Biodiversity Action Plan for the Gabel El Zeit 580 MW Wind Farm, Egypt

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Front cover image is of Gabel El Zeit 580 MW Wind Farm by Filipe Canário (TBC)

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Acronym table

Acronym	Definition
ATMP	Active Turbine Management Program
BAP	Biodiversity Action Plan
BFDs	Bird Flight Diverters
BMEP	Biodiversity Monitoring and Evaluation Plan
BMP	Biodiversity Management Plan
CEA	Cumulative Effects Assessment
CH	Critical Habitat
CHA	Critical Habitat Assessment
CR	Critically Endangered
EBRD	European Bank of Reconstruction and Development
EETC	Egyptian Electricity Holding Company
EIB	European Investment Bank
EN	Endangered
ESR6	(EBRD) Environmental and Social Requirement 6
ESIA	Environmental and Social Impact Assessment
ESS4	(EIB) Environmental and Social Standard 4
GBIF	Global Biodiversity Information Facility
IBA	Important Bird and Biodiversity Area
IBAT	Integrated Biodiversity Assessment Tool
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
LC	Least Concern
MSBs	Migratory Soaring Birds
NG	Net Gain
NNL	No Net Loss
NREA	New and Renewable Energy Authority
NT	Near Threatened
OFS	Offset Feasibility Study
OHTL	Overhead Transmission Line
OLSOD	Observer-Led Shutdown on Demand
PBF	Priority Biodiversity Feature
PCFM	Post-construction Fatality Monitoring

Acronym	Definition
PS6	(IFC) Performance Standard 6
RASOD	Radar Assisted Shutdown On Demand
SCADA	Supervisory Control and Data Acquisition
SESA	Strategic Environmental and Social Assessment
TBC	The Biodiversity Consultancy
VEC	Valued Environmental Component
VU	Vulnerable

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Table of contents

Executive Summary

This document is the Biodiversity Action Plan (BAP) for the Gebel El Zeit 580 MW operational wind farm (the Project). This project is located in the Gebel El Zeit area of the Red Sea Governorate, Egypt. Alcazar Energy Partners seeks funding from development financing institutions to acquire this project and is required to comply with the standards of the International Finance Corporation (IFC) Performance Standards, European Bank for Reconstruction and Development (EBRD) and European Investment Bank (EIB).

The BAP identifies a suite of priority biodiversity and describes the actions by which the Project will demonstrate Net Gain for Critical Habitat-qualifying features and No Net Loss for Priority Biodiversity Features (PBF) and priority Valued Environmental Components (VEC). The BAP also sets out the approach for how the mitigation hierarchy will be followed.

Impacts to birds come from, primarily, collisions with turbines and transmission lines. The project will proceed with the application of an Active Turbine Management Program (ATMP) consisting primarily of radar assisted and observer-led turbine shutdown on demand to minimise collisions. The BAP proposes improvements to the ATMP. An operations phase Biodiversity Management Plan is presented as an appendix to the BAP where implementation of mitigation and monitoring actions are detailed, along with roles and responsibilities.

Residual impacts are predicted to be close to zero for some species. However, for some species mortality thresholds defined in the Project's Cumulative Effects Assessment are exceeded. An offset feasibility study (appendix to the BAP) proposes options to compensate for the residual impacts to most species and to provide gains for Critical Habitat qualifying features.

1 Introduction

1.1 Scope and objectives

Alcazar Energy Partners (Alcazar Energy, the Client) has commissioned The Biodiversity Consultancy (TBC), to prepare a Biodiversity Action Plan (BAP) for the Gabel El Zeit 580 MW operational wind farm (the Project), located in the Ras Gharib region within the Red Sea Governorate, Egypt.

The Client is planning to acquire the Project, which is currently owned by the New and Renewable Energy Authority (NREA) and is operated by Siemens Gamesa Renewable Energy, the Operation and Maintenance (O&M) contractor. Alcazar Energy is seeking financing from international lenders and therefore aims to align the Project with the International Finance Corporation Performance Standard 6 (IFC PS6, IFC 2012), European Bank for Reconstruction and Development Environmental and Social Requirement 6 (EBRD ESR6, EBRD 2024), European Investment Bank Environmental and Social Standard 6 (EIB ESS6, EIB 2022), and the Equator Principles (Equator Principles 2020).

Developing a BAP is a requirement of the lenders' standards since a Critical Habitat Assessment (CHA) recently developed for the Project confirmed that the wind farm is sited in Critical Habitat for a few migratory soaring bird species (TBC 2026a). The CHA has been prepared in line with IFC Guidance Note 6 (IFC 2019) and EBRD ESR6 Guidance Note (EBRD 2025a) and other relevant international guidance (e.g. (Bennun *et al.* 2021; IPIECA 2022) and Good International Industry Practice (GIIP).

The BAP describes the Project's approach to management of biodiversity risks, includes a mitigation and offset strategy devised in line with the mitigation hierarchy: i.e., avoid, minimise, restore and offset (CSBI & TBC 2015). The Project is expected to mitigate and compensate impacts to achieve No Net Loss (NNL) concerning Natural Habitat, Priority Biodiversity Features (PBF), Valued Environmental Components (VECs) and Net Gain (NG) for Critical Habitat qualifying values.

The objectives of this BAP are to:

- Identify the priority biodiversity features in the Project area that are subject to NNL/NG targets;
- Identify key stakeholders relevant to the implementation of the BAP;
- Make recommendations for mitigation measures for implementation during operation phase. These actions are devised in-line with the mitigation hierarchy: avoid, minimise, restore and offset (CSBI & TBC 2015);
- Estimate residual impacts to priority biodiversity values;

- Set out a framework for biodiversity offsets, as well as monitoring and evaluation to enable the Project to demonstrate achievement of the NNL/NG targets;
- Encompass and present the Project's net gain strategy in a single document useful for planning, communication and audit purposes.

BAPs are living documents, which are reviewed and updated on a regular basis. Regular review and update will take place as Project implementation progresses, and as more information becomes available on the status and ecology of priority biodiversity features, the impacts on these features and the effectiveness of mitigation actions. Any relevant outcomes of the ongoing regional Strategic Environmental and Social Assessment (SESA) should also be incorporated in future updates of the BAP[1]. This adaptive management approach should be informed by the Project's Biodiversity Monitoring and Evaluation Plan (BMEP), a framework of which is included in this BAP.

The BAP includes as appendices an operations phase Biodiversity Management Plan (BMP) and an Offset Feasibility Study (OFS).

1.2 The Project

The Project is located in the western coast of the Gulf of Suez, within the administrative boundary of the Red Sea Governorate, approximately 280 km southeast of Cairo, 20 km south of Ras Ghareb and 3 km from Ras Shukeir (Figure 1).

The Project comprises three adjacent operational wind farms covering approximately 10 683 ha.

The operational capacity of each wind farms is as follows (the wind farms are named according to the financial institution that funded them):

- Kreditanstalt für Wiederaufbau (KFW) wind farm: 240 MW wind farm, with 120 turbines
- Japan International Cooperation Agency (JICA) wind farm: 220 MW wind farm with 110 turbines, and
- The Corporate Internationalization Fund (FIEM) wind farm: 120 MW wind farm with 60 turbines

1.2.1 Associated Facilities

The Project is connected to the national grid through 220 kV Overhead Transmission Lines (OHTLs). The OHTLs, which are essential for the Project, are owned and operated by the Egyptian

[1] The outcomes and recommendations of the SESA will be reasonably incorporated as applicable, considering that SESA is not available at the time of development of the BAP.

Electricity Holding Company (EETC), a state-owned company for electrical power generation, transmission and distribution in Egypt (see Figure 1). The project would not be feasible without the OHTLs. However, the OHTLs are understood to have been built with several objectives, including to support wind developments in the area and not specifically for the Project. While there is some association between the Project and the OHTLs, the boundaries of this association cannot be conclusive. For the purposes of the Project, the OHTLs evacuating into the grid within the boundary of the Project site are considered Associated Facility to the Project.

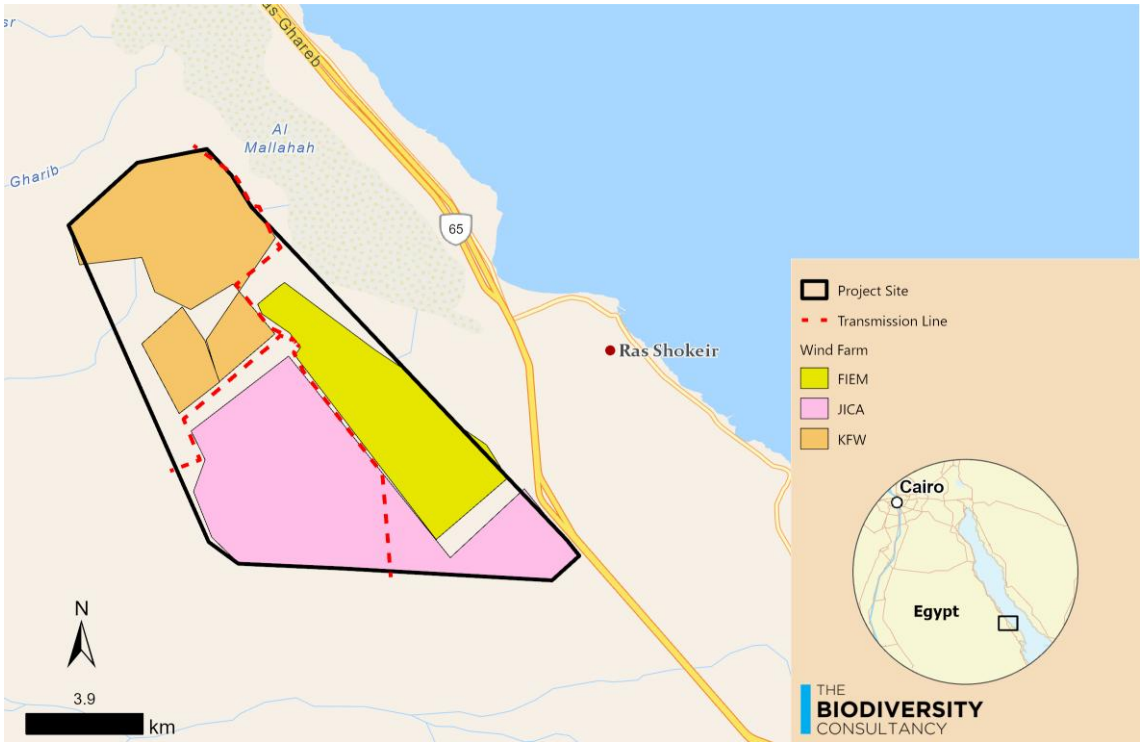

Figure 1. Project location and boundaries, showing the three adjacent wind farms (KFW 240 MW, FIEM 120 MW and JICA 220 MW). Note that only the portion of the OHTL located within the Project site boundary is the responsibility of the Project.

This BAP is based on the existing layout and composition of the three wind farms which comprise the Project and assumes that no expansion or repowering is undertaken. Should the Project be expanded, or the wind farms repowered, this BAP would need to be updated.

1.3 Spatial and temporal scope of the BAP

The spatial (geographical) scope covered by this BAP includes the Project site (see Figure 1), where direct and indirect impacts are expected to happen.

The short length of OHTL located within the Project site boundary is considered an associated facility to the Project.

According to both IFC Performance Standard 1 (PS1, IFC 2012a) and EBRD Environmental and Social Requirement 1 (ESR1, EBRD 2024a). 'Associated Facilities' are facilities which are not funded as part of the Project and that would not have been constructed or expanded if the Project did not exist and without which the Project would not be viable.

According to IFC PS1 Guidance Note, the developer should collaborate with third parties owning and/or operating associated facilities (in this case, EETC) and take action to the extent of their influence or control over them to identify risks and impacts and, as much as possible, to undertake actions to ensure these operators, operate their facilities consistent with the applicable Performance Standards. EBRD ESR1 (ESR1, EBRD 2024a) requires that the risks associated with the associated facility are addressed.

Therefore, the OHTL is outside the direct scope of the BAP as it is not under the direct control of Alcazar Energy. However, the Project must make all possible efforts to reach an understanding with EETC to ensure that impacts caused by the OHTL located within the Project site boundary on priority species are addressed, including the implementation of mitigation and monitoring in line with GIIP.

As the Project is already operational, this BAP only refers to its operational phase. Construction related impacts and any impacts resulting from operations prior to the Project acquisition are out of the scope of this document. The BAP includes actions over the remaining lifespan of the Project.

2 Stakeholder consultation

To identify and implement appropriate biodiversity actions, and to take lessons from ongoing actions and monitoring, it is important to seek advice and develop partnerships with recognised and credible conservation organisations, academic institutes, biodiversity experts and the relevant government agencies. This is especially important for projects located in Natural Habitat and Critical Habitat, or in legally protected and recognized areas (IFC 2019; EBRD 2025a).

In the present case, all wind farms comprising the Project have been fully operational for multiple years and include a comprehensive monitoring program for migratory soaring birds, as well as a turbine shutdown program to avoid bird collisions (ATMP - Active Turbine Management Program).

Appendix 1 presents the rationale and requirements for stakeholder engagement, and a list of stakeholders consulted during the development of the BAP.

3 Corporate and project policies and commitments

3.1 Corporate policy

Alcazar Energy recognises that sustainability is fundamental to long term business success and forms a core pillar of its corporate strategy. The company integrates sustainability across the way it finances, develops, and operates its projects, guided by four overarching Sustainability Principles: Environmental Stewardship, Social Responsibility, Economic Development, and Strong Governance (Alcazar Energy 2021).

