priority biodiversity features). A systematic implementation of the mitigation hierarchy (ie avoid, reduce (minimise), remedy (restore) and offset) as outlined in Section 2.4 has also been applied.

It is also intended for the BAP actions to promote industry-wide or governmental collaboration targeting ecological improvements that are otherwise challenging for the private sector.

The actions outlined in the following sections are either offsets or additional conservation actions. As the BAP is a live document, these actions will be developed further in future iterations of the BAP based on discussions with Ørsted and the stakeholders. The site/programme identification, selection and evaluation will be derived and referenced from stakeholder engagement/consultation with local academia and/or species experts.

It is important to note that the habitats of marine fauna and migratory birds (including seabirds at sea) are influenced by numerous volatile external factors that the Project will have limited influence over. This may affect the effectiveness of the BAP and as such, the Project will have to evaluate the effectiveness and applicability of the BAP actions. This BAP is a live document and entails periodic updates with Project progression. This can either be done as a separate document or as a component of the BAP in a chapter.

6.2.1 Actions for marine fauna

Action 1: Collaborate with other Taiwanese offshore windfarm developers, researchers, NGOs regulators and cross sector partners to monitor and evaluate cumulative biodiversity impacts on marine fauna, especially Taiwanese Humpback Dolphin and Taiwan picnic seabream to identify if additional management measures are required

Mitigation hierarchy: Additional conservation action

Target species/species group: For all marine species as well as the critical habitat marine mammal, Taiwanese humpback dolphin (*Sousa chinensis ssp. taiwanensis*) and marine fish Taiwan picnic seabream (*Acanthopagrus taiwanensis*) and Taiwanese wedgefish (*Rhynchobatus immaculatus*)

Objectives: This proposed action is in line with EP Principle 10: Reporting and Transparency[8]. This action aims to form a societal consensus across the various parties and stakeholders, which will create a conscious group effort to reduce external development-related or fishing pressures and increase the conservation of marine fauna and their habitat. As mentioned in IFC PS6 Guidance Note 90, qualitative net gains may be obtained by supporting additional opportunities to conserve the critical habitat values in question (IFC, 2019). As there is no significant residual impact anticipated for these target species as outlined in Table 6.1, Action 1 thereby helps to achieve a qualitative net gain by its nature of being an additional conservation action (ACA).

Current / planned measures: Presently, regular meetings on a common communication platform (ie Offshore Wind Environmental Topics Opinion Exchange Platform (OWEEP)) are being held to conduct discussion and coordination on matters regarding marine biodiversity, and setup of contact groups for facilitating mutual notification. These meetings focus on discussing how to reduce cumulative impacts on marine biodiversity. Relevant discussions will also be documented for future reference in driving BAP-related initiatives (Ørsted, 2024a). Photos and brief summary to be provided as evidence of engagement and implementation of this BAP action.

Furthermore, apart from the OWEEP meeting, regular meetings are also held with Prof. Su Nan-Jay (as the stakeholder in academia). These regular meetings are to discuss on matters regarding marine fauna , and minutes of meetings (MOM) for each meeting would be recorded.

Stakeholder engagement: Stakeholders to be engaged include the following:

- Developers of projects in execution and awarded for grid capacity in Round 3.1 and 3.2
- Academia (Prof. Su Nan-Jay)
- NGOs (Taiwan Cetacean Society)

These stakeholders will be engaged for regular OWEEP meetings and other regular meetings.

Timeline:

- OWEEP meetings and meetings with Prof. Su: Regular
  - The expected date of completion for organising stakeholder discussions is by Q1 2025. However, if required, the discussions can be extended into 2026.

Indicator:

- Provision of photos, meeting minutes to demonstrate collaborative effort by the Project

Budget:

- OWEEP meeting and regular meetings with Prof. Su: Expenses incurred are generally considered recurring expenditures, and allocations will be made based on actual needs in the future.

Review mechanism: This BAP action will be developed further in future iterations of the BAP, based on in-depth discussions with Ørsted and identified stakeholders to focus on target species / species groups.

An internal review and update of this BAP action will be conducted on a quarterly basis (ie every three months) as an adaptive management approach (ie reviewing the action based on discussions outcomes/findings). This ensures that the Project's conservation efforts are always aligned with the current circumstances and needs. This regular review will take place both during the project development phase as well as project implementation phase.

Additional recommendations for consideration if current/ planned measures are not suitable: As part of this action, CHW02 can also consider sharing information such as marine ecology monitoring results, findings and

[8] Principle 10: Reporting and Transparency of Equator Principle 4 (July 2020) states, "The EPFI (Equator Principles Financial Institutions) will encourage the client to share commercially non-sensitive Project-specific biodiversity data with the Global Biodiversity Information Facility (GBIF) and relevant national and global data repositories, using formats and conditions to enable such data to be accessed and re-used in future decisions and research applications."

Action 1: Collaborate with other Taiwanese offshore windfarm developers, researchers, NGOs regulators and cross sector partners to monitor and evaluate cumulative biodiversity impacts on marine fauna, especially Taiwanese Humpback Dolphin and Taiwan picnic seabream to identify if additional management measures are required

recommendations with relevant stakeholders in order to support national marine biodiversity databanks, assist decision-making and develop effective use of resources. Some possible actions are listed below:

- Optimising use of vessels, especially within protected areas (eg Proposed Major Wildlife habitat of Taiwanese Humpback Dolphin)
- Staggering construction schedules of the various offshore wind farms (in particular works which will generate noise impacts, eg piling) to avoid breeding season of the Taiwanese humpback dolphin, or other periods where the dolphin will be commonly found in close proximity to the project sites, as anthropogenic noise has been listed as a key threat to the species (IUCN, 2018a). Alternative piling methods to reduce noise impacts (eg vibratory/hydraulic hammering, bored piling) should also be considered and discussed (Taylor, et al., 2019).
- Engagement and collaboration with the Ocean Affairs Council regarding the gazetted Taiwanese humpback dolphin MWH, and exploring possible options to achieve net gain of the species through enhancement of the MWH, eg reduction of habitat degradation, carrying out systematic monitoring schemes and surveys of the Taiwanese humpback dolphin
- Share data (ie the additional datasets from CHW04) with Integrated Biodiversity Assessment Tool (IBAT), which hosts and maintains three global biodiversity datasets including the IUCN Red List, World Database on Protected Areas, and Key Biodiversity Areas, or with other international databases.

Action 2: Establish, implement, and support educational activities and stakeholder engagement related to conservation of marine habitat and species in the wider area of the Project

Mitigation hierarchy: Additional conservation action

Target species/species group: For critical marine habitats and species, including Taiwanese humpback dolphin (*Sousa chinensis ssp. taiwanensis*), Taiwan picnic seabream (*Acanthopagrus taiwanensis*) and Taiwanese wedgefish (*Rhynchobatus immaculatus*)

Objectives: This proposed action aims to enhance and improve educational activities and stakeholder engagement. This proposed action aims to achieve qualitative rather than quantitative net gain through educational activities and stakeholder engagement, which will enhance marine awareness and knowledge, improve public perception of marine fauna, and thereby eventually lead to more conservation efforts for the critical habitat species in the future. This will help to achieve qualitative net gain through enhanced protection and conservation efforts, as mentioned in IFC PS6 Guidance Note 90 (IFC, 2019). As there is no significant residual impact anticipated for these target species as outlined in Table 6.1, Action 2 thereby helps to achieve a qualitative net gain by its nature of being an additional conservation action (ACA).

Current / planned measures: CHW02 will organise workshops focused on conserving marine habitats and species. These workshops will invite public participation and feature knowledge sharing sessions conducted by experts (researchers and NGOs) with expertise in marine science. Through these workshops, the public will gain an understanding of the importance of conserving marine habitats and species (Ørsted, 2024a; Ørsted, 2024c).

Mott MacDonald suggests that a participant perception and feedback survey can be conducted before and after the education programmes, in order to see a tangible difference/improvement in participants' perception and awareness.

Stakeholder engagement: Stakeholders to be engaged include the following:

- Academia (Professor Su Nan-Jay from National Taiwan Ocean University) – focus on Taiwan picnic seabream, Taiwanese wedgefish as well as Taiwanese humpback dolphin

These stakeholders will be invited to conduct knowledge sharing sessions for the public.

Timeline:

- Completion of stakeholder engagements (ie discussion of possible workshops) by Q3 2024
- Initial implementation of the BAP action is targeted to commence in Q4 2024 and will be carried out regularly throughout Project lifecycle.

Indicator:

- Number of stakeholder engagement activities delivered or sponsored by the Project
- Improvement in participants' perception and understanding of marine critical habitat species based on perception survey results

Action 2: Establish, implement, and support educational activities and stakeholder engagement related to conservation of marine habitat and species in the wider area of the Project

Budget: Expenses incurred are generally considered recurring expenditures, and allocations will be made based on actual needs in the future.

Review mechanism: This BAP action will be developed further in future iterations of the BAP, based on in-depth discussions with Ørsted and identified stakeholders to focus on target species / species groups.

An internal review and update of this BAP action will be conducted on a quarterly basis (ie every three months) as an adaptive management approach (ie reviewing the action based on discussions outcomes/findings). This ensures that the Project's conservation efforts are always aligned with the current circumstances and needs. This regular review will take place both during the project development phase as well as project implementation phase.

Additional recommendations for consideration if current / planned measures are not suitable:

- Ørsted has been continuously involved in educational activities and stakeholder engagements. As indicated in Section 2.5.2, biodiversity forums will be conducted in collaboration with NCUE on environmental and social topics surrounding Taiwan's offshore wind industry as above. The Green Energy Scholarship program will be expanded into an innovation contest in partnership with MIRDC, encouraging participants to submit proposals to improve wind farm sustainability and providing funding to incubate the best ideas.
- Ørsted is also working with National Taiwan Ocean University to provide sponsorship of the 'Class B Seafarer Navigation Training Class' which aims to nurture qualified Class B crew members on vessels used in windfarm's operations. A total of 20 trainees were recruited and 392 hours of training courses were arranged, which met the training requirements of the Navigation Department of Harbour.

