



# *Draft* Biodiversity Action Plan for SUEZ Wind Energy BOO Wind Power Plant 1.1. GW – SWE South (PLOT 2)

*Placeholder for key findings*

- *Not completed for this draft document*

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## Acronym table

Acronym	Definition
ATMP	Active Turbine Management Program
BAP	Biodiversity Action Plan
BMEP	Biodiversity Monitoring and Evaluation Programme
CH	Critical Habitat
CHA	Critical Habitat Assessment
CR	Critically Endangered
EAAA	Ecologically Appropriate Area of Analysis
EBRD	European Bank for Reconstruction and Development
EN	Endangered
ESIA	Environmental and Social Impact Assessment
E&S	Environmental and Social
GIIP	Good International Industry Practice
IBA	Important Bird and Biodiversity Area
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
kV	Kilovolt
LC	Least Concern
NH	Natural Habitat
NT	Near Threatened
MW	Megawatt
NG	Net Gain
NGO	Non-Governmental Organisation
NNL	No Net Loss
OFS	Offset Feasibility Study
PCFM	Post construction fatality monitoring
PR6	Performance Requirement 6
PS6	Performance Standard 6

Acronym	Definition
RIA	Residual Impact Assessment
SDOD	Shut-Down On-Demand
TBC	The Biodiversity Consultancy
OHTL	Overhead Transmission Line
VP	Vantage Point
VO	Visual Observations
VU	Vulnerable

## Executive Summary

Not included in this draft BAP – this section will be added for the revised final version.

## 1 Introduction

### 1.1 Background

This document is the Interim Biodiversity Action Plan (BAP) for SUEZ Wind Energy (SWE, the Client) for the SUEZ Wind Energy BOO Wind Power Plant 1.1. GW – SWE South (PLOT 2) Wind Farm project (the Project), to be developed in the Gabel el Zeit area of the Red Sea Governorate, approximately 305 km south-east of Cairo, Egypt. The Project is planned to be a 550 MW (Megawatt) wind energy facility with 69 turbines.

The Project is required to comply with the International Finance Corporation's (IFC) Performance Standards, including IFC PS6 (PS6) (IFC 2012, 2019) and European Bank for Reconstruction and Development (EBRD) Performance Requirement 6 (PR6) Biodiversity conservation and sustainable management of living natural resources (EBRD 2019, 2023) to meet the Project lenders' requirements.

### 1.2 Purpose and objectives of a BAP

The purpose of this BAP is to describe a series of actions by which the Project will demonstrate Net Gain (NG) for Critical Habitat-qualifying features and No Net Loss (NNL) for Natural Habitat (NH) and for Priority Biodiversity Features (PBFs) as identified in the Project's Critical Habitat Assessment (CHA) (EcoConServ *et al.* 2024a, 2)) and NNL will also be demonstrated for priority Valued Environmental Components (VECs), as identified in the Projects' Cumulative Effects Analysis (EcoConServ *et al.* 2024b, 2). The BAP also sets out the approach for how the mitigation hierarchy will be followed, and the roles and responsibilities for internal staff and external partners.

The objectives of this BAP are to:

- Identify the priority biodiversity values for which the Project area has a NNL or NG target;
- Summarise the mitigation measures for these priority biodiversity values which be implementation during the Project's construction and operation phases;
- Estimate residual impacts to priority biodiversity values;
- Set out a framework for biodiversity offsets, and assess their feasibility<sup>1</sup>; and,

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<sup>1</sup> Discussions with potential offset implementation partners are at an early stage, and therefore the BAP and Offset Feasibility Study will likely require future iteration as offset options are confirmed.

- Set out the principles of a monitoring and evaluation framework to enable the Project to demonstrate achievement of the NNL/NG targets.

This BAP has been prepared in-line with IFC PS6 and IFC Guidance Note 6 (IFC 2012, 2019), EBRD PR6 and EBRD Guidance Note 6 (EBRD 2019, 2023). The BAP actions are devised in-line with the mitigation hierarchy: i.e., avoid, minimise, restore and offset, and offsetting measures are identified and developed in line with IFC PS6 requirements and guidance published by the Business and Biodiversity Offsets Programme (BBOP 2012).

It is important to note that BAPs are 'living' documents, i.e. intended to be 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 values, the impacts on these values and the effectiveness of mitigation actions. This adaptive management approach will be informed by the Project's Biodiversity Monitoring and Evaluation Plan (BMEP).

## 1.3 Spatial and temporal scope of the BAP

The spatial (geographical) scope covered by this BAP is the:

- Project Area of Influence;
- Ecologically Appropriate Areas of Analysis (EAAA) as defined in the Critical Habitat Assessment (CHA) for this Project (EcoConServ *et al.* 2024a, 2); and,
- Other areas beyond the EAAAs which are considered for offset implementation which include other countries located within the same migration flyway (see Section 8 and Appendix 1).

This BAP includes actions which will cover the proposed lifespan of the Project, with actions ending at different times depending on the impacts from the Project to specific priority biodiversity features and the feature's NG/NNL target.

## 1.4 Stakeholder consultation

IFC's PS6 strongly recommends projects to develop partnerships with recognised and credible conservation organisations, academic institutes, biodiversity experts and the relevant government agencies, to seek their advice during the development and implementation of a BAP. This is especially important for projects located in NH and Critical Habitat (CH), or in legally protected and internationally recognised areas (IFC 2019). Engagement with government, community and any local Non-Governmental Organisation (NGO) representatives early and through the Project will help ensure that potential offsets receive broad support and avoid unplanned costs or delays in progress towards NNL or NG. It will also ensure that the Project can learn and incorporate useful elements from other conservation programmes elsewhere in the region.

A list of stakeholders consulted during the development of the BAP are included in the Offset Feasibility Study (OFS) (Appendix 1).



## 2 Project description

The Project site is located within the Ras Gharib City (or District) and therefore administratively is under the Ras Gharib City Council. The Ras Gharib District is further divided into Ras Gharib town as well as 2 rural (village) local units (Zaafarana and Wadi Dara). The closest community settlements to the Project site would be Wadi Dara (0.9km from the Project site), Ras Shukier (9 km) and Ras Gharib (37.7 km) (Figure 1). The Project consists of:

- 69 8.0 MW wind turbines;
- Underground medium voltage cables connecting the wind turbines to substations;
- Two Substations (to convert the output from the turbines to a higher voltage);
- Building Infrastructure for the daily operation of the Project;
- Road network; and
- 220 kV 47 km long Overhead Transmission Line (OHTL).