This commitment is aligned with the principles underpinning the Sustainable Development Goals (SDGs), with particular emphasis on SDG 7 (Affordable and Clean Energy), SDG 13 (Climate Action), SDG 8 (Decent Work and Economic Growth) and SDG 4 (Quality Education), as well as the United Nations Global Compact (UNGC).

Under the Environmental Stewardship principle, Alcazar Energy commits to:

- Enabling the development of renewable energy generation and supporting host countries in their climate change adaptation efforts and greenhouse gas emissions reduction commitments
- Applying a precautionary approach to environmental impacts and associated risks, and
- Implementing initiatives that promote environmental responsibility and raise awareness among stakeholders.

Alcazar Energy's Environmental Policy (Alcazar Energy 2021) recognises that environmental protection and biodiversity conservation are fundamental to climate change mitigation and responsible infrastructure development. The policy commits the company to applying best practice techniques and an adaptive management approach, including the responsible use of natural resources, rational water consumption, adequate waste management, pollution prevention, and the proactive preservation of biodiversity, ecosystems, and natural heritage.

These actions are informed by guidance from the International Union for the Conservation of Nature (IUCN) and aligned with the principles of the SDGs and the UNGC.

The Environmental Policy sets out the following commitments:

- To comply with relevant environmental legislation, good international industry practice (GIIP), applicable international conventions and treaties, applicable permits and environmental related procedures and any other applicable environmental management requirements or safeguards of lending institutions
- To apply sound environmental management practices guided by the Company's proprietary Quality, Health & Safety, Security, Social and Environmental Management

Systems, certified according to the ISO 14001:2015 for the prevention of incidents, the identification of impacts and the control of risks

- To develop and implement tailored protocols for the monitoring of avifauna and the operational management of wind farm assets for the effective protection of biodiversity
- To define environmental indicators, objectives and targets and actively measure the performance of our activities against those through reporting systems, internal inspections and external audits, as well as, to seek opportunities for improvement and for implementing feasible and practical actions that enhance overall environmental compliance of the Company's operations, and
- To communicate information transparently, publicly, and regularly on the environmental performance of the Company's activities and management actions, recognizing both achievements and aspects that are to be improved.

The implementation of Environmental Policy across the company is supported by:

- Effective communication of environmental and biodiversity protection principles across all organisational levels—from senior management to employees in all geographies—as well as with internal and external stakeholders, to promote responsible behaviour, and
- An integrated, proprietary management system aligned with GIIP, enabling effective environmental management and continuous improvement, and supporting operational, strategic, and investment decision making.

3.2 Lender requirements

To align with Alcazar Energy's corporate policy and meet lender requirements, the Project intends to align with IFC PS6, EBRD ESR6 and EIB ESS4 and other GIIP.

Specific IFC PS6, EBRD ESR6 and EIB ESS4 requirements applicable to this BAP are highlighted in the relevant sections of this document. As part of these requirements, the Project needs to achieve NNL for Natural Habitat, PBFs, and VECs, and NG for those biodiversity values for which the Project is in an area of Critical Habitat. Gains can either be generated via biodiversity offsets (that achieve measurable, additional outcomes) where there are likely to be significant impacts to Critical Habitat values or via supporting additional conservation activities that are focused on the Critical Habitat values in projects that do not have a significant residual impact.

4 Biodiversity context

4.1 Ecological setting

The Project is located in the Red Sea Coastal Desert Ecoregion (Dinerstein *et al.* 2017), that extends along the Red Sea coast of Egypt and Sudan, characterized by its arid climate. This region represents a transition zone between the hyper-arid Sahara Desert and the marine

environment of the Red Sea, consisting of a desert area of sand and gravel plains, bisected by several shallow wadis. Land cover consists primarily of bare ground with very scattered low-growing vegetation, supporting a low diversity and abundance of terrestrial fauna (Zahran & Willis 2008).

The Project occurs within the Red Sea/Rift Valley flyway for migratory soaring birds (Figure 2) which connects breeding grounds in Europe and Western Asia with wintering areas in Africa (BirdLife International 2015). This flyway is used by over 1.5 million individuals from 37 species of migratory soaring birds, as well as a suite of migratory passerines and other bird groups (Porter 2005; BirdLife International 2015; Jobson *et al.* 2021).

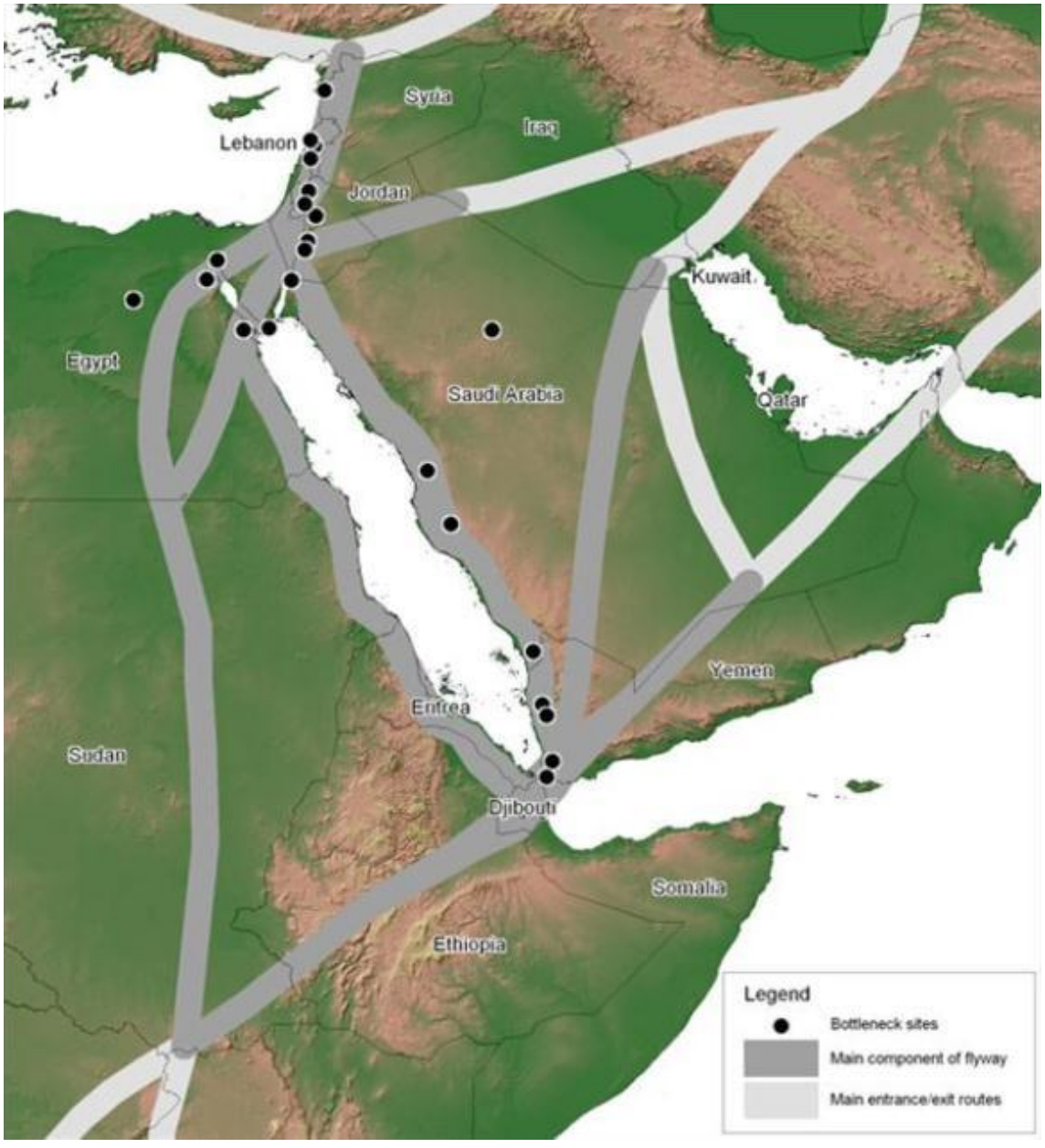

Figure 2. Map of the main elements of the Rift Valley/Red Sea flyway showing key bottleneck sites (source: BirdLife International).

Due to the Project's location and potential interaction with migratory birds, systematic bird migration monitoring, associated with the implementation of the Project Active Turbine Management Program (ATMP), was initiated in spring 2016, with the start of the operation phase of the first individual wind farm within the Project, the KfW wind farm (STRIX 2018; Ehab Ameen No date). In Autumn 2020, a wider monitoring program started, involving all three wind farms within the Project and the monitoring of both Spring and Autumn migratory periods (Ehab Ameen No date).

The number of migratory soaring birds crossing the Project area is very high during both the spring (northward) and autumn (southward) migration periods, exceeding 400,000 individuals (e.g., STRIX 2018, GreenPlus 2022, NREA & SafeSoar 2023). Most abundant species include White Stork (*Ciconia ciconia*), European Honey Buzzard (*Pernis apivorus*), Eurasian (Steppe) Buzzard (*Buteo buteo vulpinus*), Black Kite (*Milvus migrans*), Levant Sparrowhawk (*Accipiter brevipes*), Great White Pelican (*Pelecanus onocrotalus*) and Steppe Eagle (*Aquila nipalensis*).

The Project overlaps with the Gebel El Zeit Key Biodiversity Area[2] (KBA) and Important Bird Area[3] (IBA). This IBA is a very important migration corridor for soaring migrants, particularly birds of prey and storks, and forms an important stop-off point in the Red Sea/Rift Valley flyway. The IBA is located in the narrowest point in the southern part of the Gulf of Suez and migratory birds using this flyway are funnelled through the area during both spring and autumn journeys. The northern section of the IBA is a wide coastal plain with several areas of sabkha (coastal mudflat in which evaporite-saline minerals accumulate), containing pools of hyper-saline water and large patches of saltmarsh[4].

4.2 Baseline and monitoring studies

Baseline information was based on review of Project documents and secondary data. For the Project CHA and CEA (TBC 2026a, 2026b) TBC consulted the Integrated Biodiversity Assessment Tool (IBAT)[5], a source of globally authoritative biodiversity datasets including the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, the World Database on Protected Areas, and the World Database of Key Biodiversity Areas (including Important Bird and Biodiversity Areas). IBAT was used to identify the presence of threatened, restricted-range and migratory species, protected areas, Key Biodiversity Areas (including Important Bird and Biodiversity Areas), World Heritage Sites and Alliance for Zero Extinction sites. European Space Agency (ESA) landcover data was used to classify natural and modified habitats within the Ecologically Appropriate Areas of Analysis[6].

[2] https://www.keybiodiversityareas.org/site/factsheet/6217

[3] https://datazone.birdlife.org/site/factsheet/gebel-el-zeit-iba-egypt

[4] https://www.keybiodiversityareas.org/site/factsheet/6217

[5] Integrated Biodiversity Assessment Tool

[6] Refer to the CHA (TBC 2026a) for a definition of the Ecologically Appropriate Areas of Analysis used.

In addition to IBAT, several internationally and nationally relevant datasets and assessments were consulted, including:

- The IUCN Red List of Threatened Species (IUCN Red List of Threatened Species)
- IUCN Red List of Ecosystems (IUCN Ecosystems)
- The Global Biodiversity Information Facility (GBIF) (https://www.gbif.org/), filtered by records in the study area
- eBird (http://www.ebird.org), filtered by records in the study area
- BirdLife data zone (http://datazone.birdlife.org/home)
- Movebank (Movebank)
- POWO – Plants of the world online, Royal Botanic Gardens, Kew (https://powo.science.kew.org)
- WFO – The World Flora Online (http://wfoplantlist.org).
- Mammals of Egypt: Atlas, red data listing and conservation (Basuony *et al.* 2010)
- Butterflies of Egypt: Atlas, red data listing and conservation (Gilbert & Zalat 2007)
- The conservation status and distribution of the breeding birds of prey of North Africa (Garrido *et al.* 2021).

The following documents were developed for the Project and were also consulted in the preparation of the CHA and CEA:

- Gulf of El Zayt 220 MWe Wind Power Plant Project – Environmental and Social Impact Assessment (ESIA) (Executive Summary) (AL AMAR Consulting Group & Energy & Environment Consultant (E&E) 2008)
- Gebel El Zeit WPP and IBA Due Diligence Wind farm operation and MSBs conservation (Camina *et al.* 2025)
- Shutdown on Demand and Bird Monitoring - Spring Seasons 2018-2025 (GreenPlus Environmental Solutions 2018a, 2018b, 2018c; Environics 2019a; Scientific Environmental Services 2020a, 2020b; GreenPlus Environmental Solutions 2023a, 2023b, 2023c, 2024a, 2024b, 2024c; Safe Soar 2025a, 2025b, 2025c)
- Shutdown on Demand and Bird Monitoring - Autumn Seasons 2025 (GreenPlus Environmental Solutions 2018d, 2018e, 2018f, 2020a, 2020b, 2020c, 2022a, 2022b, 2022c, 2022d, 2022e, 2022f, 2023d, 2023e, 2024d, 2024e, 2024f; Environics 2019b, 2019c, 2019d).