Action 3: Support potential academic research on critical habitat trigger species

Mitigation hierarchy: Additional conservation action

Target species/species group: Marine critical habitat trigger species, including Taiwanese humpback dolphin (*Sousa chinensis ssp. taiwanensis*), Taiwan picnic seabream (*Acanthopagrus taiwanensis*) and Taiwanese wedgefish (*Rhynchobatus immaculatus*)

Objectives: The Taiwan picnic seabream is one of the critical habitat species under criterion C2 as its known geographic range is restricted to the Taiwan waters and the whole EAAA overlaps with its geographic ranges. However, it is listed as Data Deficient in the IUCN Red List as there exists extremely limited information on its population, geographic range, habitat and ecology. Existing key information on the Taiwan picnic seabream include its main threats of habitat degradation and fishing in estuarine habitats, and the use of the species as food (IUCN, 2014). The latest IUCN study was undertaken in 2009, which is considered dated. It will thus be a good opportunity for CHW02 to provide funding and support for a more comprehensive round of research on the Taiwan picnic seabream to close up existing data gaps.

This action will help to achieve qualitative net gain in conservation outcomes through an increased database of available biological and ecological information on the species, thereby indirectly enhancing protection and conservation efforts as mentioned in IFC PS6 Guidance Note 90 (IFC, 2019). As there is no significant residual impact anticipated for these target species as outlined in Table 6.1, Action 3 thereby helps to achieve a qualitative net gain by its nature of being an additional conservation action (ACA).

Current / planned measures:

Presently, CHW02 and its academic partners will conduct ecological surveys to study the spatial distribution and population of the Taiwanese humpback dolphin, Taiwanese wedgefish and Taiwanese picnic seabream in western coast of Taiwan (Ørsted, 2024c). Geo-information and location data will be obtained from fishermen logbooks (i.e. port sampling) and passive acoustic monitoring. Subsequently, habitat models (i.e. habitat suitability index, generalised linear model, generalised additive model) will be utilised to estimate the spatial distribution of the Taiwanese humpback dolphin, Taiwanese wedgefish and Taiwanese picnic seabream.

Stakeholder engagement: Stakeholders to be engaged include the following:

- Prof. Su Nan-Jay (National Taiwan Ocean University)

These stakeholders will be engaged to collaborate with Ørsted on conducting academic research on critical habitat trigger species.

Timeline:

- Complete ecological survey by Q2 2025
- Spatial distribution and population study: by Q3 2025

Action 3: Support potential academic research on critical habitat trigger species

Indicator:

- Evaluation of cumulative monitoring results
- Completion of spatial distribution and population study

Budget: 1.8 million TWD, over an estimated period of one to two years.

Review mechanism: This BAP action will be developed further in future iterations of the BAP, based on in-depth discussions with Ørsted and identified stakeholders to focus on target species / species groups.

An internal review and update of this BAP action will be conducted on a quarterly basis (ie every three months) as part of an adaptive management approach. This ensures that the Project's conservation efforts are always aligned with the current circumstances and needs. This regular review will take place both during the project development phase as well as project implementation phase.

Additional recommendations for consideration if current/ planned measures are not suitable: Some possible research approaches are as follows:

- As it is known that the Taiwan picnic seabream is used and sold as food, on-the-ground surveys can be conducted with fisherfolk, residents, market-goers and local authorities on their existing knowledge of the seabream, including catch frequency, location and volume, market price, or frequency of purchase and consumption.
- This can be complemented with field surveys at river mouths and estuarine habitats where the seabream has been previously found, and also further off the coast in order to obtain further information on the distribution and population status of the seabream.
- CHW02 will also investigate with stakeholders (eg universities, IUCN, local NGOs) to understand if there are any institutions or organisation that are conducting studies in this regard (ie improving species information). If available, CHW02 will evaluate the possibility of supporting the funding of academic studies. This fulfils the aim of increasing available information on the distribution, ecology and population trends of the Taiwan picnic seabream (or other appropriate marine species) in order for IUCN to assign a conservation status to the species, thereby achieving a qualitative net gain of this critical habitat trigger species.

6.2.2 Actions for migratory birds (including seabirds at sea)

Action 4: Collaborate with other Taiwanese offshore windfarm developers, researchers, NGOs regulators and cross sector partners to monitor and evaluate cumulative biodiversity impacts on migratory seabirds and bird species with significant collision risks to identify if additional management measures are required

Mitigation hierarchy: Additional conservation action

Target species/species group: Critical habitat migratory birds (ie black-faced spoonbill (*Platalea minor*), Saunders's gull (*Saundersilarus saundersi*), Kentish plover (*Charadrius alexandrinus*), oriental stork (*Ciconia boyciana*) and Chinese crested tern (*Thalasseus bernsteini*) and bird species with high and medium collision risks.

Objectives: This proposed action is in line with EP Principle 10: Reporting and Transparency[88]. This action aims to form a societal consensus across the various parties and stakeholders, which will create a conscious group effort to reduce external development-related pressures and increase the conservation of migratory birds and their habitat. As mentioned in IFC PS6 Guidance Note 90, qualitative net gains may be obtained by supporting additional opportunities to conserve the critical habitat values in question (IFC, 2019). Action 4 thereby helps to achieve a qualitative net gain by its nature of being an additional conservation action (ACA).

Even though there is significant residual impact anticipated for some of these target species as outlined in Table 6.1, this will be addressed through Actions 5 and 6 which serve as offsets to clearly demonstrate quantitative net gain.

Current / planned measures: Presently, regular meetings on a common communication platform (ie OWEEP) are being held to conduct discussion and coordination on matters regarding migratory birds, and setup of contact groups for facilitating mutual notification. These meetings will focus on discussing how to reduce cumulative impacts on migratory birds. Relevant discussions will also be documented for future reference in driving BAP-related initiatives (Ørsted, 2024a).

Ørsted has also identified the specific individuals or groups within the government, academia, NGOs, industry and local communities, whose engagement will be crucial in further implementing bird habitat restoration efforts. CWH02 will organise meetings and discussions with these individuals and groups, with the aim to reduce cumulative impacts on migratory birds.

Furthermore, apart from the OWEEP meeting, regular meetings are also held with Prof. Sun (as the stakeholder in academia). These regular meetings are to discuss matters regarding the bird species, and minutes of meetings (MOM) for each meeting would be recorded.

With regards to the Chinese crested tern, CHW02 collaborate with local birdwatching networks to collect records of the Chinese crested tern's stopover on Taiwan main island, with the aim to increase available information on the distribution, ecology and duration of their passage through Taiwan main island.

Stakeholder engagement: Stakeholders to be engaged include the following:

- Developers of projects in execution and awarded for grid capacity in Round 3.1 and 3.2
- Academia (Prof. Sun Yuan-hsun)
- NGOs (Wild Bird Association of Tainan, Black-faced Spoonbill Conservation Association)

These stakeholders will be engaged for regular OWEEP meetings and other regular meetings.

Timeline:

- OWEEP meetings and meetings with Prof. Sun: Regular
  - The expected date of completion for organising stakeholder discussions is by Q1 2025. However, if required, the discussions can be extended into 2026.
- Initial implementation of the BAP action is targeted to commence in Q2 2025
- Collection of data for the Chinese crested tern by Q3 2025

Indicator:

- Provision of photos, meeting minutes to demonstrate collaborative effort by the Project
- Completion of data collection for the Chinese Crested tern

Budget: Expenses incurred are generally considered recurring expenditures, and allocations will be made based on actual needs in the future.

Review mechanism: This BAP action will be developed further in future iterations of the BAP, based on in-depth discussions with Ørsted and identified stakeholders to focus on target species / species groups.

Action 4: Collaborate with other Taiwanese offshore windfarm developers, researchers, NGOs regulators and cross sector partners to monitor and evaluate cumulative biodiversity impacts on migratory seabirds and bird species with significant collision risks to identify if additional management measures are required

An internal review and update of this BAP action will be conducted on a quarterly basis (ie every three months) as part of an adaptive management approach. This ensures that the Project's conservation efforts are always aligned with the current circumstances and needs. This regular review will take place both during the project development phase as well as project implementation phase.

Additional recommendations for consideration if current / planned actions are not suitable: As part of this action, the Project should also consider sharing information such as bird monitoring results, findings and recommendations with relevant stakeholders in order to support national biodiversity databanks, assist decision making and develop effective use of resources. Some possible actions for discussion are listed below:

- Ecological monitoring data on bird flight paths and migratory routes related to the Project site via relevant bird monitoring activities with diverse survey methods, and suggested sharing of non-sensitive information with cooperating experts or research institutions.
- Connect with local birdwatching networks to collect records of the Chinese Crested Tern's stopover on Taiwan main island, with the aim to increase available information on the distribution, ecology and duration of their passage through Taiwan main island.
- Discussion on collision risk, design of speed reduction mechanism and effectiveness of the mechanism.
- Common communication platform to conduct discussion and coordination on matters regarding bird biodiversity, and suggested setup of contact groups for facilitating mutual notification
- Share data (ie the additional datasets from CHW02 with Integrated Biodiversity Assessment Tool (IBAT), which hosts and maintains three global biodiversity datasets including the IUCN Red List, World Database on Protected Areas, and Key Biodiversity Areas, or with other international databases.

Action 5: Restoration and enhancement of wading bird habitat for the critical habitat bird species and non-critical habitat trigger species with significant collision risks

Mitigation hierarchy: Offset

Target species/species group: Wading birds – Black-faced spoonbill (*Platalea minor*), Kentish plover (*Charadrius alexandrines*), oriental stork (*Ciconia boyciana*), egrets (Ardeidae)

Objectives: The black-faced spoonbill and oriental stork are critical habitat species that fulfil Criteria C1 and C3 under the CHA (Mott MacDonald, 2023a). Likewise, the Kentish plover is a critical habitat trigger species that fulfils Criteria C3. Although egrets are not critical habitat trigger species, they are considered to be wader birds that possess significant collision risk and are thus included as target species for this action.

The black-faced spoonbill, kentish plover and oriental stork mainly utilise estuarine habitats along the Taiwan coast as breeding and wintering grounds respectively. Efforts could be made to preserve and enhance such estuarine habitats as a suitable breeding or wintering site for these species. This will also benefit other wader birds such as egrets that use similar estuarine habitats and wetlands as wintering grounds. Action 5 will thereby support the achievement of net gain through increasing the availability of suitable breeding and wintering habitats for these species as mentioned in IFC PS6 Guidance Note 90 (IFC, 2019).

Current / planned measures: The preliminary research on bird habitat restoration done by NIRAS (NIRAS Taiwan Ltd, 2023) highlighted several potential habitat restoration initiatives for the black-faced spoonbill, which was one of the three target species for this long-term bird habitat enhancement pilot. Habitat restoration and enhancement recommendations for the black-faced spoonbill include collaborations with fishermen for bird-friendly aquaculture, establishment of protected areas and feeding grounds, and creation of additional artificial habitats with connectivity to existing overwintering habitats. This restoration project will take place mainly along the coastal zones of Changhua County, based on the target species and key habitat screening study.