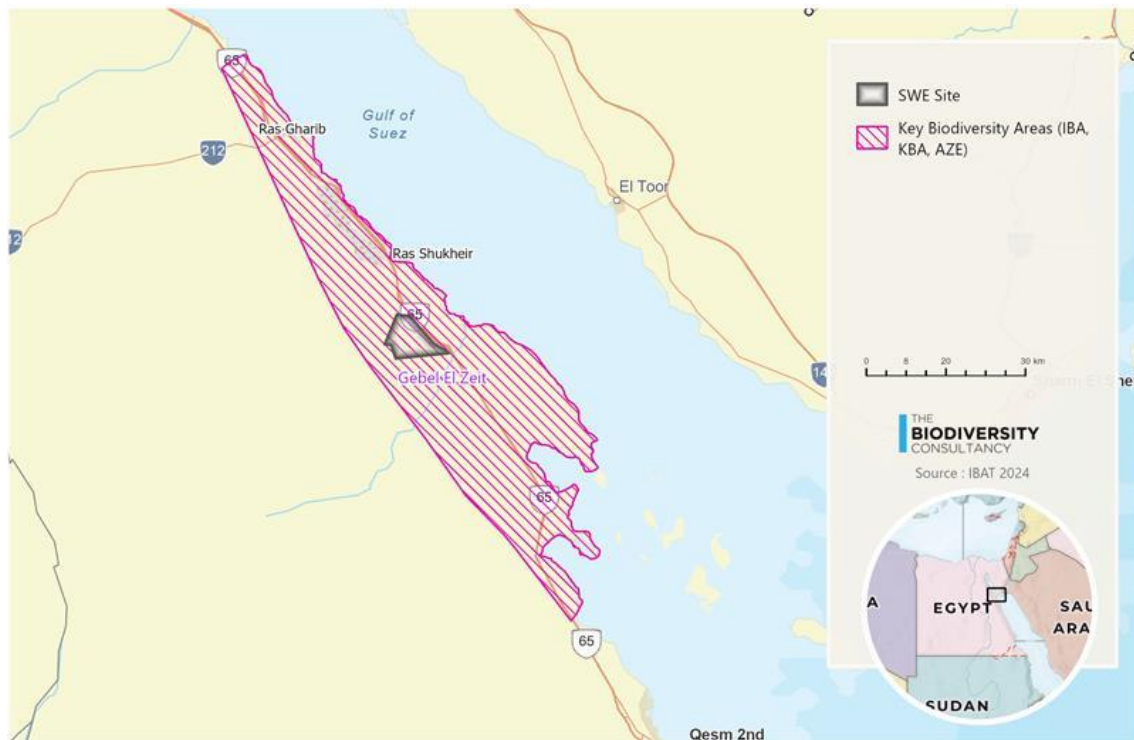


Figure 1. The Project Site, nearby population centres and the Gebel el Zeit Biodiversity Area

## 3 Project policies & commitments

### 3.1.1 Corporate policy

The Developer is committed to the protection of the environment and to the health and safety of its employees, contractors and the local community through all stages of the project life cycle. To achieve this goal, the Developer is committed to the following E&S Policy:

- Comply with all applicable national and local E&S laws and regulations as well as permitting requirements;
- Meeting internationally accepted industry best practice E&S requirements, including those of the relevant International Financing Institutions (IFIs): EBRD Performance Requirements, IFC Performance Standards, and World Bank Group (WBG) General EHS Guidelines;
- Achieve a target of Zero significant environmental accidents;
- Assessing and minimizing potential impacts to the community, worker and the environment;
- Establishing and maintaining an Environmental and Social Management System (ESMS) which identifies objectives and targets, risks and hazards, responsibilities, and includes systems of monitoring and reporting as well as incident and accident reporting and investigation;
- Realizing continual improvement in E&S performance by developing indicators, through monitoring and auditing performance, and by implementing corrective actions where needed;
- Reporting externally on E&S performance and encouraging dialogue with employees, local communities and other stakeholders to promote awareness;
- Setting and achieving targets that promote the efficient use of natural resources;
- Minimizing and managing all waste streams and where waste is generated ensure that it will be handled and disposed of safely and responsibly; and,
- Ensuring Policy is disclosed at all Project facilities and ensure that Developer's employees and contractors, are made aware of this Policy and are adequately trained to manage the E&S risks and impacts of their actions.

### 3.1.2 Lender requirements

The Project is committed to align with IFC PS6 (IFC 2012, 2019) and EBRD PR6 (EBRD 2019, 2023), and other good international industry practice (GIIP) guidance such as the World Bank Group's Environmental Health and Safety Industry General and Sectoral Guidelines on Wind Energy (World Bank Group 2015). Specific PS6 and PR6 requirements applicable to this BAP are highlighted in the relevant sections of this document. As part of these requirements, NG is required for those biodiversity values for which the Project is in an area of CH. Gains can either be generated via biodiversity offsets (that achieve measurable, additional outcomes) where the Project has impacts to CH values or via supporting additional conservation activities that are focused on CH values for which the Project has no impact. A minimum of NNL is required for PBFs and, where feasible, for NH.

## 4 Biodiversity context

The Project is in the Red Sea Coastal Desert Ecoregion (Dinerstein *et al.* 2017) and occurs in an 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 flora and fauna (EcoConServ *et al.* 2024a). Most vegetation occurs in the wadis, where the small shrub *Ochradinus baccatus* is frequent (Grontmij & EcoConServ 2010).

The Project is sited on a gently sloping sand plain at ~70–130 m above sea level and lies approximately 8 km inland from the Gulf of Suez coast to the east and 15 km from the edge of the escarpment (northern Red Sea Mountains) to the west. Within and around the Project area are several wadis, which drain the escarpment. The local area contains a number of existing wind farms and small oil fields, along with several small agricultural operations (e.g. poultry farms, date palm plantations, some crops) immediately south of the Project area (Grontmij & EcoConServ 2010).