The following studies and assessments from the wider Project region were also consulted in the preparation of the CEA:

- The Bird Migration Study (BMS), Environmental & Social Impact Assessment (ESIA) and CHA for the Suez Wind Energy (SWE) wind farm Plot 2, which present bird baseline studies from spring and autumn 2022 and 2023 (EcoConServ *et al.* 2023, 2024a, 2024b, 2024c, 2024d);
- Migration of Soaring Birds at Gebel el Zeit (IBA) in relation to wind energy developments (Camina *et al.* 2024);

- RCREEE Strategic and Cumulative Environmental and Social Assessment Active Turbine Management Program (ATMP) for Wind Power Projects in the Gulf of Suez (Lahmeyer International & Ecoda 2018);
- The ESIA of Alfa Wind Project (EcoConServ 2016);
- Italgen Gabal El-Zeit 320 MW bird baseline studies in autumn 2008, spring 2009, autumn 2013, spring 2014 and autumn 2016 (Grontmij 2009; EcoConServ 2014, 2017);
- Infinity 200 MW spring 2021 and 2023, and autumn 2021 avifaunal assessments (2021) a total of 3 seasons;
- NIAT 500MW spring and autumn 2021, 2022, 2025 and 2026 avifaunal and biodiversity assessments (2021) a total of 6 seasons;
- AMUNET 500MW spring and autumn avifaunal and biodiversity assessments (2020 – 2021) a total of four seasons;
- RSWE 500 MW spring and autumn avifaunal and biodiversity assessments (2019 – 2021) a total for 4 seasons;
- Lekela 250MW Wind Farm (2015 – 2021) a total of 8 seasons;
- RGWE 250MW Wind Farm (2018 – 2021) a total of 7 seasons;
- CEA for Lekela Wind Farm (2015-2018) involving 8 seasons;
- CEA for RSWE Wind Farm (2019-2021) involving four seasons;
- A survey in autumn 2006 in Gebel El Zeit Important Bird Area (Hilgerloh *et al.* 2011);
- Species qualifying the listing of Gebel El Zeit as an Important Bird and Biodiversity Area (BirdLife International 2024);
- The Migratory Soaring Birds Tool (BirdLife International 2023), filtered by species mapped as occurring in the project area;
- The list of bird species included in the assessment of global vulnerability to wind power development compiled by Thaxter *et al.* (2017), filtered by species mapped in IBAT as occurring in the project area.

The BAP has been based on existing Project documents and secondary data. No specific field surveys have been completed to inform the development of the BAP.

4.3 Findings of the Critical Habitat Assessment and the Cumulative Effects Assessment

The Project has completed a CHA which determined that the Project is located in an area of Critical Habitat for six migratory soaring bird species (Table 1) following IFC PS6, the EBRD ESR6 and EIB ESS4 (TBC 2026a).

Additionally, 19 PBFs (EBRD 2024b, 2025b) have been identified for the Project (TBC 2026a). One is a reptile, the Egyptian Spiny-tailed Lizard (*Uromastyx aegyptia*) and another a mammal, the Greater Mouse-tailed Bat (*Rhinopoma microphyllum*). The remaining 17 species are migratory soaring birds (see TBC 2026a for a full list of the species). The CHA also found that the Project is in an area of primarily Natural Habitat as defined by IFC (IFC 2012b, 2019).

The CEA conducted for the Project and other wind energy developments in the Gulf of Suez identified 10 migratory bird species, two bat species, and one ecosystem/habitat type (wadis with

permanent vegetation) as priority Valued Environmental Components (VECs) for the Project, which are most at risk from the combined impacts of existing and potential wind developments (TBC 2026b).

4.4 Priority biodiversity

This BAP focuses on species that require special management measures rather than all biodiversity. This section confirms the priority biodiversity values for the Project to which the goals of No Net Loss or Net Gain apply.

The following categories of biodiversity values are priorities in this BAP (Table 1):

- Critical Habitat-qualifying species under IFC PS6, EBRD ESR6 or EIB ESS4
- Migratory soaring bird species classified as Priority Biodiversity Features under EBRD ESR6
- Migratory soaring bird species considered as priority VECs

Note that Natural Habitat is not considered a priority biodiversity value in this BAP. While IFC PS6 requires NNL of Natural Habitat, where feasible (following IFC 2012b paragraph 15 and footnote 9), the assumption of this BAP is that Project impacts to Natural Habitat during construction have already been minimised as far as practicable through controls in the Project's ESIA and supporting documents (EcoConServ & EcoConsult 2023). Any further impacts are considered to be insignificant and therefore Natural Habitat will not be discussed further in this BAP.

Table 1. Priority biodiversity for the Project.

Scientific name	English name	IUCN Category[a]	CH species[b]	PBF species[b]	Priority VEC[c]
Accipiter brevipes	Levant Sparrowhawk	LC	✓		✓
Aquila heliaca	Eastern Imperial Eagle	VU		✓	
Aquila nipalensis	Steppe Eagle	EN	✓		✓
Buteo buteo vulpinus	Eurasian (Steppe) Buzzard	LC		✓	✓
Ciconia ciconia	White Stork	LC	✓		✓
Ciconia nigra	Black Stork	LC	✓		✓
Clanga pomarina	Lesser Spotted Eagle	LC		✓	
Grus grus	Common Crane	LC		✓	✓
Neophron percnopterus	Egyptian Vulture	EN		✓	
Pelecanus onocrotalus	Great White Pelican	LC	✓		✓
Pernis apivorus	European Honey-buzzard	LC	✓		✓
Accipiter nisus	Eurasian Sparrowhawk	LC		✓	
Buteo rufinus	Long-legged Buzzard	LC		✓	
Circaetus gallicus	Short-toed Eagle	LC		✓	
Circus aeruginosus	Western Marsh Harrier	LC		✓	

Scientific name	English name	IUCN Category[a]	CH species[b]	PBF species[b]	Priority VEC[c]
Circus macrourus	Pallid Harrier	NT		✓	
Circus pygargus	Montagu's Harrier	LC		✓	
Clanga clanga	Greater Spotted Eagle	VU		✓	✓
Falco concolor	Sooty Falcon	VU		✓	
Falco tinnunculus	Common Kestrel	LC		✓	
Hieraaetus pennatus	Booted Eagle	LC		✓	
Milvus migrans	Black Kite	LC		✓	✓
Pandion haliaetus	Osprey	LC		✓	

[a] LC = Least Concern, DD = Data Deficient, EN = Endangered, VU = Vulnerable and NT = Near Threatened.

[b] As defined in the Critical Habitat Assessment (TBC 2025a).

[c] As defined in the Cumulative Effects Assessment (TBC 2025b)

4.4.1 Critical Habitat qualifying biodiversity

The CHA concluded that six migratory soaring bird species trigger Critical Habitat (TBC 2026a). Consequently, and according to paragraph 18 of IFC PS6 (IFC 2012), the Project must develop a BAP describing a mitigation strategy designed to achieve Net Gain of those biodiversity values for which Critical Habitat was triggered.

4.4.2 Priority Biodiversity Features

In addition to Critical Habitat-qualifying features, EBRD also requires identification of a suite of PBFs which are of lower concern than Critical Habitat, but still important for a project to consider (EBRD 2024b, 2025b). The Project CHA (TBC 2026a) classified 17 migratory soaring bird species as PBFs (Table 1).

According to EBRD ESR6, the Project must achieve at least NNL for PBFs. The Project's mitigation strategy to achieve NNL for these features is described in the following sections of this report. Where significant residual impacts on PBFs remain, additional remediation and offset measures are likely to be required to achieve NNL.

4.4.3 Priority VECs

Valued Environmental and Social Components (VECs) is a concept used in the practice of cumulative impact assessment to indicate an environmental or social attribute that is considered important in assessing risk. While VECs have been mostly considered during the assessment of cumulative effects from several developments, they may also be directly or indirectly affected by a specific development (IFC 2013). Priority VECs are those at highest risk of effects from the Project in the study area, and identification of Priority VECs allows mitigation, monitoring and management measures to be focused on those species or habitats of highest risk.

Identification of Priority VECs for the Project has been undertaken in a Cumulative Effects Analysis (CEA) (TBC 2026b), The analysis broadly followed the IFC and the IUCN's guidance on cumulative impact assessment (IFC 2013; Bennun *et al.* 2024), as well as the approach developed in the

equivalent CEA reports for the Tafila Region Wind Power Projects in Jordan, the Lekela North Ras Ghareb wind farm (IFC 2017; TBC 2019) and the Scatec 200 MW wind development project (TBC 2025c), both in Egypt's Red Sea Coast.

This resulted in the identification of 10 bird priority VECs (Table 1), all of which are migratory soaring birds.

4.4.4 Legally Protected Areas and Internationally Recognised Areas

The Project is located entirely within an Internationally Recognised Area, the Gebel el Zeit KBA and IBA (Figure 3).

The Gebel el Zeit KBA covers 1,584 km2 of the Gulf of Suez coast from Ras Gharib in the north to the bay of Ghubbet El Gemsa in the south. The Gebel El Zeit KBA represents a globally important migration corridor for soaring migratory birds, particularly birds of prey and storks, which are funnelled through this stretch of coast, between the Gulf of Suez and the Red Sea Mountains, on their spring and/or autumn migrations. Birds of prey, storks and pelicans migrate through and usually land, rest or roost near the coastline and on the surrounding desert plains and hills. Gebel El Zeit itself serves as a stepping-stone for birds that make the crossing between the western coast of the Gulf of Suez and south Sinai in spring. In autumn the area is especially critical as many birds, after crossing the Gulf of Suez, arrive tired, flying at low altitudes and often land in large numbers.

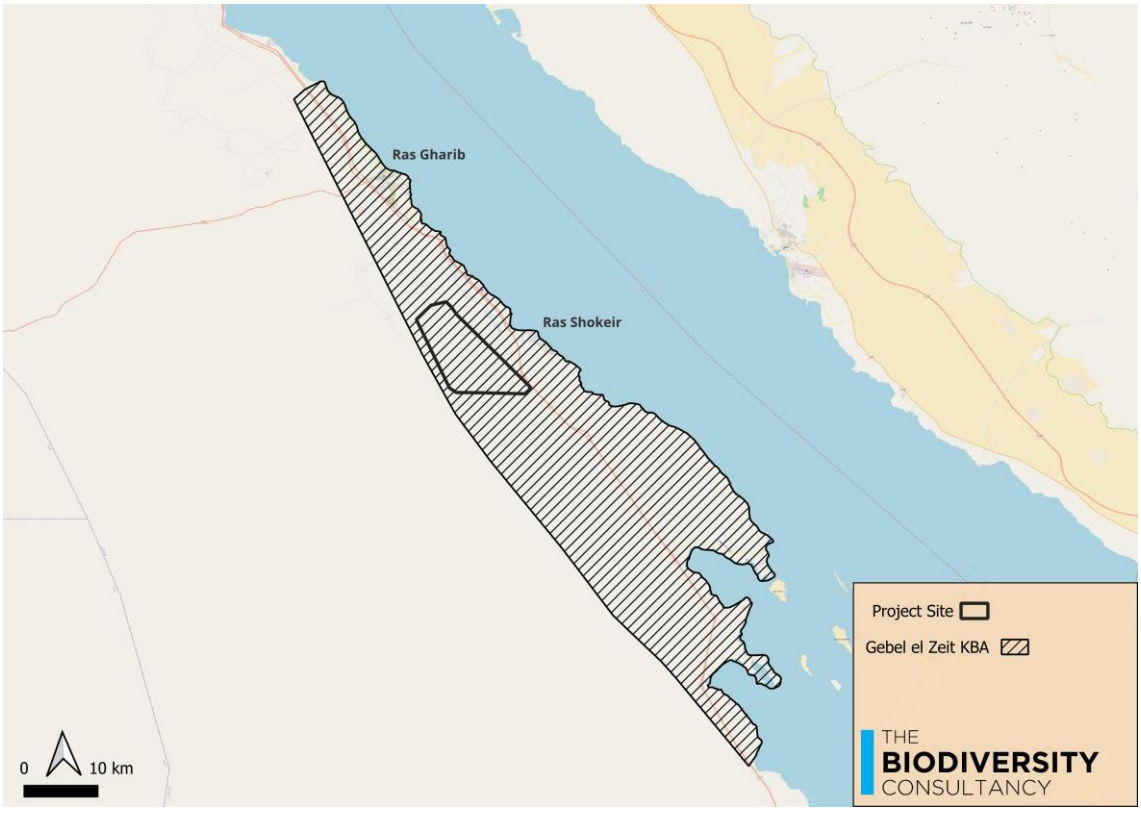

Figure 3. Location of the Project in relation to the Gebel el Zeit KBA..

5 Potential impacts on priority biodiversity

As the three wind farms comprising the Project are already operating, potential impacts during the construction phase were not considered relevant in the current BAP.

ESIA studies conducted at the Project or wider area of the Gulf of Suez highlighted collisions with infrastructures and barrier effects as the main potential impacts on birds from operating wind farms in the region (Al Amar Consulting Group *No date*, Lahmeyer International & Ecoda 2011, Lahmeyer & Ecoda 2013).

The impacts of relevance to the priority species (see Section 3.4) covered by this BAP are from:

- Bird collision with turbine blades; or,
- Bird collisions with Project transmission lines.

Electrocutions are very rare on transmission lines since with most pylons the gaps between live components are too large to be bridged by birds (Prinsen *et al.* 2011). Exceptions may occur where large nests are placed on the pylons (e.g. storks) or when several birds perch together in wet weather. Since neither of these scenarios are likely in this case and PCFM conducted in other projects in the region hasn't revealed mortality caused by electrocutions (ENDECO, SafeSoar pers. comm.), electrocution impacts are not considered relevant in the BAP.