CHW02 will build upon the foundation of stakeholder collaboration, education programmes, and academic research support. Through collaboration with experts and NGOs, they will initiate a series of conservation actions targeting selected critical habitats and bird species, in order to make the restored habitat favourable for the species (Ørsted, 2024c). These conservation actions currently include the following:

- Regulate water levels – This habitat restoration method focuses on regulating water levels at Zhuoshui salt pan to create suitable foraging grounds (10-30ha) for the Black-faced Spoonbill and Kentish Plover. To monitor the

Action 5: Restoration and enhancement of wading bird habitat for the critical habitat bird species and non-critical habitat trigger species with significant collision risks

effectiveness of the restoration, camera traps will be utilised to track the number of Black-faced Spoonbill and Kentish Plover sightings post-restoration on a monthly basis.

- Several studies have found that such actions (ie regulating water levels) could help to achieve positive net gain for the Black-faced spoonbill by creating foraging grounds. Lin et al. (2024) demonstrates that aquaculture ponds managed with water depths of 10-20cm, the installation of vegetated bunds, and minimal artificial materials tend to attract larger flocks of black-faced spoonbills in Taiwan.
- This is further supported by a second study, whereby it investigated if water drawdown of aquaculture ponds, following the seasonal milkfish aquaculture, can create resources that attract water birds in Tainan City in southern Taiwan (Wang et al., 2020). The density of Black-faced spoonbills was found to peak at 5-6 individuals/ha in water depths ranging from less than 5cm to under 20cm. Likewise, the density of Kentish Plovers peaked at 0.3-0.6 individuals/ha in water depths ranging from less than 5cm to under 20cm.
- Based on comparison between the findings from literature review and the estimated loss as predicted in the CRM, it seems that the gains from Orsted's proposed restoration site would be commensurate with the potential predicted loss (refer to Table B.4) caused by the windfarm for the Black-faced Spoonbill and Kentish Plover.

- Nest tower set-up – This established conservation method for the Oriental Stork involves erecting 25-meter-high nest towers in key habitats such as the Aogu Wetlands and the Zhuoshui River Estuary. To assess the effectiveness of this restoration effort, camera traps will be utilised to monitor the number of Oriental Stork sightings post-restoration, on a monthly basis during the breeding season.
  - In line with this action for the Oriental Stork, Xue et al. (2010) demonstrates that the population of Oriental Storks can be effectively increased by utilising power pole nests, artificial nests, and pylon nests. A total of 21 nests were built and each nest attracted a breeding pair. Among the 21 breeding pairs monitored, 17 pairs successfully hatched 47 chicks, with 37 nestlings surviving to the fledging stage.
  - Based on comparison between the findings from literature review and the estimated loss as predicted in the CRM, it seems that the gains from Orsted's proposed restoration site would be commensurate with the potential predicted loss (refer to Table B.4) caused by the windfarm for the Oriental Stork.

In addition, CHW02 will conduct ecological surveys to study the spatial distribution and population of Black-faced spoonbill, Kentish plover and Oriental stork in the western coast of Taiwan (Ørsted, 2024c). Bird surveys will be conducted via visual surveys and satellite tags. Subsequently, band models will be utilised to estimate the collision rate of the Black-faced spoonbill, Kentish plover and Oriental stork with the wind turbine blades.

Stakeholder engagement: Stakeholders to be engaged include the following:

1. Prof. Sun Yuan-hsun – focus on oriental stork
2. NGOs (Wild Bird Association of Tainan, Black-Faced Spoonbill Conservation Association, Wild Bird Society of Changhua, Mailiao Cultural Society) – collaborate with academia according to relevant target species

These stakeholders will be invited to collaborate on habitat restoration efforts.

Timeline:

Indicative implementation timelines for the habitat restoration are as follows:

- Q3 2024 – Q4 2024
  - Study and assessment of bird habitats in the shortlisted restoration site
- Q3 2024 – Q2 2025
  - Start to establish ecological baseline of shortlisted restoration sites
- Q3 2025 – Q3 2026
  - Implement bird habitat restorations measures in the restoration site
- Q4 2025 to Q3 2026
  - Monitor bird species via camera traps on a monthly basis
-

Spatial distribution and population study for the Black-faced spoonbill, Kentish plover and Oriental stork: by Q3 2025

Indicator:

- Status and result of the restoration and enhancement programme
- Increase in viable habitats for black-faced spoonbill, Kentish plover and egrets
- Increase in Black-faced spoonbill sightings as compared to the 2024 baseline at the Zhuoshui saltpan, in accordance with the number of estimated Black-faced Spoonbill bird collisions (see **Table B.4**)

Action 5: Restoration and enhancement of wading bird habitat for the critical habitat bird species and non-critical habitat trigger species with significant collision risks

- Increase in Kentish plover sightings as compared to the 2024 baseline at the Zhuoshui saltpan, in accordance with the number of estimated Kentish Plover bird collisions (see **Table B.4**)
- Successful utilisation of nest towers by the Oriental stork
- Evaluation of cumulative monitoring results
- Completion of spatial distribution and population study for the Black-faced spoonbill, Kentish plover and Oriental stork

Budget: 4.7 million TWD, over an estimated period of two years. Note that this budget is a summation of budget from both Action 5 and 6 of CHW02.

Review mechanism: This BAP action will be developed further in future iterations of the BAP, based on in-depth discussions with Ørsted and identified stakeholders, to ensure that there are measurable efforts (e.g. targeted habitat size, obtaining of necessary land use permits for habitat restoration) to achieve net gain for the identified target species.

An internal review and update of this BAP action will be conducted on a quarterly basis (ie every three months) as part of an adaptive management approach. This ensures that the Project's conservation efforts are always aligned with the current circumstances and needs. This regular review will take place both during the project development phase as well as project implementation phase.

Additional recommendations: CHW02 can also consider reaching out to relevant government authorities (such as the Tainan City government) and NGOs to find out if there are existing or estuarine habitat restoration or enhancement programme that the company could contribute to, following which further details of the restoration and enhancement plan can be developed. Some other possible actions include:

- Increased monitoring and restoration efforts, enforcing regulations against habitat destruction, or conducting surveys and population census of the black-faced spoonbill, Kentish plover, oriental stork and egrets in the area.
- Consultations with relevant academia and other stakeholders (eg ornithologists and conservation biologists) should also be carried out periodically to optimise and ensure conservation efforts are feasible.
- Efforts could be made to preserve and enhance estuarine habitats as a suitable breeding or wintering site.

Action 6: Restoration and enhancement of seabird habitats for the critical habitat bird species and non-critical habitat species with significant collision risks

Mitigation hierarchy: Offset

Target species/species group: Seabirds – Saunders's gull (*Saundersilarus saundersi*), terns (Laridae), and shearwaters (Procellariidae)

Objectives: The Saunders's gull is critical habitat species that fulfil Criteria C1 and C3 under the CHA (Mott MacDonald, 2024a). Although other terns from the Laridae family, petrels and shearwaters are not critical habitat trigger species, they are considered to be seabirds that possess significant collision risk and are thus included as target species for this action.

The primary threat to the Saunders's Gull is the destruction and deterioration of tidal flats and salt marshes where it forages, along with the disappearance of vegetation that is essential for breeding. For the Chinese crested tern, which is already critically endangered, major threats include egg collection, shellfish fishing near breeding grounds and algal blooms caused by industrial pollution.

The most important and fundamental way to protect these species is to restore the estuary wetlands and increase the natural habitat area whilst preserving the existing breeding grounds (Dong, et al., 2024). As the Saunders's gull are winter residents and do not breed in Taiwan, it is vital that conservation efforts are focused on expanding the suitable habitat range of these species by enhancing and restoring natural estuary wetlands. This will also benefit other seabirds such as petrels, shearwaters and terns that use similar coastal habitats as wintering breeding grounds. This action will also support the achievement of net gain through an enhancement of these species breeding and wintering habitats. Although the CRM results are considered to be low (<0.1 bird per year), this action will provide an increase in the overall population of these species, thereby achieving net gain as indicated in IFC PS6 Guidance Note 90 (IFC, 2019).

Current / planned measures: The preliminary research on bird habitat restoration done by NIRAS (NIRAS Taiwan Ltd, 2023) has highlighted several potential habitat restoration initiatives of the little tern, which was one of the three target species for this long-term bird habitat enhancement pilot. The main restoration objective identified for the little tern is to establish conservation zones, which would include weeding and slope construction for drainage, placing decoy birds to entice little terns to populate suitable breeding habitats, and setting up stones, tiles and bricks as shelters for chicks. It is noted from the stakeholder discussions that Changhua would be a preferable location for

Action 6: Restoration and enhancement of seabird habitats for the critical habitat bird species and non-critical habitat species with significant collision risks

such habitat restoration efforts, as there are more chances of success by acquiring land ownership for long-term conservation (NIRAS Taiwan Ltd, 2023). This restoration project will take place mainly along the coastal zones of Changhua County, based on target species and key habitat screening study.

CHW02 has build and will continue to build upon the foundation of stakeholder collaboration, education programmes, and academic research support. Through collaboration with experts and NGOs, the Project has initiated a series of conservation actions targeting selected critical habitats and bird species, in order to make the restored habitat favourable for both breeding and wintering species. These conservation actions currently include the following:

- Mudflat restoration – This habitat restoration method focuses on restoring mudflats in Zhuoshui salt pan to create suitable foraging grounds (10-30ha) for the Saunders's gull. To monitor the effectiveness of the restoration, camera traps will be utilised to track the number of Saunders's gull sightings post-restoration on a monthly basis.
  - It is noted that the foraging grounds for Saunders's gulls include mudflats, estuarine tidal flats and artificial wetlands. Bai et al. (2018) indicates that artificial wetlands provided suitable foraging grounds for the Saunders's gull. In which, there were approximately 25 to 94 Saunders's gulls observed across artificial wetlands of varying sizes between 244 ha to 399 ha in Changhua, Taiwan.
  - Although quantitative data to support this specific restoration effort is currently unavailable, the restoration of mudflats as proposed by CHW02 could offer valuable foraging grounds for the Saunders's gull. The success of this restoration initiative can be monitored as part of an adaptive management strategy.
- Nest induction set-up – this is an established method for conservation of streaked shearwaters, and is often done in conjunction with the creation of grassy islands. As streaked shearwaters habitually nest in burrows, they do not enter or leave the nest during the day, but only sneak in after dark during the breeding season. Suitable locations can be selected to set up artificial burrows or nest boxes, with the possibility of installing monitoring devices and scales inside the nest boxes. This will be implemented on Mianhua Islet off the coast of Keelung.
- Artificial nests – This habitat restoration method focuses on providing the Little Tern with viable breeding sites by utilising artificial nests. This is an established method that has been successful in other parts of Taiwan. This will be implemented within Zhuoshui River Estuary of Changhua or Changhua Coastal Industrial Park.