The Project occurs within the Red Sea/Rift Valley flyway (Figure 2) for migratory soaring birds which connects breeding grounds in Europe with wintering areas in Africa (BirdLife International 2015). This flyway is used by over 1.5 million individuals from 37 species of species, as well as a suite of migratory passerines and other bird groups (BirdLife International 2015). The Project is also entirely within the Gebel El Zeit Key Biodiversity Area<sup>2</sup> (KBA) and Important Bird Area<sup>3</sup> (IBA). This KBA 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. This IBA is 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 KBA is identified as a 'bottleneck' site on the Red Sea/Rift Valley flyway by BirdLife International<sup>4</sup>.

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<sup>2</sup> <https://www.keybiodiversityareas.org/site/factsheet/6217>

<sup>3</sup> <https://datazone.birdlife.org/site/factsheet/gebel-el-zeit-iba-egypt>

<sup>4</sup> <https://datazone.birdlife.org/birdlife-is-working-to-mainstream-soaring-bird-conservation-along-the-rift-valley/red-sea-flyway>

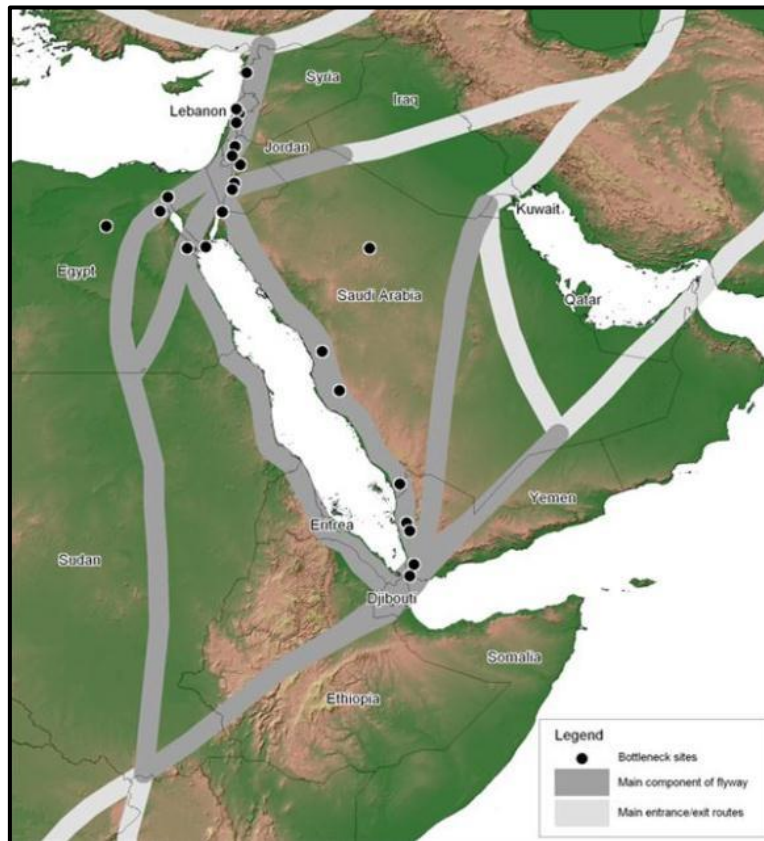


Figure 2: Map of the main elements of the Rift Valley/Red Sea flyway showing key bottleneck sites  
(Source: BirdLife International)

## 4.1 Priority biodiversity values

### 4.1.1 Overview

This BAP focuses on biodiversity features which require special management measures rather than all biodiversity. The priority biodiversity features for this BAP are those within at least one of the categories below (elaborated in subsequent sections), and which are likely to be affected by the Project:

- Critical Habitat-qualifying species under the IFC PS6 and EBRD PR6;
- Species classified as Priority Biodiversity Features under the EBRD PR6; or,
- Species considered as Priority Valued Environmental Components.

### 4.1.2 Critical Habitat values

Areas of “high biodiversity value” are termed Critical Habitat by both the IFC and EBRD. Such a designation is based on the presence and/or quantity of significant types of biodiversity (e.g., threatened species, highly threatened ecosystems) and is independent of the condition of the habitat. The Critical Habitat Assessment for the Project (EcoConServ *et al.* 2024c) identified that the Project is in an area of Critical Habitat for ten species (Table 1), all of which are migratory soaring birds.

For these species the Project is required to demonstrate (IFC 2012, paragraph 17):

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

This BAP describes the Project's mitigation strategy to achieve net gain for these species in Section 6.

*Table 1. Biodiversity priority species for the Project.*

Taxa	Scientific name	English name	IUCN Category <sup>a</sup>	Critical Habitat species <sup>b</sup>	Priority Biodiversity feature <sup>b</sup>	Priority VEC <sup>c</sup>
Birds	<i>Accipiter brevipes</i>	Levant Sparrowhawk	LC	Yes	No	Yes
	<i>Aquila nipalensis</i>	Steppe Eagle	EN	Yes	No	Yes
	<i>Aquila heliaca</i>	Eastern Imperial Eagle	VU	Yes	No	Yes
	<i>Buteo buteo vulpinus</i>	Eurasian (Steppe) Buzzard	LC	Yes	No	Yes
	<i>Ciconia ciconia</i>	White Stork	LC	Yes	No	Yes
	<i>Ciconia nigra</i>	Black Stork	LC	Yes	No	Yes
	<i>Circus macrourus</i>	Pallid Harrier	NT	No	No	Yes
	<i>Clanga clanga</i>	Greater Spotted Eagle	VU	No	Yes	Yes
	<i>Grus grus</i>	Common Crane	LC	Yes	No	Yes
	<i>Hieraaetus pennatus</i>	Booted Eagle	LC	No	No	Yes
	<i>Milvus migrans</i>	Black Kite	LC	No	No	Yes
	<i>Neophron percnopterus</i>	Egyptian Vulture	EN	Yes	No	Yes
	<i>Pelecanus onocrotalus</i>	Great White Pelican	LC	Yes	No	Yes
	<i>Pernis apivorus</i>	European Honey-buzzard	LC	Yes	No	Yes
Reptiles	<i>Uromastix aegyptia</i>	Egyptian Spiny-tailed Lizard	VU	No	Yes	No

<sup>a</sup> LC = Least Concern, EN = Endangered, VU = Vulnerable and NT = Near Threatened.