Impacts to the non-bird priority species are expected to be non-significant. The main impacts on the Egyptian Spiny-tailed Lizard, namely the potential destruction of burrows and disturbance due to construction activities, are only expected to occur during construction so they are not included in the current BAP. Impacts on bat species, specifically the risk of collision with turbine blades, are expected to be negligible, since PCFM results from other projects in the region have shown that bat mortality is absent or extremely rare (ENDECO, SafeSoar pers. comm.). Nonetheless, continued monitoring through Post-Construction Fatality Monitoring (PCFM) is required, and adaptive management measures will be implemented if impacts are detected.

No other impacts to biodiversity are considered further in this BAP.

6 Mitigation approach for biodiversity management

6.1 Mitigation hierarchy

The mitigation measures adopted by the Project will follow the mitigation hierarchy: avoid, minimise, restore, and compensate/offset (Figure 4). Avoidance entails 'designing out' an impact or risk (e.g., through relocating a project component, avoiding a harmful activity, employing alternative technology), preventing their expected impacts on biodiversity. Minimisation reduces the severity of impacts on biodiversity by controlling or limiting the source of that impact and reduce the likelihood or magnitude of biodiversity impacts, but do not completely prevent them.

Restoration seeks to recreate the original (pre-project) habitat type or to actively enhance the rate of recovery of degraded habitats on the Project site, with a focus on areas affected temporarily during construction. Where significant residual impacts remain, compensation and/or offset actions to achieve an overall NNL for Natural Habitat, where feasible, and NG for Critical Habitat-qualifying features will need to be developed.

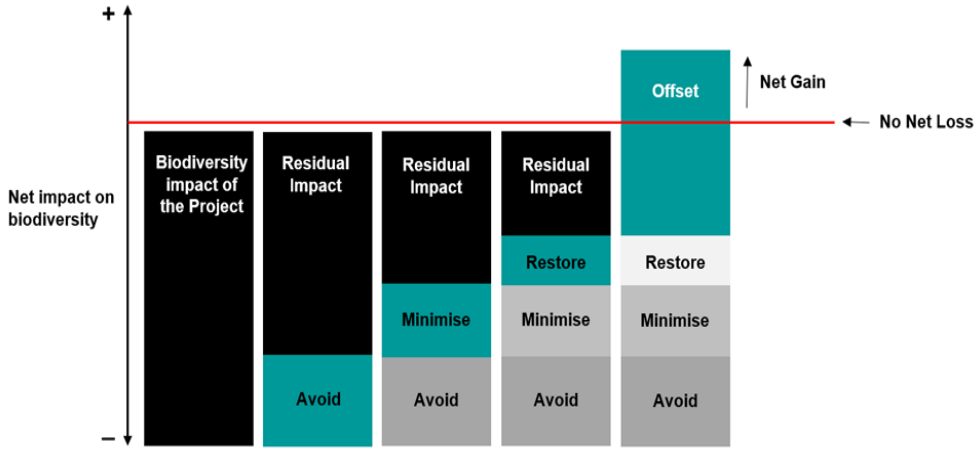

Figure 4. The mitigation hierarchy and delivery of net positive impact on biodiversity

6.2 Mitigation and monitoring actions

A list and details of all the mitigation measures to be implemented to address Project impacts on biodiversity during operation are provided in the Biodiversity Management Plan appended to the BAP (Appendix 2)

As the three adjacent wind farms that form the Gabel El Zeit Project are already installed and fully operational, **avoidance** of impacts (e.g., relocation of individual turbines or selection of a different, less sensitive, installation site) is not possible at this stage.

Soaring bird collision mortality has been identified as the main biodiversity risk associated with the Project. **Minimisation** of such impacts on migratory soaring birds has been implemented in the Project since the start of operation, through the adoption of Shut-Down On Demand (SDOD) following the protocols established under the overarching framework of the ATMP for Wind Power Projects in the Gulf of Suez (e.g., GreenPlus 2021, GreenPlus 2022, NREA & SafeSoar 2023).

6.2.1 Minimisation of turbine collision mortality

The shut down on demand protocol is implemented during 89-90 days during spring (20 February – 20 May) and similarly during autumn (10 August – 10 November), covering the full migration periods for soaring birds in the region. These dates will be reviewed before the start of each season, depending on the cumulative results of previous seasons. It has been suggested that an extra week is added before the start of each season and after the end of each season – this will be considered based on the available data. Monitoring lasts for 10 – 12 hours each day,

between *c.* one hour after sunrise and *c.* one hour before sunset. During this period trained observers are placed across 13 vantage points to detect migratory soaring birds. Observers detect and count all migratory soaring birds in the Project area and map their movements. They also evaluate collision risk and determine whether one or more wind turbines should be temporarily shut-down, based on pre-determined shut-down criteria.

The Project has adopted a Radar-Assisted Shutdown On-Demand (RASOD) approach during spring, involving two radars that further support early detection, while during autumn, radars are not used, and monitoring and surveillance rely on an Observer-Led Shutdown on Demand (OLSOD) approach. In both approaches observers at vantage points use walkie-talkies (and mobile phones, as a backup) to communicate between each other and with the Supervisory Control and Data Acquisition (SCADA) Coordinator when a shutdown is necessary. A detailed description of the SDOD protocols is provided in the BMP (see Appendix 2).

6.2.2 Minimisation of OHTL collision mortality

The short length of OHTL that is within the Project site is considered associated facility. The portion of the OHTLs that are outside the Project site boundaries are not considered an associated facility and are the responsibility of EETC. In accordance with IFC PS1 and EBRD ESR1, the Project must make all possible efforts to reach an understanding with EETC to ensure that impacts caused by the OHTL on priority species are addressed, including the implementation of mitigation and monitoring in line with GIIP. Specifically, the Project should liaise with EETC to develop a protocol for the installation of Bird Flight Diverters (BFDs) along the segments of OHTL that are within the Project site to minimize bird collisions. General guidance for BFDs implementation is provided in the BMP (Appendix 2).

6.2.3 General GIIP mitigation actions

The BMP also provides a set of mitigation measures to address other less relevant impacts, but which are considered good practice to implement in all projects. (Appendix 2).

6.2.4 Monitoring

The Project must also implement monitoring activities to evaluate the implementation of the biodiversity mitigation measures. A summary of the monitoring activities foreseen in these programmes is also provided in the BMP (Appendix 2).

The Project is already conducting PCFM during spring and autumn, to better assess and improve the efficiency of SDOD implementation in avoiding collisions. Although PCFM actions started with the operational phase of the first wind farms comprised by the Project, only since 2021 it has been conducted in a systematized way (Saber A Riad 2021a, 2022a). This includes conducting periodic searches under all turbines throughout the monitoring seasons, as well as conducting bias correction trials (e.g. searcher efficiency and carcass removal trials) and calculating corrected estimated fatalities using a generalized mortality estimator (GenEst). Non-systematic PCFM has also been conducted on OHTLs associated with the Project. A detailed

description and suggestions of improvement of the current PCFM approaches are provided in the BMP (see Appendix 2).

Onsite **restoration** of habitats is not applicable for the priority species of the BAP as none are likely to regularly use any terrestrial habitat present.

The requirement for **offsets** is discussed in Section 8.2.

6.2.5 Proposed improvements in mitigation

While the operation of the ATMP has been successful in avoiding a large number of soaring bird collisions at the Project, some fatalities of priority species have been reported (see Section 7 – Residual Impact Assessment). Based on the experience from recent years in the operation of the ATMP[7], several improvement opportunities have been identified and are recommended to further enhance the efficiency of this minimization measure in avoiding collisions (Table 2).

It should be noted that a Strategic Environmental and Social Assessment (SESA) sponsored by EBRD is being conducted for all renewable energy projects in the Gulf of Suez. One of the expected outputs of this SESA is to provide guidelines for impact mitigation, so it is likely that a revision of the proposed mitigation will need to be conducted following the disclosure of the SESA.

Table 2. Recommended improvements to mitigation actions and their expected impact in reducing collisions of migratory soaring birds.

Improvement action	Stage	Expected impact in reducing collision fatalities
Increase the number of total vantage points from 13 to 16 (adding one extra vantage point per wind farm. Location of the new vantage points and potential relocation of existing ones will be decided by the field team before the start of the season.	Field work	High
Installation of Bird Flight Diverters along the portion of OHTLs within the project site, which are associated with the Project (dependent on a protocol with EETC)	Equipment	High
The number of observers should increase to 19 (16 observers in Vantage Points and 3 field coordinators).	Field work	Moderate

[7] From TBC's involvement in biodiversity studies for several projects in the region, including lender advisor role (which have provided opportunities to evaluate ongoing mitigation, monitoring and implementation of adaptive management), and from consultation with relevant stakeholders such as SafeSoar and RCREEE (see Appendix 1 for an account of the Stakeholder Engagement).

Improvement action	Stage	Expected impact in reducing collision fatalities
Implementation of two daily shifts at each vantage point (currently observation periods may last 12 consecutive hours), to reduce fatigue and maintain detection efficiency.	Field work	Moderate
Installation of one or more additional radio repeater in strategic location(s) within the Project, to improve the communication between the field coordinators and the SCADA coordinator. This action is subject to approval by Military Authorities.	Equipment	Moderate
Use of the two existing radars in both monitoring seasons (spring and autumn) with re-location to optimized locations, that should be evaluated and indicated by experienced radar ornithologists. Additional, radar operators should receive comprehensive training in all aspects of RASOD, including bird migration[8].	Equipment	Moderate
All mortality events and observed near misses (turbines not shutting down before birds fly through or not shutting down at all) should be investigated to provide indications for improvement under adaptive management. For each carcass that is found an investigation must be conducted by the ATMP team in order to investigate what likely reasons leading to the failure in the RASOD system (e.g., communication failure, bird was not detected, adverse weather/sand storm, bird disturbed while roosting, SCADA failure). Results of this investigation, along with any resulting changes in protocols, should be included in the ATMP monitoring report.	Data analyses	Moderate
Overall revision and standardization of RASOD/OLSOD and PCFM protocols implemented in the three wind farms forming the Project, including details on the chain of responsibility and sequence of actions for successful implementation of shutdowns.	Planning	Low
ATMP period starting a week before and extending for an extra week at the end of each migratory season. This extended period may be performed with a reduced number of vantage points, but results obtained will be used to calibrate the ATMP implementation season for future campaigns.	Field work	Low
Reporting and analysis of all occurrences of birds roosting in the Project area or its vicinity (<2 km) in the ATMP monitoring reports (species, numbers and location). If adequate, further measures should be adopted to reduce risk associated with this behaviour (e.g., setting camera traps to investigating disturbance causes, limiting access to frequent roost sites).	Data analyses	Low
Compilation and analysis of the collective data on monitoring results (migration counts, shutdown on demand operations and fatalities) from all seasons and all wind farms that compose the Project (aiming to provide insights relevant to inform ongoing ATMP and fatality monitoring).	Data analyses	Low

[8] The feasibility of this action will need to be assessed, since currently there are severe military constraints related to the type and location of the radar. Stakeholder engagement with the relevant military authorities will be required to assess the feasibility of the action.

7 Residual impact assessment

Residual impacts from the Project were calculated based on spring and autumn PCFM results from the last four years (2022-2025), from all the three wind farms comprised by the Project (KfW, FIEM and JICA) (Safe Soar 2026).

As PCFM results were not available for spring 2024 for any of the wind farms, the mean fatality across all spring seasons for each wind farm were used as estimates. An average annual observed fatality for each species could then be derived from the 2022-2025 data. Average annual observed fatalities for the Project totalled 17.7 individuals of 11 priority bird species (Table 3).

For the residual impact assessment, the corrected fatality estimates were used (column "Corrected estimated fatalities (residual impacts)", which were derived using GenEst on observed fatalities (column "Average annual observed fatalities"). This 'correction factor' accounts for different sources of bias, in particular, searcher efficiency and carcass persistence (though also incorporates bias correction trial results, and the Density Weighted Proportion (DWP) for each size and visibility class and accounting for unsearched areas). The correction factor used was the mean of those included in PCFM reports for all three wind farms between 2020 and 2023, as the correction factors for the 2022-2025 period were not available at the time of the BAP development (Migratory Soaring Bird Project 2020; Saber A. Riad 2021; Saber A Riad 2021b, 2022b; Saber A. Riad 2022a, 2022b, 2022c; Riad 2023a, 2023b, 2023c). It is assumed that this correction factor is also representative of searcher efficiency and carcass persistence for the 2022-2025 data used in this residual impact assessment. It should be noted that, although this correction factor includes a single mean carcass persistence/removal rate which was applied across all species, this rate is likely to vary between species. However, the available data is insufficient to derive species-specific estimates at this stage.

As an example, for the Black Kite, the average observed annual fatalities (*i.e.* spring + autumn) were 1.3 birds, as calculated from the spring and autumn PCFM results from 2022-2025 for the three wind farms comprised by the Project (where the value for spring 2024 in each wind farm corresponded to the average spring fatality for the site from 2022, 2023 and 2025). A corrected fatalities estimate for the species (*i.e.*, the species specific residual impacts) was then derived, using GenEst over the observed fatalities, which integrated a "correction factor", as per the explanation above. The (average) annual corrected fatality for Black Kite was four, whereas the corrected annual estimated fatalities for all priority bird species totalled 47.5 individuals (Table 3).