In addition, CHW02 will conduct ecological surveys to study the spatial distribution and population of Saunders's gull in the western coast of Taiwan (Ørsted, 2024c). Bird surveys will be conducted via visual surveys and satellite tags. Subsequently, band models will be utilised to estimate the collision rate of the Saunders's gull with the wind turbine blades.

Stakeholder engagement: Stakeholders to be engaged include the following:

- Prof. Sun Yuan-hsun
- NGOs (Wild Bird Association of Tainan, Wild Bird Association of Keelung, Wild Bird Society of Changhua, Mailiao Cultural Society) – collaborate with academia according to relevant target species

These stakeholders will be invited to collaborate on habitat restoration efforts.

Timeline:

Indicative implementation timelines for the habitat restoration are as follows:

- Q3 2024 – Q4 2024
  - Study and assessment of bird habitats in the shortlisted restoration site
- Q3 2024 – Q2 2025
  - Start to establish ecological baseline of shortlisted restoration sites
- Q3 2025 – Q3 2026
  - Implement bird habitat restorations measures in the restoration site
  - Monitor bird species via camera traps on a monthly basis

Spatial distribution and population study for the Saunders's gull: by Q3 2025

Indicator:

- Increase in viable habitats for seabirds (eg Saunders's gull, petrels, shearwaters and terns)
- Increase in Saunders's gull sightings as compared to the 2024 baseline at the Zhuoshui saltpan, in accordance with the number of estimated Saunders's gull bird collisions (see **Table B.4**)
- Successful utilisation of artificial nests by the streaked shearwater and little tern
- Evaluation of cumulative monitoring results
- Completion of spatial distribution and population study for the Saunders's gull

Action 6: Restoration and enhancement of seabird habitats for the critical habitat bird species and non-critical habitat species with significant collision risks
Budget: 4.7 million TWD, over an estimated period of two years. Note that this budget is a summation of budget from both Actions 5 and 6 of CHW02.
Review mechanism: This BAP action will be developed further in future iterations of the BAP, based on in-depth discussions with Ørsted and identified stakeholders, to ensure that there are measurable efforts (e.g. targeted habitat size, obtaining of necessary land use permits for habitat restoration) to achieve net gain for the identified target species. The expected date of completion for organising the restoration programme is end-Q3 2025. Following this, initial implementation of the BAP action will commence in Q4 2025. An internal review and update of this BAP action will be conducted on a quarterly basis (ie every three months) as part of an adaptive management approach. This ensures that the Project's conservation efforts are always aligned with the current circumstances and needs. This regular review will take place both during the project development phase as well as project implementation phase.
Additional recommendations for consideration if current / planned measures are not suitable: CHW02 can also consider reaching out to relevant government authorities (such as the Tainan City government) and NGOs to find out if there are existing or estuarine habitat restoration or enhancement programme that the company could contribute to, following which further details of the restoration and enhancement plan can be developed. Some other possible actions include: ● Increased monitoring and restoration efforts, enforcing regulations against habitat destruction, or conducting surveys and population census of the Saunders's gull, other terns, petrels and shearwaters. ● Consultations with relevant academia and other stakeholders (eg ornithologists and conservation biologists) should also be carried out periodically to optimise and ensure conservation efforts are feasible.

6.3 Responsibility, planning and reporting requirements

A structured framework approach of monitoring and reviewing the feasibility as well as progress/execution of the BAP actions will be implemented as part of the adaptive management approach detailed in Section 7.3.

This framework approach will help in determining if modifications, such as initiating or halting programs, or re-evaluating timelines, will be needed for the BAP actions. In circumstances where it is deemed necessary, the Project may then need to identify and support new conservation initiatives or establish additional commitments. This approach ensures the adaptability and effectiveness of the BAP.

Specifically, the following steps will be undertaken:

- Discussions between the Project and key stakeholders to define and screen feasible BAP actions
- The selection of BAP actions will be finalised following the completion of stakeholder engagements by Q3 2024, and the implementation of selected BAP actions will commence by end-Q4 2024 (eg beginning with required meetings, studies, bird surveys, land use permit applications) and continue through 2025 (eg securing land use permits, actual on-site bird habitat restoration activities). During the early stages of the BAP implementation, the results of stakeholder engagement and finalisation of BAP actions will be updated and presented to the Lenders within the quarterly E&S report (ie every three months). Once the BAP actions are finalised, the reporting frequency of each BAP action to the Lenders will be carried out in accordance with the frequency stated in Table 6.2 below.
- To maintain an up-to-date understanding of the continued effectiveness and viability of the BAP actions, an internal review and update of the BAP actions will be conducted on a quarterly basis (ie every three months). This ensures that the Project's conservation efforts are always aligned with the current circumstances and needs. This regular review will take place both during the project development phase as well as project implementation phase.

- During the programme development phase, where programmes or actions are observed to be unlikely to be implementable (eg due to issues with permitting/approvals), plans to investigate and secure alternatives will be proposed. During the programmes' implementation phase, key performance indicators (KPIs) will be identified and formalised to inform for the quarterly review.
- If KPIs are not met and/or the programmes are deemed ineffective, the quarterly review will determine whether each specific action should continue to receive funding and support or be replaced with a new action / programme. Discussions on possible budget re-allocation to new actions / programmes will be carried out if necessary.
- Any changes required to the BAP actions, resources, and review timeline will be subject to agreement from the Lenders.
- Overall, the parties responsible for this quarterly internal review of the BAP actions are outline as follows:
  - Project Company's Construction Manager
  - Project Company's Environmental Manager
  - Project Company's Consent Manager
  - Project Company's Local Stakeholder Manager/ Community Liaison Officer
  - Contractor's Environmental Managers
  - Marine Affairs Officer
  - National or international biodiversity expert / Local biodiversity consultants
  - Project Company's Sustainability Advisor

The above monitoring and review for each BAP action will be reported through the responsible parties and requirements as described in Table 6.2 below.

Table 6.2: Responsibility and reporting requirement of the BAP actions

Action No.	BAP action	Responsibility	Reporting
For critical habitat marine fauna			
1	Collaboration between Taiwanese offshore windfarm developers, researchers, NGOs regulators and cross sector partners to reduce cumulative biodiversity impacts on marine fauna, especially Taiwanese Humpback Dolphin and Taiwan picnic seabream	● Project Company's Construction Manager ● Environmental Manager ● Sustainability Advisor ● Consent Manager ● Local Stakeholder Manager/ Community Liaison Officer	OWEEP meetings and monthly meetings with Prof. Su: Semi-annual report throughout the Project's construction duration to be provided to the Lenders Environmental and Social Safeguards Consultant (LESC) and Intercreditor Agent (ICA)
2	Establish, implement and support educational and stakeholder engagement related to conservation of marine habitat and species in the wider area of the project	● Sustainability Advisor ● Local Stakeholder Manager/ Community Liaison Officer ● Marine Affairs Officer	Annual report throughout project lifecycle to be provided to the LESC and ICA
3	Support academic research on critical habitat trigger species (eg Taiwan picnic seabream)	● Consent Manager ● National or international biodiversity expert / Local biodiversity consultants ● Sustainability Advisor ● Contractor's Environmental Managers	● One report to be provided within 12 months from BAP approval to the LESC and ICA ● Spatial distribution and population study: One report to be provided by Q3 2025

Action No.	BAP action	Responsibility	Reporting
For critical habitat migratory birds (including seabirds at sea)			
4	Collaboration between Taiwanese offshore windfarm developers, researchers, NGOs regulators and cross sector partners to reduce cumulative biodiversity impacts on migratory seabirds and bird species with significant collision risks	● Project Company's Construction Manager ● Environmental Manager ● Sustainability Advisor ● Consent Manager ● Local Stakeholder Manager/ Community Liaison Officer	● OWEEP meetings: Annual report throughout project lifecycle to be provided to the LESC and ICA ● Monthly meetings with Prof. Sun: Semi-annual report throughout the Project's construction duration to be provided to the LESC and ICA ● Collection of data for the Chinese crested tern: One report to be submitted by Q3 2025
5	Restoration and enhancement of wader birds habitat for the critical habitat bird species and non-critical habitat trigger species with significant collision risks	● Consent Manager ● National or international biodiversity expert / Local biodiversity consultants ● Sustainability Advisor ● Contractor's Environmental Managers	● Semi-annual report on progress throughout the project lifecycle to be provided to the LESC and ICA ● Spatial distribution and population study for the Black-faced spoonbill, Kentish plover and Oriental stork: One report to be provided by Q3 2025
6	Restoration and enhancement of seabird habitats for the critical habitat bird species and non-critical habitat trigger species with significant collision risks	● Consent Manager ● National or international biodiversity expert / Local biodiversity consultants ● Sustainability Advisor ● Contractor's Environmental Managers	● Semi-annual report on progress throughout the project lifecycle to be provided to the LESC and ICA ● Spatial distribution and population study for the Saunders's gull: One report to be provided by Q3 2025

Source: Mott MacDonald, 2024

7 Biodiversity monitoring and evaluation plan

7.1 Construction (including pre-construction) phase monitoring

Construction phase monitoring will consist of one- or two-years' pre-construction phase monitoring (depending on the monitoring type) prior to construction commencement.

The details of the biodiversity monitoring during construction are provided in Table 7.1. The predicted Project impacts on biodiversity will be verified through on-going monitoring. This will also ensure that the mitigation measures and actions adopted by the Project (Section 5 and 6) are appropriate to the magnitude of impacts and sufficient to demonstrate net gain for critical habitat trigger features. The methodology has been deemed scientifically robust and will use the Before-After-Control-Impact (BACI) approach.