<sup>b</sup> As defined in the Critical Habitat Assessment (EcoConServ et al. 2024b).

<sup>c</sup> As defined in the Cumulative Effects Assessment (EcoConServ et al. 2024a).

#### 4.1.3 Priority Biodiversity Features

In addition to CH values, EBRD also considers a suite of PBFs which are of lower concern, but still important for a project to consider (EBRD 2019, 2023). The Project CHA (EcoConServ et al. 2024c) classified two species, the Egyptian Spiny-tailed Lizard (*Uromastix aegyptia*) and Greater Spotted Eagle (*Clanga clanga*) as PBFs (Table 1). According to EBRD PR6, the Project must achieve an NNL for PBFs. The Project's mitigation strategy to achieve NNL for these features will

be described in 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.

#### 4.1.4 Priority VECs

Valued Environmental 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. Priority VECs are those at highest risk of cumulative 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 of highest risk. Identification of Priority VECs for the Project has been undertaken in a Cumulative Effects Analysis (CEA) (EcoConServ *et al.* 2024b), which identified 14 priority VECs and set accompanying acceptable impact thresholds for each species. Priority VECs for the Project include all the bird species described in the last two sections as CH-qualifying and as PBFs plus Booted Eagle (*Hieraaetus pennatus*), Pallid Harrier (*Circus macrourus*) and Black Kite (*Milvus migrans*) (Table 1). The Project's goal for these additional VECs is NNL.

## 5 Potential impacts on biodiversity

This section provides an overview of potential biodiversity impacts related to the wind farm and transmission line for the Project's construction and operation phases. The impacts mentioned have been compiled and interpreted from the Project ESIA (EcoConServ *et al.* 2024a) and impacts and mitigation actions in relevant sector guidelines (Bennun *et al.* 2021; OCDE 2024).

Mitigation measures for the predicted impacts are presented in Section 6 and a quantitative residual impact assessment, assuming the successful implementation of the mitigation measures, is presented in Section 7 of this BAP.

### 5.1 Construction impacts

For both the wind farm site and along the transmission line, impacts are associated with the installation of turbines, transmission line pylons and associated infrastructure (e.g., access roads, hard stands, buildings). These activities will primarily affect the Egyptian Spiny-tailed Lizard through habitat loss and degradation and direct loss of individuals. Also, species could be impacted due to:

- Disturbance due to noise, light and human presence (machinery, vehicles, blasting);
- collision with vehicles; and,
- hunting pressure by project staff.

### 5.2 Operational impacts

The main impact of the operational wind farm is the collision of susceptible bird with turbines. Turbines may also act as a barrier to the normal movements of some bird species.

Electrocutions of birds may also occur at transmission pylons, while collisions of birds may occur with wires of the transmission line. The transmission line may also act as a barrier to the normal movements of some bird species.

Impacts to the Egyptian Spiny-tailed Lizard during operation are related to:

- Disturbance due to noise, light, and human presence (machinery, vehicles, blasting);
- collision with vehicles; and,
- hunting pressure by project staff.

## 6 Mitigation Strategy

### 6.1 Mitigation hierarchy

The mitigation measures adopted by the Project follow the mitigation hierarchy of avoid, minimise, restore, and compensate/offset (Figure 3). 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 impact. Such actions reduce the likelihood or magnitude of biodiversity impacts, but 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/offset actions to achieve an overall NNL for NH (where feasible), PBFs and Priority VECs, and NG for CH-qualifying features will need to be developed.

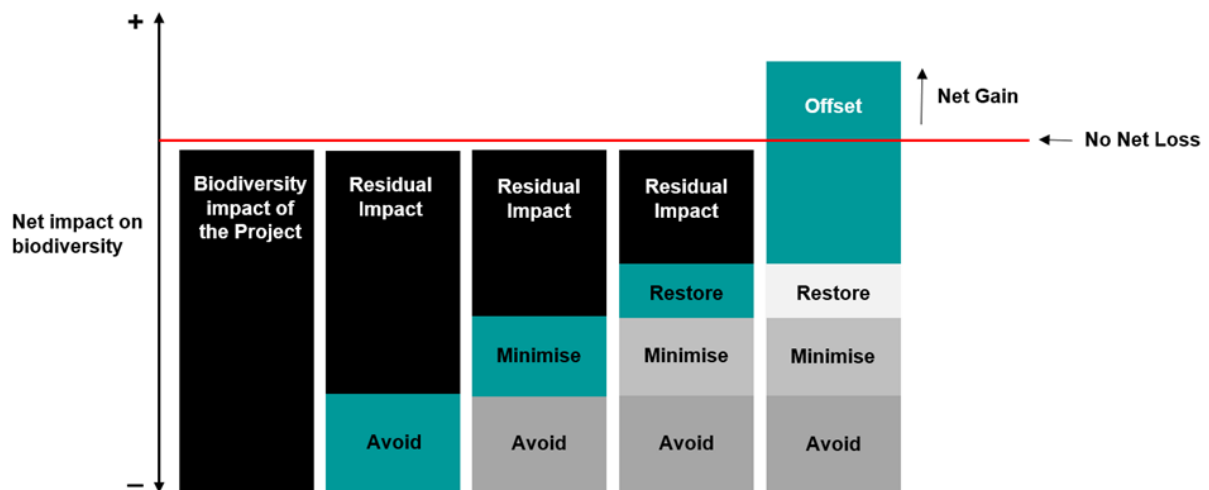


Figure 3. The Mitigation Hierarchy and delivery of net positive impact on biodiversity.



## 6.2 Mitigation actions

The overall approach to mitigation is detailed within the Project ESIA (EcoConServ *et al.* 2024) and BMP (EcoConSer & ECO Consult 2024) and should be referred to for detailed information. The following sections summarise the relevant mitigation actions for priority biodiversity values, birds and the Egyptian Spiny-tailed Lizard.

### 6.2.1 Priority Birds

**Avoidance** of impacts is not possible without moving the wind farm which is in unfeasible given the existing and planned neighbouring farms.