To our knowledge, there are no available reports presenting systematic PCFM data for the Project OHTL. The only available data are those presented in Table 4, which relate to the section of the OHTL overlapping the KfW Project from disperse sources (GreenPlus 2017, Environics 2019, Migratory Soaring Bird Project 2020, Riad 2021a, 2021b, 2022). The methodology employed and the survey effort are unknown. It is also unclear whether surveys were conducted in all seasons (with no fatalities recorded in some seasons) or whether surveys were conducted only during selected seasons.

Table 3. Estimated annual fatalities from collisions with wind turbines at the Project area for priority birds.

Common name	Scientific name	Target	Average annual observed fatalities[i]	Corrected estimated fatalities (residual impacts)[j]	Estimated fatalities after additional mitigation[k]
Black Kite	*Milvus migrans*	NNL	1.3	4	3.2-3.8
Black Stork	*Ciconia nigra*	NG	0	0	0
Booted Eagle	*Hieraaetus pennatus*	NNL	0.3	0.9	0.7-0.9
Common Crane	*Grus grus*	NNL	0	0	0
Common Kestrel	*Falco tinnunculus*	NNL	0.9	2.5	2-2.4
Eastern Imperial Eagle	*Aquila heliaca*	NNL	0	0	0
Egyptian Vulture	*Neophron percnopterus*	NNL	0	0	0
Eurasian (Steppe) Buzzard	*Buteo buteo*	NNL	0.8	2	1.6-1.9
Eurasian Sparrowhawk	*Accipiter nisus*	NNL	1	2.7	2.2-2.6
European Honey-buzzard	*Pernis apivorus*	NG	2.8	8[l]	6.4-7.6
Great White Pelican	*Pelecanus onocrotalus*	NG	0	0	0
Greater Spotted Eagle	*Clanga clanga*	NNL	0	0	0
Lesser Spotted Eagle	*Clanga pomarina*	NNL	0	0	0
Levant Sparrowhawk	*Accipiter brevipes*	NG	0	0	0
Long-legged Buzzard	*Buteo rufinus*	NNL	0	0	0

[i] Based on four years of PCFM (2022-2025)

[j] Using GenEst.

[k] Minimum values (as additional likely fatalities caused by OHTLs were not considered) and assuming all improvements in mitigation are implemented (see text).

[l] Likely to be higher if collisions with OHTLs are included.

Common name	Scientific name	Target	Average annual observed fatalities[i]	Corrected estimated fatalities (residual impacts)[j]	Estimated fatalities after additional mitigation[k]
Montagu's Harrier	*Circus pygargus*	NNL	0.3	0.7	0.6-0.7
Osprey	*Pandion haliaetus*	NNL	0	0	0
Pallid Harrier	*Circus macrourus*	NNL	0	0	0
Short-toed Eagle	*Circaetus gallicus*	NNL	0	0	0
Sooty Falcon	*Falco concolor*	NNL	0.3	0.7	0.6-0.7
Steppe Eagle	*Aquila nipalensis*	NG	1	2.9	2.3-2.8
Western Marsh Harrier	*Circus aeruginosus*	NNL	1.8	5	4-4.8
White Stork	*Ciconia ciconia*	NG	7.2	18.1[l]	11-17

Table 4: Fatality data for the OHTL (KfW wind farm)

	Autmn		Spring	
Year	**Species**	**Fatalities**	**Species**	**Fatalities**
2014	White Stork	1		
	Great White Pelican	1		
2018	White Stork	1	Black Kite	1
	Honey Buzzard	1		
2019	White Stork	2		
	Honey Buzzard	5		
	Stork sp.	1		
2021	White Stork	3	Honey Buzzard	1
	Marsh Harrier	1		
2024	Honey Buzzard	2		
	White Stork	4		
	Great White Pelican	2		

The species most frequently recorded as collision fatalities were the White Stork (11 individuals), the Honey Buzzard (9) and the Great White Pelican (3). If we assume that the survey effort was similar between spring and autumn, the available data suggest that collision risk associated with the OHTL is considerably higher during the autumn migratory season. A similar pattern has been reported for other projects in the region.

In order to estimate OHTL collision fatalities, estimates produced in the Assessment of Associated Facilities for the Shadwan 900 MW Project were used (EcoConsult & SafeSoar, 2025[13]). These estimates consider that the OHTL will be fitted with BFDs and that these will have a 50% efficacy in avoiding collisions (Bernardino *et al.* 2019).

The Shadwan Wind Farm OHTL has a length of 45 km, while this project's OHTL is roughly half its length (approximately 22.6 km).

[13] https://www.ebrd.com/home/work-with-us/projects/psd/57366.html#customtab-ad7d7ef5aa-item-b27f6e0554-tab https://www.scatec.com/en/sustainability/esg-resources/

In the absence of reliable Project-specific data, mortality estimates from the Shadwan Wind Farm were used as a proxy to estimate mortality associated with the Project's OHTL. These estimates were halved to account for the shorter length of the Project's OHTL (see Table 5).

Table 5 Wind turbine, OHTL and total residual impacts for the priority migratory soaring birds

Common name	OHTL predicted residual impacts	WTG predicted residual impacts	*Project predicted residual impacts (WTG + OHTL)*
Black Kite	0.6	3.2-3.8	***3.8-4.4***
Black Stork	0.05	0	***0***
Booted Eagle	0	0.7-0.9	***0.7-0.0***
Common Crane	0	0	***0***
Common Kestrel	0	2-2.4	***2-2.4***
Eastern Imperial Eagle	0	0	***0***
Egyptian Vulture	0	0	***0***
Eurasian (Steppe) Buzzard	0	1.6-1.9	***1.6-1.9***
Eurasian Sparrowhawk	0	2.2-2.6	***2.2-2.6***
European Honey-buzzard	0	6.4-7.6	***6.4-7.6***
Great White Pelican	2.5	0	***2.5***
Greater Spotted Eagle	0	0	***0***
Lesser Spotted Eagle	0	0	***0***
Levant Sparrowhawk	0	0	***0***
Long-legged Buzzard	0	0	***0***
Montagu's Harrier	0	0.6-0.7	***0.6-0.7***
Osprey	0	0	***0***
Pallid Harrier	0	0	***0***
Short-toed Eagle	0	0	***0***
Sooty Falcon	0	0.6-0.7	***0.6-0.7***
Steppe Eagle	0	2.3-2.8	***2.3-2.8***
Western Marsh Harrier	0.05	4-4.8	***4-4.9***
White Stork	6.8	11-17	***17.8-23.8***

It is assumed that all OHTLs within the Project boundaries (considered an associated facility according to IFC PS1 and EBRD ESR1 (IFC 2012a; EBRD 2024a) are the responsibility of the EETC, Alcazar Energy will collaborate with EETC to undertake actions to ensure that impacts on priority species from the OHTLs are appropriately mitigated, i.e. BDFs should be installed on the full length of the lines within the Project site.

Mitigation implementation in the Project, mainly through the operation of the ATMP by trained teams, has proved quite successful in avoiding a large number of migratory soaring birds' fatalities in an area holding such an outstanding importance for hundreds of thousands of birds. Consequently, the potential for major improvement in ATMP effectiveness is probably limited, although some incremental improvements could be possible that to reduce collision risk. This is the case particularly with a better siting of radars (if authorised by the military authorities), and a better use of radar information, and regarding the installation of BFDs along OHTLs (Table 2). Such changes will potentially be more beneficial for species occurring in larger and more compact flocks that may be detected and tracked at greater distances from the Project area (Common Crane *Grus grus*, Great White Pelican *Pelecanus onocrotalus*, White Stork *Ciconia ciconia*), and that are also more affected/likely to be affected by collisions with OHTLs. Furthermore, the same species will also benefit from the recording and analysis of roosting areas near the Project area and potential actions to reduce the associated risk (Table 2). Consequently, the impact of additional mitigation measures (see Table 2) on reducing the annual fatalities of these species was estimated to vary between 5% and 40%[14]. For the remaining species this interval was estimated at 5% to 20%. Using the above-mentioned Black Kite as an example, this means that for this species (that do not tend to occur in large or compact flocks in the area and is not particularly susceptible to collisions with OHTLs), mitigation measures should result reduce annual fatalities by 5% to 20%., leading to residual impacts for the species of 3.2 - 3.8 fatalities per year (Table 3).

Using this same approach and correction percentages on the corrected annual estimated fatalities, and assuming that all potential enhancement in mitigation (Table 2) is implemented, minimum annual estimated fatalities (since not considering additional likely fatalities caused by OHTLs) range from ~0 (12 species) to 11-17 for White Stork, with 11 species having predicted annual fatalities >0 (Table 3).

Ongoing PCFM (that should be extended to the OHTLs associated with the Project) will allow determination of the effects of additional mitigation measures on actual fatalities of priority

[14] These percentages were derived from expert judgement, resulting from extensive field experience in the region, including soaring bird monitoring and implementation of ATMP (Filipe Canário and Ricardo Tomé, TBC) and various consultations with SafeSoar, the company which has been responsible for the implementation of the ATMP and soaring bird monitoring for most of the wind energy projects in the Gulf of Suez.

species, informing the need of revising the estimated residual impacts and of further adaptive management and mitigation.

8 Offset strategy

8.1 No Net Loss/Net Gain approach

Offsets should be used as the last resort in the mitigation hierarchy, if significant residual impacts remain after the previous steps (avoidance, minimization, restoration) have been implemented (e.g. CSBI & TBC 2015).

Offset actions can generate biodiversity gains either through averted loss (i.e. conservation actions that prevent predicted impacts from happening) and/or improvement (i.e. actions that increase a species' survival or productivity).

8.1.1 Good practice for achieving NNL/NG

The development of potential offset actions should follow good practice (BBOP 2012, ICMM & IUCN 2013, Ledec & Johnson 2016) and key offset principles for achieving NNL/NG include:

- **Ecological equivalence**: Biodiversity gains from offsets will be planned as "like-for-like or better".
- **Landscape context**: Offsets will be designed accounting for connectivity across the landscape, avoiding fragmentation, and maintaining flows of ecosystem services.
- **Net gain**: Biodiversity offsets will be designed and implemented to achieve in-situ, measurable conservation outcomes that can reasonably be expected to result in a NG of biodiversity.
- **Additional**: Conservation gains will be clearly attributable to the Project's actions and will demonstrably be above and beyond results that would have occurred if the offset had not taken place.
- **Transparency**: The design, implementation and monitored outcomes of biodiversity offsets will be transparent, and communicated in the public domain.
- **Precautionary approach**: Estimates of gains and losses will be conservative and include a margin of precaution proportional to the risks involved in offset delivery.
- **Long-term outcomes**: Offsets will use an adaptive management approach, incorporating monitoring and evaluation, to secure outcomes that last at least as long as the Project impacts. Securing long-term financing is essential to ensuring permanence of the offset.
- **Stakeholder participation**: Offsets will be based upon appropriate, extensive and transparent stakeholder consultation.

8.2 Offset requirements and targets

Annual offset goals for biodiversity priority species are shown in Table 6.

Note that annual estimated fatalities are 0.7-0.9 for Booted Eagle, and 0.6-0.7 for Sooty Falcon (both species have a fatality threshold of zero), which likely reflects occasional mortality events at the NREA windfarm, as fatalities in this species are usually rare in operational wind farms in the region. If PCFM results indicate that mortality is occurring regularly, adaptive management actions will be required. Should these actions fail in reducing mortality, offsets should be considered.

For the Western Marsh Harrier and Eurasian Sparrowhawk, their annual estimated fatalities slightly exceed their respective thresholds. Offsets for these two species are not proposed at this time because it is believed that adaptive management will be sufficient to ensure No Net Loss, though if PCFM results indicate that the threshold is reached, adaptive management will be triggered. If mortality persists above the threshold, these species will then require offsets.

It must be acknowledged that a SESA for wind energy developments in the Red Sea region is being developed. One of the outcomes of the SESA is to propose annual mortality thresholds for migratory soaring birds and it is likely that any offset strategy for projects in the region will need to be informed by the guidance to be proposed in the SESA. Therefore, it is likely that offset goals for this Project will need to be revised once the SESA is published.

For species subject to No Net Loss requirement, no offsets are proposed at this stage where estimated mortality exceeds the applicable threshold by less than one individual. Fatality rates for all species will be monitored through GIIP PCFM and adaptive management will be implemented. Reporting framework will assess if fatality rates have exceeded NNL thresholds. The need for offsets will be based on these annual assessments.

*Table 6. Annual offset goals for biodiversity priority species for the Project (CH species shown in bold, for which Net Gain is required). * species for which thresholds were exceeded by less than 1 – no offsets are proposed at this point (see text).*

Common name	Scientific name	Target	Estimated fatalities after additional mitigation[15]	Mortality thresholds (TBC 2026b)	Annual offset target[16]
Black Kite	*Milvus migrans*	NNL	3.8-3.4	3	0*
Black Stork	***Ciconia nigra***	**NG**	**0**	**0**	**≥1**
Booted Eagle	*Hieraaetus pennatus*	NNL	0.7-0.9	0	0
Common Crane	*Grus grus*	NLL	0	0	0
Common Kestrel	*Falco tinnunculus*	NNL	2-2.4	5	0
Eastern Imperial Eagle	*Aquila heliaca*	NNL	0	0	0

[15] Minimum values (as additional likely fatalities caused by OHTLs were not considered) and assuming all improvements in mitigation are implemented (see text).