Table 7.1: Construction (including pre-construction) phase monitoring

Biodiversity feature	Monitoring method	Monitoring sites	Frequency	Indicator and threshold for adaptive management	Documentation / Reporting	Responsibility
Terrestrial flora and fauna Flora Mammals Herpetofauna Birds	**Flora:** Transect and quadrat survey **Mammals:** Transect survey, trapping and bat ultrasound monitoring **Herpetofauna:** Transect survey **Birds:** Point count and transect survey	Terrestrial electrical distribution system (substation, onshore cable and their surroundings)	Quarterly (ie once every season during construction)	Habitat loss/degradation outside the project footprint Reported injuries/mortalities of fauna due to construction activities Presence of non-native species	Quarterly monitoring report	Project Company (overarching responsibility) A suitably qualified local biodiversity specialist (implementation)
Intertidal ecology	Transect survey	Within 50m on both sides of the cable landing point	Quarterly during construction	Habitat loss degradation outside the project footprint	Quarterly monitoring report	
Marine ecology Phytoplankton Zooplankton Ichthyoplankton Benthos	**Phytoplankton:** Filtering water samples **Zooplankton and ichthyoplankton:** Towing plankton net **Benthos:** Towing rectangular dredge	Twelve monitoring stations around the Project's WTGs	Quarterly during construction	Reported lower species and counts	Quarterly monitoring report	
Fishes	Trawl survey	Three transects within the Project area	Quarterly during construction	Reported injuries/mortalities of fauna due to construction activities	Quarterly monitoring report	
	Underwater photography	One selected WTG	Once before piling and after completion of	N/A		

Biodiversity feature	Monitoring method	Monitoring sites	Frequency	Indicator and threshold for adaptive management	Documentation / Reporting	Responsibility
			piling during construction			
Marine mammals	Visual survey	Project area	20 survey trips a year (at least once every season) (one year before construction and during construction)	Reported injuries/mortalities of fauna due to construction activities	Quarterly monitoring report Monthly monitoring report	
	Underwater noise monitoring	Four stations at 750m radius around the piling location	Once during piling of each WTG	Change in planned noise reduction measures or exceedance of noise threshold (160 dB [(dB) re. 1μPa2s at 750m distance)		
	Underwater noise monitoring	Two stations near the wind farm boundary	Quarterly (30 days for each monitoring) (One year before construction and during construction)	Exceedance of noise threshold (160 dB [(dB) re. 1μPa2s at 750m distance).		
Marine reptiles	Visual survey	Project area	20 survey trips a year (at least once every season) (one year before construction and during construction)	Reported injuries/mortalities of fauna due to construction activities	Quarterly monitoring report Monthly monitoring report	
Marine water quality	In-situ monitoring and laboratory analyses	Twelve monitoring stations around the Project's WTGs	Quarterly (one year before construction and during construction)	Degradation of water quality	Quarterly monitoring report	
Birds Seabirds Coastal birds Terrestrial birds	Boat survey	Vicinity of the Project's WTGs and coast around the cable landing point	10 surveys a year: Monthly between March and November; Once between December and February (two years before construction and during construction	Reported lower species and counts	Quarterly monitoring report	

Biodiversity feature	Monitoring method	Monitoring sites	Frequency	Indicator and threshold for adaptive management	Documentation / Reporting	Responsibility
	Radar survey	Project area	Quarterly (two years before construction) (at least five days in spring, summer and autumn; number of survey days will depend on weather in winter)	Reported lower species and counts		
	Satellite tracking	Coast of Changhua	Quarterly before construction	N/A		

Source

7.2 Operation phase

Operation phase monitoring will generally be undertaken following the same methods used for the construction phase monitoring to allow for direct comparison of the data and to identify any changes in species distribution and abundance. In some cases, the monitoring frequency and sites will be amended to reflect the different impacts during operation compared to construction.

The operation phase monitoring will be undertaken and implemented for the entire lifespan of the Project (ie envisaged for over a minimum period of 25 years).

Monitoring of target species and frequency of each type of monitoring are reflected in Table 7.2. The overall coordination and reporting will be undertaken by an external ecological consultant and trained MMOs for marine mammals.

Table 7.2: Operation phase monitoring

Biodiversity feature	Monitoring method	Monitoring sites	Frequency	Indicator and threshold for adaptive management	Documentation / Reporting	Responsibility
Maine ecology Phytoplankton Zooplankton Ichthyoplankton Benthos	**Phytoplankton:** Filtering water samples **Zooplankton and ichthyoplankton:** Towing plankton net **Benthos:** Towing rectangular dredge	Twelve monitoring stations around the Project's WTGs	Quarterly (ie once for every season)	Reduction in monitored marine ecology (counts and species) in comparison to the baseline	Quarterly monitoring report	Project Company (overarching responsibility) A suitably qualified local biodiversity specialist (implementation)
Fishes	Trawl survey	Three transects within the Project area	Quarterly	Reduction in comparison to the baseline		
	Underwater photography	Two selected WTGs	Quarterly	Reduction in comparison to the baseline		
Marine mammals	Visual survey	Project area	20 survey trips a year	Reduction in comparison to the baseline		
	Underwater noise monitoring	Two stations near the windfarm boundary	Quarterly (30 days for each monitoring)	Significant increase in comparison to the baseline		
Marine reptiles	Visual survey	Project area	20 survey trips a year (at least once every season) (during operation)	Reported injuries/mortalities of fauna due to construction activities		
Birds Seabirds Coastal birds Terrestrial birds	Boat survey	Vicinity of the Project's WTGs and coast around the cable landing point	10 surveys a year: Monthly between March and November; Once between December and February (two years before construction and during construction)	Reduction in comparison to the baseline. Increase in the Collision Risk Thresholds will be calculated before the start of operation using		

Biodiversity feature	Monitoring method	Monitoring sites	Frequency	Indicator and threshold for adaptive management	Documentation / Reporting	Responsibility
	Joint surveillance system (thermal imaging, acoustic microphone and high-performance radar, or more advanced monitoring devices at the time)	One selected location in the wind farm	Continuous monitoring	information from bird monitoring and updated collision risk models. All actual observed collision events will be recorded.		
	Video recording	Two selected locations in the wind farm	Continuous monitoring			
Critical habitat species ● Black-faced spoonbill (Platalea minor) ● Kentish plover (Charadrius alexandrines)	Camera traps	Zhuoshui Salt Pan in Yunlin County	Monthly monitoring (October 2024 to April 2026)	Reduction in comparison to the baseline. Net gain will be achieved when the number of bird sightings has increased as compared to the baseline.		
Critical habitat species ● Oriental stork (*Ciconia boyciana*)	Camera traps	Zhuoshui River Estuary in Yunlin County or Aogu Wetlands in Chiayi County.	Monthly monitoring during breeding season (March – July)	Reduction in comparison to the baseline. Net gain will be achieved when the number of bird sightings has increased as compared to the baseline.		
Critical habitat species ● Saunders's gull (Saundersilarus saundersi)	Camera traps	Zhuoshui Salt Pan in Yunlin County	Monthly monitoring (October 2024 to April 2026)	Reduction in comparison to the baseline. Net gain will be achieved when the number of bird		

Biodiversity feature	Monitoring method	Monitoring sites	Frequency	Indicator and threshold for adaptive management	Documentation / Reporting	Responsibility
				sightings has increased as compared to the baseline.		
Bird species with medium to high collision vulnerability ● Streaked shearwater (*Calonectris leucomelas*)	Camera traps	Mianhua Islet of Keelung City	Monthly monitoring during breeding season (June – September)	Reduction in comparison to the baseline.		
Bird species with medium to high collision vulnerability ● Little Tern (Sternula albifrons)	Camera traps	Zhuoshui River Estuary in Yunlin County or Changhua Coastal Industrial Park	Monthly monitoring during breeding season (June – September)	Reduction in comparison to the baseline.		

Source: Mott MacDonald, 2024

7.3 Adaptive management strategy

Adaptive management is required to ensure uncertain outcomes of mitigation measures are accommodated for in the Project's biodiversity mitigation and management planning. In which, the implementation of mitigation and management measures are responsive to changing conditions and the results of monitoring throughout the project's lifecycle.

Adaptive management measures will be undertaken for marine fauna when indicators and thresholds for adaptive management are met. This includes habitat loss outside the project footprint, reported injuries/mortalities of fauna due to construction activities, presence of non-native species, exceedances of noise thresholds and reductions in monitored marine ecology. Further details on adaptive management indicators and thresholds for marine fauna are provided in Section 7.1.

As part of an adaptive management strategy for migratory birds, the project will run a collision risk assessment at the end of each operational monitoring period (migratory and non-migratory seasons) using the Band Model (Band, Madders, & Whitfield, 2007). The results of the assessment will then be compared against the baseline risk collision risk assessment. Should there be a significant increase in risk, adaptive management will be undertaken. Adaptive management could include a radar-led shutdown on demand during peak migration seasons (spring and autumn) for the targeted species. Further details on adaptive management indicators and thresholds for migratory birds are provided in Section 7.2.

A structured framework approach of monitoring and reviewing the feasibility as well as progress/execution of the BAP actions will also be implemented as part of the adaptive management approach. This framework approach will help in determining if modifications, such as initiating or halting programs, or re-evaluating timelines, will be needed for the BAP actions. In circumstances where it is deemed necessary, the Project may then need to identify and support new conservation initiatives or establish additional commitments. This approach ensures the adaptability and effectiveness of the BAP.

As part of this approach, an internal review and update of the BAP actions will be conducted on a quarterly basis (ie every three months). Further details of the framework approach are provided in Section 6.3 above.

8 Staff requirements and responsibilities

8.1 Overview

In order to implement the monitoring and mitigation measures identified within this BAP, a number of key staff have been identified as responsible to implement these actions.

The Contractor(s) is responsible for ensuring that all avoidance and minimisation mitigation measures specific to their work activities are implemented throughout construction and operation phases (see Table 5.3). The Project Company has the overall responsibility of ensuring that these measures (including monitoring) are being implemented appropriately.

All work method statements and monitoring surveys will be subject to the Project Company's review and approval prior to commencement of any work.

8.2 Key staff and responsibilities

This section lists the key staff involved in the implementation of the mitigation measures and BAP actions. Their responsibilities for these actions have also been identified. The Project Company has the overall responsibility to ensure that all personnel (ie the Project Company's internal staff and the appointed external contractors) have undergone the appropriate briefing and training relevant to their work streams.