Soaring bird collision mortality has been identified as the main biodiversity risk associated with the Project. **Minimisation** of these impacts on migratory soaring birds will occur from the start of operation through the adoption of Shut-Down on Demand (SDOD) following the protocols established in the Active Turbine Management Program (ATMP) for Wind Power Projects in the Gulf of Suez (e.g., GreenPlus 2021, GreenPlus 2022, NREA & SafeSoar 2023). The general principles to comply with established protocols are described below.

SDOD bird monitoring will occur place during 90 days during spring (20 February – 20 May) and 78 days during autumn (12 August – 28 October), covering the full migration periods for soaring birds in the region. The monitoring will last for 10 – 12 hours each day, between c. one hour after sunrise and c. one hour before sunset.

A set of Vantage Points (VPs) for monitoring flight activity and to facilitate effective SDOD will be defined, ensuring all the turbines and a buffer area will be covered by constant observation. The buffer will ensure that enough time is available for turbines to be shut down when birds approach. Observers at vantage points will use walkie-talkies (and mobile phones, as a backup) to communicate between each other and the SCADA coordinator (when a shutdown is necessary). Observers will work in pairs and in shifts to ensure a vigilance throughout the daily survey period. During the SDOD monitoring, observers will detect and count all migratory soaring birds in the Project area and map their movements. They also will evaluate collision risk and determine whether one or more wind turbines should be temporarily shut-down, based on pre-determined shut-down criteria, that include:

- *Condition 1 – Threatened species*  
Whenever a targeted soaring bird(s) of a threatened species (according to up-to-date IUCN Red List) is detected in the wind farm area or heading towards it at risky flight altitudes ( $\leq 200$  m).
- *Condition 2 – Flocks with 10 or more targeted soaring birds*  
Whenever flocks with 10 or more soaring birds are detected in the wind farm area, or heading towards it, at risky flight altitudes ( $\leq 200$  m).
- *Condition 3 – Imminent risk of collision*



Even when the previous conditions are not met, one or more turbines should be shut down whenever there is an imminent high risk of collision of migratory soaring bird(s) with turbine(s).

- *Condition 4 – Extreme weather*

Turbines should be shut down during extreme weather events (e.g., sand/dust storms) or other precarious events that threaten the safety of the monitoring team or the targeted soaring birds, whenever conditions 1 or 2 have been verified in the two hours that preceded the event.

- *Condition 5 – Roosting inside or near windfarm area*

Whenever bird(s) of a threatened species (Condition 1) or flocks with 10 or more soaring birds (Condition 2) is detected roosting or attempting to roost inside or near the windfarm area ( $\leq 2000$  m), risky turbines should be shut down until the bird(s) depart the risk zone, or until the risk is assessed as low by the Field Coordinator.

Existing and future data on bird monitoring, bird behavioural variables, site specific characteristics and weather data and other relevant data will be used to:

- define/delimit the key flight activity periods at the Project area;
- identify high-risk areas and times, and definition of groups of turbines by zones for the SDOD Program and achieve effective coverage throughout the Project;

This information could then be used to establish a predictive fixed shutdown of some or all turbines located in the identified sensitive areas during the sensitive periods, and could lead to increased mitigation effectiveness. The use of a Radar Systems (RSs) approach to assist visual observations using VPs is also under consideration, being dependent of the approval from the responsible military authorities. Their use will only be considered if approval for their optimal location is approved.

The final detailed delineation of the ATMP will be coordinated by the Developer and RCREEE, and will be described in future update versions of this BAP.

Also, in order to increase visibility of the turbines, and thus increase natural avoidance behaviour, a single blade will be painted black from the tip to halfway up the blade. This BAP assumes that painting will occur on all blades, however the ESIA is not clear on this point (EcoConServ *et al.* 2024c).

**Minimisation** of impacts in the Overhead Transmission Line (OHTL) will be through the installation of Bird Flight Diverters (BFDs) on all Project transmission lines and ensuring that transmission lines, especially pylons, are designed to be wildlife-friendly. BFDs will be installed every 10 m along the entire length of the OHTL and on the shield wire. All BFDs installed will be dynamic (e.g. move in the wind) to increase visibility. The BFDs installed within the IBA and within 4 km of the dam in Plot 2 will include models that glow or light up at night (e.g. FireFly diverters) to increase visibility for birds staging in the area and arriving late or leaving early.

Onsite **restoration** of habitats is not possible for these species as none are likely to regularly use any terrestrial habitat present.

The requirement for **offsets** for priority birds is discussed in Chapter 8.

#### 6.2.1.1 Proposed improvements in mitigation

The mitigation of Project's impacts on birds can be further enhanced if other improvements opportunities, resulting from the acquired knowledge from other projects in the area (TBC 2023; Camiña Cardenal *et al.* 2024) are added to the ATMP described in the ESIA and presented in the previous section (Table 2). Exploration of the effects of implementing these additional mitigation actions on the residual impacts of priority birds is discussed in Chapter 7.

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

Improvement action	Stage	Potential for reducing collision fatalities
Standardization of SDOD and PCFM protocols, including details on the chain of responsibility and sequence of actions for successful implementation of shutdowns. Supervision of the SDOD and PCFM by a wildlife expert with a proper background on data collection.	Planning	Low
'Results from bird monitoring and PCFM will inform on the need to extend the SDOD period for migratory seasons'. 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
Development of a Carcass Management Plan to keep the project area and its surroundings free of carcasses. This should be maintained for the life of the project, alone, or in cooperation with other developers, which could be potentially affected. Support the development of a Carcass Management and Social Action Plan to manage the dead chicken from the farms in the surroundings to decrease bird collision risks	Field work	Moderate
Extend the daily observation periods to 12 consecutive hours to cover the full day light period	Field work	Moderate
Reduce the number of WTGs monitored by each VP (ideal ratio of 1 VP to 4 WGT) and the average distance between monitored WTGs and VPs, as collisions are more likely at WTGs at 750 m – 1,500 m from VPs (Camiña Cardenal <i>et al.</i> 2024). Adopt an equal monitoring effort among VPs.	Field work	High
Install one or more additional radio repeaters in strategic location(s) within the Project area to improve the communication between the field coordinators and the SCADA coordinator.	Equipment	Moderate
Use of two radars in both monitoring seasons (spring and autumn) located in locations selected by experienced radar ornithologists. Radar operators should also receive comprehensive training in all aspects of RASOD, including bird migration.	Equipment	High

Improvement action	Stage	Potential for reducing collision fatalities
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 SDOD 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

### 6.2.2 Egyptian Spiny-tailed Lizard

Project impacts to the Egyptian Spiny-tailed Lizard is primarily the destruction of habitat, plus the potential loss of, or disturbance to, individuals from construction activities (noise, light, vibration) and human presence (machinery, vehicles, blasting), collision with vehicles and increased hunting pressure by project staff.