[16] No multipliers were used to account uncertainty in delivery and delays between impact and gains. Any uncertainty should be appropriately presented in reports from offset action delivery partners.

Common name	Scientific name	Target	Estimated fatalities after additional mitigation[15]	Mortality thresholds (TBC 2026b)	Annual offset target[16]
Egyptian Vulture	*Neophron percnopterus*	NLL	0	0	0
Eurasian (Steppe) Buzzard	*Buteo buteo*	NLL	1.6-1.9	5	0
Eurasian Sparrowhawk	*Accipiter nisus*	NNL	2.2-2.6	0	0
European Honey-buzzard	***Pernis apivorus***	**NG**	**6.4-7.6**	**5**	**≥8**
Great White Pelican	***Pelecanus onocrotalus***	**NG**	**2.5**	**0**	**≥3**
Greater Spotted Eagle	*Clanga clanga*	NNL	0	0	0
Lesser Spotted Eagle	*Clanga pomarina*	NLL	0	3	0
Levant Sparrowhawk	***Accipiter brevipes***	**NG**	**0**	**3**	**≥1**
Long-legged Buzzard	*Buteo rufinus*	NNL	0	3	0
Montagu's Harrier	*Circus pygargus*	NNL	0.6-0.7	3	0
Osprey	*Pandion haliaetus*	NNL	0	0	0
Pallid Harrier	*Circus macrourus*	NNL	0	0	0
Short-toed Eagle	*Circaetus gallicus*	NNL	0	0	0
Sooty Falcon	*Falco concolor*	NNL	0.6-0.7	0	0
Steppe Eagle	***Aquila nipalensis***	**NG**	**2.3-2.8**	**0**	**≥3**
Western Marsh Harrier	*Circus aeruginosus*	NNL	4-4.8	3	0
White Stork	***Ciconia ciconia***	**NG**	**17.8-23.8**	**5**	**≥24**

8.3 Offset options

Given the number of species involved, there are a suite of potential offset projects which could be supported by the Project to meet its NNL/NG commitments. Currently, only a preliminary identification of a long list of options (see Table 7), and initial contacts with the involved stakeholders, have been conducted. Most of the priority species are only passage migrants with few threats in Egypt, hence there are few opportunities for conservation actions within the country. Therefore, conservation projects in other countries within the species' ranges were also included in the assessment of options.

Offset options are detailed in the Offset Feasibility Study (Appendix 3) where an initial feasibility analysis has been completed.

A comprehensive Offset Feasibility Analysis will be developed in the next phase of the BAP, aiming at the evaluation of the different options regarding the expected biodiversity gains, social and institutional feasibility, implementation risks and cost.

The Project needs to agree and finance a credible set of offsets that will achieve compliance with Net Gain/No Net Loss requirements. This should take place before the project is operation and generates impacts.

Table 7. Relative importance of offset options to generate the necessary gains for each priority species in the Project. ***X –*** *main offset option; x – secondary offset option. BS – Black Stork; EHB – European Honey Buzzard; GWP – Great White Pelican; LS – Levant Sparrowhawk; SE – Steppe Eagle; WS – White Stork.*

	BS	EHB	GWP	LS	SE	WS
1. Protecting nests and breeding habitat, Ukraine, Belarus and Poland	**X**	x				
2. Reducing illegal hunting, Georgia		**X**		**X**		
3. Enhancing habitat and reducing anthropogenic threats, Balkans			**X**			
4. Reducing illegal trapping, Georgia				**X**		
5. Retrofitting power lines, Kazakhstan		x			**X**	
6. Reducing illegal trapping, Egypt		x			**X**	
7. Retrofitting power lines, Jordan					**X**	**X**
8. Managing unofficial chicken waste dumping sites, Egypt					**X**	
9. Rehabilitating a water treatment station, Egypt						**X**
10. Retrofitting power lines, Egypt		x	x			**X**
11. Banning hunting in Lake Nasser, Egypt			x			x

9 Biodiversity Monitoring and Evaluation Plan Framework

The development of a Biodiversity Monitoring and Evaluation Plan (BMEP) is required to demonstrate compliance with paragraphs 7 and 17 of IFC PS6. The BMEP needs to be in place

before offsets are implemented[17], and will be updated as new information of work actions become available. While the BMEP may be referenced in an updated BAP at a later timeframe, some general guidance relevant for determining the Project's net position (i.e. losses and gains) are highlighted below. The BMEP must include an adaptive management approach, so that monitoring can inform changes to mitigation actions if impacts are shown to be significantly higher or lower than predicted in this BAP.

Post Construction Fatality Monitoring

This BAP assumes that standardized PCFM, in line with current best practice guidance (IFC *et al.* 2023) will be implemented in the wind farm and associated OHTLs for the life of the Project to monitor actual levels of mortality. PCFM must be completed at all the turbines and OHTL and the program of PCFM must include carcass searching, searcher efficiency trials and carcass persistence trials. This information will be used to estimate annual fatalities using GenEst. The PCFM results are essential to evaluate the effectiveness of mitigation measures targeting the minimisation of bird collisions with turbines, allow for adaptive management of the ATMP and refine the Project's need for offsets if fatalities are much less or greater than predicted in this BAP.

Articulation between the team conducting PCFM and the soaring bird monitoring team will be essential to investigate the circumstances of each mortality event (date, time of the day, wind conditions, visibility conditions, intensity of the migratory flux) in order to understand why mitigation failed and to obtain valuable lessons learned. A similar approach will be undertaken for near mises.

Overhead Transmission Line mitigation

Once an agreement is reached with EETC regarding the installation of BFDs on the OHTL that is within the Project site, this installation will be recorded by the Project Ecologist and all BFDs checked prior to the spring and autumn migration seasons to confirm they are in place and operational for these higher risk periods. Any damaged or defective BFDs should be replaced within two months of being reported as faulty. Since it is EETC's responsibility to maintain the BFDs, Alcazar Energy will engage with EETC and use its best endeavours to encourage the timely replacement of any faulty BFDs.

Offsets

For the proposed set of offset actions, once they are contracted, the Project, in consultation with lenders and implementing partners, would need to:

[17] A Biodiversity Offset Management and Implementation Plan will be developed to operationalise the offset options to which the Project commits.

- Define an agreed set of biological monitoring indicators to demonstrate gains to the level required for the relevant species (as defined in this BAP); or,
- Agree that the cost of quantifying gains for some actions may be disproportionately high (e.g. quantifying the gains of reducing illegal hunting activities) compared with the cost of implementing the action and reach a collective agreement between the Project, lenders and implementing parties on likely gains from any effort or intervention; and
- Agree on process indicators to show that the action is proceeding in a manner to deliver the assumed gain (i.e. process indicators). These short, medium and long term KPIs will be provided in the BOMIP, which the Project will develop ahead of operational impacts occurring.

10 BAP implementation

10.1 Integration into Project management

The BAP is a core component of the project's Environmental and Social Management System (ESMS), ensuring that biodiversity risks and opportunities are systematically identified, managed, and monitored throughout the Project lifecycle. The BAP aligns with and complements several existing and forthcoming management plans and procedures, including:

- Operations Phase BMP: The BAP provides long-term biodiversity objectives and monitoring protocols that will be embedded into operational procedures to minimize ongoing impacts and support ecological restoration or enhancement where feasible (see Appendix 2).
- Active Turbine Management Program (ATMP): The BAP informs the ATMP on the priority bird species, appropriate number of VPs needed, and recommended improvements to mitigation actions and their expected impact in reducing collisions of migratory soaring birds. Besides, ATMP support the BAP by contributing data on bird movement patterns, collision risks, and mitigation strategies such as SDOD protocols, predictive fixed shutdown periods, and any bird monitoring technologies if any needed.

10.2 Roles and responsibilities

It is assumed that Alcazar Energy will have the ultimate responsibility of implementation and oversight of the mitigation and monitoring measures (refer to BMP), (with the exception of the OHTL inside the Project site boundary which is the ultimate responsibility of EETC but will require collaboration with Alcazar Energy, as practically possible). The responsibilities of Alcazar Energy include: employing a Biodiversity Manager; ensuring that sufficient resources are allocated to achieve effective implementation of this BAP; undertaking the planning, implementation and follow-up of the BAP; preparing monitoring reports as required by this BAP (refer to BMP); coordinating biodiversity-related activities in response to routine or emerging

issue; ensuring that training programs informing workers of the species of concern are held (refer to BMP).

The Biodiversity Manager will be employed by Alcazar Energy, who will be responsible for ensuring the correct implementation of all biodiversity-related operation and site-related mitigation measures detailed in the BMP. This role may be part of a wider role within the company (e.g. Environmental and Social Manager).

11 Next steps

11.1 Update of the BAP

During the continuing operation of the Project, the BAP should be updated regularly to incorporate:

- Any changes in the Project design (repowering or turbine extension)
- Significant findings from the biodiversity monitoring
- Progress with offset implementation and gains achieved

Further BAP revisions should be prepared by biodiversity consultants with the appropriate expertise in biodiversity conservation and experience in delivering documents that are aligned with GIIP and lender's requirements.

11.2 Stakeholder engagement

In line with GIIP (IFC 2007), regarding stakeholder engagement, the Project will define:

- A strategy and timetable for sharing information and consulting with stakeholders regarding the selection and implementation of offsets
- How stakeholder engagement activities will be incorporated into the company's management system.

11.3 Detailed offset feasibility

The long list of potential offset options presented as a draft Offset Feasibility Study (OFS) as an appendix to this draft BAP will be evaluated comprehensively in the final OFS in the next phase of the BAP. This will involve a stakeholder engagement process with all relevant stakeholders and managers for each of the identified projects. The goal of this engagement is to obtain a deeper understanding of the project, including likely gains and costs, as well as the practicalities of the projects supporting implementation of a conservation action. The final OFS will also comprehend a quantification of gains as accurate as possible, and the evaluation of the set of actions and level of effort necessary to deliver the NNL/NG commitment for the different species.

Alcazar Energy has agreed to support and finance lender endorsed offsets to achieve NG for Black Stork, European Honey-buzzard, Great White Pelican, Levant Sparrowhawk, Steppe Eagle and White Stork and a minimum of NNL for other priority species if they exceed the fatality thresholds.

The next step is for a Biodiversity Offset Management and Implementation Plan (BOMIP) to be developed. The BOMIP will summarise the actions that should be developed by Alcazar Energy to generate conservation benefits to the priority species that will be sufficient to compensate for the residual impacts. This will require additional details to be collected for all offset actions, including detailed plans of work, the level of support, likely gains and the practicalities of engagement. The Project may also wish to visit the identified options to provide further assurance that they meet Lender standards and the Project's requirements for Net Gain. For any final suite of options, the Project and implementing agency should agree on:

- The scope of support – i.e., level of funding, time period, responsibilities; and,
- A set of financial and management indicators to demonstrate that the action is functioning as intended and likely to deliver the assumed gain.

11.4 Full Biodiversity Monitoring and Evaluation Plan

A BMEP framework is provided in Section 8 of this BAP. A full BMEP (including a detailed update of monitoring protocols, programme and costs) should be prepared before offsets are implemented. The full BMEP should be prepared by biodiversity consultants with IFC PS6 experience, together with local biodiversity specialists.

12 References

Al Amar Consulting Group (No date) Gulf of El Zayt 220 MWe Wind Power Plant Project. Environmental and Social Impact Assessment. Executive Summary.

AL AMAR Consulting Group & Energy & Environment Consultant (E&E) (2008) Gulf of El Zayt 220 MWe Wind Power Plant – ESIA Executive Summary. JICA; NREA, Egypt.

Alcazar Energy (2021) Environmental Policy.

Basuony, M.I., Gilbert, F. & Zalat, S. (2010) Mammals of Egypt. Atlas, red data listing and conservation.

BBOP (2012) Principles for Biodiversity Offsets. Business and Biodiversity Offsets Programme, Washington D.C., USA.

Bennun, L., Fletcher, C., Cook, A., Wilson, D., Jobson, B., Asante-Owusu, R., Dakmejian, A. & Liu, Q. (2024) *Guidance on biodiversity cumulative impact assessment for wind and solar developments and associated infrastructure*. IUCN, International Union for Conservation of Nature.

Bennun, L., van Bochove, J., Ng, C., Fletcher, C., Wilson, D., Phair, N. & Carbone, G. (2021) *Mitigating biodiversity impacts associated with solar and wind energy development*. IUCN International Union for Conservation of Nature and The Biodiversity Consultancy, Gland, Switzerland and Cambridge, UK.

Bernardino, J., Martins, R., Bispo, R. & Moriera, F. (2019) Re-assessing the effectiveness of wire-marking to mitigate bird collisions with power lines: A meta-analysis and guidelines for field studies. *Journal of Environmental Management* 252: 109651.

BirdLife International (2015) BirdLife is working to mainstream soaring bird conservation along the Rift Valley/Red Sea flyway. https://datazone.birdlife.org/birdlife-is-working-to-mainstream-soaring-bird-conservation-along-the-rift-valley/red-sea-flyway

BirdLife International (2023) Migratory Soaring Birds Tool V3. https://maps.birdlife.org/MSBtool/

BirdLife International (2024) Important Bird Area factsheet: Gebel El Zeit. https://datazone.birdlife.org/site/factsheet/gebel-el-zeit-iba-egypt

Camina, A., Ceballos, P. & Vicente, N. (2024) Migration of Soaring Birds at Gebel el Zeit (IBA) in relation to wind energy developments (Report for EcoConsult on behalf of RCREEE). ACRENASL, Madrid, Spain.