Table 8.1: Key staff and associated responsibility

Key personnel	Responsibility	Timeframe
Project Company's Construction Manager	Oversee the implementation of the mitigation measures, monitoring and reporting requirements as described in the Project's management plans (ie BAP, local EIA, and EIS report)	Construction phase
Project Company's Environmental Manager	Coordinate the implementation of the BAP actions as described in Table 6.2 and the monitoring in Section 7. Monitor and audit to ensure that the monitoring and mitigation measures are being appropriately implemented. Hire and supervise the external biodiversity specialists needed for the implementation of the mitigation and monitoring prescribed in this BAP. Ensure that all staff and contractors have been trained/briefed on biodiversity mitigations and compliance to the Wildlife Conservation Act (Article no. 16 and 17) and the requirements of this BAP. Report any non-compliance by contractors to the Construction Manager and HSE Manager	Pre-construction, construction and operation phases
Project Company's Local Stakeholder Manager/ Community Liaison Officer	Engage community and external stakeholders pertaining to biodiversity measures	Pre-construction, construction and operation phases
Project Company's Consent Manager	Leads the consent team (ie application and environmental specialists) in ensuring compliance of environmental and permit	Pre-construction, construction and operation phases

Key personnel	Responsibility	Timeframe
	applications in any aspect, and aligning with industry standards and project requirements.	
Project Company's Sustainability Advisor	Advise on the Project's biodiversity action plan for priority species and habitat selection, restoration and offset target setting. Advise the Environmental Manager on methodology development for biodiversity actions, oversee the implementation of biodiversity actions, monitoring and data collection for reporting. Engage and liaise with academia experts to validate Project's biodiversity action plan and outcomes.	Pre-construction, construction and operation phases
Contractors' Environmental Managers (construction and operation)	Undertake their respective scopes of work with adherence to the commitments and mitigations prescribed by this BAP and the national legislation. Oversee the activity of the biodiversity specialists listed below.	Pre-construction, construction and operation phases
National or international biodiversity expert (from academia, NGO or consultancy)	Coordinate the biodiversity monitoring and evaluate the results.	Pre-construction, construction and operation phases
Local biodiversity consultants who are specialists in the species (groups) to be monitored	Undertake their respective specialist scope for mitigations and monitoring pertaining to biodiversity, as instructed by the Project Company	Pre-construction, construction and operation phases
Marine Affairs Officer		

Source: Mott MacDonald, 2023

In addition to the above, it is expected that communications will be held with external stakeholders such as NGOs. In the case that socialisation about biodiversity aspects is required, this will be arranged via the Community Liaison Officer and the appropriate channels identified within the Stakeholder Engagement Plan will be followed.

9 Reporting and evaluation of BAP implementation

The EPC and Operation Contractors will have internal reporting responsibilities, which will include reporting findings from the daily site inspections; reporting of weekly site inspections; and prepare monthly health, safety and environmental (HSE) reports to the Project Company.

These responsibilities are in relation to the avoidance and minimisation measures presented in Table 5.3. The Project Company is expected to be fully responsible for the following reporting HSE requirements to the lenders (quarterly during pre-construction and construction phases and semi-annual during operation phase): non-compliance incidents, environmental monitoring and social complaints, corrective actions, results of environmental monitoring and overall environmental and social performance. This will also include semi-annual progress update of the BAP actions to the lenders for the full duration of construction and operation.

The Project Company will employ suitably qualified local biodiversity specialists to undertake the actual biodiversity monitoring presented in Section 7. The biodiversity monitoring will be coordinated and evaluated by an external national or international biodiversity expert to be hired by the Project Company. If evidence suggests a decline in the ecological conditions relating to the construction and operational activities of the Project, then appropriate intervention and follow up remedial measures will be defined and implemented accordingly.

Monitoring results will be published on the Project's official website on a quarterly basis. The environmental protection monitoring committee (as required by Article 17 of the EIA Act) will share information with the public on the activities and progress of the Project.

Following completion of each of the biodiversity monitoring surveys, the results will be evaluated by the external biodiversity expert in conjunction with the Project Company. The mitigation measures included in the BAP will also be reviewed against the results of monitoring surveys and relevant changes to the mitigations will be made where deemed necessary. To maintain an up-to-date understanding of the continued effectiveness and viability of the BAP actions, an internal review and update of the BAP actions will be conducted on a quarterly basis (ie every three months) as part of the BAP's overarching adaptive management strategy as described in Section 7.3. This ensures that the Project's conservation efforts are always aligned with the current circumstances and needs. This regular review will take place both during the project development phase as well as project implementation phase. Details of the structured framework approach of monitoring and reviewing the feasibility as well as progress/execution of the BAP actions are provided in Section 6.3 above.

As per the WBG EHS Guidelines for Wind Energy, multiple wind farm facilities that are located in the same geographical area and near areas of high biodiversity value are encouraged to implement a coordinated approach to surveys and monitoring. This will be in line with the proposed BAP actions in Section 6.2.

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Appendices

A. Summary of project surveys conducted

The baseline field surveys undertaken as part of the CHW02 EIA are summarised below.

Survey conducted	Summary of results
Terrestrial ecology	
● Terrestrial plant	● Surveys were carried out in August and November 2017, as well as one supplementary survey on the common corridor in Lunwei area in July 2017 (See EIA report Section 6.3.1). ● 34 families, 95 genera and 112 species of plants were recorded. ● Main habitats identified were natural grassland, deserted grassland and roadside land. No natural or secondary forest was observed. No habitats of conservation value were identified. ● Vegetation found during the survey was dominated by native species rather than exotic species. ● Endemic plant species found during the main surveys include Taiwan golden rain tree (*Koelreuteria elegans*), Formosan peacock-plume (*Chloris formosana (Honda) Keng*) and Formosan date palm (*Phoenix hanceana*). Only one rare plant was found (*Thespesia populnea*), which was artificially planted. ● Endemic plant species found during the supplementary survey in Lunwei include the Tashiro Indian hawthorn (*Raphiolepis indica Lindl*), Taiwan golden rain tree (*Koelreuteria elegans*), Formosan peacock-plume (*Chloris formosana (Honda) Keng*) and Formosan date palm (*Phoenix hanceana*). Three rare plants were found – Lanyu podocarp, common garcinia and bhendi tree – all of which were artificially planted.
Terrestrial mammals (including bats)	● Surveys were carried out in August and October 2017, as well as one supplementary survey on the common corridor in Lunwei area in July 2017 (See EIA report Section 6.3.1). ● 21 species of mammals, including eight species of bats, were identified. ● Species endemic to Taiwan were *Rattus losea, Mus caroli, Myotis secundus* and *Murina puta.* No protected species were identified.
Terrestrial birds	● Surveys were carried out in August and October 2017, as well as one supplementary survey on the common corridor in Lunwei area in July 2017 (See EIA report Section 6.3.1). ● 48 species of birds were identified, characterised into 25 resident species, 16 winter bird species, five exotic bird species and two summer bird species. ● There were four protected species, including the Common kestrel, black-winged kite, oriental pratincole and brown shrike.
Terrestrial amphibians	● Surveys were carried out in August and October 2017, as well as one supplementary survey on the common corridor in Lunwei area in July 2017 (See EIA report Section 6.3.1). ● Three amphibian species were recorded. None of these were protected, endemic or exotic species.
Terrestrial reptiles	● Surveys were carried out in August and October 2017, as well as one supplementary survey on the common corridor in Lunwei area in July 2017 (See EIA report Section 6.3.1). ● Three reptile species were recorded. None were protected or exotic species, but one was endemic (Stejneger's grass lizard). ● The most dominant species was *Hemidactylus frenatus.*.
Butterflies	● Surveys were carried out in August and October 2017, as well as one supplementary survey on the common corridor in Lunwei area in July 2017 (See EIA report Section 6.3.1).

Survey conducted	Summary of results
	● Ten butterfly species were recorded, none of which were protected or exotic. ● Two endemic subspecies were identified – striped policeman and *Polygonia c-aureum lunulata*.
Dragonflies	● Surveys were carried out in August and October 2017, as well as one supplementary survey on the common corridor in Lunwei area in July 2017 (See EIA report Section 6.3.1). ● Five dragonfly species were recorded, none of which were protected or endemic. ● The dominant dragonfly species was *Pantala flavescens*.
Marine ecology	
Phytoplankton Zooplankton Benthic organisms Intertidal benthic organisms Sessile marine plants Fish	● Six surveys were carried out between February 2016 and July 2017 (see EIA report Section 6.3.2). ● No species of conservation concern were observed. ● Five supplementary surveys were carried out for the EIA addendum, between January 2020 and July 2020 (see EIA addendum report Section 6.3.2) ● Dominant fish species include Triacanthus biaculeatus and Benthosema pterotum
Marine avian species ecology	
Marine avian species	● 12 surveys were carried out between March 2016 and March 2017 (see EIA report Section 6.3.4). ● The dominant species were the barn swallow and streaked shearwater. ● Three protected species were recorded: bridled tern, roseate tern and greater crested tern. ● 20 supplementary surveys were carried out between March 2019 and December 2020 for the EIA addendum (see EIA addendum report section 6.8.1.2) ● Dominant species included great egret, barn swallow and rock pigeon.
Coastal birds	● Eight surveys were carried out between March and December 2016 (see EIA report Section 6.3.4). ● Out of the 40 species identified, 21 were winter migrants, 8 were resident birds, 8 were transit birds, and 2 were summer birds. ● Seven protected species were recorded: rare and valuable species were the black-faced spoonbill, black-shouldered kite, osprey and common kestrel; species of conservation significance were the Eurasian curlew and eastern collared pratincole. ● No endemic coastal bird species were observed.
Raptor migratory survey	● Meteorological radar data of three raptors (*Butastur indicus* and *Accipiter soloensis*) and ground / satellite data of the common tern and black-faced spoonbill were analysed (see EIA report Section 6.3.4). ● For *Butastur indicus*, flight altitudes ranged from 167m to 1796m, while 0.2% of individuals were estimated to enter the blade sweep range of the WTGs. ● For *Accipiter soloensis*, flight altitudes ranged from 426m to 760m, while 0.028% of individuals were estimated to enter the blade sweep range of the WTGs. ● Protected common terns are commonly found in the estuaries along the western coast of Taiwan and breed in the Matsu / Penghu islands. It is still undetermined as to whether their migratory route passes through the planned WTGs or not. ● The black-faced spoonbill flies to Taiwan from the Korean peninsula from October to November, and returns to their breeding ground in the Korean peninsula from March to May. They are unlikely to pass through the wind farm.

Survey conducted	Summary of results
Nocturnal bird radar survey	● Two surveys were carried out in August and September 2017 (see EIA report section 6.3.4) ● A total of 162 records of flightpaths and no records of flight altitudes were observed. Majority of the birds were flying towards the south. There were no records of flight directions towards north, northeast and east. ● Peak nocturnal activity was between 0300-0400 with most number of records (20). ● High potential risk collision towards night avian species with flight altitude between 25-300m.
Cetaceans	● Surveys were carried out between April 2016 and March 2017 for a total of 20 days (See EIA report section 6.3.5). ● No Taiwanese Humpback Dolphin were observed within in or proximity to the Project area during the survey. ● Five groups of Indo-Pacific Bottlenose Dolphins (with 2 to 10 individuals per group) were observed within the Project area during the survey. Satellite tracking showed that the Taiwan Strait is their roosting and foraging ground and the Project area is their active area.