Pre-construction surveys for sensitive species of herpetofauna have taken place, allowing to map the locations of known/active burrows used by Egyptian Spiny-tailed Lizard throughout the Project Area. Detailed design for the final layout will consider the results of these pre-construction surveys and Project infrastructure will be sited to avoid the identified burrows to the greatest extent possible. Where this is not possible, or where fresh burrows are identified at the commencement of clearance works, these burrows will be excavated by hand and the animals captured and translocated.

Prior to work in an area containing Spiny-tailed Lizard burrows any remaining burrows within 50 m of proposed works will be re-checked by an ecologist using an endoscope and if empty dug out and destroyed. If any animal is found back in the working areas the burrow will be dug out carefully by hand and the animal captured and placed in a secure box before taking to a cool location ready for translocation to the receptor site. Once the lizard is removed from the burrow the hole will be collapsed and made unsuitable for future use.

Capture and movement of Spiny-tailed Lizards will only be completed as a last resort. All works will be completed at least 50 m from active burrows. Locations where burrows are present between 50 and 100 m of construction will be monitored throughout the construction period and if significant negative impacts (i.e., abandonment of burrows or increased mortality) are observed the remaining burrows in closest proximity will be excavated and the animals translocated to holding areas in accordance with the below protocols for the duration of the construction window in that location.

If areas suitable for translocation exist within the Project Area these will be prioritized as this minimizes the impacts of transporting animals away from the Project site. If no such sites exist,

suitable sites within 10 km of the Project area will be identified for future release of individuals. Any suitable translocation receptor site must:

- Contain appropriate vegetation for the species, considering both food and cover;
- Have suitable soil types to allow animals to dig and create new burrows; and,
- Not already be close to carrying capacity for this species.

Studies have shown (O'Donovan & O'Riordan 2018) that soft releasing Spiny-tailed Lizards leads to a better survival rate than simply releasing the animals into a new site so any animal which is translocated will be soft-released into an individual mesh enclosure within an area of suitable habitat. The pen will measure at least 2 m x 2 m and be covered to provide shade and prevent attack from above. A "starter hole" will be dug using a 20 cm auger to a depth of approximately 30 cm to provide some initial shelter. Supplementary feeding will also be undertaken and after a period of seven days the enclosure will be removed to allow the lizards to move and forage naturally.

The following measures will also be implemented to minimize onsite disturbance on the species:

- Promote awareness among staff and contractors of the ban on hunting and train them in the environmentally appropriate procedures to follow on site during construction and operation;
- If the use of explosives is necessary during construction, pre-cutting techniques and the use of micro-retarders should be used, thus attenuating the intensity of the vibrations produced;
- Establish low-speed traffic rules and adequate signposting on the project's roads/accesses to reduce the likelihood of road kills.

## 7 Residual impact assessment

### 7.1 Birds

The predicted residual impacts used in this BAP are based on fatality estimates provided by the Client for the wind farm prior to mitigation and for the OHTL (EcoConsult & Turnstone Ecology 2024) (grey columns in Table 3). Use of these values in the BAP does not suggest or imply endorsement of those values as correct – TBC has not reviewed the raw data and analysis approach used to derive those values.

There were two additional steps to derive a residual fatality estimate from the collision values:

- Fatality estimates for collisions with turbine blades were adjusted by the effectiveness of the proposed ATMP mitigation, which is assumed to reduce fatalities by 98%; and,
- These adjusted fatality predictions were then compared with actual fatalities from Post-Construction Fatality Monitoring at the adjacent Blade wind farm (TBC 2023), as fatalities predicted from CRM may not strongly correlate with actual fatalities.

The higher value from the CRM predictions adjusted by the ATMP effectiveness or the fatalities reported from Blade was considered the annual fatality prediction for the Project. For three species, Pallid Harrier, Booted Eagle and Black Kite there were no results from the CRM model, and the PCFM results from the Project Blade (TBC 2023) were used.

No modifications were made to the fatality values predicted on the OHTL.

Annual estimated fatalities for the Project totalled 41 soaring birds (Table 3) mostly associated with collision with the OHTL. Predicted fatalities include: 19 White Stork (*Ciconia ciconia*), 11 European Honey-buzzard (*Pernis apivorus*), five Eurasian (Steppe) Buzzard (*Buteo buteo vulpinus*), four Black kite, one Steppe Eagle, one Great White Pelican (*Pelecanus onocrotalus*) and one Levant Sparrowhawk (*Accipiter brevipes*).

Apart from the minimisation measures the Project has committed to implement (see Section 6.2.1.), some improvements to reduce collision risk could be obtained with the implementation of the actions described in Table 2. If these were implemented by the Project, mitigation effectiveness is assumed to increase to 99%. Applying this improved mitigation to the collision fatality estimates would result in a predicted annual fatality estimate of 32 individuals (pale blue columns in Table 3): one each for Levant Sparrowhawk, Great White Pelican and Steppe Eagle, three Black Kite, four Eurasian (Steppe) Buzzard, nine Eurasian Honey Buzzard and 15 White Stork (see the final column of Table 3). Therefore, the adoption of this suggested additional mitigation would allow for a reduction in the predicted residual impacts and consequently would reduce the need for offsets and their magnitude.

These are predicted impacts, and PCFM is required to determine the actual fatalities of priority species. PCFM is essential to update the Project's residual impacts and to allow for adaptive management and mitigation during operation.