Camina, A., Vicente, N., Martin, J. & Garrido, J.R. (2025) Gebel El Zeit WPP and IBA: Due Diligence - Wind farm operation and MSBs conservation. ACRENASL.

CSBI & TBC (2015) A cross-sector guide to implementing the Mitigation Hierarchy. Cross-Sector Biodiversity Initiative, Cambridge, UK. http://www.csbi.org.uk/our-work/mitigation-hierarchy-guide/

Dinerstein, E., Olson, D., Joshi, A., Vynne, C., Burgess, N.D., Wikramanayake, E., Hahn, N., Palminteri, S., Hedao, P., Noss, R., Hansen, M., Locke, H., Ellis, E.C., Jones, B., Barber, C.V., Hayes, R., Kormos, C., Martin, V., Crist, E., Sechrest, W., Price, L., Baillie, J.E.M., Weeden, D., Suckling, K., Davis, C., Sizer, N., Moore, R., Thau, D., Birch, T., Potapov, P., Turubanova, S., Tyukavina, A., de Souza, N., Pintea, L., Brito, J.C., Llewellyn, O.A., Miller, A.G., Patzelt, A., Ghazanfar, S.A., Timberlake, J., Klöser, H., Shennan-Farpón, Y., Kindt, R., Lillesø, J.-P.B., van Breugel, P., Graudal, L., Voge, M., Al-Shammari, K.F. & Saleem, M. (2017) An ecoregion-based approach to protecting half the terrestrial realm. *BioScience* 67: 534–545.

EBRD (2024a) EBRD Environmental and Social Requirement 1: Assessment and management of environmental and social risks and impacts.

EBRD (2024b) Environmental and Social Policy 2024 - Environmental and Social Requirement 6.

EBRD (2025a) Environmental and Social Requirement 6: Biodiversity conservation and sustainable management of living natural resources. Guidance note. European Bank for Reconstruction and Development, London, UK.

EBRD (2025b) EBRD Performance Requirement 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. Guidance Note. March 2023. European Bank for Reconstruction and Development, London, UK.

EcoConServ (2014) Environmental and Social Impact Assessment Italgen 140-200MW Wind Farm at Gabal El Zayt (Phase 2) (Report for Italgen). EcoConServ, Cairo, Egypt.

EcoConServ (2016) Alfa Wind Project: Environmental and Social Impact Assessment 2nd draft report (Report for Alfanar Energy). EcoConServ, Cairo, Egypt.

EcoConServ (2017) Ornithological Study for ITALGEN Wind Farm Project, Gebel El Ziet Autumn, 2016 (Report for Italgen). EcoConServ, Cairo, Egypt.

EcoConServ & EcoConsult (2023) Infinity Power Holding Wind Power Plant 450 MW at Gulf of Suez - Draft Environmental and Social Impact Assessment (ESIA) (Report for Infinity Power Holdings B.V.). EcoConServ and EcoConsult, Cairo, Egypt and Amman, Jordan.

EcoConServ, EcoConsult & Safe Soar (2024a) Environmental & Social Impact Assessment (ESIA): Suez Wind Energy BOO Wind Power Plant 1.1 GW - SWE South (Plot 2). RECREEE, Cairo, Egypt.

EcoConServ, EcoConsult & Safe Soar (2024b) Critical Habitat Assessment (CHA): Suez Wind Energy BOO Wind Power Plant 1.1 GW - SWE South (Plot 2). RECREEE, Cairo, Egypt.

EcoConServ, EcoConsult & Safe Soar (2024c) Autumn bird migration study 2023. SUEZ Wind Energy BOO Wind Power Plant 1.1. GW – SWE PLOTS 1 & 2.

EcoConServ, EcoConsult & Safe Soar (2024d) Spring bird migration study 2023. SUEZ Wind Energy BOO Wind Power Plant 1.1. GW – SWE PLOTS 1 & 2.

EcoConServ, EcoConsult, Safe Soar & Natural Power (2023) Bird Migration Study for Suez Wind Energy BOO Wind Power Plant 1.1 GW during Spring and Autumn seasons 2022. RECREEE, Cairo, Egypt.

Ehab Ameen (No date) NREA Wind Farm Projects & Birds conservation in Egypt.

Environics (2019a) Shutdown on Demand and Bird Monitoring at FIEM 120 MW Wind Farm, Gebel El Zeit – Spring 2019 Final Report. Environics, Cairo, Egypt.

Environics (2019b) Shutdown on Demand and Bird Monitoring at FIEM 120 MW Wind Farm in Gebel El Zeit – Autumn 2019 Final Report. Environics, Cairo, Egypt.

Environics (2019c) Shutdown on Demand and Bird Monitoring at JICA 120 MW Wind Farm in Gebel El Zeit – Autumn 2019 Final Report. Environics, Cairo, Egypt.

Environics (2019d) Shutdown on Demand and Bird Monitoring at KFW 240 MW Wind Farm, Gebel El Zeit – Autumn 2019 Final Report. Environics, Cairo, Egypt.

Environics (2019e) Shutdown on Demand and bird monitoring at KFW 240 MW Wind Farm in Gebel El Zeit Autumn 2019 Final Report.

Equator Principles (2020) The Equator Principles EP4 July 2020.

Garrido, J., Numa, C., Barrios, V., Qninba, A., Riad, A., Haitham, O., Hasnaoui, H., Buirzayqah, S., Onrubia, A., Fellous-Djardini, A., Saheb, M., Rousellon, K., Cherkaoui, S., Essetti, I., Noaman, M., Radi, M., Cuzin, F., Irizi, A., Monchaux, G., Hamdi, N., Monti, F., Bergier, P.,

Ouni, R., Etayeb, K., Chokri, M., Azafzaf, H., Gyenge, P., Si Bachar, A. & Bakass, B. (2021) The conservation status and distribution of the breeding birds of prey of North Africa. International Union for Conservation of Nature, Gland, Switzerland.

Gilbert, F. & Zalat, S. (2007) Butterflies of Egypt. Atlas, red data listing and conservation. Ministry of State for Environmental Affairs, Cairo, Egypt.

GreenPlus Environmental Solutions (2017) Soaring birds carcass search project in KFW wind farm at Gebel El Zeit, autumn 2017. GreenPlus Environmental Solutions, Maadi, Egypt.

GreenPlus Environmental Solutions (2018a) Shutdown on Demand Criteria for JICA and Spanish FIEM Wind Farms, Gebel El Zeit – Spring 2018. Green Plus Environmental Solution Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2018b) Shutdown on Demand Project in FIEM Wind Farm at Gebel El Zeit – Spring 2018 Draft Final Report. Green Plus Environmental Solution Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2018c) Shutdown on Demand Project in JICA Wind Farm at Gebel El Zeit – Spring 2018 (Draft Final Report). Green Plus Environmental Solution Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2018d) Birds Monitoring and Shutdown on Demand, FIEM Wind Farm at Gebel El Zeit – Autumn 2018 Final Report. Green Plus Environmental Solution Company, Maadi, Cairo, Egypt.

GreenPlus Environmental Solutions (2018e) Birds Monitoring and Shutdown on Demand, JICA Wind Farm at Gebel El Zeit – Autumn 2018 Final Report. Green Plus Environmental Solution Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2018f) Birds Monitoring and Shutdown on Demand, KFW 240 MW Wind Farm at Gebel El Zeit – Autumn 2018 Final Report. Green Plus Environmental Solution Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2020a) Birds Monitoring and Shutdown on Demand, FIEM Wind Farm at Gabel El Zeit – Autumn 2020 Final Report. Green Plus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2020b) Birds Monitoring and Shutdown on Demand, JICA Wind Farm at Gabel El Zeit – Autumn 2020 Final Report. Green Plus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2020c) Shutdown on Demand and Bird Monitoring, KFW Wind Farm – Autumn 2020 Final Report. Green Plus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2021) Shutdown on demand and bird monitoring. NREA wind farm complex. Final collective report autumn 2021 (Report for the New and Renewable Energy Agency). GreenPlus Environmental Solutions, Maadi, Egypt.

GreenPlus Environmental Solutions (2022a) Shutdown on Demand and Bird Monitoring, FIEM Wind Farm – Autumn 2022 Draft Report. GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2022b) Shutdown on Demand and Bird Monitoring, JICA Wind Farm – Autumn 2022 Final Draft Report. GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2022c) Shutdown on Demand and Bird Monitoring, KFW Wind Farm – Autumn 2022 Draft Report. Green Plus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2022d) Shutdown on demand and bird monitoring. FIEM wind farm - Gebel El Zeit. Draft report spring 2022 (Report for the New and Renewable Energy Agency). GreenPlus Environmental Solutions, Maadi, Egypt.

GreenPlus Environmental Solutions (2022e) Shutdown on demand and bird monitoring. JICA wind farm - Gebel El Zeit. Draft report spring 2022 (Report for the New and Renewable Energy Agency). GreenPlus Environmental Solutions, Maadi, Egypt.

GreenPlus Environmental Solutions (2022f) Shutdown on demand and bird monitoring. KFW wind farm - Gebel El Zeit. Draft report spring 2022 (Report for the New and Renewable Energy Agency). GreenPlus Environmental Solutions, Maadi, Egypt.

GreenPlus Environmental Solutions (2022g) Shutdown on demand and bird monitoring. NREA wind farm complex. Final collective report spring 2022 (Report for the New and Renewable Energy Agency). GreenPlus Environmental Solutions, Maadi, Egypt.

GreenPlus Environmental Solutions (2023a) Shutdown on Demand & Bird Monitoring – KFW Wind Farm – Gebel El Zeit (1) – Spring 2023 (Draft Report). GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2023b) Shutdown on Demand and Bird Monitoring, FIEM Wind Farm – Spring 2023 Draft Report. GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2023c) Shutdown on Demand and Bird Monitoring, JICA Wind Farm – Gebel El Zeit – Spring 2023 (Draft Report). GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2023d) Shutdown on Demand and Bird Monitoring, FIEM Wind Farm – Autumn 2023 Draft Report. GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2023e) Shutdown on Demand and Bird Monitoring, KFW Wind Farm – Autumn 2023 Draft Report. Green Plus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2024a) Shutdown on Demand & Bird Monitoring – JICA Wind Farm – Gebel El Zeit (2) – Spring 2024 (Draft Report). GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2024b) Shutdown on Demand & Bird Monitoring – KFW Wind Farm – Gebel El Zeit (2) – Spring 2024 (Draft Report). GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2024c) Shutdown on Demand and Bird Monitoring, FIEM Wind Farm – Spring 2024 Draft Final Report. GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2024d) Shutdown on Demand and Bird Monitoring, FIEM Wind Farm – Autumn 2024 Draft Report. GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2024e) Shutdown on Demand and Bird Monitoring, JICA Wind Farm – Autumn 2024 Draft Report. GreenPlus Environmental Solutions Company, Cairo, Egypt.

GreenPlus Environmental Solutions (2024f) Shutdown on Demand and Bird Monitoring, KFW Wind Farm – Autumn 2024 Draft Report. Green Plus Environmental Solutions Company, Cairo, Egypt.

Grontmij (2009) Bird Migration Study El Zayt, Egypt (Report for Italgen). Aarhus University, Aarhus, Denmark.

Gullison, R.E., Hardner, J., Anstee, S. & Meyer, M. (2015) Good Practices for the Collection of Biodiversity Baseline Data. Prepared for the Multilateral Financing Institutions Biodiversity Working Group and Cross-Sector Biodiversity Initiative. http://www.csbi.org.uk/our-work/good-practices-for-the-collection-of-biodiversity-baseline-data/

Hardner, J., R.E. Gullison, S. Anstee, & M. Meyer (2015) Good Practices for Biodiversity Inclusive Impact Assessment and Management Planning. Multilateral Financing Institutions. https://publications.iadb.org/bitstream/handle/11319/7094/Good_Practices_for_Biodiversity_Inclusive_Impact_Assessment.pdf?sequence=1

Hilgerloh, G., Michalik, A. & Raddatz, B. (2011) Autumn migration of soaring birds through the Gebel El Zeit Important Bird Area (IBA), Egypt, threatened by wind farm projects. *Bird Conservation International* 21: 365–375.

ICMM & IUCN (2013) Independent report on biodiversity offsets. Prepared by The Biodiversity Consultancy, available at: www.icmm.com/biodiversity-offsets.

IFC (2007) Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets.

IFC (2012a) Guidance Note 1: Assessment and Management of Environmental and Social Risks and Impacts. International Finance Corporation, Washington DC, USA.

IFC (2012b) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation (IFC), Washington DC, USA.

IFC (2013) Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets. International Finance Corporation, Washington D.C., USA.

https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_cumulativeimpactassessment

IFC (2017) Tafila Region Wind Power Projects Cumulative Effects Assessment. International Finance Corporation, Washington D.C.

IFC (2019) Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation (IFC), Washington DC, USA.

IPIECA (2022) A guide to developing biodiversity action plans for the oil, gas and alternative energy sector.

Jobson, B., Allinson, T., Sheldon, R., Vansteelant, W., Oppel, S. & Jones, V.R. (2021) Monitoring of migratory soaring birds in the East African-Eurasian flyway: a review and recommendations for future steps. *Sandgrouse* 43: 1–23.