Source: Mott MacDonald, 2024

B. Collision risk model results

Table B.1 and Table B.2 present the estimated collision counts of each bird species with different configurations at a presumed avoidance rate of 0.98, taken from the CHW02 EIA amendment report (Unitech, 2021).

The CRM used survey results from offshore bird surveys in 2019 and 2020. Considering the large number of birds found in the survey in 2019 and the pattern in long-term survey results, collision simulations were done under two scenarios, one using all survey data in 2019, and another using all survey data from 2019 to 2020. Three turbine layouts were assumed for the simulation: 8MW, 16MW, and a combination of 8MW and 16MW turbines.

Table B.1: CRM results under various turbine layouts with 98% avoidance rate, adopting survey data from 2019

Scientific name	Common name	No. of simulated annual bird collisions		
		Layout 1 (8MW)	Layout 2 (16MW)	Layout 3 (8 + 16MW)
Bulweria bulwerii	Bulwer's petrel	<0.1	<0.1	<0.1
Calonectris leucomelas	Streaked shearwater	<0.1	<0.1	<0.1
Ardea alba	Great egret	34.9	31	65.9
Egretta garzetta	Little egret	4	3.6	7.6
Bubulcus ibis	Cattle egret	8.8	7.8	16.7
Charadrius alexandrinus	Kentish plover	0.5	0.4	0.9
Scolopacidae spp.	Sandpipers	2.5	2.1	4.6
Charadriiformes spp. (shorebirds)	Shorebirds	0.6	0.5	1.1
Saundersilarus saundersi	Saunders's gull	0.5	0.4	0.9
Onychoprion anaethetus	Bridled tern	1.0	0.8	1.9
Chlidonias leucopterus	White-winged tern	3.5	2.8	6.3
Chlidonias hybrida	Whiskered tern	2.5	2.1	4.6
Larida spp.	Seabirds	8.7	6.9	15.6
Hirundo rustica	Barn swallow	0.1	<0.1	0.1
Phylloscopus fuscatus	Dusky warbler	<0.1	<0.1	<0.1
Ficedula parva	Red-breasted flycatcher	<0.1	<0.1	<0.1
Total		67.8	58.5	126.3

Source: Unitech, 2022

Table B.2: CRM results under various turbine layouts with 98% avoidance rate, adopting survey data from 2019 and 2020

Scientific name	Common name	No. of simulated annual bird collisions		
		Layout 1 (8MW)	Layout 2 (16MW)	Layout 3 (8 + 16MW)
Bulweria bulwerii	Bulwer's petrel	<0.1	<0.1	<0.1
Calonectris leucomelas	Streaked shearwater	<0.1	<0.1	<0.1
Sula sula	Red-footed booby	<0.1	<0.1	<0.1
Ardea alba	Great egret	17.5	15.5	33.0
Egretta garzetta	Little egret	3.5	3.1	6.6
Bubulcus ibis	Cattle egret	4.4	3.9	8.3
Charadrius alexandrinus	Kentish plover	0.3	0.2	0.5
Scolopacidae spp.	Sandpipers	1.3	1.0	2.3
Charadriiformes spp. (shorebirds)	Shorebirds	0.3	0.3	0.6
Stercorarius longicaudus	Long-tailed jaeger	0.9	0.7	1.5
Saundersilarus saundersi	Saunders's gull	0.2	0.2	0.4
Anous stolidus	Brown noddy	0.2	0.2	0.4
Onychoprion anaethetus	Bridled tern	0.6	0.5	1.0
Chlidonias leucopterus	White-winged tern	1.7	1.4	3.1
Chlidonias hybrida	Whiskered tern	1.3	1.0	2.3
Larida spp.	Seabirds	4.3	3.5	7.8
Columba livia	Rock dove	0.2	0.2	0.4
Hirundo rustica	Barn swallow	0.1	<0.1	0.1
Phylloscopus fuscatus	Dusky warbler	<0.1	<0.1	<0.1
Ficedula parva	Red-breasted flycatcher	<0.1	<0.1	<0.1
Total		36.7	31.7	68.4

Source: Unitech, 2022

Table B.3 is taken from publicly available report, HL No.3 EIA Bird Monitoring Report carried out for all windfarms in western Taiwan (Unitech, 2020a). This overarching CRM analysis encompassed a total of 1178 WTGs situated in greater Changhua seas of western Taiwan. The WTGs covered within the CRM are:

- 670 WTGs are situated within the greater Changhua outer seas, which include the Project, CHW01, Hai Long 2 and 3, Haiding and others shown in Figure 1.2.
- 402 WTGs are situated in greater Changhua coastal seas, which include windfarm developments like Haixia, Huanyang, Changhua Changfang and others.
- 106 WTGs belong to Yunlin OWF, which is the southernmost windfarm within this CIA's spatial boundary.
- Results of the CRM conducted for BFS (ie as based on potential windfarms in western Taiwan) was presented in Appendix 3 of the HL No.3 Bird Monitoring Report and

summarised in Table B.3 below. It is noted that the collision counts presented below are the same and applicable to 6MW, 8MW or 10MW size WTGs.

Table B.3: BFS collision risk modelling of western Taiwan windfarms

Wind farms	Number of WTGs	Collision count based on avoidance rate			
		95%	98%	99%	99.5%
Greater Changhua outer seas	670	2	1	0	0
Greater Changhua inner seas	402	4	2	1	0
Yunlin OWF	106	0	0	0	0

Source: Unitech, 2020a

An updated CRM was conducted following the finalisation of CHW02's technical specifications and project location. The primary focus of this CRM was to assess the collision risk for both critical habitat bird species and non-critical habitat bird species with high and medium collision vulnerability. This CRM utilised survey results from satellite tracking, boat surveys as well as the migratory path of birds through satellite tracking.

Table B.4 present the estimated collision counts of each bird species, taken from the CHW04 and CHW02 Collision Risk Modelling Report (WavesCan Ecology, 2024).

Table B.4: Annual CRM results for each bird species at CHW02

Bird species	No. of estimated annual bird collisions (36 WTGs of 8MW + 24 WTGs of 14MW)
Black-Faced Spoonbill (黑面琵鷺)	0.32
Oriental Stork	<0.01
Chinese Crested Tern	<0.001
Saunders's Gull	0.30
Kentish Plover	0.06
Streaked Shearwater	0.39
Eurasian Curlew	0.04
Little Tern	0

Source: WavesCan Ecology, 2024

C. Ecologically appropriate areas of analysis (EAAAs)

The species with regular occurrence in the project's area of influence typically occur within relatively broad landscape and seascape units and fall into several distinct ecological groups. As per IFC GN6 (Paragraph GN59), the EAAAs have been defined taking in consideration the distribution of species or ecosystems (within and sometimes extending beyond the Project's area of influence) and the ecological patterns, processes, features, and functions that are necessary for maintaining them (IFC, 2019).The ecological patterns, processes, features, and functions that are necessary for maintaining these groups is however largely limited and are little known in the Project area, particularly in relation to species in the marine environment. A separate EAAA was defined for each of the main ecological groups of species: marine flora and fauna, migratory birds (including seabirds at sea) and terrestrial flora and fauna.

The three EAAAs considered for this Project, one for each of the main groups of species, are summarised below:

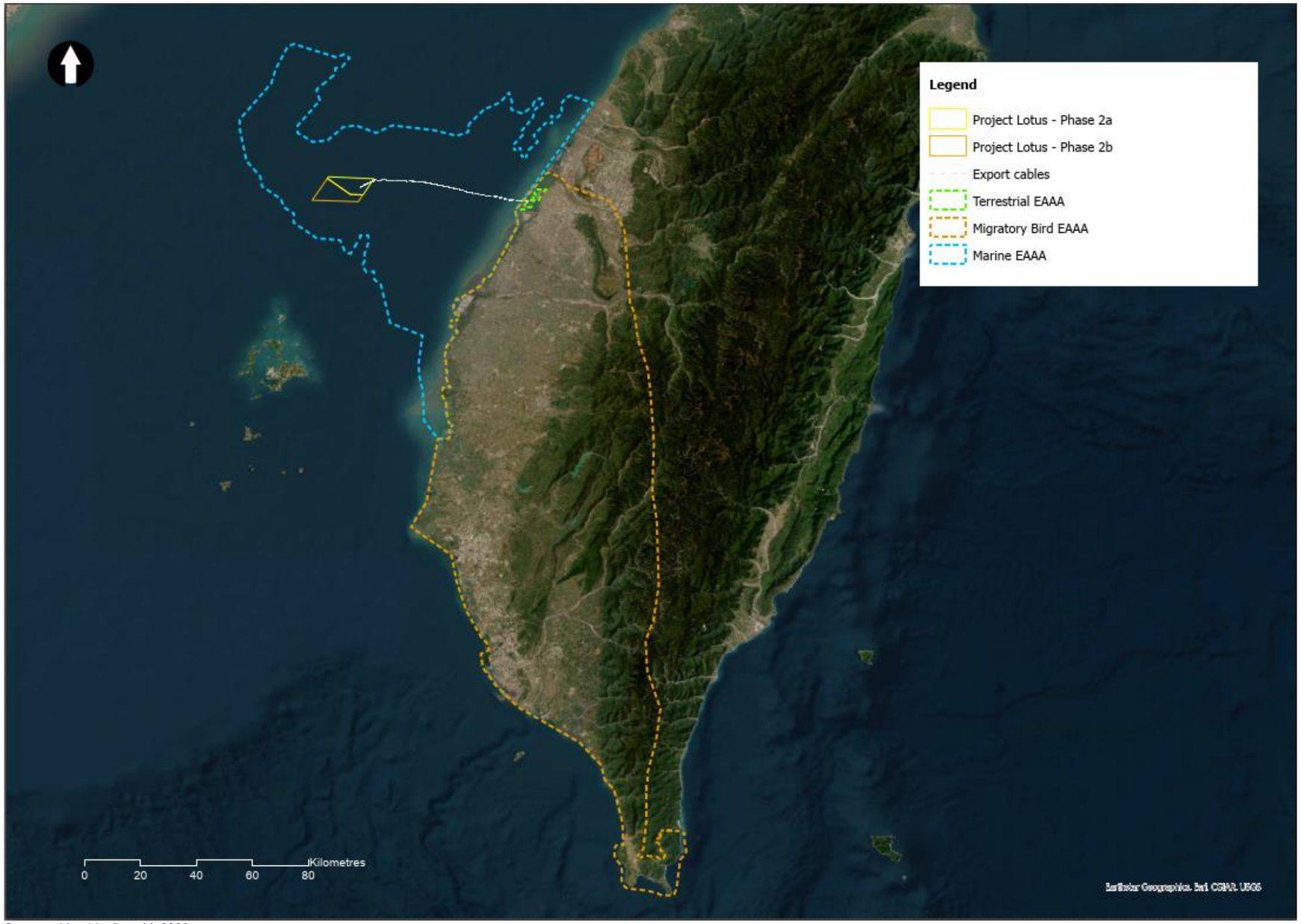
- Terrestrial flora and fauna, including bats and resident terrestrial birds (Figure C.1):
  - Terrestrial flora and fauna EAAA includes Xianxi area (線西區) and Lunwei area (崙尾區) of Changhua Binhai Industrial Park (彰濱工業區) in the coast of Changhua County of Taiwan. The Changhua Binhai Industrial Park is located on reclaimed land and separated from Xianxi Township (線西鄉) by Qingan water channel (慶安水道) and Xianxi water channel (線西水道). In light of the artificial and recent nature of the landform creation (c. 1995) and the limited connectivity with the natural landform of Taiwan, it was considered that the land area defined above forms a discrete ecologically significant unit of space within the wider landscape. Furthermore, this area is equivalent in scale to areas mapped for practical site-based conservation such as Important Bird and Biodiversity Areas (IBAs). As the terrestrial flora and fauna EAAA is within a reclaimed industrial land, this area is considered as a modified habitat.
- **Marine flora and fauna** (Figure C.1):
  - The marine EAAA consists of the western marine waters of Taiwan, whereby it takes into account the bathymetry of the Chang-Yuen Ridge, bottom marine water temperature gradient, and the Marine Ecoregions of the World (MEOW) obtained from ArcGIS Hub (The Nature Conservancy, 2019). The species range of threatened species off the west coast of Taiwan, potential underwater noise impacts generated during pilling and the operation phase were also considered.
  - Using data from the Marine Ecoregions of the World (MEOW) obtained from ArcGIS Hub (The Nature Conservancy, 2019), the western coast of Taiwan was divided into two parts according to the two marine ecoregions – East China Sea and South China Sea.
    - The Project's lies within the South China Sea ecoregion. The northern boundary of the marine EAAA is thus defined by the South China Sea marine ecoregion.
  - The Chang-Yuen Ridge is a shelf sand ridge that lies within a depth of 50 meters below the sea surface (Liao & Yu, 2005). It is prominently situated in the middle of the Taiwan Strait, extending westward from Taiwan's west coast to the centre of the Taiwan Strait (Li et al., 2018).
    - In parallel, there are three primary water masses with different characteristics within the Taiwan Strait: Kuroshio Branch Current, Mixed China Coastal Current and South China Sea Current (Tseng, et al., 2020).