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

English name	Fatality threshold <sup>a</sup>	Max. annual collision fatalities	Predicted residual impacts from collisions <sup>b</sup>	Blade annual collisions <sup>c</sup>	Final predicted residual impacts from collisions	Predicted Residual Collisions WTG - Additional Mitigation <sup>d</sup>	Predicted residual impact from the OHTL	Predicted Project Residual Impact <sup>b</sup>	Predicted Project Residual Impact -Additional Mitigation <sup>d</sup>
Levant Sparrowhawk	0	0	0	0	0	0	1	1	1
Eastern Imperial Eagle	0	0	0	0	0	0	0	0	0
Steppe Eagle	0	0	0	0	0	0	0	1	1
Eurasian (Steppe) Buzzard	0	3	0	2	2	1	3	5	4
White Stork	0	19	0	9	9	5	10	19	15
Black Stork	0	0	0	0	0	0	0	0	0
Pallid Harrier	-	-	0	0	0	0	0	0	0
Greater Spotted Eagle	0	0	0	0	0	0	0	0	0
Common Crane	0	0	0	0	0	0	0	0	0
Booted Eagle	0	-	-	0	0	0	0	0	0
Black Kite	10	-	-	2	2	1	2	4	3
Egyptian Vulture	0	0	0	0	0	0	0	0	0
Great White Pelican	0	0	0	1	1	0	0	1	1
European Honey-buzzard	0	8	0	4	4	2	7	11	9

<sup>a</sup> As defined in the Cumulative Effects Assessment (EcoConServ et al. 2024a).

<sup>b</sup> Assuming that the ATMP reduces fatalities by 98%

<sup>c</sup> Based on PCFM data from TBC 2023.

<sup>d</sup> Assuming that the ATMP reduces fatalities by 99%

## 7.2 Egyptian Spiny-tailed Lizard

The devised mitigation actions targeting the Egyptian Spiny-tailed Lizard are considered adequate to ensure that there are no predicted significant residual impacts for the species associated to the Project area and accordingly no offsetting will be required.

## 8 Offset strategy

### 8.1 Offset approach

Biodiversity offsets and/or other forms of compensation are required to ensure overall NG of CH and NNL for NH, PBFs and priority VECs, in line with IFC PS6 and EBRD PR6.

Offsets should be used as the last resource in the mitigation hierarchy, if significant residual impacts remain after the previous steps of the mitigation hierarchy (avoidance, minimisation, restoration) have been implemented (e.g. CSBI & TBC 2015). Offsets can include off-site habitat restoration and actions that increase a species' survival or productivity (restoration offsets), and/or measures to stop the ongoing degradation and loss of biodiversity in existing designated sites or sites proposed for designation (averted loss offsets).

### 8.2 Offset principles

The development of potential offset actions should follow good practice (e.g. 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;
- **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; and,
- **Stakeholder participation:** Offsets will be based upon appropriate, extensive and transparent stakeholder consultation.

## 8.3 Offset governance

Biodiversity offsets are more likely to be feasible in contexts with clear institutional arrangements, good governance and management responsibility, including a high level of stakeholder involvement throughout. This provides a good basis for long-lasting implementation conservation actions. Important design principles for establishing this type of management system approach are to:

- Use existing governance structures wherever feasible;
- Ensure any new structures that are created are appropriate to the scale and stakeholders involved;
- Develop downward as well as upward accountability (implementation and financial) for all management structures; and,
- Ensure there is sufficient capacity and technical assistance within the governance and management structures to function efficiently.

## 8.4 Offset requirements and targets

No significant residual impacts are predicted for the single non-bird priority species (the Egyptian Spiny-tailed Lizard), and therefore the development of offsets is only necessary to attain the NG and>NNL goals for priority bird species: these goals are presented in Table 4.

*Table 4. Annual offset goals for biodiversity priority species for the Project (CH species shown in bold, for which NG is required).*

Scientific name	English name	Critical Habitat species	Predicted Project Residual Impact	Predicted Project Residual Impact - Additional Mitigation	Annual Offset target <sup>5</sup>
<b><i>Accipiter brevipes</i></b>	<b>Levant Sparrowhawk</b>	Yes	1	1	≥2
<b><i>Aquila nipalensis</i></b>	<b>Steppe Eagle</b>	Yes	0	0	≥1
<b><i>Aquila heliaca</i></b>	<b>Eastern Imperial Eagle</b>	Yes	1	1	≥2
<b><i>Buteo buteo vulpinus</i></b>	<b>Eurasian (Steppe) Buzzard</b>	Yes	5	4	≥6
<b><i>Ciconia ciconia</i></b>	<b>White Stork</b>	Yes	19	15	≥20
<b><i>Ciconia nigra</i></b>	<b>Black Stork</b>	Yes	0	0	≥1
<i>Circus macrourus</i>	Pallid Harrier	No	0	0	0
<i>Clanga clanga</i>	Greater Spotted Eagle	No	0	0	0
<i>Grus grus</i>	Common Crane	Yes	0	0	≥1

<sup>5</sup> No multipliers were used to take into account uncertainty in delivery and delays between impact and gains.



Scientific name	English name	Critical Habitat species	Predicted Project Residual Impact	Predicted Project Residual Impact - Additional Mitigation	Annual Offset target <sup>5</sup>
<i>Hieraetus pennatus</i>	Booted Eagle	No	0	0	0
<i>Milvus migrans</i>	Black Kite	No	4	3	4
<b><i>Neophron percnopterus</i></b>	<b>Egyptian Vulture</b>	<b>Yes</b>	<b>0</b>	<b>0</b>	<b>≥1</b>
<b><i>Pelecanus onocrotalus</i></b>	<b>Great White Pelican</b>	<b>Yes</b>	<b>1</b>	<b>1</b>	<b>≥2</b>
<b><i>Pernis apivorus</i></b>	<b>European Honey-buzzard</b>	<b>Yes</b>	<b>11</b>	<b>9</b>	<b>≥12</b>

## 8.5 Offset actions

Eight potential offset actions were considered for their potential to deliver the annual gains required by the Project for one or more target species. Four of these options are analysed in detailed in the Offset Feasibility Study while detailed information for the remaining four is not yet available.

Addition information on offsets options are provided in the Offset Feasibility Study, Appendix 1.