Lahmeyer & Ecoda (2013) Environmental and Social Impact Assessment for an Area of 300 km^2 at the Golf of Suez.

Lahmeyer International & Ecoda (2011) Environmental and Social Impact Assessment Study. 1,000 MW Wind Farms at the Gulf of Suez (No. Report to the Egypt Ministry of Electricity and Energy, New and Renewable Energy Authority). Lahmeyer International GmbH and Ecoda, Bad Vilbel and Dortmund, Germany.

Lahmeyer International & Ecoda (2018) Strategic and Cumulative Environmental and Social Assessment Active Turbine Management Program (ATMP) for Wind Power Projects in the Gulf of Suez. Final report (D-8) on the Strategic Environmental and Social Assessment for an Area of 284km^2 at the Gulf of Suez (Report for RCREEE, the Regional Centre for Renewable Energy and Energy Efficiency). JV Lahmeyer International GmbH & ecoda Environmental Consultants GbR, Bad Vilbel, Germany.

Ledec, G.C. & Johnson, S.D.R. (2016) Biodiversity offsets: a user guide (Working Paper No. 110820). World Bank Group, Washington, D.C.

Migratory Soaring Bird Project (2020) Post-construction fatality monitoring for KFW windfarm project (240 MW) at Gabel Al-Zayt - autumn 2020 (Report for the Egyptian Environmental Affairs Agency (EEAA) & BirdLife International/UNDP/GEF Migratory Soaring Birds Project).

NREA & SafeSoar (2023) Active Turbine Management Program at NREA Wind Farms.

Porter, R. (2005) Soaring Bird Migration in the Middle East and North-East Africa: the bottleneck sites. pp. 127–167 in: *Mainstreaming Conservation of Migratory Soaring Birds into Key Productive Sectors Along the Rift Valley/ Red Sea Flyway*. UNDP.

Prinsen, H., Boere, G., Píres, N. & Smallie, J. (2011) Review of the conflict between migratory birds and electricity power grids in the African-Eurasian region (No. CMS Technical Series No. XX, AEWA Technical Series No. XX.). Bonn, Germany.

Riad, Saber A (2021a) Post-construction fatality monitoring for KFW windfarm project (240 MW) at Gebel Al-Zait - spring 2021 (Report for the Egyptian Environmental Affairs Agency

(EEAA) & BirdLife International/UNDP/GEF Migratory Soaring Birds Project). Al-Zhar University, Egypt.

Riad, Saber A. (2021) Post-Construction Fatality Monitoring for KFW Windfarm Project (240 MW) at Gabel Al-Zait – Spring 2021.

Riad, Saber A (2021b) Post-construction fatality monitoring for FIEM windfarm project (120 MW) at Gabel Al-Zait - spring 2021 (Report for the Egyptian Environmental Affairs Agency (EEAA) & BirdLife International/UNDP/GEF Migratory Soaring Birds Project). Al-Zhar University, Egypt.

Riad, Saber A (2021c) Post-construction fatality monitoring during operation of observer-led shutdown on demand system with radar for KFW (240 MW), JICA (220MW) & FIEM (120 MW) windfarms projects at Gabel Al-Zayt (Report for the Egyptian Environmental Affairs Agency (EEAA) & BirdLife International/UNDP/GEF Migratory Soaring Birds Project). Al-Zhar University, Egypt.

Riad, Saber A (2022a) Post-construction fatality monitoring for FIEM windfarm project (120 MW) at Gabel Al-Zeit - autumn 2022 (Report for the Egyptian Environmental Affairs Agency (EEAA) & BirdLife International/UNDP/GEF Migratory Soaring Birds Project). Al-Zhar University, Egypt.

Riad, Saber A (2022b) Post-construction fatality monitoring for FIEM windfarm project (120 MW) at Gabel Al-Zait - spring 2022 (Report for the Egyptian Environmental Affairs Agency (EEAA) & BirdLife International/UNDP/GEF Migratory Soaring Birds Project). Al-Zhar University, Egypt.

Riad, Saber A. (2022a) Post-Construction Fatality Monitoring for KFW Windfarm Project (240 MW) at Gabel Al-Zait – Autumn 2022.

Riad, Saber A. (2022b) Post-Construction Fatality Monitoring for JICA Windfarm Project (220 MW) at Gabel Al-Zait – Autumn 2022.

Riad, Saber A. (2022c) Post-Construction Fatality Monitoring for FIEM Windfarm Project (120 MW) at Gabel Al-Zait – Autumn 2022.

Riad, S.A. (2023a) Post-construction fatality monitoring for KFW windfarm project (240 MW) at Gebel Al-Zait - spring 2023 (Report for the Egyptian Environmental Affairs Agency (EEAA) & BirdLife International/UNDP/GEF Migratory Soaring Birds Project). Al-Zhar University, Egypt.

Riad, S.A. (2023b) Post-construction fatality monitoring for JICA windfarm project (220 MW) at Gabel Al-Zait - spring 2023 (Report for the Egyptian Environmental Affairs Agency (EEAA) & BirdLife International/UNDP/GEF Migratory Soaring Birds Project). Al-Azhar University.

Riad, S.A. (2023c) Post-construction fatality monitoring for FIEM windfarm project (120 MW) at Gabel Al-Zait - spring 2023 (Report for the Egyptian Environmental Affairs Agency (EEAA) & BirdLife International/UNDP/GEF Migratory Soaring Birds Project). Al-Zhar University, Egypt.

Safe Soar (2025a) Bird Monitoring Program and Active Turbine Management during Spring 2025 at FIEM Wind Farm 120 MW in the Gulf of Suez (Draft Report). Safe Soar for Environmental Studies and Consultations, Giza, Egypt.

Safe Soar (2025b) Bird Monitoring Program and Active Turbine Management during Spring 2025 at JICA Wind Farm 220 MW in the Gulf of Suez (Draft Report). Safe Soar for Environmental Studies and Consultations, Giza, Egypt.

Safe Soar (2025c) Bird Monitoring Program and Active Turbine Management during Spring 2025 at KFW Wind Farm 240 MW in the Gulf of Suez (Draft Report). Safe Soar for Environmental Studies and Consultations, Giza, Egypt.

Safe Soar (2026) Gebel El Zeit carcass data - 2022-2025.

Scientific Environmental Services (2020a) Radar-Assisted Shutdown on Demand and Bird Monitoring at FIEM Wind Farm – Spring 2020 Final Report. Scientific Environmental Services (SENS), Ismailia, Egypt.

Scientific Environmental Services (2020b) Radar-Assisted Shutdown on Demand and Bird Monitoring at the JICA Wind Farm in Gebel El Zeit – Spring 2020 (Final Report). Scientific Environmental Services (SENS), Ismailia, Egypt.

STRIX (2018) Wind turbine shutdown on demand operations and bird migration monitoring in the Gabal el Zayt Wind Farm (200 MW), Egypt. Unpublished Report, Carcavelos.

TBC (2019) Lekela North Ras Gharib 250 MW: Analysis of cumulative effects to biodiversity (Unpublished report prepared on behalf of Lekela Power Ltd). The Biodiversity Consultancy Ltd, Cambridge.

TBC (2025a) Revised final Critical Habitat Assessment for the Scatec wind farm, Egypt (Report for RCREEE, the Regional Centre for Renewable Energy and Energy Efficiency). The Biodiversity Consultancy Ltd, Cambridge, UK.

TBC (2025b) Draft final Cumulative Effects Analysis for the Scatec wind farm (Report for RCREEE, the Regional Centre for Renewable Energy and Energy Efficiency). The Biodiversity Consultancy Ltd, Cambridge, UK.

TBC (2025c) Cumulative Effects Analysis for the Scatec wind farm, Egypt. The Biodiversity Consultancy, Cambridge, U.K.

TBC (2026a) Critical Habitat Assessment for the Gabel El Zeit 580 Wind Farm, Egypt.

TBC (2026b) Cumulative Effects Assessment for the Gebel El Zeit 580 MW Wind Farm, Egypt. The Biodiversity Consultancy, Cambridge, United Kingdom.

Thaxter, C.B., Buchanan, G.M., Carr, J., Butchart, S.H.M., Newbold, T., Green, R.E., Tobias, J.A., Foden, W.B., O'Brien, S. & Pearce-Higgins, J.W. (2017) Bird and bat species' global vulnerability to collision mortality at wind farms revealed through a trait-based assessment. *Proceedings of the Royal Society B: Biological Sciences* 284: 20170829.

Zahran, M.A. & Willis, A.J. (2008) *The Vegetation of Egypt*. Springer Dordrecht.

Appendix 1 Stakeholder Engagement

1 Rationale and requirements for biodiversity stakeholder engagement

Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Most companies undertake stakeholder consultation during the planning phase of a development project. However, stakeholder engagement is a broader, more inclusive, and continuous process between a company and those potentially impacted, which encompasses a range of activities and approaches, and spans the entire life of a project (IFC 2007).

Stakeholder engagement is necessary to validate the biodiversity baseline information, predicted impacts and the mitigation measures proposed by a project. It is good practice to show that the feedback received from stakeholders is recorded, considered, and reflected in project documents where appropriate. Early engagement can help identify biodiversity values that are important to stakeholders, and local knowledge can reveal important information relevant to the biodiversity values within the project area of influence, and the dependence/use of this biodiversity value and/or ecosystem services by project-affected communities (Gullison *et al.* 2015). Local stakeholders may have a greater appreciation than external technical experts of the biodiversity values in the Project area and their sensitivity to impacts. It is good practice to document perceived impacts, even if they appear technically unfounded (Hardner et al. 2015).

There are specific regulatory and lender requirements that highlight the importance of engaging with stakeholders throughout the implementation of a development project.

Paragraph 20 of IFC PS6 requires that developers should 'consult protected area sponsors and managers, Affected Communities, Indigenous Peoples and other stakeholders on the proposed project'. IFC Guidance Note 6 (IFC 2019) states that 'stakeholder engagement and consultation is required for all projects located in legally protected and internationally recognized areas. The IFC requirements for stakeholder engagement are described in Paragraphs 26–33 of IFC PS1 and relevant paragraphs in Guidance Note 1.

Since, in this case the Project has been operational for several years, stakeholder engagement should focus mainly on addressing the most relevant impacts on priority biodiversity, which is soaring bird collision mortality.

2 Identification of relevant stakeholders

Table 8 shows a list of relevant stakeholders that have been identified as particularly relevant for the BAP. This list does not include out of country potential implementation partners.

Table 8. Summary of biodiversity relevant stakeholders

Stakeholder type	Stakeholder	Relevance
Government Agency	Egyptian Environmental Affairs Agency (EEAA)	Environmental licensing, Environmental authority and management of the KBA.
	New and Renewable Energy Authority (NREA)	Current owner and operator or the Wind Farm.
	Egyptian Electricity Holding Company (EETC)	State-owned company for electrical power generation, transmission and distribution in Egypt. Responsible for the Project OHTL and connection to the grid.
Non-Government Organizations	Regional Center for Renewable Energy and Energy Efficiency (RCREEE)	Entity responsible for the implementation of the ATMP in all private sector wind energy projects in the Red Sea region.
	Nature Conservation Egypt (NCE)	Egyptian BirdLife partner, provider of information about soaring bird migration in the region and threats to soaring birds. Potential offset implementing partner.
Consultants/Local experts	SafeSoar	Local consultancy responsible for the implementation of the ATMP in most projects in the region.

3 Stakeholder engagement to date

This section only includes stakeholder engagement that took place under the scope of the BAP (does not include any stakeholder engagement conducted within the ESIA process).

For the BAP, priority was given to engage with local experts who could provide insights regarding the improvement of ongoing mitigation actions, additional threats faced by soaring birds in the region and in-country offset opportunities. Additional consultation took place with some off-country potential offset partners/providers.

Table 9 summarises stakeholder engagement to date.

Table 9. Engagement conducted with stakeholders relevant to the BAP

Stakeholder organisation	Stakeholder contacts	Date and method of engagement	Topics discussed
RCREEE	Ali Khasma	19/03/2026 – Teams meeting	Improvements on the ATMP, opportunities for improving radar performance, additional threats faced by soaring bird, potential offset options.
SafeSoar	Mahmoud Mongy, Tamer Attala, Ahmed Abdullah	16/03/2026 – Teams meeting	Improvements on the ATMP (lessons learned from this and other projects), soaring bird mortality, ideas for offsets.
	Tamer Attala	22/03/2026 – WhatsApp	Comprehensive information on soaring bird mortality in the region

Stakeholder organisation	Stakeholder contacts	Date and method of engagement	Topics discussed
Nature Conservation Egypt (NCE)	Khaled el Noby	19/03/2026 – Teams meeting	Threats on soaring birds in Egypt. Potential offset options for priority species.
	Khaled el Noby	25/03/2026 – Teams meeting	Further exploring offset options.
Milvus Group (Romanian NGO)	Tamas Papp	24/03/2026 – Teams meeting	Potential Lesser Spotted Eagle offset in Romania
British Trust for Ornithology	Adham Ashton-Butt	27/03/2026 – Teams meeting	Potential offset options for Black Stork, Common Crane and European Honey Buzzard
Fauna & Flora	Giorgia Bianca Roberts and Gizo Seskuria	27/03/2026 – Teams meeting	Potential offset options for Levant Sparrowhawk and other species in Georgia

Appendix 2 Biodiversity Management Plan

Presented as a separate document.

Appendix 3 Offset feasibility study

Presented as a separate document.