    - Jan et al. (2002) indicates that the Chang-Yuen Ridge distinctly divides the Kuroshio Branch Current and South China Sea Current into bottom and surface water flow. This leads to the formation of bottom water flow along the Chang-Yuen Ridge and surface water flow over the Chang-Yuen Ridge, which in turn establishes a distinct ecological demarcation within the marine ecosystem of the Taiwan Strait.
    - Thus, the western boundary of the marine EAAA is defined by the Chang-Yuen Ridge.
  - Furthermore, the varying mixing ratios of the three primary water masses in the Taiwan Strait can lead to diverse chemical and hydrographic conditions.
    - One notable outcome of the interactions between the Kuroshio Branch Current and Mixed China Coastal Current is a 2°C difference in the temperature of the bottom water.
    - This temperature variation has a significant impact on the spatial and temporal distribution of fish assemblages along the western coast of Taiwan (Chen et al., 2023). This phenomenon is most prominently observed between the coastal areas of Taixi and Qigu.
    - Thus, the southern boundary of the marine EAAA is determined by the temperature gradient of bottom marine water along the western coast of Taiwan.
  - As the marine EAAA consists of open water habitats, this area is considered to be a natural habitat.
- Migratory birds, including seabirds at sea (Figure C.1):
  - The migratory bird EAAA includes the Important Bird Areas (IBAs) in the south-western region of Taiwan (Figure C.2) and the corresponding areas of connectivity between the IBAs.
  - An initial comparison was done between the IBAs and the EIA survey data (Unitech, 2018; Unitech, 2021) in order to find overlaps between qualifying species of IBAs along the western coast of Taiwan and bird species identified in the EIA surveys.
  - Further analysis also took into consideration bird migratory route maps that were developed from observations from radar surveys in the EIA (Unitech, 2018).
  - In consideration of the analysis done above, the migratory bird EAAA was determined to include the south-western region of Taiwan.
  - The IBAs within the migratory bird EAAA includes the following IBAs, namely:
    - Dadu River Estuary Wetland (TW013)
    - Hanbao Wetland, Changhua County (TW014)
    - North Section of Baguashan, Changhua County (TW015)
    - Zhuoshui River Estuary Wetland (TW016)
    - Huben, Yunlin County (TW017)
    - Aogu Wetland, Chiayi County (TW021)
    - Puzi River Estuary, Chiayi County (TW022)
    - Budai Wetland, Chiayi County (TW023)
    - Middle Section of Bazhang River, Chiayi County (TW024)
    - Beimen, Tainan City (TW025)
    - Qingkunshen, Tainan City (TW026)
    - Qigu, Tainan City (TW027)
    - Hulupi, Tainan City (TW028)
    - Sicao Wildlife Refuge, Tainan City (TW029)
    - Yong'an, Kaohsiung City (TW030)

- Yellow Butterfly Valley, Kaohsiung City (TW031)
- Shanping, Kaohsiung City (TW032)
- Chuyunshan Nature Reserve (TW033)
- Fengshan Reservoir, Kaoshiung City (TW035)
- Dawushan Nature Reserve and Shuang-guei Lake Major Wildlife Habitat (TW036)
- Gaoping River, Pingtung County (TW037)
- Kenting National Park (TW038)
- Qieding Wetland, Kaohsiung City (TW054)
- Fangyuan Wetland, Changhua County (TW056) (prospective)

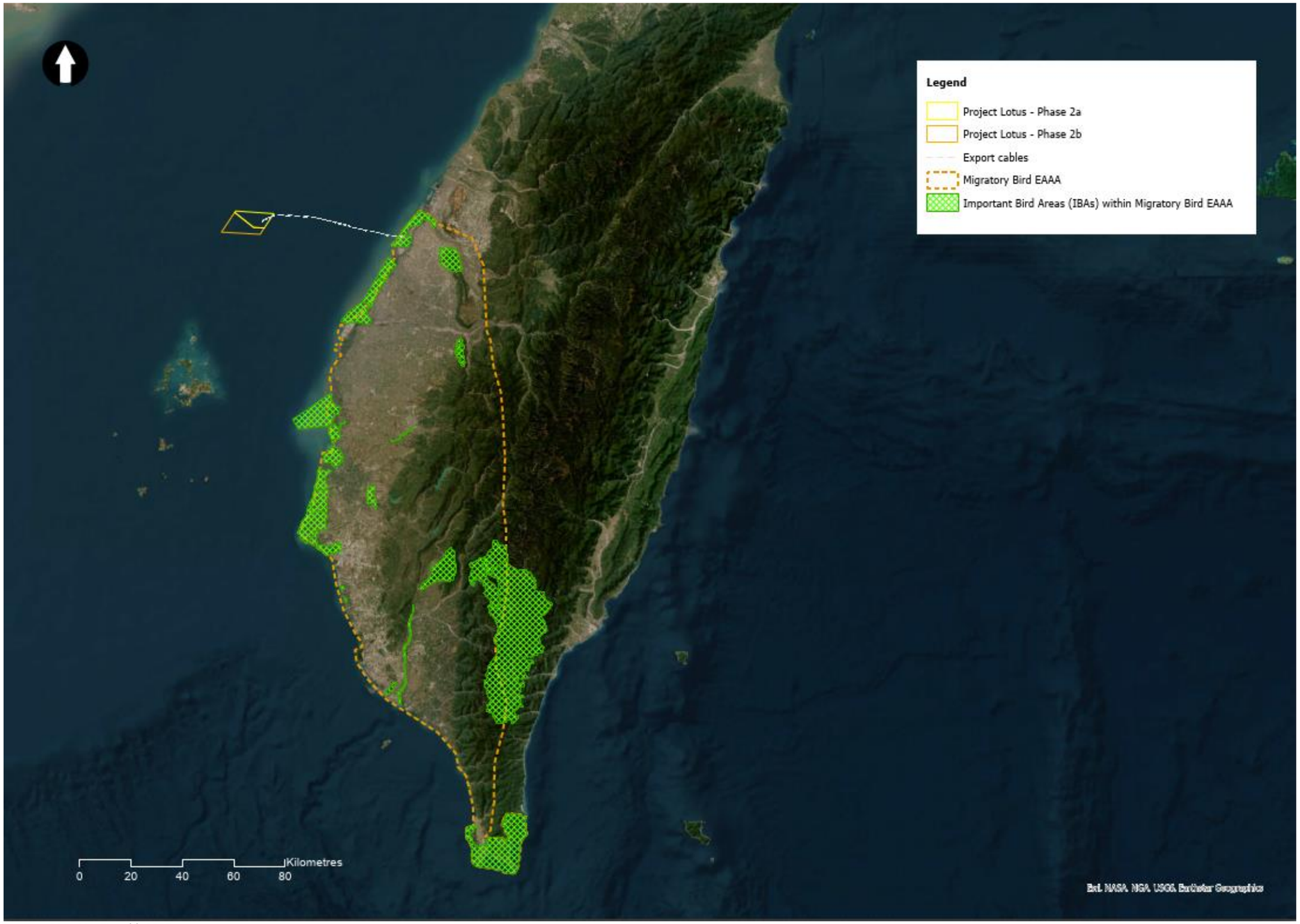
– As the migratory bird EAAA encompasses built-up areas along the inland and coastal regions of Taiwan, as well as IBAs and natural areas, this area is considered to be a mix of natural and modified habitat.

Figure C.1: Ecologically Appropriate Areas of Analysis (EAAAs) of marine flora and fauna, migratory birds (including seabirds at sea) and terrestrial flora and fauna



Source: Mott MacDonald, 2022

Figure C.2: Important Bird Areas (IBAs) within the migratory birds (including seabirds at sea) EAAA



Source: Mott MacDonald, 2022