*Table 5. Target species for each offset option. X – main target species; o – secondary target species.*

English name	Retrofitting power lines in Kazakhstan	Retrofitting power lines in Egypt	Retrofitting power lines in Jordan	Program against illegal hunting/capture in the Middle East	Conservation actions for Sooty Falcon in Egypt/Middle East	Conservation actions for Great White Pelican in the Balkans	Program against illegal hunting/capture in Georgia	Program against illegal hunting/capture in Malta
Levant Sparrowhawk		o		X			X	
Steppe Eagle	X	o		X			X	
Eastern Imperial Eagle	X	o	X	X			o	
Eurasian (Steppe) Buzzard	X	X		X			X	
White Stork		X	X	X				
Black Stork		X	o	X			o	o
Pallid Harrier		o		X			o	
Greater Spotted Eagle		o		X				
Common Crane		X		X				o
Booted Eagle		o		X			X	o
Black Kite	o	X	X	X			X	o
Egyptian Vulture		o	X	o			o	o
Great White Pelican		X		o		X		

English name	Retrofitting power lines in Kazakhstan	Retrofitting power lines in Egypt	Retrofitting power lines in Jordan	Program against illegal hunting/capture in the Middle East	Conservation actions for Sooty Falcon in Egypt/Middle East	Conservation actions for Great White Pelican in the Balkans	Program against illegal hunting/capture in Georgia	Program against illegal hunting/capture in Malta
European Honey-buzzard		X		X			X	X

## 8.6 Additional actions to support conservation

The present version of the BAP does not propose specific additional actions to support conservation. However, in compliance with paragraph 20 of IFC's PS6 for projects within an Internationally Recognized Area (such as an IBA), the project "will implement additional programs, as appropriate, to promote and enhance the conservation aims and effective management of the area", and therefore such programs will be investigated in the final version of the BAP.

Should the Project wish to support conservation actions for priority biodiversity with no predicted impacts or non-priority biodiversity for the Project (e.g. Sooty Falcon; see Table 5), this would respectively either represent an additional action until a fatality is recorded - at which time it would automatically become an offset -, or an additional conservation action .

## 9 Next steps

### 9.1 Implementations

Development and implementation of the offsets will require a Biodiversity Offset Implementation Plan. This will be appended to future versions of the BAP and summarised in this section.

### 9.2 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 PS6. 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 the ESIA and this BAP.

As indicated in the Project ESIA (EcoConServ *et al.* 2024c) and BMP (EcoConServ & EcoConsult 2024a ), 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 of the turbines and OHTL and the programme of post construction monitoring 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.

Recent assessments of the current methods and analysis of the bird monitoring associated with windfarms at the Gebel El Zeit IBA (Camiña *et al.* 2024) suggest that specific monitoring of Project OHTLs should also occur immediately after each sandstorm. This is important to provide realistic information about the impact of this type of environmental event when bird visibility is minimal and manoeuvrability may be limited, likely increasing the likelihood of collision.

Installation of BFDs will be recorded by the Project Ecologist checked prior to the spring and autumn migration seasons to confirm they are in place and operational for these higher risk periods (EcoConServ *et al.* 2024c). Any damaged or defective BFDs will be replaced within two months of being reported as faulty.

Human activities related to poultry management in the surrounding area of the Project, in particular carcass dumping, could also acting as a factor of attraction of priority birds, increasing the collision risk for the Project. A previous dumping site within the Project area was cleaned but adjacent sites remain a risk. The monitoring of the location remains appropriate to ensure that dumping of carcasses does not resume and should be associated with the implementation of the recommended Carcass Management Plan

The success of the translocation of the Egyptian Spiny-tailed Lizard must be monitored, targeting the translocated individuals as well of non-translocated individuals in the receptor area and other 'control' populations with no intervention. This should include details of any translocations, and the long-term survival of translocated individuals compared to resident individuals.

For the agreed set of offset actions, the Project, in consultation with lenders and implementing partners, would need to:

- Agree on the level of quantification for any predicted gain, and define an agreed set of biological monitoring indicators to demonstrate gains to the level required; and
- Agree on process indicators to show that the action is proceeding in a manner to deliver the assumed gain (i.e. process indicators).

For many actions, the cost of quantifying gains may be disproportionately high compared with the cost of implementing the action. A pragmatic solution in some cases may be for there to be a collective agreement between the Project, lenders and implementing parties on likely gains from any effort or intervention so that the majority of funding can be allocated to implementation.

## 10 BAP implementation

### 10.1 Roles and responsibilities

The principal roles and responsibilities for the implementation of this BAP are outlined below, and follow the Project's Environmental and Social Management System (EcoConServ & EcoConsult 2024b). As the Project moves towards operation, additional plans may be required to operationalise the commitments made in this BAP.

The Project Company's Environmental & Social Manager will have overall responsibility for 1) coordinating the implementation of the BAP; 2) coordinate subsequent BAP updates after the Final BAP; and 3) communicate the BAP requirements to all relevant Project personnel and contractors. The Operations Manager will ensure that all parties comply with the requirements set out in this BAP, and will approve sufficient resources for the implementation of the BAP.

The biodiversity mitigation measures described in the ESIA and BMP (EcoConServ & EcoConsult 2024a; EcoConServ *et al.* 2024c) and summarised in Section 6 of this BAP, will be implemented by the EPC Contractor during construction and the Operation & Maintenance Contractor during Operation. The Environmental and Social Manager of the EPC Contractor will be responsible for the implementation of the construction and site-related mitigation measures, and they will report to the Project Company's Environmental Manager.

A Biodiversity Manager will be responsible for the overall implementation of all the biodiversity components during construction and operation.

The key to a successful BAP is the continuous monitoring of its actions and evaluation of their effectiveness in meeting the BAP objectives. The Project Company will employ a suitably qualified biodiversity specialist to monitor whether the specific actions in the BAP are being implemented and highlight requirements for adaptive management. The biodiversity monitoring required for the offset actions will be detailed in future versions of the BMEP and BAP, and will be developed once individual offset actions have been confirmed.

### 10.2 Budget considerations

Not included in this version of the BAP – estimates of costs for offset actions have been provided separately.

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## Appendix 1 Offset feasibility study

See separate Offset Feasibility Study document. In the final version, that document will be incorporated here.